INTERNATIONAL JOURNAL OF LATEST TECHNOLOGY IN ENGINEERING, MANAGEMENT & APPLIED SCIENCE (IJLTEMAS)

ISSN 2278-2540 | DOI: 10.51583/IJLTEMAS | Volume XIV, Issue X, October 2025

WOMB: A Web-Based System for Maternal Support and Infant Health Tracking With Integrated Data Analytics and Smart Algorithms

Lance Yzrael Mendoz., Mar Kenneth Geraldo., Harvey Daryl Francisco., Mark Lester Domingo., John Albert Regencia., Mike Kagakit

(SY 2025-2026) Arellano University, Pasig Campus

DOI: https://doi.org/10.51583/IJLTEMAS.2025.1410000025

Received: 17 October 2025; Accepted: 23 October 2025; Published: 05 November 2025

Abstract: The growing demand for accessible, efficient, and data-driven healthcare systems has encouraged the development of digital solutions addressing maternal and infant health challenges. In response, the researchers developed WOMB: A Web-Based System for Maternity Support and Infant Health Tracking with Integrated Data Analytics and Smart Algorithms, a platform designed to assist mothers and healthcare professionals in monitoring health data, improving record accuracy, and enhancing communication.

The WOMB system is a centralized, user-friendly web platform that strengthens the management of maternal and infant healthcare. It provides essential functions such as tracking infant growth, scheduling medical appointments, managing health records, and offering educational resources for both mothers and healthcare workers. Through data analytics and intelligent algorithms, the system generates predictive insights, automates reminders, and supports evidence-based healthcare decisions. Built using PHP, MySQL, HTML, CSS, and JavaScript, the system complies with ISO/IEC 25010 Software Quality Standards to ensure security, usability, functionality, and performance efficiency. Its beneficiaries include mothers, infants, and healthcare providers, as it promotes improved health tracking, organized digital record management, and better access to critical information. ISO/IEC 25010 is an international software quality standard that defines attributes such as functionality, reliability, and usability to evaluate software effectiveness.

This study utilized an Applied Research Design and adopted the Waterfall Model of the System Development Life Cycle (SDLC) to guide system creation and evaluation. The model involved six key phases—requirement analysis, system design, implementation, testing, deployment, and maintenance—to ensure structured and high-quality development. Data were collected through surveys, interviews, and observations from selected healthcare professionals and mothers to identify their needs and challenges in managing maternal and infant healthcare records. The Software Development Life Cycle (SDLC) is a structured process for planning, creating, testing, and deploying an information system efficiently.

A total of 60 respondents participated in the system evaluation, consisting of 40 user respondents (mothers and healthcare providers) and 20 technical respondents (IT specialists and system developers). They assessed the system using the ISO/IEC 25010 Software Quality Model, focusing on the attributes of functionality, reliability, usability, efficiency, maintainability, portability, and security. Statistical tools such as the weighted mean were applied to analyze the results, which showed overall average means of 3.50 for user respondents and 3.63 for technical respondents—both interpreted as Strongly Agree. ISO/IEC 25010 is an international software quality standard that defines attributes such as functionality, reliability, and usability to evaluate software effectiveness.

The evaluation results show that respondents found the system functional, secure, and easy to use for managing maternal and infant data. Usability received the highest rating among users, while functionality ranked highest among technical respondents. Although reliability obtained slightly lower ratings, it remained positive, suggesting only minor areas for improvement. Overall, the findings affirm that WOMB effectively meets international software quality standards and fulfills its purpose of promoting digital innovation in maternal and infant healthcare.

Keywords: Web-Based Application, Data Analytics, Smart Algorithms, ISO 25010, SDLC Waterfall Model, PHP and MySQL, Health Informatics, Predictive Analytics, WOMB System, Maternal Health, Infant Health Tracking, and User-Centered Design. The Software Development Life Cycle (SDLC) is a structured process for planning, creating, testing, and deploying an information system efficiently.

I. Introduction

Maternal and infant healthcare continues to experience persistent challenges across the globe, particularly in low-resource areas. Reports from the World Health Organization (WHO, 2023) and UNICEF (2024) indicate that preventable maternal and infant deaths remain alarmingly high due to inadequate access to skilled health professionals, limited health literacy, and inefficient monitoring systems. Many mothers are unable to receive consistent prenatal checkups, and infants often miss essential immunizations and developmental assessments. The COVID-19 pandemic further intensified these problems by disrupting healthcare operations in multiple regions. Despite technological progress in medicine, a large gap in maternal and infant care remains. Addressing these issues calls for the integration of digital innovations that can deliver timely healthcare, strengthen existing systems, and promote better health outcomes for both mothers and their children.

ISSN 2278-2540 | DOI: 10.51583/IJLTEMAS | Volume XIV, Issue X, October 2025

Founded in 2013, World of My Baby (WOMB) was established with the mission of providing compassionate and accessible prenatal imaging and wellness services. The organization's commitment to using advanced technology in a nurturing environment has made it a trusted name in prenatal care. Through services such as 2D/3D/4D ultrasound imaging, fetal biometry, and wellness monitoring, WOMB has supported thousands of families in visualizing and understanding their baby's development. Over the years, it has built strong partnerships with healthcare providers, offering accurate, detailed scans for both medical evaluation and emotional connection. The proposed WOMB web-based system builds upon this foundation by incorporating intelligent data analytics and predictive algorithms to deliver personalized healthcare support. It collects and analyzes maternal and infant health information to provide alerts, recommendations, and progress insights. With features like digital health tracking, educational resources, and communication tools, the system aims to strengthen maternal and infant care through accessible, data-driven, and proactive healthcare management.

The research seeks to develop and implement a comprehensive web platform for World of My Baby (WOMB) to improve service accessibility, efficiency, and maternal health management. The project addresses common issues such as uncoordinated appointment scheduling, limited online presence, and difficulty in managing health-related data. By designing a centralized web-based solution, WOMB aims to provide an organized, user-friendly platform that supports product browsing, appointment booking, and health record management. The system intends to enhance the experience of mothers and healthcare providers by streamlining workflows, reducing errors, and enabling smarter healthcare monitoring through integrated data analytics and predictive modeling.

General Objective:

To design and develop a web-based maternal and infant health management system that utilizes data analytics and smart algorithms to enhance healthcare monitoring, accessibility, and decision-making while ensuring compliance with the ISO/IEC 25010 software quality model.

Specific Objectives:

- Develop a user-friendly interface suitable for mothers with varying educational and technical backgrounds.
- Create a tracking module for monitoring pregnancy stages, infant growth milestones, and vaccination schedules.
- Implement automated alerts and reminders for prenatal visits, postnatal care, and immunizations.
- Integrate a library of educational content that provides accurate, easy-to-understand health information.
- Enable healthcare providers to monitor patient data, analyze trends, and provide personalized recommendations.
- Ensure the system's functionality aligns with ISO 25010 quality attributes, focusing on Functional Suitability, Usability, Reliability, Performance efficiency, and Security.

Scope

The proposed WOMB: Web-Based System for Maternal Support and Infant Health Tracking integrate multiple modules that cater to both mothers and healthcare providers. The system is designed to serve as an all-in-one digital platform for managing maternal and infant healthcare activities, offering accessibility, organization, and efficiency. It allows users to create accounts and securely log in, ensuring that each user—whether a mother or healthcare provider—has a customized experience aligned with their role.

WOMB system is intended to improve coordination between mothers and healthcare professionals, support timely medical interventions, and reduce manual record-keeping. It also aims to make health monitoring more accessible in both clinical and community settings by providing an intuitive, responsive, and data-driven platform.

Limitation

The WOMB: Web-Based System for Maternal Support and Infant Health Tracking has certain constraints that define the extent of its implementation and functionality. These limitations are recognized to ensure that users and stakeholders understand the system's proper scope of use and technological boundaries. These are:

- Internet Connectivity Requirement – The system operates entirely online, meaning users must have a stable internet connection to access its features. It does not support offline use.
- Not a Substitute for Professional Medical Diagnosis – While the platform assists in tracking and managing health data, it is not designed to replace consultations with medical professionals or serve as an emergency response tool.
- Intended for Individual or Community Use – The system is primarily developed for personal use or deployment within local healthcare centers and community clinics.
- Dependence on User Input Accuracy – The reliability of the system's data analytics, recommendations, and generated reports depends heavily on the accuracy and consistency of the information provided by users.

These limitations are acknowledged to maintain transparency and guide future system improvements. They also highlight areas for potential enhancement, such as enabling offline functionality, expanding scalability for larger institutions, and incorporating validation features to ensure data accuracy.

Theoretical Framework

ISSN 2278-2540 | DOI: 10.51583/IJLTEMAS | Volume XIV, Issue X, October 2025

The WOMB: Web-Based System for Maternal Support and Infant Health Tracking is anchored on several theoretical foundations that guided its system design, data processing, and service functionality. These include the Health Informatics Model, the SERVQUAL Model, and the Machine Learning and Analytics Model (Algorithmic Framework). Each framework supports a distinct component of the system, ensuring that it is not only technologically robust but also data-driven, service-oriented, and user-centered.

1. *Machine Learning and Analytics Model (Algorithmic Framework)*

The Machine Learning and Analytics Model serves as the analytical foundation of the WOMB system, enabling it to transform raw health data into meaningful and predictive insights. This framework is based on the principle that algorithms can identify patterns from collected data, learn from them, and generate intelligent outputs that assist both mothers and healthcare professionals.

In the WOMB system, the machine learning and analytics components perform several essential functions:

- Data Pattern Recognition: The system analyzes historical maternal and infant health data to identify trends, such as growth progress and appointment consistency.
- Predictive Analysis: Using algorithmic logic, the system generates reminders and forecasts upcoming health activities, like vaccination schedules or checkup intervals.
- Automated Alerts and Recommendations: Through built-in algorithms, WOMB notifies users of potential health concerns or missed appointments, helping promote proactive healthcare management.
- Continuous Learning: The algorithm adapts over time based on user input, improving the accuracy of its health predictions and data analytics with each use.
- The integration of machine learning and analytics ensures that the WOMB system operates intelligently — not just storing information, but also analyzing and interpreting it to guide informed healthcare decisions. This model enhances the system's effectiveness, efficiency, and scalability by turning data into actionable insights that support maternal and infant well-being.

2. Health Informatics Model

The Health Informatics Model emphasizes the integration of information and communication technologies (ICT) in healthcare for efficient data collection, management, and analysis. It serves as the foundation for organizing, storing, and processing health-related information in digital form.

In the WOMB system, this theory is reflected through its centralized health database, automated scheduling, and record monitoring features. The platform allows users and healthcare providers to input and access accurate medical data such as infant growth records, vaccination schedules, and prenatal checkups. By applying informatics principles, WOMB improves healthcare data reliability, enhances communication between users and professionals, and supports informed medical decision-making through digital health insights.

SERVQUAL Model

The SERVQUAL model focuses on delivering and measuring service quality through five key dimensions: reliability, responsiveness, assurance, empathy, and tangibles.

Conceptual Framework

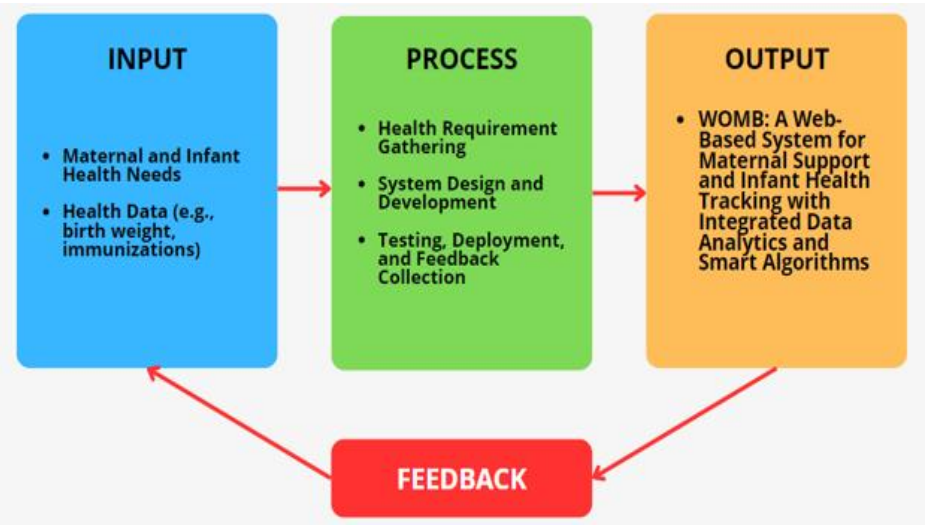

Figure 1: Conceptual Framework

ISSN 2278-2540 | DOI: 10.51583/IJLTEMAS | Volume XIV, Issue X, October 2025

The conceptual framework of the *WOMB: Web-Based System for Maternal Support and Infant Health Tracking* is designed based on the Input–Process–Output (IPO) Model, which illustrates the logical flow of the system from data collection to outcome generation.

Input

The *input* stage involves collecting vital information and resources necessary to design and implement the system.

Process

The *process* stage focuses on the steps and activities that transform the collected inputs into functional components of the system.

Output

The *output* represents the final system and its intended benefits.

The *Feedback* component allows continuous evaluation and enhancement of the WOMB system. It involves gathering responses from both users (mothers and healthcare workers) and technical experts to identify issues, assess satisfaction, and suggest improvements. This feedback loop ensures that the system remains updated, secure, and aligned with user needs. Additionally, analytical data generated from user interactions are used to refine algorithms and improve system accuracy and performance.

Significance of the Study

This study is significant as it contributes to improving maternal and infant healthcare through the integration of digital technology, data analytics, and intelligent systems. These groups are:

- For Mothers: The system provides a convenient and reliable digital platform that empowers mothers to make informed decisions about their health and their infant's well-being.
- For Healthcare Providers: Healthcare workers and midwives benefit from improved patient monitoring and record management.
- For Community Clinics: The WOMB system can be utilized by barangay health centers and small community clinics as a supplemental tool for maternal and infant health programs.
- For Researchers and Developers: Future researchers and system developers can use this study as a reference for developing similar technology-driven healthcare systems.

II. Review of Related Literature

Chen et al. (2020) conducted a randomized controlled trial in Australia to evaluate the effects of a web-based intervention designed to enhance maternal self-care and reduce postnatal depression among first-time mothers. The study revealed that mothers who accessed structured educational content and self-monitoring tools through the platform exhibited significant improvements in their mental health and self-efficacy. This supports the WOMB system's goal of promoting maternal well-being by offering accessible educational resources and digital self-monitoring features.

In a related study, Lee and Park (2021) developed a mobile-integrated maternal health monitoring system in South Korea that allowed real-time tracking of vital signs, fetal development, and dietary patterns. Their findings showed that the system improved prenatal care compliance and strengthened communication between healthcare professionals and expectant mothers. The WOMB system expands upon these findings by including both maternal and infant tracking functionalities, incorporating data analytics for enhanced health visualization and prediction.

Bautista et al. (2022) investigated the use of eHealth tools in maternal and child healthcare in rural areas of Luzon. Their study found that digital health applications significantly improved antenatal visit attendance and enabled midwives to manage records more efficiently. The WOMB system aligns with this by centralizing data and providing a user-friendly platform that enhances coordination between healthcare providers and mothers.

Synthesis

The reviewed literature emphasizes the growing influence of digital technologies in improving maternal and infant health outcomes. International research, including studies by Chen et al. (2020) and Lee & Park (2021), revealed that online and mobile-based healthcare platforms enhance maternal self-care, reduce postpartum complications, and strengthen communication between mothers and healthcare providers. Similarly, Zhang et al. (2019) and Thompson & Ng (2020) highlighted the value of integrating data analytics, automated reminders, and educational modules into maternal health systems, which enable early detection of potential health issues and promote proactive healthcare management. These findings collectively align with the objectives of the WOMB system, which seeks to utilize intelligent algorithms and data-driven approaches to support continuous healthcare monitoring and improved decision-making for both mothers and infants.

In the Philippine context, studies by Bautista et al. (2022), Rivera & Santos (2021), and institutional reports from the Department of Health (DOH, 2021) and the Philippine Institute for Development Studies (PIDS, 2020) affirm the necessity of accessible,

ISSN 2278-2540 | DOI: 10.51583/IJLTEMAS | Volume XIV, Issue X, October 2025

culturally sensitive, and user-friendly digital healthcare tools, particularly for underserved communities. Building on these global and local insights, the *WOMB: Web-Based System for Maternal Support and Infant Health Tracking* integrates maternal and infant health monitoring, automated notifications, and educational features to provide a holistic and adaptive digital healthcare solution. Overall, the synthesis demonstrates that the WOMB system effectively responds to the limitations of traditional maternal healthcare systems by merging technology, accessibility, and user-centered design to promote better health outcomes for mothers and their infants.

III. Methodology of the Study

This study uses an Applied Research Design, focusing on the creation of a practical digital solution aimed at improving maternal and infant healthcare services.

The research is conducted in selected community health centers, involving mothers, midwives, and healthcare workers as key participants. A purposive sampling technique is utilized to ensure that the respondents are individuals directly engaged in maternal and infant care. This approach allowed the researchers to gather relevant, experience-based insights essential for designing a user-centered and functional web platform.

To gather essential information, the researchers used a combination of survey questionnaires and direct observations.

The collected data served as the foundation for the system's design and functionality. Moreover, system usage logs and feedback forms are analyzed to assess the platform's usability, performance, and user satisfaction. All data collection procedures followed ethical research standards, including informed consent and compliance with the Data Privacy Act of 2012, ensuring the confidentiality and security of all gathered information.

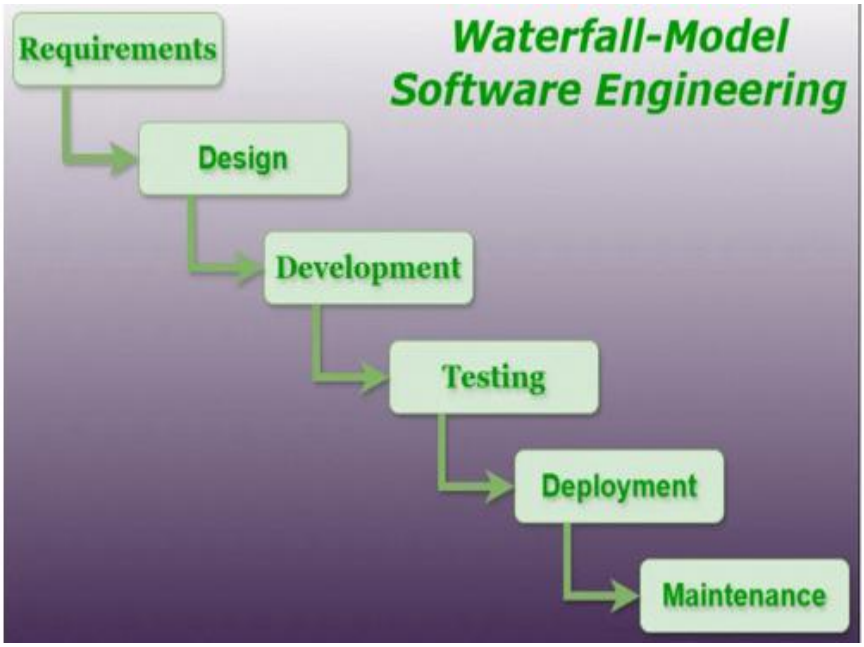

Figure 2: SDLC Waterfall Model

The Software Development Life Cycle (SDLC) is a structured process for planning, creating, testing, and deploying an information system efficiently.

The WOMB system follows the Waterfall Model of the System Development Life Cycle (SDLC), which provides a clear, sequential framework for developing and maintaining the system. This model is chosen because of its structured nature, ensuring that each phase is completed before the next begins — suitable for a healthcare project that demands accuracy, reliability, and documentation. The Software Development Life Cycle (SDLC) is a structured process for planning, creating, testing, and deploying an information system efficiently.

The database design of the WOMB system is structured to manage maternal and infant health data efficiently while ensuring scalability and security. It includes both the logical and physical structure of data storage to support the system's main functions such as health tracking, appointment scheduling, and data analytics.

The database stores information on users, healthcare providers, mothers, infants, and their respective health records. It maintains the relationships among these entities to ensure smooth data flow and integrity. Shown below is an illustration of its context diagram.

ISSN 2278-2540 | DOI: 10.51583/IJLTEMAS | Volume XIV, Issue X, October 2025

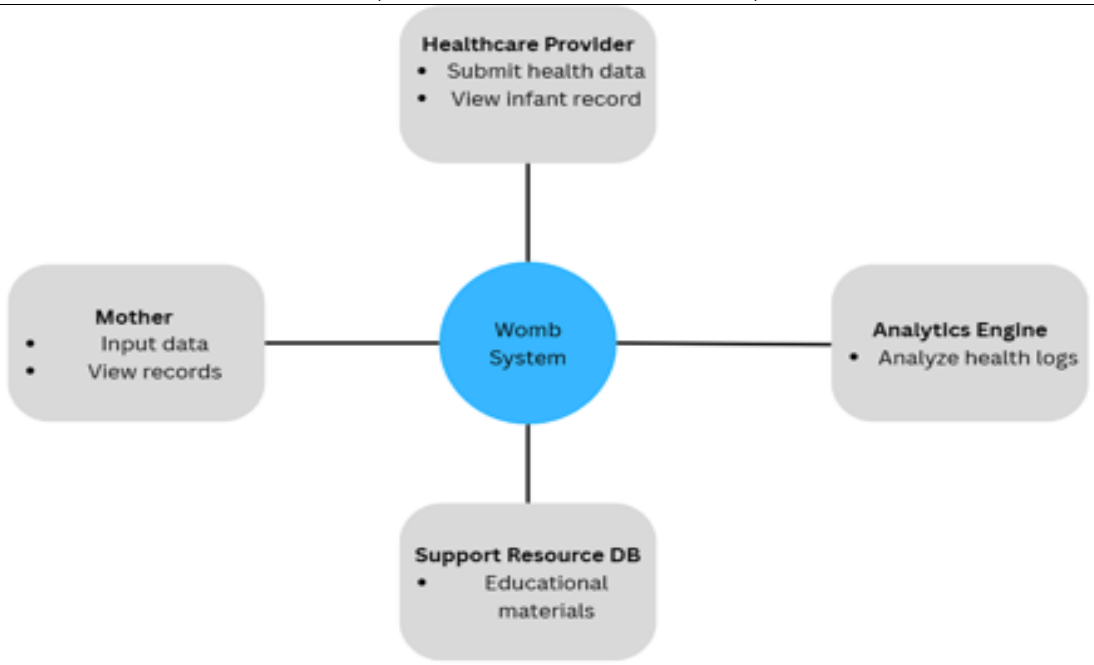

Figure 3: Context Diagram of the WOMB System

Figure 3 shows how primary users, such as mothers and healthcare providers interacts with the system. This interaction ensures efficient two-way communication and reliable health data management.

Respondents Of The Study

The respondents of this study consist of individuals who are directly involved in maternal and infant health care, as well as those who are potential users of the WOMB: Web-Based System for Maternal Support and Infant Health Tracking. These respondents are carefully selected through purposive sampling, ensuring that only participants with relevant experience or involvement in maternal health services are included.

The study involved a total of 60 respondents with 40 in the user group and 20 technical experts who participated in the evaluation activities.

By involving these two groups, the researchers ensured a well-rounded evaluation of the WOMB system from both user and professional perspectives. This multidisciplinary collaboration strengthened the validity and applicability of the system within real-world healthcare settings.

Development And Evaluation Procedure

The development of *WOMB: Web-Based System for Maternal Support and Infant Health Tracking* utilized a combination of programming languages, software frameworks, and design tools to ensure system functionality, security, and usability. These tools are chosen to support a responsive web interface and efficient data processing suitable for both healthcare workers and mothers. The main tools used include:

- PHP: Used for the back-end development to handle server-side logic, data management, and dynamic content generation.
- HTML and CSS: Responsible for structuring and styling the web pages, ensuring a clean and user-friendly interface.
- JavaScript: Implemented for interactivity and form validation, enhancing user experience and responsiveness.
- MySQL: Selected as the primary database system for storing maternal and infant records, user information, and system activity logs. It was chosen for its efficiency, scalability, and strong integration with PHP.
- XAMPP: Used as the local server environment to host and test the system during the development phase. It integrates Apache, MySQL, and PHP, enabling smooth local deployment and testing.
- Figma and Canva: Utilized to design the system's layout, icons, and visual components for an appealing and accessible user interface.
- GitHub: Employed for code management, collaboration, and version tracking throughout the system's development stages.

The evaluation of the WOMB system followed a systematic process to assess its performance, usability, and overall effectiveness in meeting user requirements. The researchers employed both technical testing and user-based evaluation to ensure the system met the standards of functionality, reliability, and user satisfaction.

ISSN 2278-2540 | DOI: 10.51583/IJLTEMAS | Volume XIV, Issue X, October 2025

The evaluation procedure consisted of the following steps:

1. Alpha Testing: Conducted by the development team to identify and resolve internal system errors. This stage focused on debugging, verifying data accuracy, and ensuring that each module—such as user login, health tracking, and reminder notifications—performed according to design specifications.
2. Beta Testing: Implemented with selected end-users, including mothers, healthcare providers, and IT specialists. This testing phase aimed to gather feedback on the system's usability, accessibility, and responsiveness. Participants evaluated the system based on their experience in performing common tasks like registering accounts, entering health data, and accessing reports.
3. Evaluation using ISO/IEC 25010 Standards: The system is assessed according to the ISO 25010 Software Quality Model, which measures quality across eight characteristics: Functionality, Reliability, Usability, Efficiency, Maintainability, Portability, Security, and Compatibility.

Feedback and scores from user evaluation forms are compiled, analyzed, and interpreted using statistical tools. The results helped the researchers identify areas of improvement and validate the system's overall quality based on ISO standards.

Data Analysis Plan

The evaluation of the *WOMB: Web-Based System for Maternal Support and Infant Health Tracking* is guided by the ISO/IEC 25010 Software Quality Model**,** which serves as an international framework for assessing the overall quality of software systems. This model is selected because it provides a comprehensive and structured set of quality characteristics that align with the system's objectives of reliability, functionality, and user satisfaction.

To analyze the gathered data from user evaluations, the researchers employed appropriate statistical tools to interpret and validate the system's performance and user satisfaction levels. These tools provided a quantitative understanding of the results derived from survey responses.

- Weighted Mean: This statistical method is used to summarize respondents' feedback and determine the overall rating for each ISO 25010 quality attribute. The weighted mean allowed the researchers to measure the system's acceptability across multiple indicators by considering the frequency of each response.
- Frequency Percentage: The distribution of the respondents by grade level is ascertained using this statistical method. The outcomes are displayed as a percentage.

These statistical analyses helped the researchers evaluate whether the system met the desired quality standards and user expectations effectively.

The researchers utilized a five-point Likert Scale to gather user feedback on the system's quality, usability, and overall satisfaction. This scale provided a structured way for respondents to express their level of agreement with specific statements about the system's performance.

- The scale ranged from the lowest (1) to the highest (5) level of satisfaction allowing users to rate their experiences numerically.
- The numerical values have verbal interpretations of "Strongly Disagree" (1), "Disagree" (2), "Agree" (3), and "Strongly Agree" (4).
- Each statement in the evaluation tool corresponded to an ISO 25010 characteristic, enabling the researchers to determine how effectively each attribute is met based on user and technical respondents' perception.

This rating system provided an objective means of assessing user feedback, ensuring that the evaluation results could be interpreted statistically and meaningfully. The Likert scale results, combined with the weighted mean and frequency percentage, enabled the researchers to measure the overall acceptance and effectiveness of the WOMB system from the perspective of its respondents.

The System

The *WOMB: Web-Based System for Maternal Support and Infant Health Tracking* is an innovative digital platform designed to improve maternal and infant healthcare through accessible, data-driven solutions. The system allows mothers and healthcare providers to monitor health records, track pregnancy milestones, schedule appointments, and receive automated reminders for vaccinations and checkups. It integrates intelligent data analytics to interpret trends and provide insights that support early detection and preventive care. Developed using PHP, MySQL, HTML, CSS, and JavaScript, the system ensures security, accuracy, and reliability while maintaining a user-friendly interface accessible across multiple devices. The project specifically addresses common challenges such as inconsistent health monitoring, lost medical records, and limited communication between mothers and healthcare professionals. By combining web-based technology with smart algorithms, WOMB promotes better health management and continuity of care, especially in community-level healthcare settings.

ISSN 2278-2540 | DOI: 10.51583/IJLTEMAS | Volume XIV, Issue X, October 2025

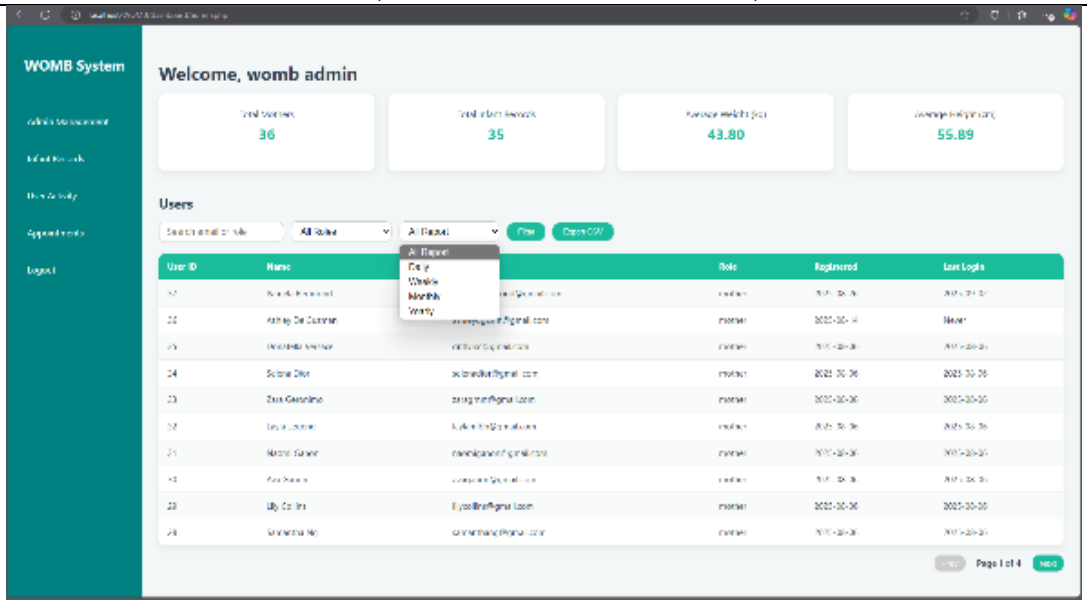

Figure 4: Data Analytics & Report Page

The Admin Dashboard Interface serves as the central control panel for system administrators within the WOMB platform. It presents essential statistics such as the total number of registered users, scheduled appointments, and summarized health data records. The interface incorporates a searchable and filterable data table, enabling administrators to view, organize, and manage user information efficiently. Its well-structured layout ensures smooth navigation, quick access to records, and real-time monitoring of ongoing system activities.

In addition to these functions, the Report Generation Feature is integrated into the Data Analytics Page to enhance administrative decision-making. This function allows the system to automatically compile and generate customized analytical reports based on selected criteria such as user demographics, appointment frequency, infant growth statistics, and vaccination records. Administrators can export these reports in formats such as PDF or Excel, making them useful for documentation, performance reviews, and health trend analysis. The report generation module not only simplifies data consolidation but also supports data-driven decision-making, enabling healthcare professionals and system managers to evaluate service efficiency, identify usage trends, and improve maternal and infant care delivery.

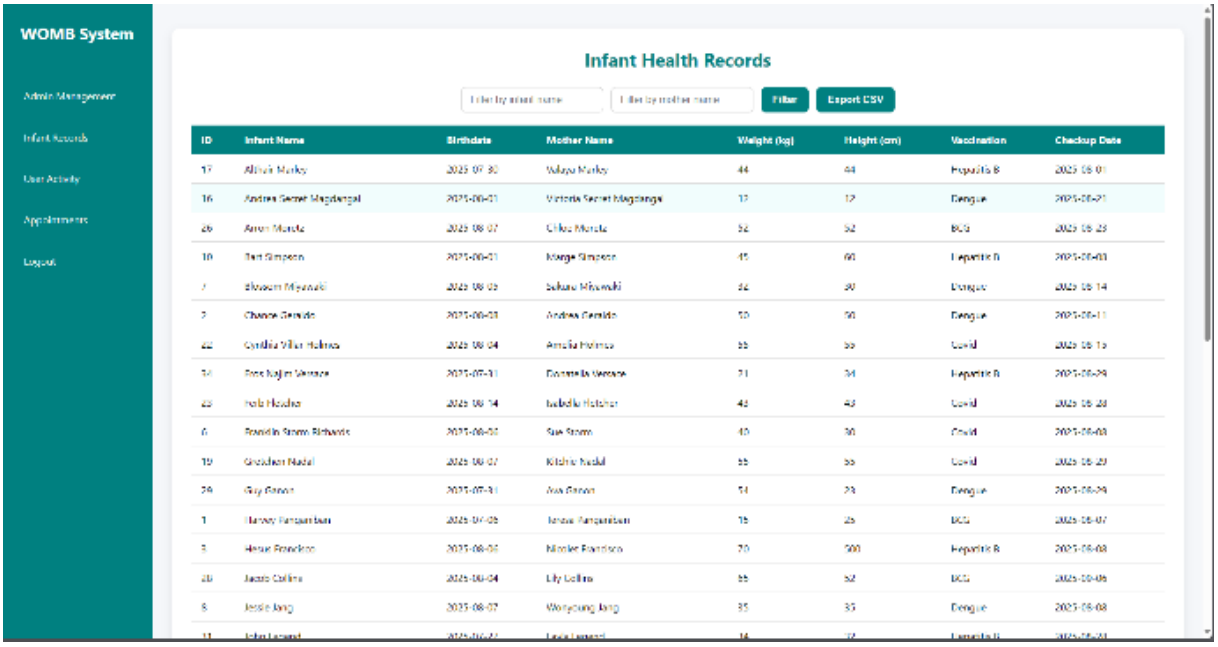

Figure 5. Infant Health Records Inter□

The Infant Health Records Interface is designed to help administrators and healthcare providers efficiently manage and monitor infant data. It displays a complete list of infant profiles, including their birthdates, guardian information, weight, height, vaccination status, and check-up schedules. This interface also provides search, filter, and export options, allowing users to generate reports

ISSN 2278-2540 | DOI: 10.51583/IJLTEMAS | Volume XIV, Issue X, October 2025

and track health trends easily. The organized tabular layout supports accuracy and accessibility, ensuring that health records can be retrieved and updated promptly for better infant care management.

Assessment: Summary Of Respondents on the System

The following table presents the consolidated summary of responses from the participants who evaluated the *WOMB: Web-Based System for Maternal Support and Infant Health Tracking*. The assessment is conducted using the ISO/IEC 25010 Software Quality Model**,** focusing on various quality characteristics such as functionality, reliability, usability, efficiency, maintainability, portability, security, and compatibility. The evaluation aimed to measure the system's overall effectiveness and user satisfaction based on feedback from mothers, healthcare workers, and technical experts.

Table 1. Summary and Comparison of Respondents' Assessment Based on ISO 25010 Standards

Criteria (ISO25010)	Respondents (60)			
	Users (40)		Technical (20)	
	WM	VI	WM	VI
1. Functionality	3.52	SA	3.78	SA
2. Reliability	3.44	SA	3.48	SA
3. Usability	3.54	SA	3.6	SA
4. Effectiveness	3.52	SA	3.58	SA
5. Security	3.47	SA	3.7	SA
Overall Average Mean	3.50	SA	3.63	SA

Table 1 presents the summarized comparison of the respondents' evaluations based on the ISO/IEC 25010 software quality standards. The results show that user respondents obtained an overall average mean of 3.50, interpreted as Strongly Agree, while technical respondents achieved an overall average mean of 3.63, also interpreted as Strongly Agree. Among the evaluated criteria, Usability received the highest rating from user respondents, with a weighted mean of 3.54, indicating that the system is easy to navigate and user-friendly. Meanwhile, Functionality ranked highest among technical respondents, with a weighted mean of 3.78, reflecting their strong agreement on the system's operational performance and practical utility. Conversely, Reliability obtained the lowest scores from both groups—3.44 from users and 3.48 from technical respondents—suggesting minor areas for improvement in ensuring consistent performance. In general, both user and technical respondents strongly agreed that the system complies with the ISO 25010 quality criteria, demonstrating confidence in its functionality, usability, and security.

Ethical Considerations

The researchers gained informed consent from all participants by clearly explaining the study's objective, procedures, and advantages. They also assured them of their right to withdraw at any moment without penalty. To ensure anonymity and secrecy, identifiable information is removed or coded, and data is only accessible to researchers. Furthermore, researchers worked hard to reduce potential injury to participants by minimizing physical, psychological, social, and legal hazards in their operations. All participants are treated fairly and justly, and the research's benefits and burdens are dispersed evenly. The researchers disclose that any conflicts of interest to prevent bias and maintain the study's credibility are avoided.

Summary

The evaluation of the *WOMB: Web-Based System for Maternal Support and Infant Health Tracking* yielded positive results, indicating that the system effectively meets its intended objectives and the expectations of its respondents. The study's findings, based on assessments conducted under the ISO/IEC 25010 Software Quality Model, confirmed that the system attained a high level of acceptance across all major software quality attributes.

Respondents, composed of mothers, healthcare professionals, and IT experts, collectively rated the system as "Strongly Agree". The results show that respondents found the WOMB system easy to navigate, responsive, and reliable in handling maternal and infant health data.

Overall, the findings validate that the WOMB system fulfills its core objective of providing an accessible, secure, and efficient platform for maternal and infant health tracking. The system's positive evaluation reflects its potential to enhance community-based healthcare operations by improving communication, organization, and health awareness among mothers and healthcare providers.

IV. Conclusion

Based on the results of the system evaluation and the feedback gathered from respondents, the researchers conclude that the *WOMB: Web-Based System for Maternal Support and Infant Health Tracking* has successfully achieved its primary goal of providing an efficient, secure, and user-friendly platform for monitoring maternal and infant health. The study confirmed that the system meets

ISSN 2278-2540 | DOI: 10.51583/IJLTEMAS | Volume XIV, Issue X, October 2025

the essential quality standards under the ISO/IEC 25010 Software Quality Model**,** showing that it performs effectively across all major attributes, including functionality, reliability, usability, and security.

In conclusion, the WOMB system is a useful and dependable tool for enhancing maternal and infant health care. The system not only fulfills worldwide software quality standards, but it also makes a significant contribution to the development of digital healthcare solutions in the Philippines.

Recommendation

Based on the findings and conclusions of the study, the researchers propose several recommendations to improve the performance, usability, and scalability of the *WOMB: Web-Based System for Maternal Support and Infant Health Tracking*. These suggestions aim to enhance the system's long-term functionality and further support the digital transformation of maternal and infant healthcare services. These are the following:

- Integration with Mobile Platforms: It is recommended to develop a mobile application version of the WOMB system. A mobile-friendly app would allow users—especially mothers in remote or low-connectivity areas—to access the system conveniently through smartphones, ensuring real-time tracking and alerts.
- Offline Functionality: The addition of offline data input features is suggested. This would allow users to record health data even without an internet connection, and with automatic synchronization once connectivity is restored.
- Expansion of Analytics and Predictive Tools: Future enhancements could include more advanced data analytics, such as predictive algorithms for risk detection in maternal or infant health. These insights could help healthcare providers intervene earlier in potential health issues.
- Broader Implementation in Community Health Centers: The system may be deployed in additional barangay health stations and rural clinics to strengthen community-level healthcare management. This would allow more mothers and healthcare workers to benefit from digital recordkeeping and automated reminders.
- Continuous Training and Orientation: Regular orientation and digital literacy training for healthcare providers and users are recommended to ensure proper usage and to maximize the benefits of the system.
- Periodic System Updates and Maintenance: To maintain system quality and security, it is advised that periodic updates be conducted. These updates should include improvements to data security, user interface design, and system efficiency.

Overall, the researchers recommend continued development, testing, and integration of the WOMB system into broader digital health infrastructures. Through continuous innovation and collaboration with public health agencies, the system can become a sustainable and scalable solution for maternal and infant healthcare management.

References

1. Alim, A., & Imtiaz, M. H. (2023). Wearable sensors for monitoring maternal health. Sensors, 23(5), 2411.
2. Aliyi, A., Mesfin, B., & Hassen, F. (2023). Antenatal care management platform: A digital health solution. BMC Digital Health, 1, 51.
3. Bautista, R., Cruz, M., & Dela Peña, J. (2022). E-health tools for maternal and child healthcare in rural Luzon. Philippine Journal of Health Informatics.
4. Calcaterra, V., Pagani, V., & Zuccotti, G. (2023). Maternal and fetal health in the digital twin era. Frontiers in Pediatrics, 11, 1251427.
5. Chen, X., Wang, S., & Roberts, L. (2020). A web-based intervention for maternal self-care. Journal of Medical Internet Research, 22(3).
6. Hossain, M. M., Kashem, M. A., & Islam, M. M. (2023). IoT in pregnancy care coordination and management. Sensors, 23(23), 9367
7. Lee, J., & Park, H. (2021). Mobile-integrated maternal health monitoring system in South Korea. International Journal of Digital Health, 3(2).
8. Rivera, K., & Santos, A. (2021). Localized mobile applications for maternal health monitoring in Metro Manila. Journal of ICT Research, 15(2), 45–58.