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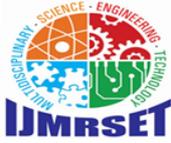
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Healthsync: A Mobile Based Health Advisory and Appointment Booking System

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ABSTRACT: Rural municipalities face persistent healthcare challenges, including inefficient appointment scheduling, poor patient-provider communication, and fragmented access to health information. This study presents HealthSync, a web-based health advisory and appointment booking system developed for the CarCanMadCarLan municipalities of Surigao del Sur to improve healthcare accessibility and service efficiency. Using a developmental-descriptive design and the Iterative Software Development Life Cycle, the system was evaluated through the ISO/IEC 25010 quality model. Results indicate a “effective” rating, confirming HealthSync’s effectiveness, usability, reliability, and contribution to improved healthcare coordination and patient engagement.

KEYWORDS: Digital Health System, Appointment Booking, Health Advisory System, Web-Based Application, ISO/IEC 25010.

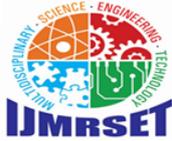
I. INTRODUCTION

Access to timely and reliable healthcare services is a critical factor in improving community health outcomes, particularly in rural and underserved areas. Despite advancements in digital technologies, many local healthcare facilities continue to rely on manual appointment scheduling, paper-based records, and face-to-face inquiries, resulting in inefficiencies and delays in service delivery. These challenges are evident in the CarCanMadCarLan municipalities, where patients often experience long waiting times and limited access to health information.

Digital health systems offer a practical solution to these challenges by enabling centralized data management, automated scheduling, and real-time communication between patients and healthcare providers. Previous studies have shown that web-based health applications significantly improve operational efficiency, reduce administrative workload, and enhance patient satisfaction. However, the lack of a localized and integrated healthcare platform tailored to the needs of rural municipalities remains a pressing concern. To address these issues, this study developed HealthSync, a web-based health advisory and appointment booking system designed specifically for the healthcare context of CarCanMadCarLan. The system aims to streamline appointment management, improve communication, and provide accessible health information through a user-friendly digital platform.

II. LITERATURE SURVEY

Healthcare information systems play a vital role in modernizing healthcare delivery by improving efficiency, accuracy, and accessibility of medical services. Numerous studies emphasize that the adoption of digital health platforms enhances patient engagement and reduces service delays, particularly in resource-limited settings.



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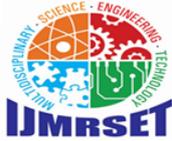
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Research on appointment scheduling systems indicates that automated booking platforms reduce patient waiting times and improve clinic workflow management. Studies on mobile and web-based health applications further highlight the importance of usability, security, and reliability in ensuring successful adoption. Secure access control and data protection mechanisms are essential, given the sensitivity of health information.

Local studies in the Philippines reveal similar challenges in rural healthcare delivery, where limited digital infrastructure and manual processes hinder efficient service provision. These studies underscore the need for localized digital health solutions that align with community needs and healthcare practices. The findings from both foreign and local literature provide strong justification for the development of HealthSync as a practical and sustainable healthcare information system.

Table1. Summary of Relevant Literatures

No.	Paper Title	Author Name	Key Points	Remarks
1	Adaptive User Interface Design for Mobile Health Applications	Wang et al. (2025)	Emphasized that engagement and accessibility are critical for long-term adoption of mHealth applications. Proposed nine validated guidelines for adaptive user interface design based on user feedback and practitioner evaluation.	Supports the importance of usability and engagement in HealthSync; however, HealthSync focuses on general healthcare access in rural communities rather than chronic disease management.
2	Integration of Mobile Health Technology for Patient Education and Follow-Up Care	Henarejos (2022)	Demonstrated that integrating mHealth software with patient education significantly reduced surgical site infections in rural Philippine hospitals by improving follow-up care and communication.	Supports HealthSync's objective of strengthening healthcare communication and follow-up services in resource-limited and rural communities.
3	OASapp: A Mobile Application for Improving Medication Adherence among Stroke Survivors	Cao et al. (2024)	Developed a mobile health application using a structured, behavior-based design process to improve medication adherence among older stroke survivors.	Demonstrates the effectiveness of mHealth platforms in improving health outcomes; however, HealthSync differs by addressing broader community healthcare needs rather than a single patient group.
4	Mobile-Based Intervention for Improving Antiretroviral Therapy Adherence	O'Connor (2021)	Implemented a mobile intervention to enhance antiretroviral therapy adherence among men who have sex with men in the Philippines, emphasizing the importance of personalized support mechanisms.	Highlights the value of personalized digital support in healthcare; this principle informs HealthSync's design for responsive and patient-centered services across broader populations.
5	User-Centered Design Factors in Philippine Mobile Health Systems	Gonzales et al. (2022)	Identified simplicity, privacy, security, and system integration as key factors influencing user trust and adoption of mHealth systems in the Philippines.	Supports HealthSync's user-centered approach by emphasizing an inclusive, secure, and easy-to-navigate platform for both healthcare providers and community residents.



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In conclusion, the reviewed literature shows that despite policy support for digital health initiatives, healthcare services at the municipal and community level remain constrained by manual processes and technical limitations. Prior studies confirm that well-designed digital health systems enhance efficiency, accessibility, communication, and patient engagement. HealthSync addresses these gaps through a secure, user-centered, web-based health advisory and appointment management system aligned with national digital health goals and global best practices.

III. METHODOLOGY

Research Design

This study utilized a developmental-descriptive research design. The developmental phase focused on the design and implementation of the HealthSync system, while the descriptive phase evaluated the system's performance and quality based on user feedback. The system was developed using the Agile Software Development Life Cycle (SDLC), allowing iterative development, continuous testing, and refinement based on stakeholder input. Core functionalities such as appointment booking, health advisory display, and integrated messaging were developed incrementally.

Instruments

To measure the software quality of HealthSync, this study adopted the ISO/IEC 25010 framework for software validation to ensure that the system aligns with internationally recognized standards. A five-point Likert scale questionnaire was administered to selected respondents to collect quantitative feedback on key software quality characteristics, namely functional suitability, performance efficiency, compatibility, usability, reliability, security, maintainability, and portability. Each item in the questionnaire was rated using a five-point scale, with responses ranging from 1 = Not Effective to 5 = Very Effective.

Data Collection and Participants

The study involved 50 respondents who were directly involved in or knowledgeable about healthcare service delivery and digital health systems within the CarCanMadCarLan municipalities. The participants included healthcare providers, local residents or patients, and IT practitioners with experience in health information systems. Healthcare personnel served as primary respondents due to their direct involvement in appointment management and patient coordination, while community residents provided user-based perspectives. This diverse group ensured that the HealthSync evaluation captured both technical and operational viewpoints.

IV. DATA ANALYSIS

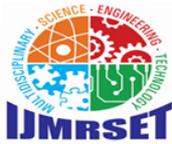
The data collected from surveys, interviews, and system evaluations were processed using appropriate statistical and analytical methods. The following data treatments were applied:

1. Weighted Mean, which was computed to determine the overall scores of the software quality characteristics based on the ISO/IEC 25010 model, including functional suitability, performance efficiency, compatibility, usability, reliability, security, maintainability, and portability.
2. Scale Interpretation, wherein respondents' ratings were translated into a five-point descriptive scale (4.21–5.00 = Very Effective, 3.41–4.20 = More Effective, 2.61–3.40 = Effective, 1.81–2.60 = slightly Effective, and 1.00–1.80 = Not Effective) to facilitate meaningful interpretation of results.
3. Qualitative Data Analysis, where responses from interviews and open-ended survey questions were categorized and summarized to identify recurring patterns, trends, and insights related to system usability and healthcare operations.
4. Triangulation, in which data gathered from surveys, interviews, and system observations were cross-validated to ensure consistency, reliability, and validity of the findings.

System Features

HealthSync successfully digitized healthcare advisory and appointment management processes through a centralized web-based platform. Its key modules include role-based access control to ensure secure and controlled system operations for healthcare providers

administrators, and community residents; patient and clinic registration for organized health profiling; real-time appointment booking and scheduling to improve service coordination and reduce waiting time; integrated chat and



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automated notification features to support timely patient–provider communication; health advisory and information dissemination to enhance patient education; and administrative reporting and analytics tools that enable monitoring, evaluation, and data-driven decision-making in healthcare service delivery.

Performance Evaluation

The system received an overall rating interpreted as “effective”, with an average weighted mean score of 3.64. Among the evaluated software quality attributes, Maintainability obtained the highest mean score of 3.85, while the other attributes also achieved favorable ratings, reflecting the system’s acceptable performance, reliability, and ease of use.

Table2. Performance Evaluation System Tabulation

Criterion	Weighted Mean (WM)	Verbal Interpretation
Functionality Suitability	3.67	effective
Performance Efficiency	3.52	effective
Maintainability	3.85	effective
Usability	3.55	effective
Reliability	3.61	effective
Overall Mean	3.64	effective

V. CONCLUSION

HealthSync successfully meets recognized software quality standards and demonstrates its effectiveness as a web-based solution for improving healthcare advisory services and appointment scheduling across the participating municipalities. By integrating centralized appointment management, health information dissemination, role-based access, and real-time patient–provider communication, the system bridges the gap between traditional manual healthcare processes and the growing demand for accessible, timely, and coordinated healthcare services in rural communities.

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