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By Alia Tri Utami

Innovation in Design and Construction of Posyandu Information System as a Web-Based Toddler Growth and Development Monitoring Solution in Sukabakti Village, Tarogong Kidul, Garut Regency

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Abstract

To prevent stunting, the *Pos Pelayanan Terpadu* (Posyandu) is a community-managed healthcare program offering essential health services by monitoring children's growth and development. Universitas Muhammadiyah Bandung lecturers and students worked on a project to address the manual procedures still in place in Posyandu for data collection, reporting, and monitoring activities. The group's main goal was to create a web application that included important elements such as a dashboard, anthropometric data for toddlers, and growth and development tracking for toddlers.

The main objective of this initiative was to enhance the effectiveness and security of toddler growth data collection, especially for Posyandu cadres. To maximize the application's use, Posyandu cadres were trained in information technology development and utilization. As the project's result, the Posyandu Sukabakti web application was successfully implemented. The software development process used the Rapid Application Development (RAD) methodology.

In conclusion, the community service effort at Posyandu in Sukabakti Village has yielded significant benefits. The adopted solution has greatly simplified the management of toddler data at Posyandu Sukabakti, Tarogong Kidul, and Garut Regency for Posyandu cadres. This streamlined process has improved the efficiency and accuracy of data collection and reporting, ultimately contributing to the prevention of stunting in the community.

Introduction

The Pos Pelayanan Terpadu (Posyandu), a community-based health program, has enhanced public health by providing integrated health services. *Lembaga Kemasyarakatan Desa/Kelurahan*, or LKD/LKK, is the village/urban community institution that Posyandu operates as. Operating under the village/urban community institution, Lembaga Kemasyarakatan Desa/Kelurahan (LKD/LKK), it serves as a platform for community involvement to support village chiefs or urban leaders in improving social services in health and other areas based on local potential and needs (Ministry of Health, 2023). The successful operation of Posyandu activities in Sukabakti Village, Tarogong Kidul, has markedly improved the community's overall health, particularly for young children.

One service provided by healthcare to toddlers is monthly growth monitoring. Anthropometric evaluations include measuring height and weight, checking nutritional status, giving vitamins, performing physical examinations, and vaccinations (Muliyana et al., 2020). As a result of these Posyandu initiatives, the Sukabakti Village Government has successfully lowered the annual rate of toddler stunting.

According to data, Sukabakti Village had 54 stunted toddlers in 2022; this number fell to 44 in 2023 and 38 in 2024. Notwithstanding these successes, difficulties still exist since manual data recording is still done. In the Mother and Child Health Book (*Buku KIA*), information about toddlers, including weight, height, and immunizations, is manually entered. This causes inefficiencies in timekeeping, data input errors, and reporting challenges.

To facilitate data management, a more effective information system is required to deliver precise and timely information to Posyandu cadres. A system like this would direct focused health treatments and streamline the Posyandu administration. To achieve zero stunting in Sukabakti Village, Tarogong Kidul, Garut Regency, Posyandu can better monitor toddler

growth in Sukabakti, identify early symptoms of stunting, take corrective action, and improve public health services, especially for toddlers, with the help of an upgraded information system.

Research on the integration of information technology into Posyandu management consistently reveals its potential to significantly enhance the efficiency of Posyandu cadres. This is evident in improved data collection, streamlined activity reporting, and more effective child growth monitoring. The use of web-based information systems enables better data management, minimizes data loss and damage, and simplifies the process of creating reports as needed (Derian Shakti, 2022; Andrianto et al., 2023; Mahanani & Kurniadi, 2015; Kamilah & Ratsari, 2020; Warjiono et al., 2022).

Nevertheless, there are some parallels and divergences between the study you are conducting and earlier research. The similarities reside in the black box method of testing. The approach taken in system development makes a difference. Unlike the waterfall method often employed in previous studies, your research will use the Rapid Application Development (RAD) method, considered more appropriate for large projects due to its iterative approach and cost efficiency (Murdiani & Hermawan, 2022).

Method

Universitas Muhammadiyah Bandung lecturers and students have started a community service initiative to help Posyandu in Sukabakti Village, Tarogong Kidul, Garut Regency, West Java. Posyandu faces difficulties with manual data recording, reporting, and toddler growth tracking, primarily due to a lack of funding and technical expertise. This has made Posyandu's management less effective and efficient.

Recognizing the need for a more effective and efficient Posyandu, the Universitas Muhammadiyah Bandung team in Sukabakti Village embarked on a collaborative journey. They conducted extensive interviews, examined current data management procedures, assessed the cadres' requirements, and heard the objectives and aspirations of all parties

involved. This collaborative effort led to the creation of a thorough plan, the allocation of the proper resources, and the meticulous planning of the project's execution.

The website was initially developed with Posyandu Sukabakti Village's needs in mind. Following the design, development, and testing phases utilizing the black box approach, it was ready for launch (Derian Shakti, 2022). The web-based information system is still being designed and developed, with more phases slated for improvement.

Afterward, Bunda PKK, Posyandu cadres, and parents of young children received training from lecturers and a group of Universitas Muhammadiyah Bandung students to ensure they had the necessary skills to administer the website correctly. Information management, content upkeep, and platform utilization were the key topics of the course. The team monitored the website's performance after it went live to ensure it worked well, satisfied Posyandu's and stakeholders' expectations, and delivered the promised advantages.

It is imperative that Bunda PKK and Posyandu cadres take an active role in the management of the website. The Universitas Muhammadiyah Bandung team, in addition to providing a sustainable and beneficial solution for Posyandu in Sukabakti Village, Tarogong Kidul, also anticipates that this initiative will be advantageous for all stakeholders, including parents of toddlers, Posyandu cadres, Bunda PKK, and local officials. The team is committed to achieving zero stunting in Sukabakti Village and significantly and sustainably improving public health through strong collaboration and a dedication to providing the best health services to the community.

Results and Discussion

Universitas Muhammadiyah Bandung instructors and students arranged a community service event on August 26, 2024, as part of their institutional mission. By developing a website to handle data recording,

storage, and child growth monitoring, the project aims to help Posyandu in Sukabakti Village. This will enhance services and the general quality of health in Sukabakti Village, Tarogong Kidul, Garut Regency, West Java.

The initiative, "Sistem Informasi Posyandu Sukabakti," was centered on the Posyandu activities carried out in each Sukabakti Village RW (local unit). The project's target participants were the primary players overseeing Posyandu operations in each RW, including administrators, cadres, and Bunda PKK.
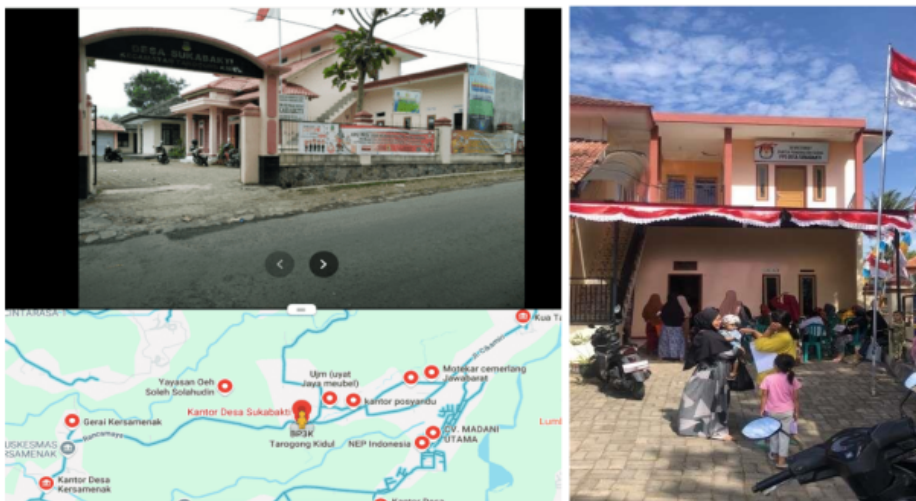

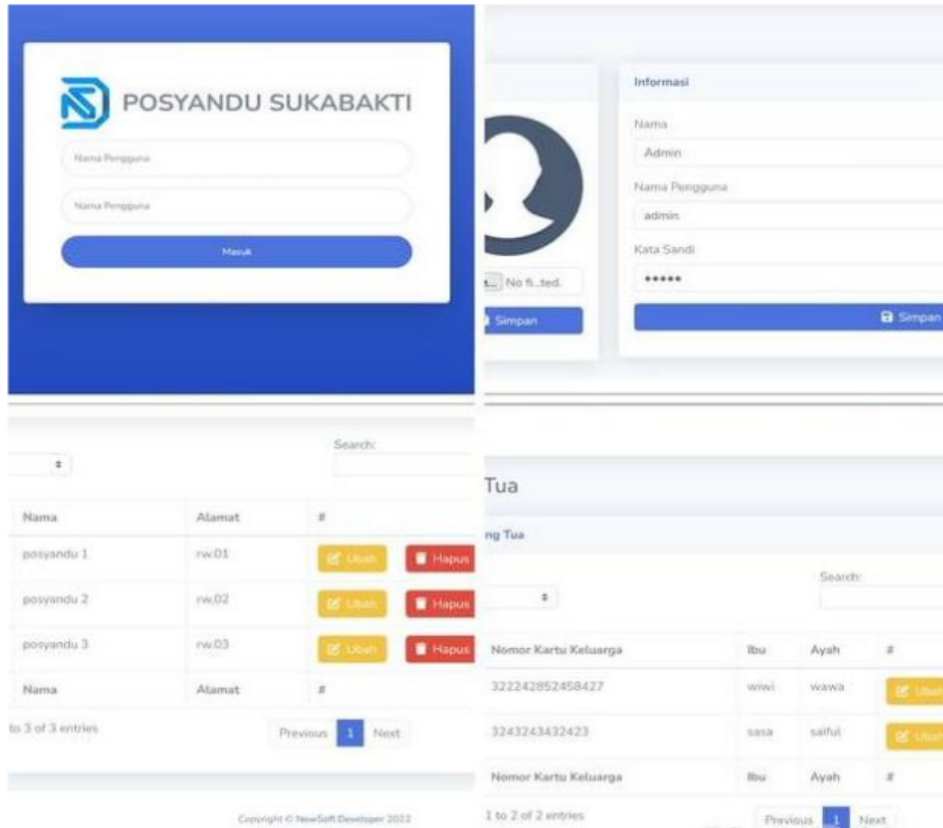Figure 1. Location of Community Service Activities

Figure 2. Login display, dashboard, Posyandu data and parent &
toddler data

The Sukabakti Village Posyandu Website, a web-based information system, was developed for this project. The dashboard is shown in Figure 2 (bottom left), admin data is shown in Figure 2 (top right), and toddler parent data is displayed in Figure 2 (bottom right). The login display is shown in Figure 2 (top left). The Sukabakti Village Toddler Nutrition Monitoring Information System was created to provide comprehensive monitoring and assessment of the nutritional status of toddlers. This system incorporates several crucial data input elements to facilitate tracking the development and well-being of local children.

Data on toddler age in months can be entered into the system. This information is crucial for tracking the growth of toddlers every month. The

technique can give a clear picture of a toddler's growth over time by precisely estimating their age, which forms the foundation for assessing their nutritional health. Enter the weight of the toddler second. One of the key indicators used to evaluate the nutritional condition of toddlers is the weight graph for age (BB/A), which is calculated using this data. Based on precise weight data, the device can determine whether the toddler receives good, insufficient, or even poor nutrition.

Third, enter the height of the toddler. Height measurement is crucial because it serves as the foundation for understanding the height-to-age (H/U) graph. A toddler's average height indicates healthy physical development; variations from this graph may suggest dietary or medical issues. Fourth, enter the arm circumference of a toddler. When evaluating nutritional status, arm circumference is frequently utilized as an extra indicator, particularly when acute malnutrition is suspected. This measurement offers more detailed information about toddlers' nutritional status than looking only at their weight or height.

Fifth, enter the statistics about toddler head circumference. Head circumference measurement is a tool for tracking brain growth and identifying any health issues. Diagnosing growth or developmental issues based on abnormal measures enables early intervention. Sixth, enter data on the nutritional status of toddlers. In contrast to other indications, nutritional status is manually entered using a formula that combines height, weight, and age. Malnutrition, undernutrition, good nutrition, and overnutrition are employed in nutritional status categories. This categorization aids in matching each toddler's condition to the proper course of care.

The system records vital information on toddlers, including name, date of birth, Family Card (KK) number, Posyandu attended, and gender, in addition to health indicators. In addition to being necessary for identification, this information also helps to guarantee that every toddler is accurately entered into the system and registered. An additional essential component of the system is parent data input. The system may link toddler data to family data by providing the KK number and the mother's and

father's names. This facilitates the tracking and managing of cases that might call for family intervention.

Lastly, the system has a posyandu data entry capability that enables data gathering on the quantity and characteristics of posyandus in the work area of the health center. The management and observation of posyandu activities and ensuring that every toddler is appropriately watched at the proper posyandu depend heavily on this posyandu data. In the Sukabakti Village area of Tarogong Kidul, Garut Regency, West Java, this system is hoped to make managing toddler nutritional data more effective and efficient, enabling faster and more precise handling in dealing with nutritional problems or preventing stunting.

The black box testing approach was used to test this information system to ensure that it was developed and constructed according to developers' and users' expectations. Sukoco et al., 2022; Purwadi & Hendrawan, 2020; Purwati et al., 2024)

Conclusion

Universitas Muhammadiyah Bandung lecturers and student organizations conducted a project to support Posyandu in Desa Sukabakti Tarogong Kidul, Kabupaten Garut. The objective was to ensure that data recording, management, reporting, and monitoring of toddler growth and development were handled completely, effectively, and efficiently. This included assessing needs, creating the website, and training Posyandu cadres.

Rapid Application growth (RAD) is a technique used by the web-based Posyandu information system to track child growth. To test the design of this web-based Posyandu information system, we evaluated the functioning and flow of each menu by applying the

black box method. These tests indicated that the features fulfilled the necessary and anticipated requirements.

The instructors and students from Universitas Muhammadiyah Bandung came to the thoughtful and intellectual conclusion that this initiative has given Posyandu Desa Sukabakti and the entire Sukabakti Village and its community valuable solutions. In order to attain Zero Stunting in Desa Sukabakti, it is imperative to extend unwavering support to Posyandu Desa Sukabakti to optimize the website's usage, guarantee the project's survival, and foster greater collaboration. By putting these suggestions into practice, the instructors and students at Universitas Muhammadiyah Bandung think that the project would help the current and set the stage for future growth and empowerment.

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