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Kabataan-Konek: A Barangay Web-Based Youth Information Management System with Data Analytics

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ABSTRACT

Cities are divided into barangays, the smallest local government units managed by Barangay and Sangguniang Kabataan (SK) officials. Barangay officials oversee community welfare, basic services, and local projects, while SK officials focus on youth development through programs and initiatives. However, managing resident data is currently a manual process, requiring SK officials to visit households, record details on paper, transfer them to Word documents, and print them. This labor-intensive approach is both time- consuming and inefficient, particularly when sorting data by specific criteria like age groups. To address these challenges, a study was conducted to develop a more efficient system to streamline these processes. A web-based application made as a solution where residents can create accounts and input their personal details through a userfriendly graphical user interface (GUI). This system implemented features such as data analytics and surveys to support project evaluation. Additionally, key functionalities such as QR code integration for Barangay SK clearance ensure its authenticity, project monitoring and evaluation tools, a resident portal, a dashboard for SK Chairperson and SK Kagawad, as well as modules for announcements, certificate requests, and a history log to ensure data privacy and security. This system aimed to make administrative tasks more effective and reliable. The testing results have shown that the software meets ISO 25010 standards for software quality, which has an average of 95.63% passed. The system demonstrates functional suitability with high success rates, efficient performance under varying loads, and reliability with minimal downtime. In conclusion, the system is a high-quality solution that effectively addresses the needs of the barangay. Its robust design and thorough testing confirm its readiness for deployment, ensuring longterm usability and reliability.

Key words: Barangay SK Clearance, QR Code, Project Monitoring, Data Analytics, Data Privacy, Authentication

1. INTRODUCTION

The general description of the study was to assist Barangay San Francisco under the City of Pagadian in profiling all the residents within the community. These processes are currently done manually, where SK officials visit each household to collect residents' details. The information is then written on bond paper, transferred to a Word document, and printed for record keeping. These manual approaches are time-consuming, especially when they need to sort through the printed papers for specific criteria, such as age groups.

Globally, digital solutions enhance administrative processes and community development. [1] highlight the benefits of digital technologies for local communities, while [2] discuss digital transformation's positive impacts on rural areas. In the Philippines, [3] emphasize the importance of digital solutions in local governance, and KPMG Philippines [4] discusses the need for agile government models. Locally, [5] and [6] highlight the effectiveness of digital profiling systems in local communities.

The study developed a more efficient system that will make their work easier and it proposed web-based Youth Information Management System in Figure 1 it illustrates the digital system, showing features such as resident account creation, Figure 2 it provides a comprehensive view of how users such as residents and SK officials interact with the system modules. Figure 4 shows an add profile user interface, Figure 5 Request Clearance user interface, automated archiving for those aged 30+, QR codes for SK clearance ensure its authenticity, project tracking, data analytics, and a dashboard for SK officials. This system aims to improve service delivery, transparency, and resident empowerment, aligning with national and international trends in digital governance.



Figure 1: Product Perspective



Figure 2: Use-case Diagram

2. RELATED LITERATURE

Digital transformation has steadily gained traction at the barangay level, driven by the demand for efficient data management and citizen service. Several studies have emphasized the transformative potential of digital systems in enhancing barangay-level governance and data management. [7] developed a health-focused web portal system tailored for barangay-level use, streamlining health information access and improving service delivery. Similarly, [8] pioneered early efforts in creating a barangay database information system, setting a foundational model for digital transformation in local governance. Recent works, such as [9], designed and evaluated a web-based barangay profiling and issuance system using regression analysis to optimize data retrieval and decision-making. [10] also contributed with a comprehensive Barangay Management Information System (BMIS) applicable to municipalities, while [11] focused on managing resident data through a user-friendly web-based platform. Moreover, [12] introduced an open data and geobased information system that supports spatial analytics, proving beneficial in strategic planning and community mapping. These studies underscore the importance of integrated, secure, and user-centric systems in improving barangay operations and public service delivery.

3. METHODOLOGY

The research follows a waterfall model with sequential phases: analysis, design, implementation, testing, and deployment. Initially, stakeholder requirements and existing procedures will be analyzed to create a Software Requirements Specification (SRS) for the Barangay Youth Information Management System (BYIMS). The design phase will focus on system architecture, UI, and database design. Implementation will develop the system as specified, followed by rigorous testing for functionality, reliability, and security. Finally, the system will be deployed, supported by user training and ongoing documentation to ensure alignment with project goals. These refinements will further solidify the

system's functionality, usability, and long-term reliability.

To develop the system, we utilized several essential tools. PHP, as shown in Figure 3, served as the primary server- side scripting language, enabling the creation of dynamic websites and efficient interaction with databases. VS Code was employed as the versatile code editor, providing robust features for writing, debugging, and managing the project's codebase. Finally, XAMPP was used as the local server environment, incorporating tools such as Apache for web server functionality, MySQL for database management, and phpMyAdmin for simplified database administration. Together, these tools played a crucial role in building and testing the system effectively.



Figure 3: Development Tools

4. SYSTEM SCREENSHOTS

CARLO GONZAGA		RESIDENT INFORMATION	
Youth Resident		PERSONAL INFORMATION	
		fill up all the required helds with asterick	1
lesident Profile		Choose File No file of	Nosen
RCELINE COLORISA	First name*	Middle name	Last name*
lerouecement	And name	Mathinsone	(alt tare
larangay Officials	Suffix	Ses*	Birthdata*
hrsmer Survey 👩	4/8 *	tes	em/dd/ww D
legaest SK Clearance	Aga*	Civil status*	Contact type*
	- 10 C	Del taña 🤟 👻	Contact face
post	Contact*	Height (Spinut)	Weight (Centure)
	Earthan Aurthor	landar/Cardinami	dispisie
	Citizenship*	Religion*	Decupation status*
	country *	Aplant v	
	Occupation*	Adding Occupation	
	Organitional W	Add Quantities	
	Educational Attainment*	Mother's full name	Father's Full name
	"Infert Dispersional Internant		Entrary but same

Figure 4: Add Profile

	Online SK Clearance Request
CARLO GONZAGA	SK Clearance Request Form
Youth Resident	
RAL	Choose Date to be Picked Up:
👔 Resident Profile 🕈 Account	From 12/04/2024 To - mm/dd/yyyy
çiş Annouscement ▶ Barangay Officials ♦ Answer Survey 🙀	Select Reason for Requesting SK Clearance: Select Reason for Requesting SK Clearance
2 Request SK Clearance	Submit Request

Figure 5: Request Clearance

5. RESULTS AND DISCUSSION

This section presents the key research findings, highlighting their significance and relation to the research question. It interprets the data, acknowledges any limitations, and offers suggestions for future improvements.



Figure 6: Functional Test

In Figure 6 it demonstrates that the system excels in most key functionalities, achieving a 100% pass rate in the majority of areas, showcasing exceptional performance. However, one functionality achieved a slightly lower score of 92.90%, indicating room for minor improvement. Overall, the system is highly effective, with only a few aspects needing potential fine-tuning.



Figure 7: Non-Functional Test

In Figure 7 it demonstrates strong performance across several key aspects. The system achieved high ratings in performance efficiency (95.14%), compatibility (95.71%), and security (97.11%), reflecting solid overall functionality. Accessibility was rated at 90%, indicating potential areas for improvement. Reliability was rated at 96.14%, while integrity, functional suitability, and confidentiality each received outstanding scores of 97.14%. The system's user-friendliness was rated at 94.17%, showcasing an intuitive design. Overall, the average is 95.63% indicating that the system performs exceptionally well across most areas, with minor adjustments recommended to enhance accessibility.

6.CONCLUSION

The Kabataan-Konek: A Barangay Web-Based Youth Information Management System is a high-quality, reliable solution that successfully meets its objectives and adheres to the ISO 25010 software quality framework. It performs core functions effectively, ensures robust data security, and features a user-friendly design accessible to all users. Its adaptability allows for future scalability, making it a dependable tool for addressing the barangay's needs.

Based on the comprehensive testing and evaluation, the Kabataan-Konek system fulfills its objectives and adheres to the ISO 25010 software quality framework. Key takeaways include:

Functionality: The system performs its core tasks effectively, meeting all functional requirements with high accuracy and reliability. Users can rely on the system for managing youth information efficiently.

Security and Privacy: Robust security features ensure data is safeguarded, providing a secure platform for handling sensitive information.

Usability and Adaptability: The system's user-friendly design enhances the overall experience, making it accessible even for non-technical users. Its flexibility ensures it can evolve with future needs.

Overall Quality: The system combines strong functionality with dependable performance, security, and maintainability, making it a reliable tool for the intended users.

In conclusion, the Kabataan-Konek system is a highquality solution that effectively addresses the needs of the barangay. Its robust design and thorough testing confirm its readiness for deployment, ensuring long-term usability and reliability.

RECOMMENDATIONS

1. Real-Time SMS Notifications for Security:

Implement a real-time SMS notification system to enhance security. This feature will send an SMS notification to the user each time they log in from a new device or connection. The message will include details such as the location and IP address of the login attempt.

2. Mobile App for SK Officials:

Create a dedicated mobile application for SK Officials to facilitate direct communication. This app enables officials to receive internet calls initiated by youth residents through the website. Provide real-time assistance and handle queries efficiently. This enhancement aims to improve user experience, streamline communication and strengthen system security, offering a robust platform for current and future users.

3. Enhance Overall Security of the Website:

Future researchers are encouraged to focus on strengthening the security of web-based systems. Enhancing security can be achieved by integrating advanced authentication mechanisms, such as multi- factor authentication (MFA), and ensuring all data transmissions are encrypted using Secure Sockets Layer (SSL) or similar protocols. Conducting periodic vulnerability assessments, penetration testing, and adhering to globally recognized security standards such as ISO/IEC 25010 is also recommended. These practices will help ensure the system's resilience against cyber threats, safeguard sensitive data, and maintain user trust. Future studies could explore emerging technologies in cybersecurity, such as artificial intelligencebased threat detection, to proactively address evolving security challenges.

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REFERENCES

- [1] Shchukin, L., Gusev, S., & Yushkina, N. (2022). Digital Tools for Sustainable Development of Local Communities. SpringerLink.
- [2] Ferrari, A., Bacco, M., Gaber, K., Jedlitschka, A., Hess, S., Kaipainen, J., . . . Brunori, G. (2022). Drivers, barriers, and impacts of digitalization in rural areas from the Information and Software Technology.

- [3] Debbarma, A., & Sharma, C. (2013). DIGITAL TRANSFORMATION IN LOCAL GOVERNANCE: OPPORTUNITIES, CHALLENGES AND STRATEGIES. International Journal of Social Science Educational Economics Agriculture Research and Technology.
- [4] Bonoan, E. P. (2023, June 19). Voices on 2030:Diitilizing government - KPMG Philippines. https://kpmg.com/ph/en/home/insights/2023/06/voices -on-2030-digitalizing-government.html
- [5] Bringula, R., Napolis, J., Vale, M., Oliva, F., & Serna, D. (2022). E-Barangay: A Framework for a Web-Based System for Local Communities and Its Usability. International Journal of Electronic Government Research.
- [6] Jacobe, B., Pascua, M., Tumbali, B., Aquino, M., & Gumabay, M. (2021). Barangay Profiling System with Analytics. International Journal of Advanced Trends in Computer Science and Engineering.
- [7] Altura, K. P., Madjalis, H. C., Sungahid, M. G., Serrano, E. A., & Rod, R. L. (2023). Development of a Web-Portal Health Information System for Barangay. International Conference on Information and Education Technology (ICIET).
- [8] Celeste, R. C. (2004). ESTABLISHMENT OF A BARANGAY DATABASE INFORMATION SYSTEM IN REGION 10.
- [9] Gonzaga, M. B., Donaire, M. M., Singzon, R. M., Naz, S. M., Tanael, D. V., & Centeno, C. J. (october 20, 2023). Development and Evaluation of Web-based Barangay Profiling and Issuance System using Regression Analysis.
- [10] Imus, J. P., Magleo, E. D., Soriano, M. A., & Olalia, R.
 L. (2018). Barangay Management Information System (BMIS) for Cities and Municipalities in the Philippines.
- [11] Melendres, U. M., & Aranda, K. M. (2024). Development and Evaluation of a Web-Based Resident Information Management System. Journal of Computer, Software, and Program, 1(1),, 14-22.
- [12] Mercurio, D. I., & Hernandez, A. A. (2022). An Open Data and Geo-based Information Systems. International Journal of Advanced Trends in Computer Science and Engineering, 11(1), 1-7.