

PAPER

Integration of Mobile and Web Applications to Prevent Crime

Elvis Barrionuevo,
Wilfredo Ticona()

Universidad Tecnológica del
Perú, Lima, Perú

wmamani@esan.edu.pe

ABSTRACT

Citizen insecurity and crime represent one of the greatest challenges, as they affect people's peace of mind and perception of security. Crime prevention and emergency management face challenges due to the lack of effective mechanisms for collecting and managing information, which hinder decision-making and affect the effectiveness of measures to combat crime. Therefore, the implementation of mobile and web applications is intended to reduce the risk of crime by supporting daily data collection, strategy planning, crime monitoring, diagnosis of the current situation, and coordination and evaluation of the competencies of citizen security agents. The SCRUM framework was applied to address the development and implementation of the model, considering all phases and artifacts. The results demonstrate that the implementation of mobile and web applications significantly supports crime prevention and strengthens district citizen security.

KEYWORDS

web application, mobile application, crime, citizen in-security

1 INTRODUCTION

Crime prevention comprises strategies and measures that seek to reduce the risk of crime occurring and its potential harmful effects on individuals and society, including the fear of crime, by intervening to influence its multiple causes. Well-planned crime prevention strategies not only prevent crime but also contribute to sustainable development [1].

The overall crime rates in the United States are 49.2, Venezuela 82.1, Syria 69.1, and Peru 67.5. Some of the lowest crime rates in the world are seen in Switzerland, Denmark, Norway, Japan, and New Zealand. Each of these countries has very effective law enforcement, and Denmark, Norway, and Japan have the most restrictive gun laws in the world [2].

Citizen security is a constant concern in different districts of Peru. Despite the measures and efforts of the authorities, the results do not always meet the expectations

Barrionuevo, E., Ticona, W. (2025). Integration of Mobile and Web Applications to Prevent Crime. *International Journal of Interactive Mobile Technologies (ijim)*, 19(2), pp. 111–125. <https://doi.org/10.3991/ijim.v19i02.52839>

Article submitted 2024-08-13. Revision uploaded 2024-09-27. Final acceptance 2024-10-06.

© 2025 by the authors of this article. Published under CC-BY.

of the population, often due to the scarcity of resources, inadequate procedures, or lack of training of the personnel involved. According to [3], 26.9% of the Peruvian population aged 15 years and older have been victims of a criminal act.

In the district municipality of Cayma, interventions by public safety officers revealed recurrent problems such as informal commerce, alcohol consumption, and drug consumption on public roads, which represent significant percentages of the incidents recorded. To address these challenges, municipal institutions have implemented technological improvements, such as monitoring centers and information systems. However, problems persist in crime prevention and incident management due to the absence of effective mechanisms to collect, analyze, and manage information [4].

The integration of mobile and web applications can help combat citizen insecurity and crime prevention [5], [6], and [7]. This technological solution allows the collection, analysis, and management of information for decision-making. Figure 1 shows the proposed solution.



Fig. 1. Integration of mobile and web application

2 RELATED WORKS

The rise of mobile applications has revolutionized citizen security. These tools, designed to use the functionalities of these mobile devices, provide more options to counteract criminal acts and have changed the way citizens and authorities prevent and address criminal incidents. The potential of mobile devices has not gone unnoticed by government institutions. The design of a mobile application allows citizens and authorities to be informed and share criminal acts occurring in different environments in real time, all of which are oriented toward preventing criminal acts or incidents [8]. Therefore, one objective of mobile emergency solutions is to take advantage of the high-precision location techniques of smartphones and manage data using emergency information systems; however, additional information can be provided [9]. In fact, mobile applications focused on this context allow users to obtain photographic evidence or videos of crime scenes, thus facilitating the reporting process and evidence collection [10]. Likewise, GPS can be accessed through the device such that the coordinates of the exact location of the crime or emergency

can be known in the form of latitude and longitude data [11]. Therefore, the social interest that they generate in citizens or the community in general in terms of integrity and physical or material security makes the use of these technological tools of information and communication helpful in making these emergency and accident care effective and in which competent agencies can take charge [12]. In short, the transformative power of mobile applications in the context of citizen security is undeniable; their ability to foster collaboration between citizens and government agencies by providing instant information using their characteristics regarding criminal incidents has marked a milestone in the prevention and reduction of crime. These tools continue to be a fundamental pillar of public safety in the digital era.

In the current context, web applications have become indispensable in the field of public safety, offering a modern solution to improve existing procedures performed by the authorities responsible for public protection and adding value to prevent and control crimes. Web applications are also very relevant information systems because, in many scenarios, the authorities in charge of public safety perform their processes manually, and being able to integrate such systems can enable better management and access to information. In addition to the above, the primary objective of these web applications is to store, manage, and manipulate data that the security department requires efficiently and provide reporting [13]. In addition, the information stored is structured so that it can be relevant to the type of crime or incident general descriptions, location, and images that can be handled, allowing an exploratory analysis of the collected data and focus on more detailed and targeted reports so that officers can work more effectively [14]. For this purpose, web applications must meet certain quality standards; some systems do not have high performance because they are slow and unfriendly to users; thus, such information systems should be focused on reducing processing time and improving communication and data management [15]. In short, the role of web applications in the citizen security framework is fundamental because these information systems have transformed how authorities manage and access data relevant to their work, such as their ability to organize data in a practical way and generate detailed reports. This has enhanced the effectiveness of officials in their daily activities, considering that the quality and performance of these applications are crucial aspects that must be addressed to ensure their operational effectiveness and value for the authorities responsible for ensuring security in the digital age.

Technological solutions for public safety and crime prevention must meet some essential criteria, including nonfunctional requirements. These criteria extend beyond the specific functions of the software. In the implementation of information systems, such as mobile and web applications, user satisfaction has been demonstrated to be related to the quality and perception of such systems, as well as ease of use, which is a factor that favors user experience. This provides a source to evaluate and measure the performance of these services without losing the objective of these systems, which is to provide tools that focus on collecting data on criminal activities in an identified geographical area, providing authorities with the ability to eliminate or reduce criminal activity [16]. Therefore, the accuracy and effectiveness of the systems were evaluated through usability testing, and the results reflected the level of satisfaction and efficiency of the applications, thereby making them reliable tools for reporting and managing crimes and incidents. This is also related to ensuring that the user interface planned for the applications is easy to use, has a simple navigation, and regularly includes various sections, such as login information, incident reports, view incident details, and emergency contacts. The user interface is regularly designed following material design guidelines to ensure

consistency across both Android and iOS platforms [17]. Given this, with the implementation of technology in citizen security, it will increase the confidence and quality of life of people, and the use of mobile applications to improve security allows to carry out better control in society; digital tools help to monitor and use strategies to promote good service and contribute to the improvement of the quality of life of people; there are numerous advantages derived from the incorporation of new technology in the fight against citizen insecurity; mobile applications offer the possibility of overcoming obstacles, challenging conventions, and improving the interaction between people and these applications [18]. In short, the introduction of mobile and web applications in the context of citizen security marks a fundamental advance in monitoring and social surveillance, coupled with the fact that these solutions meet certain quality standards and can comply with the processes that users have planned; these digital solutions not only seek to strengthen security but also have a significant impact on the welfare of society. Finally, their adoption brings several benefits by overcoming conventional obstacles.

3 METHODOLOGY

For the development of this research, the SCRUM framework was used, supported by the proposals of [13] and [15]. This consists of five phases: Initiation, planning and estimation, implementation, review and retrospective, and release. The methodology used is graphically shown in Figure 2.

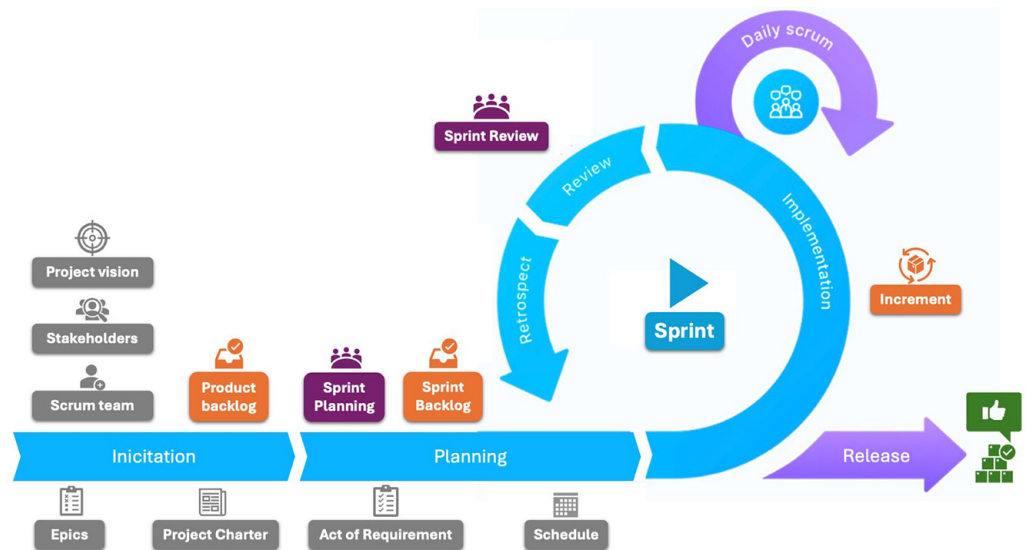


Fig. 2. Framework SCRUM

3.1 Initiation

The initiation phase stands as a pivotal juncture in laying down a robust groundwork for the project. This phase encompasses a series of critical activities, each meticulously designed to sculpt the project’s direction and framework. Below (refer to Table 1) is an elaboration of these activities, including their descriptions and the corresponding roles engaged.

Table 1. Initiation phase

Activity	Description	Tasks
Identification of stakeholders	Identification of the stakeholders involved in the project	Stakeholder identification: Product Owner, Scrum Master and Scrum Team
Definition of the project scope	Define the vision and scope of the project	Document the vision and scope of the project
Construction of the business process diagram	Detailed and visualize the processes of the current and future states of the business	Analyze and document the processes that currently exist in the business
		Design future processes that the business needs

Activity 1: Identification of stakeholders: This activity identifies and recognizes all stakeholders who will be involved throughout the project, including those who have direct and indirect interest, and considers those who have an influence on and can influence the expected results. This procedure is crucial for establishing effective channels and effective communication to ensure product success.

Activity 2: Definition of the project scope: In this activity, emphasis is placed on determining the vision of the project and delimiting its scope. The team proceeds to document these sections, providing an overview of what is intended to be developed, detailing in detail the limits that will exist, obtaining the approval of stakeholders, and ensuring an accurate understanding of all stakeholders (refer to Table 2).

Table 2. Project vision and scope

Project Vision	
Description	Objectives
Develop a mobile and web application for crime prevention in the District Municipality of Cayman, providing effective tools to report incidents, access relevant information and encourage community collaboration in crime prevention.	Provide effective incident reporting tools.
	Facilitate access to relevant information.
	Encourage collaboration in crime prevention.
Project Scope	
Development of mobile and web applications for crime prevention, including the following functionalities: <ul style="list-style-type: none"> – User management – Unit management – Incident type management – Emergency contact management – Incident management – API rest services documentation – VPS deployment – Mockup design and prototyping – Mobile functionality development – PlayStore publishing 	Develop specific functionalities to manage users, units, incident types, emergency contacts and incidents.
	Document API Rest services and deploy on a VPS server.
	Design mockups and prototypes.
	Develop specific functionalities for mobile applications.
	Develop specific functionalities for web applications.
	Publishing the mobile application.
	Deployment of the web application.

Activity 3: Construction of the business process diagram: Figure 3 shows the process diagram, which details the flow of the implementation of mobile and web applications in the municipality by the citizen security division to deal with a crime or incident, where the new actions to be taken by those involved are detailed.

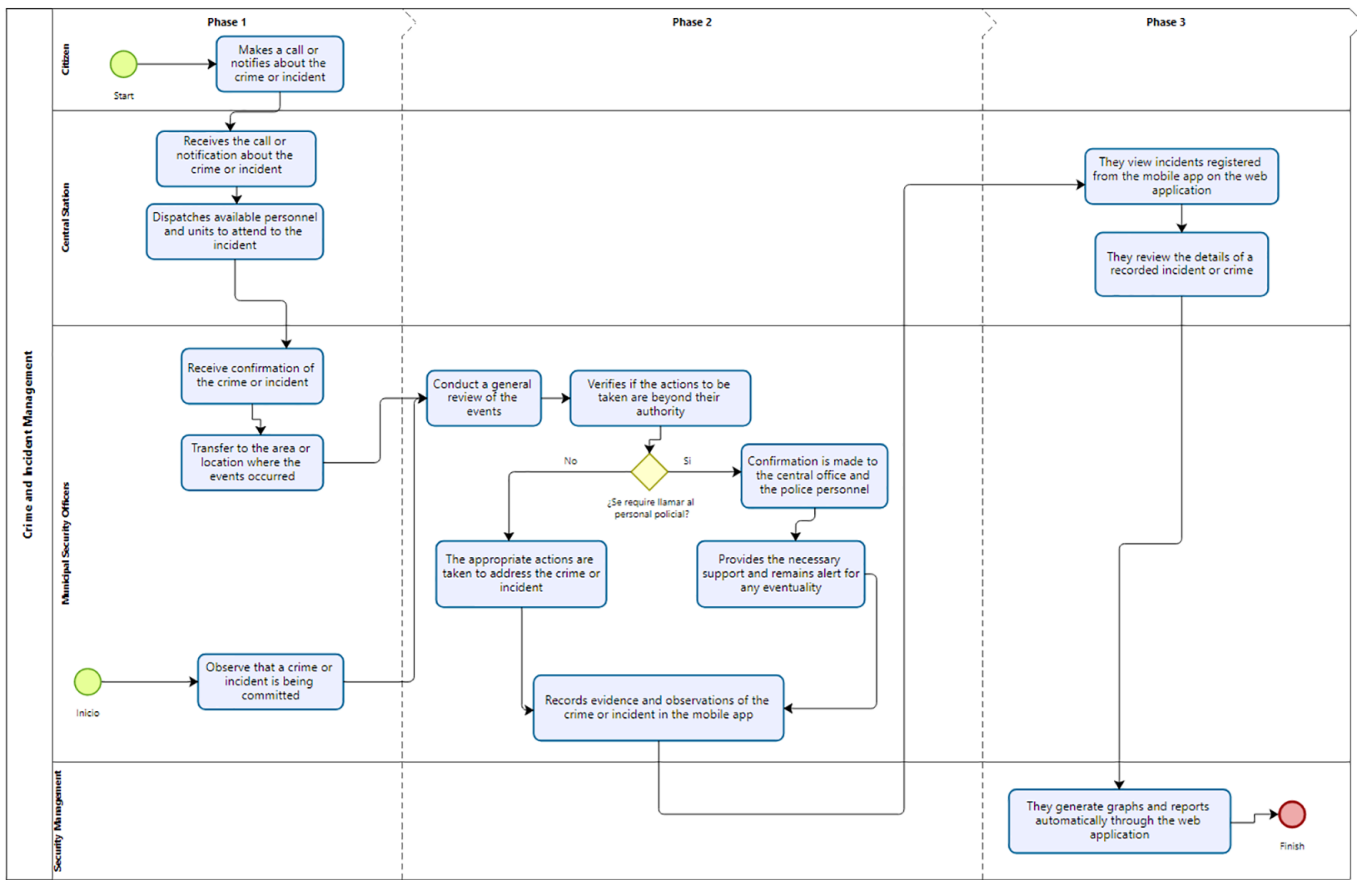


Fig. 3. Future state business processes

3.2 Planning and estimation

The planning and estimation phase focuses on the detailed preparation of the project, from the elaboration of the plan to the definition of user stories, to establish the necessary basis for effective development execution. Table 3 lists the activities.

Table 3. Initiation phase

Activity	Description	Tasks
Elaboration of the general project plan	Develop a comprehensive plan for the project	Define goals, deadlines, and resources
Definition of the product backlog	Establish and prioritize functionalities in the Product Backlog	Identifying crucial functionalities for development
Definition of fact	Establish completion criteria for each user story and task	Define clear criteria to consider a task or user story as “done”
Development of users	Create detailed user stories	Key functionalities of the product

Activity 1: Elaboration of the general project plan: The project plan (refer to Table 4) presented below serves as a general strategic guide, ensuring alignment with the objectives of the citizen security division of the Cayma District Municipality.

Table 4. General project plan

General Description
The development of mobile and web applications is presented as an overall comprehensive strategic guide designed to ensure precise alignment with the objectives established by the Citizen Security Division of the District Municipality of Cayman. This plan successfully implements these two products.
General Schedule and Milestones
<ul style="list-style-type: none"> – Start phase: Identifying needs and training Scrum team members. – Planning phase: Development of the present plan and establishment of the overall structure. – Iterative development phase: Sprint execution and development of key functionalities. – Delivery and closure phase: Preparation of deliverables and formal project closure. – Critical milestones: Presentation of functional product (mobile application and web application), approval of API Rest service documentation.
Resources Required
<ul style="list-style-type: none"> – Human resources: Citizen Security Division Representatives, Software Developers, UX/UI Designer, QA Specialist – Technological resources: Specialized software and cloud services – Financial resources: The budget allocated for development and implementation
Management Strategies
<ul style="list-style-type: none"> – Risk management: Proactive identification and mitigation of potential obstacles. – Communication: Regular team meetings and constant progress reporting. – Quality: Unit tests and code reviews are conducted to ensure the quality of the final product.
Alignment with Organizational Objectives
<ul style="list-style-type: none"> – Organizational Impact: The operational efficiency of the Public Safety Division, improvement of general processes related to crime prevention, and strengthening of the relationship with the community

Activity 2: Definition of the product backlog: For the product backlog, the team identified and prioritized all functionalities and requirements necessary for project development. This process involves collaboration between the product owner and the scrum team to ensure that all customer needs are satisfied. This process is described in detail below (refer to Table 5).

Table 5. Product backlog definition

Code	Description	HU Points	Category
B01	Preliminary database modeling	5	Backend
B02	Develop the initial architecture of the project	5	
B03	Implement user management and authentication	5	
B04	Implement unit management	4	
B05	Implement incident type management	4	
B06	Implement emergency contact management	4	
B07	Implement incident management	4	
B08	Develop API Rest service documentation	5	
B09	The application is deployed on the VPS	3	

(Continued)

Table 5. Product backlog definition (Continued)

Code	Description	HU Points	Category
M01	Design of mockups and prototyping	5	Mobile application
M02	Login	4	
M03	Manage the user profile	2	
M04	Registers registered incidents generally	4	
M05	View the details of a registered issue	4	
M06	Register a new issue	5	
M07	List the history of user incidents	3	
M08	Filter user incidents by date	4	
M09	In general, list emergency contacts	3	
M10	Application deployment in the PlayStore	2	
W01	Design of mockups and prototyping	5	Web application
W02	Login	4	
W03	Manage general user data and roles	4	
W04	Manage unit data	4	
W05	Manage incident type data	4	
W06	Manage emergency contact data	4	
W07	The incidents registered by users are listed	4	
W08	View the details of a registered incident	4	
W09	Apply filters to registered incidents	3	
W10	The incident data were exported in spreadsheet format	3	
W11	Visualization of heat map of the recorded incidents	4	
W12	Application deployment on the VPS	3	

Activity 3: Definition of fact: The definition of done sets the criteria required to consider a functionality as completed or finalized. Specific standards have been established for the different development areas of the project; the following are the key criteria for backend implementation, mobile application development, and web application development, thus ensuring a comprehensive and rigorous approach for each development cycle (refer to Table 6).

Table 6. Fact definition

Backend Development
<ul style="list-style-type: none"> – The code has been written and reviewed – Tests were created and passed successfully – Integration tests were performed to ensure interoperability – Documentation of the code has been completed
Mobile Application Development
<ul style="list-style-type: none"> – Mockups and prototypes have been designed and approved – Tasks were implemented as specified in the user stories – The user interface (UI) and user experience (UX) tests were performed

(Continued)

Table 6. Fact definition (*Continued*)

Web Application development	
	<ul style="list-style-type: none"> – Mockups and prototypes were designed and validated – Tasks were implemented as specified in the user stories – The user interface (UI) and user experience (UX) testing were performed – Compatibility testing with popular browsers was performed

Activity 4: Development of user stories: For the development of user stories, the team focused on detailing each functionality defined in the product backlog, which is an essential procedure to transform customer requirements into functional deliverables. The user story development is segmented into three categories, starting with the backend category. An example user story is presented in Table 7.

Table 7. Implement incident type management

Code	B05	HU	Implement Incident Type Management
User			–
Description	Develop the base architecture of the project in Node, determining all the required functionalities related to business logic, connectivity, testing and deployment.		
HU points	5		
Priority	High		
Tasks	<ul style="list-style-type: none"> – Start with a Node project and the installation of third-party libraries. – Structuring the initial architecture, routes, controllers, services and interfaces. 		
Responsible	Scrum team		

3.3 Implementation

The iterative design and development phase focuses on performing iterative Sprints or development cycles to advance the implementation of mobile and web applications. During this phase, a focus on flexibility and adaptability is prioritized, allowing adjustments based on the results obtained and lessons learned during each Sprint. Table 8 lists the activities.

Table 8. Implementation phase activities

Activity	Description	Tasks
Sprint 1 execution	Undertook the first iterative development period oriented toward the project goals.	Develop and implement the priority functionalities defined for the first Sprint.
Sprint 2 execution	Perform the second iterative development period, which is oriented toward the project goals.	Develop and implement the priority features defined for the second Sprint.
Sprint 3 execution	Perform the third iterative development period, which is oriented toward the project goals.	Develop and implement the priority features defined for the third Sprint.
Sprint 4 execution	Perform the fourth iterative development period based on the project goals.	Develop and implement the priority features defined for the fourth Sprint.

Activity 1: Sprint 1 execution

Sprint backlog for sprint 1: To start with sprint 1, relevant user stories were selected for this first iterative cycle, taking into consideration the existing story

points and priorities, as well as outlining the tasks and responsibilities. Through this activity, we are not only implementing tangible functionality but also consolidating team collaboration and adjusting existing planning as needed (refer to Table 9).

Table 9. Sprint backlog – sprint 1

Code	Description	HU Points	Category
B01	Preliminary database modeling	5	Backend
B02	Develop the initial architecture of the project	5	
B03	Implement user management and authentication	5	
M01	Design of mockups and prototyping	5	Mobile application
M02	Login	4	
W01	Design of mockups and prototyping	5	Web application
W02	Login	4	

Development of sprint 1 functionalities: At the beginning of the first sprint, the preliminary database modeling that will be used throughout the project is established and carried out, for which the corresponding tables and relationships are identified (see Figure 4): Unit, IncidentType, Zone, User, EmergencyLocation, and Incident.

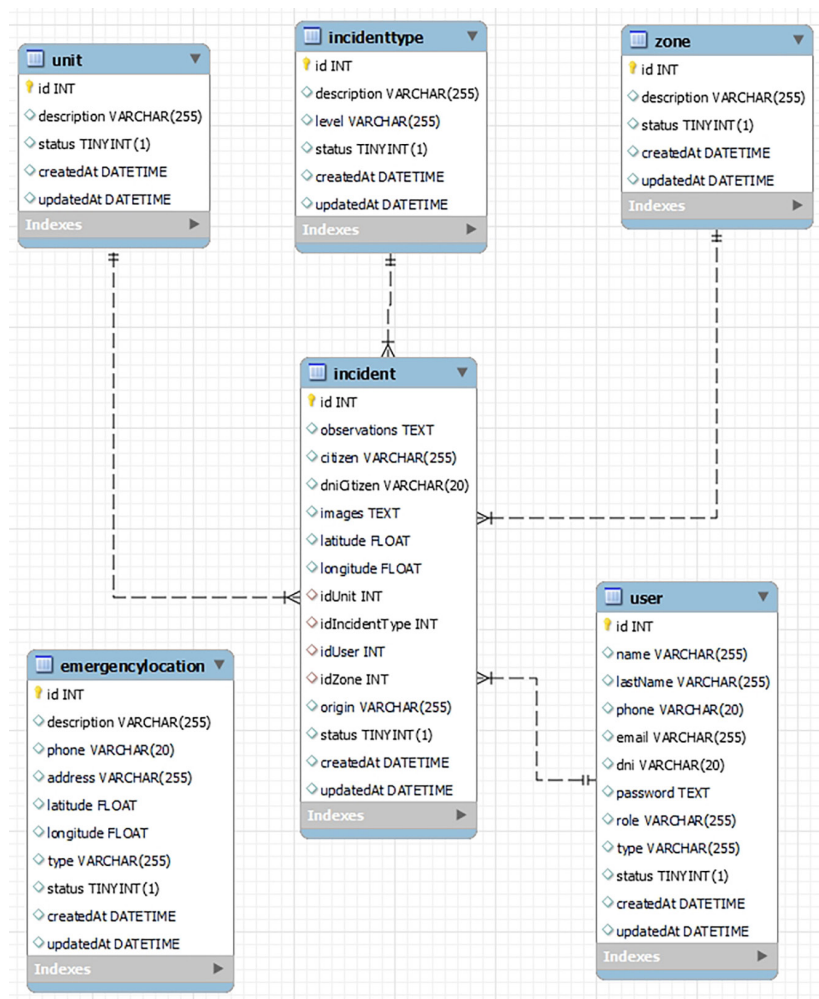


Fig. 4. General database diagram

Figure 5 shows the mobile application used by citizen security agents to record incidents in real time. These records are sent to the web application for information management and decision-making.

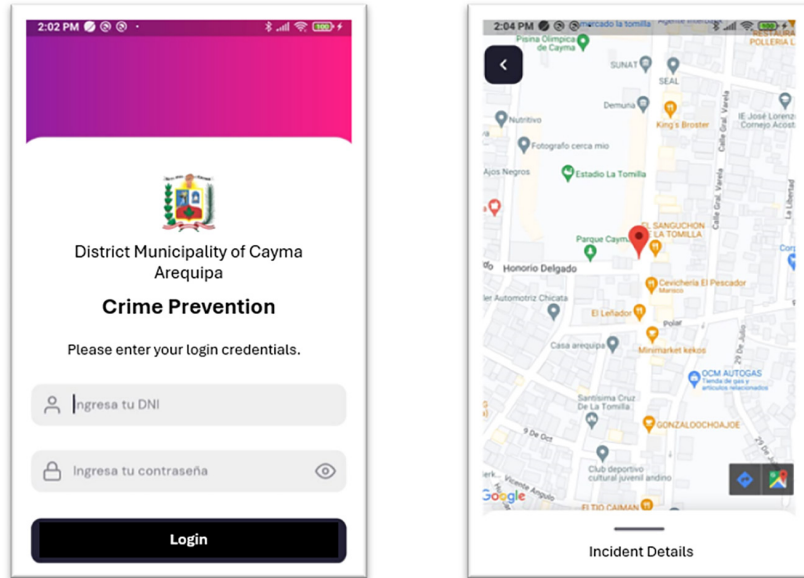


Fig. 5. Mobile application login

Figure 6 shows the web application, which is used to centralize information, manage information, and make decisions. Finally, orders are sent to citizen security agents to combat crime.

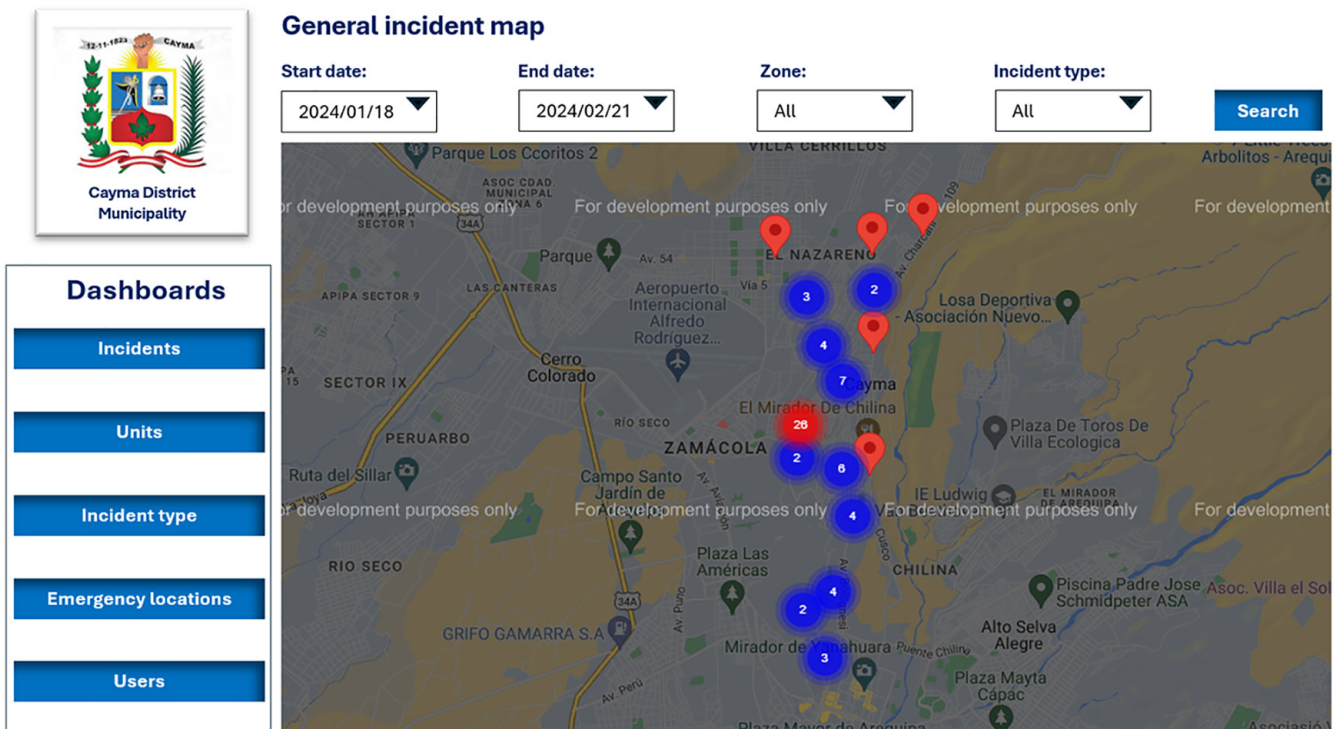


Fig. 6. Web application

4 RESULTS

Two instruments were used to collect data: an observation guide and a questionnaire [19] and [20]. The web application is currently in production at the following link: <https://muni-front.vercel.app/>

4.1 Observation guide instrument

Figure 7 shows the time reduction of 14.83 minutes in the daily data collection.

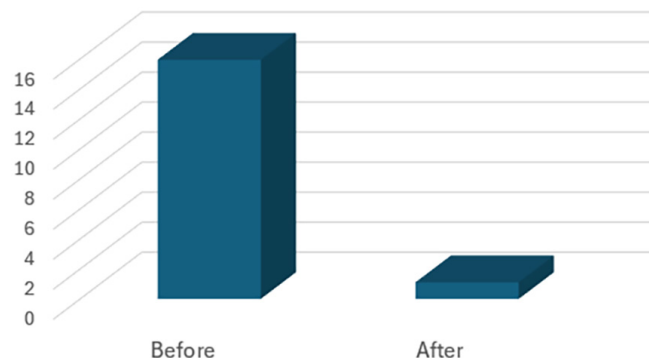


Fig. 7. Daily collection of data

Figure 8 shows the time reduction of 7.74 minutes in strategy planning.

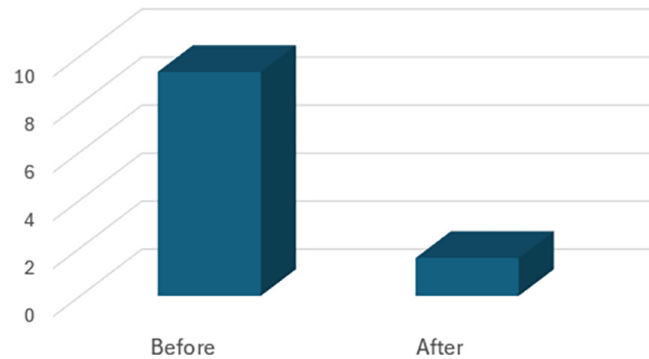


Fig. 8. Strategy planning

Figure 9 shows the time reduction of 12.6 minutes in the detailed crime tracking.

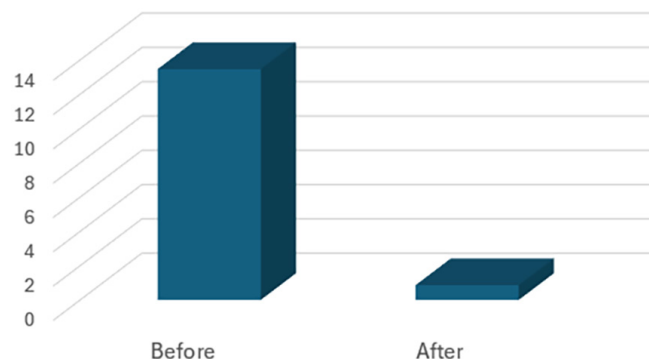


Fig. 9. Detailed crime tracking

4.2 Questionnaire instrument

The questionnaire was administered to 29 public safety agents. Cronbach's alpha was used to measure the reliability of the instrument; the result was 0.906, indicating high internal consistency. The Shapiro-Wilk normality test was then performed, with a significance value of less than 0.05 indicating that the distribution of the data was not normal. Finally, the Rho-Sperman test was applied, and the results are shown in Table 10.

Table 10. Rho-Spearman correlation results

	General and Specific Hypothesis	Correlation
General hypothesis	The implementation of mobile and web applications contributes significantly to crime prevention.	.559
Specific hypothesis 1	Implementing mobile and web applications contributes significantly to crime prevention.	.590
Specific hypothesis 2	Implementing mobile and web applications contributes significantly to crime prevention strategies.	.454
Specific hypothesis 3	Implementing mobile and web applications contributes significantly to daily crime prevention monitoring.	.607

5 DISCUSSIONS

Crime prevention and emergency management face challenges due to the lack of effective information collection and management mechanisms, which hinder decision-making and affect the effectiveness of crime control measures. The results demonstrate that the implementation of mobile and web applications contributes significantly to crime prevention. The study indicators show a significant reduction in the time spent on daily data collection, from 15.94 to 1.11 minutes; on strategy planning, from 6.33 to 1.58 minutes; and on detailed crime monitoring, from 13.46 to 0.86 minutes. The application also provides a channel for citizen and security agent incident logging, centralizes information for decision-making, monitors crime, and strengthens anti-crime strategies. However, one limitation of such applications is the need for ongoing training for citizen security officers and application administrators. Finally, the scope of this study is limited to the use of mobile and web applications; however, other studies have proposed integrating artificial intelligence with video surveillance cameras, which can complement the fight against crime by identifying crimes in real time.

6 CONCLUSIONS

Implementing mobile and web applications has demonstrated a significant impact on crime prevention in the Cayma district. The results were obtained from two research instruments: (i) The results for the indicators of the observation guide: Daily data collection, strategy planning time, and crime tracking are: 1.11, 1.58, and 0.86 min, respectively. (ii) A satisfaction survey was administered to 29 public safety officers: First, the reliability of the instrument was measured using Cronbach's alpha, the result of which was 0.906, indicating excellent internal consistency.

Next, the Shapiro-Wilk normality test was performed, the result of which was 0.001, indicating a non-normal distribution. Finally, the Rho Spearman test was applied, and the result was 0.559, indicating a moderate positive correlation. In conclusion, the implementation of mobile and web applications to strengthen citizen security in municipalities is highlighted significantly.

7 REFERENCES

- [1] United Nations Office on Drugs and Crime, “Crime prevention.” [Online]. Available: <https://www.unodc.org/unodc/justice-and-prison-reform/cpcj-crimeprevention-home.html> [Accessed: Sep. 16, 2024].
- [2] World Population Review, “Crime rate by country 2024.” [Online]. Available: <https://worldpopulationreview.com/country-rankings/crime-rate-by-country> [Accessed: Sep. 16, 2024].
- [3] Instituto Nacional de Estadística e Informática – INEI, “Estadísticas de Seguridad Ciudadana,” INEI. [Online]. Available: <https://m.inei.gob.pe/biblioteca-virtual/boletines/estadisticas-de-seguridad-ciudadana/1/#lista> [Accessed: Sep. 16, 2024].
- [4] MDC, “Municipalidad Distrital de Cayma (MDC).” [Online]. Available: <https://www.gob.pe/municayma> [Accessed: Sep. 17, 2024].
- [5] W. P. Yohanes Sigit Purnomo, T. D. Indriasari, K. Anindito, Y. Andrean, and J. G. Prasetyo, “CrimeID: Towards crime prevention and community safety in Indonesia using mobile and web technology,” *International Journal of Interactive Mobile Technologies (IJIM)*, vol. 13, no. 9, pp. 52–65, 2019. <https://doi.org/10.3991/ijim.v13i09.10172>
- [6] C. Oduor, F. Acosta, and E. Makhanu, “The adoption of mobile technology as a tool for situational crime prevention in Kenya,” in *2014 IST-Africa Conference Proceedings*, Pointe aux Piments, Mauritius, 2014, pp. 1–7. <https://doi.org/10.1109/ISTAFRICA.2014.6880669>
- [7] W. Jakkhupan and P. Klaypaksee, “A web-based criminal record system using mobile device: A case study of Hat Yai municipality,” in *2014 IEEE Asia Pacific Conference on Wireless and Mobile*, 2014, pp. 243–246. <https://doi.org/10.1109/APWiMob.2014.6920295>
- [8] A. Delgado, E. L. Huamaní, and E. J. Cortez-De La Peña, “A mobile application design to prevent criminal acts in Lima, Peru,” *Advances in Science, Technology and Engineering Systems*, vol. 5, no. 4, pp. 40–46, 2020. <https://doi.org/10.25046/aj050406>
- [9] R. Repanovici and A. Nedelcu, “Mobile emergency notification apps: Current state, barriers and future potential,” *IOP Conference Series: Materials Science and Engineering*, vol. 1009, pp. 1–11, 2021. <https://doi.org/10.1088/1757-899X/1009/1/012049>
- [10] K. Mkhwanazi, P. A. Owolawi, T. Mapayi, and G. Aiyetoro, “An automatic crime reporting and immediate response system,” in *2020 International Conference on Artificial Intelligence, Big Data, Computing and Data Communication Systems (icABCD)*, 2020, pp. 1–6. <https://doi.org/10.1109/icABCD49160.2020.9183837>
- [11] M. H. Munandar *et al.*, “Android application for crime prevention with GPS integrated technology,” *IOP Conference Series: Materials Science and Engineering*, vol. 1088, pp. 1–5, 2021. <https://doi.org/10.1088/1757-899X/1088/1/012009>
- [12] L. Haz, I. Carrera, M. F. Molina, and G. V. S. Bernal, “Prototype of smart community alarm for monitoring events and incidents related to citizen safety,” in *Iberian Conference on Information Systems and Technologies (CISTI)*, 2019, pp. 1–4. <https://doi.org/10.23919/CISTI.2019.8760645>
- [13] P. Pal, S. Singh, and S. Kumar Mitra, “A web application-based criminal record system,” *International Research Journal of Modernization in Engineering Technology and Science*, vol. 763, pp. 2582–5208, 2020. [Online]. Available: www.irjmets.com

- [14] J. Kiruthika, A. Sait, and S. A. Fathima, “Interactive mobile based crime reporting system integrated with map feature and exploratory data analysis,” *International Journal of Aquatic Science*, vol. 12, p. 8, 2021.
- [15] S. Mishra, “Website development of crime management system,” in *International Conference on Distributed Computing and Internet Technology*, 2022. [Online]. Available: <https://www.researchgate.net/publication/358079049>
- [16] T. Alameri, A. H. Alhilali, N. S. Ali, and J. K. Mezaal, “Crime reporting and police controlling: Mobile and web-based approach for information-sharing in Iraq,” *Journal of Intelligent Systems*, vol. 31, no. 1, pp. 726–738, 2022. <https://doi.org/10.1515/jisys-2022-0034>
- [17] J. M. Gallera, “Development of crime and incident reporting mobile application with SMS notification,” *International Research Journal of Advanced Engineering and Science*, vol. 8, no. 2, pp. 63–66, 2023. <https://doi.org/10.1145/3448971.3449021>
- [18] J. C. Chocce, L. Andrade-Arenas, D. Hernández Celis, and M. Cabanillas-Carbonell, “Use of mobile applications in citizen security,” *Bulletin of Electrical Engineering and Informatics*, vol. 12, no. 4, pp. 2328–2339, 2023. <https://doi.org/10.11591/eei.v12i4.5227>
- [19] X. Liu, *Using and Developing Measurement Instruments in Science Education*, 2020.
- [20] D. T. Cathryn Dippo, *Survey Measurement and Process Quality*, 2012.

8 AUTHORS

Elvis Barrionuevo is a Systems and Computer Engineer at the Universidad Tecnológica del Perú in Lima, Perú (E-mail: 1414067@utp.edu.pe).

Wilfredo Ticona is a Research Professor. Master’s degree in Electrical Engineering at the Universidad Tecnológica del in Lima, Perú (E-mail: wmamani@esan.edu.pe, c19404@utp.edu.pe).