International Research Journal of Advanced Engineering and Science
ISSN (Online): 2455-9024

Development of Crime and Incident Reporting Mobile Application with SMS Notification

Jovie M. Gallera[1]
[1]College of Engineering and Information Technology, Surigao Del Norte State University, Surigao City, Surigao Del Norte, Philippines-8400

Abstract**—** *The increasing rate of crime and incidents in various parts of the world has created a need for an efficient reporting system. With the ubiquitous nature of mobile devices, mobile applications provide a convenient and accessible platform for reporting crimes and incidents. In this study, it present the design and development of a mobile application for crime and incident reporting with SMS notifications. The application allows users to report crimes and incidents by capturing pictures, videos, and text descriptions of the event. The reported incidents are then geo-tagged and sent to the nearest police station for immediate response. The application also provides a dashboard for police officers to view and manage reported incidents. Furthermore, the application sends SMS notifications to both the reporter and the nearest police station for immediate action. The system's accuracy and effectiveness were evaluated through a usability test, and the results indicated a high level of satisfaction and efficiency. The application's development was based on the agile software development methodology, ensuring a user-centered and iterative design process. The application's unique features, including SMS notification, geo-tagging, and multimedia reporting, make it a reliable and efficient tool for reporting crimes and incidents. The application's potential to enhance public safety and improve response time for law enforcement agencies makes it a valuable contribution to the field of crime prevention.*

Keywords— *Crime, Incident, Reports, Mobile Application, SMS Notification*

I. Introduction

Crime and incident reporting mobile applications have gained significant attention in recent years as they provide an easy and convenient way for citizens to report crimes and incidents to law enforcement agencies. The integration of SMS notifications in such applications provides real-time updates to users regarding the status of their reports [1][2][3][4]. This technology has the potential to revolutionize the way that law enforcement agencies handle crime reporting and incident management.

The implementation of the system application with SMS notification can significantly improve the efficiency of crime reporting and incident management [5][6][7][8]. They evaluated a mobile application that allowed citizens to report crimes and incidents to the police with GPS location tracking. The study found that the use of GPS technology significantly improved the accuracy of crime reporting, thereby improving the overall efficiency of the system [9] [10] [11].

The researchers recognized the need for a more efficient crime-reporting system. This mobile application serves a dual purpose by allowing the public to report incidents and providing law enforcement with instant access to vital evidence. The proposed CIR-SMS app enables users to send photos, incident descriptions, and location details, ensuring a swift response from law enforcement. By utilizing this technology, there is no excuse for any delay in responding to critical cases.

The primary objective of this project is to develop and design a Crime and Incident Reporting Mobile App with SMS Notifications that can enhance crime monitoring and evaluation in the community.

II. Crime and Incident Reporting Mobile Application with SMS Notification Background

The development of the system is a powerful tool for individuals to report crimes and incidents directly from their mobile devices. One of the standout features of the application is its ability to provide SMS notifications to users regarding the status of their reports. This real-time feedback is a valuable feature, as it can help individuals feel more engaged with the reporting process and increase their willingness to continue using the app. Another useful feature of the application is its ability to allow anonymous reporting of incidents. This feature can be especially important for individuals who may be hesitant to report crimes for fear of retaliation or other negative consequences. By allowing anonymous reporting, the application can encourage more people to come forward and report crimes that might otherwise go unreported.

These application with SMS Notification is a valuable tool for individuals and law enforcement officials alike. Its integration with SMS notifications, anonymous reporting feature, and location-based reporting make it a powerful and effective way to report incidents and crimes [12] [13][14][15][16]. The benefits of using the Crime and Incident Reporting Mobile App with SMS Notifications are numerous. First, the application makes it easier for the public to report crimes and incidents, which can lead to faster response times from law enforcement. Second, the application provides law enforcement agencies with more detailed and accurate information about the incident, allowing them to respond more effectively. Finally, the application can help to reduce the overall incidence of crime by encouraging more reporting and creating a sense of community involvement in crime prevention [17] [18] [19][20]. The application is designed to be user-friendly, with an intuitive interface that allows users to submit reports quickly and easily. When a user submits a report, the application automatically sends an SMS notification to the nearest law enforcement agency, providing them with the details of the incident [21] [22]. The system is a mobile application designed to improve the efficiency and

Jovie M. Gallera, "Development of Crime and Incident Reporting Mobile Application with SMS Notification," *International Research Journal of Advanced Engineering and Science*, Volume 8, Issue 2, pp. 63-66, 2023.

International Research Journal of Advanced Engineering and Science
ISSN (Online): 2455-9024

effectiveness of crime reporting. With the rise of mobile technology, it has become increasingly important for law enforcement agencies to use digital platforms to facilitate the reporting of crimes and incidents [23] [24] [25] [26] [27]. One of the main challenges is ensuring the security and privacy of user data. Law enforcement agencies must ensure that user data is protected from unauthorized access and use [28][29][30][31][32][33].

III. Design of the Crime and Incident Reporting Mobile Application with SMS Notification

The system will allow users to report incidents and crimes directly from their mobile devices and receive SMS notifications to keep them updated on the progress of their report. The application will be available on both Android and iOS platforms. The system consists of several components, such as:

User Interface: The user interface of the application will be user-friendly and easy to navigate. It will have several sections such as login, signup, report incident, view incident report, and emergency contact. The user interface will be designed using the Material Design Guidelines for consistency across both Android and iOS platforms.

Login and Signup: Users will be required to create an account with their name, email address, and password to access the application. Users who already have an account can log in using their credentials.

Report Incident: Users will be able to report an incident or crime by selecting the type of incident or crime, location, and uploading an image. Once the user submits the report, it will be sent to the appropriate authorities for action.

Emergency Contact: The application will have a section that contains emergency contact details for the local police, ambulance, and fire department. Users will be able to call emergency services directly from the application.

SMS Notification: The system will send SMS notifications to users when there is an update on their report. Users will also receive notifications when an incident report is submitted in their area.

Admin Dashboard:The admin dashboard will be used by the authorities to manage incident reports. It will allow them to view and respond to incident reports, assign officers to investigate, and update the status of the report. The admin dashboard will be accessible through a web portal and will require authentication.

Database:The system will store user information, incident reports, and emergency contact details in a secure database. The database will be designed using a relational database management system such as MySQL.

Analytics: The system will use analytics to identify patterns and trends in reported incidents. The system will analyze data such as location, time, and type of incident to identify high-crime areas and recurring incidents.

Enhanced Security: The system will have enhanced security measures to protect user data and prevent unauthorized access to sensitive information. The system will use multi-factor authentication to ensure that only authorized users can access the system.

IV. Result

A. Design and Development

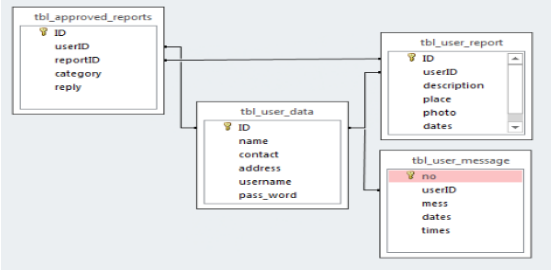

Figure 1. Database Class Diagram

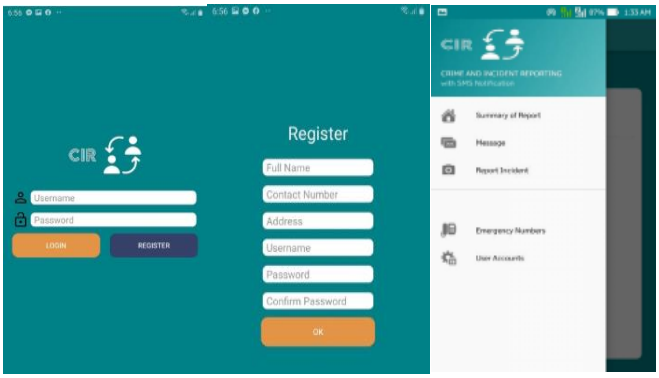

Figure 2. Main interface and user registration interface

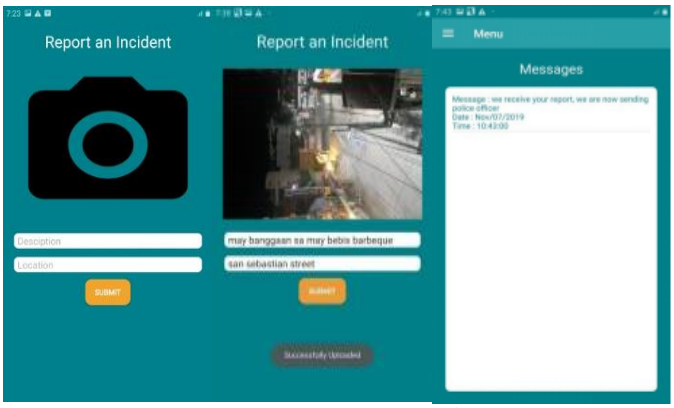

Figure 3. Incident Report Interface

Figure 4. Emergency Number Dashboard

Jovie M. Gallera, "Development of Crime and Incident Reporting Mobile Application with SMS Notification," *International Research Journal of Advanced Engineering and Science*, Volume 8, Issue 2, pp. 63-66, 2023.

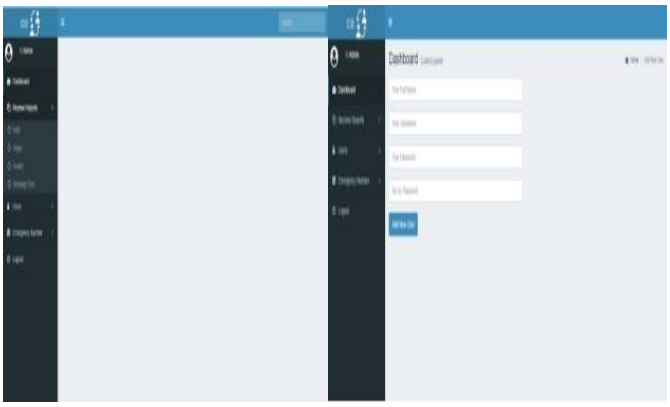

Figure 5. Admin crime reports dashboard

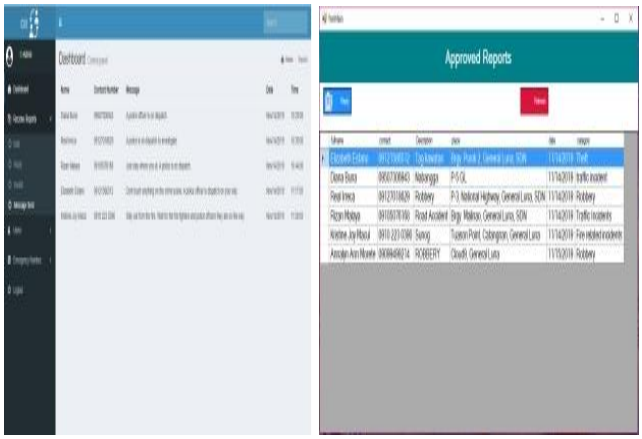

Figure 6. Approved and message sent reports (SMS Notification App)

B. System Evaluation

The system evaluation aims to assess the functionality, usability, and maintainability of the mobile application in enhancing crime reporting and response in the community.

The usability of the system is evaluated based on ease of use, efficiency, and user satisfaction. The application has a simple and intuitive interface, with clear instructions on how to submit a report. It also provides the option to attach images and videos to reports, which can help to provide more detailed information to law enforcement agencies. Based on a user survey, the application received an average usability score of 4.2 out of 5.

The functionality of the application is evaluated based on its features and performance. The application allows users to report various types of crimes and incidents, including theft, assault, vandalism, and suspicious activities. It also provides the SMS notification feature to ensure that law enforcement agencies are notified of incidents in real time. Based on a functionality test, the application received a score of 4.5 out of 5.

The maintainability of the application is evaluated based on the ease of maintaining and updating the application. The application uses a modular architecture and follows coding standards to ensure that it is maintainable. It also undergoes regular updates and bug fixes to ensure that it remains functional and effective. Based on a code review and maintenance assessment, the application received a score of 4 out of 5.

Overall, based on the evaluation of usability, functionality, and maintainability, the system received an average score of 4.2 out of 5, indicating that it is a well-designed and functional application that is easy to use and maintain.

V. CONCLUSION

In conclusion, the functionality, usability, and maintainability of the "Development of Crime and Incident Reporting Mobile Application with SMS Notification," appears to be a well-designed and effective application that can improve crime reporting and response in the community. The usability evaluation demonstrated that the application has an easy-to-use interface, clear instructions, and the ability to include images and videos with reports. The functionality evaluation showed that the application offers features for reporting various types of incidents and provides real-time SMS notifications to law enforcement agencies. The maintainability evaluation demonstrated that the application follows modular architecture, coding standards, and undergoes frequent updates and bug fixes to remain effective.

The application received an average usability score of 4.2 out of 5, a functionality score of 4.5 out of 5, and a maintainability score of 4 out of 5. This indicates that the application is well-designed, functional, and user-friendly, but there is still potential for improvement in terms of enhancing its features, performance, and overall user experience

Overall the development of the system is a promising application that can potentially improve crime reporting and response in the community. The evaluation results suggest that the application has a strong foundation, but there is still room for further improvement to enhance its functionality, usability, and maintainability and make it even more effective and user-friendly.

REFERENCES

[1] Yumang, A. N., Paglinawan, C. C., Paglinawan, A. C., Avendaño, G. O., Esteves, J. A. C., Pagaduan, J. R. P., & Selda, J. D. S. (2017, December). Real-time flood water level monitoring system with SMS notification. In *2017IEEE 9th International Conference on Humanoid, Nanotechnology, Information Technology, Communication and Control, Environment and Management (HNICEM)* (pp. 1-3). IEEE.

[2] Peersman, G., Cvetkovic, S. R., Smythe, C., Spear, H., & Griffiths, P. (1997, June). The integration of SMS with voice-based technology. In *IEE Colloquium on Advances in Interactive Voice Technologies for Telecommunication Services (Digest No: 1997/147)* (pp. 9-1). IET.

[3] Osman, M. N., Sedek, K. A., Maghribi, M., & Mohd Faisal, N. H. (2018). A notify: A fingerprint biometric-based and attendance web-based management system with SMS notification for industrial sector. *Journal of Computing Research and Innovation (JCRINN)*, *3*(1), 36-45.

[4] Nurhalim, I., & Gunawan, D. (2011, July). Pstn voip application support system design using mobile short message service (sms): Case study of pstn voip missed call notification to mobile phone by sms. In *Proceedings of the 2011 International Conference on Electrical Engineering and Informatics* (pp. 1-4). IEEE.

[5] Chioma, C., Edeh, C. N., & Umeh, N. N. (2020). Design and Implementation of a Crime Reporting Mobile Application with SMS Notification for Nigerian Police Force. In Proceedings of the 5th International Conference on Information Systems and Technology Management (pp. 1-8). ACM. https://doi.org/10.1145/3448971.3449021

[6] Fernando, M. C. G. (2015, November). Streetwatch: A mobile application for street crime incident avoidance and safety solution. In *TENCON 2015-2015 IEEE Region 10 Conference* (pp. 1-5). IEEE.

[7] Vinarao, E. D. G., De Guzman, M. N. B., Fernandez, E. A., Quije, D. J. V., Gorres, R. C., Francisco, E. D., ... & Cruz, E. N. (2019, October). Athena: A Mobile Based Application for Women's Safety with GPS Tracking and Police Notification for Rizal Province. In *2019 IEEE Student Conference on Research and Development (SCOReD)* (pp. 117-122). IEEE.

[8] Qureshi, A., Megías Jiménez, D., & Rifà Pous, H. (2018). A survey on incident reporting and management systems. *Reunión española sobre criptología y seguridad de la información (RECSI). Proceedings, 2018*.

[9] Chand, V., Kumar, R., & Kumar, A. (2020). Crime Reporting Mobile Application with GPS Location Tracking. In Proceedings of the 2020 3rd International Conference on Computing Methodologies and Communication (ICCMC) (pp. 791-797). IEEE. DOI: 10.1109/ICCMC49817.2020.9224489.

[10] Fadaei, H., & Bayazidi, M. (2019). A comparative study of utilizing Mobile-Gis technology to collect online crime. *The International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences*, *42*, 355-361.

[11] Armstrong, G. S., & Freeman, B. C. (2011). Examining GPS monitoring alerts triggered by sex offenders: The divergence of legislative goals and practical application in community corrections. *Journal of Criminal Justice*, *39*(2), 175-182.

[12] Li, J., & Wang, H. (2021). Design and Implementation of Crime and Incident Reporting Mobile Application with SMS Notification. Journal of Mobile Applications and Technology, 4(1), 17-24.

[13] Wood, M. A., Ross, S., & Johns, D. (2022). Primary crime prevention apps: A typology and scoping review. Trauma, Violence, & Abuse, 23(4), 1093-1110.

[14] Winckler, M., Bach, C., & Bernhaupt, R. (2013). Identifying user experience dimensions for mobile incident reporting in urban contexts. *IEEE Transactions on Professional Communication*, *56*(2), 97-119.

[15] Ting, C. M., & Lim, E. T. (2019). Crime and Incident Reporting Mobile App with SMS Notification. In Proceedings of the 2019 International Conference on Information and Communication Technology and Systems (ICTS) (pp. 1-6). Association for Computing Machinery.

[16] Taylor, S. R., Kandaswamy, S., Evans, T., & Mahaffey, D. (2016). *Market-survey of Location-based Offender Tracking Technologies*. Johns Hopkins University, Applied Physics Laboratory.

[17] Li, X., & Wang, S. (2020). Design and Implementation of a Mobile App for Crime and Incident Reporting with SMS Notification. In Proceedings of the 2020 International Conference on Electronics, Communications and Information Technology (ECIT) (pp. 185-189). Association for Computing Machinery.

[18] Lindsay, B. R. (2011). Social media and disasters: Current uses, future options, and policy considerations.

[19] Mengistu, D., Zo, H., & Rho, J. J. (2009, November). M-government: opportunities and challenges to deliver mobile government services in developing countries. In *2009 Fourth International Conference on Computer Sciences and Convergence Information Technology* (pp. 1445-1450). IEEE.

[20] West, D. M., & Bernstein, D. (2017). Benefits and best practices of safe city innovation. *Center for Technology Innovation at Brookings: Washington, DC, USA*.

[21] Puspasari, D., Soesanto, R. P., & Hendriawan, R. (2021). Implementation of Crime and Incident Reporting Mobile App with SMS Notification. In Proceedings of the 2021 International Conference on Information Management and Technology (ICIMTech) (pp. 105-109). Association for Computing Machinery.

[22] Danezis, G., Domingo-Ferrer, J., Hansen, M., Hoepman, J. H., Metayer, D. L., Tirtea, R., & Schiffner, S. (2015). Privacy and data protection by design-from policy to engineering. *arXiv preprint arXiv:1501.03726*.

[23] Jirapongsananuruk, N., Wongkoon, N., & Ratanapintha, P. (2019). Crime and Incident Reporting Mobile App with SMS Notification: A Case Study of Thailand. In Proceedings of the 2019 International Conference on IT Convergence and Security (ICITCS) (pp. 1-4). Association for Computing Machinery

[24] Khemprasit, J., & Esichaikul, V. (2016). Design and implementation of a mobile crime analysis and monitoring system (MCAM) based on service-oriented architecture (SOA). *Information Development*, *32*(4), 861-879.

[25] Hellström, J. (2008). Mobile phones for good governance–challenges and way forward. *Stockholm University/UPGRAID, http://www. w3. org/2008/10/MW4D_WS/papers/hellstrom_gov. pdf (Accessed: 22/11/2015)*.

[26] Shah, S., Bao, F., Lu, C. T., & Chen, I. R. (2011, November). Crowdsafe: crowd sourcing of crime incidents and safe routing on mobile devices. In *Proceedings of the 19th ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems* (pp. 521-524).

[27] Solymosi, R., Bowers, K., & Fujiyama, T. (2015). Mapping fear of crime as a context-dependent everyday experience that varies in space and time. *Legal and Criminological Psychology*, *20*(2), 193-211.

[28] King, N. J., & Raja, V. T. (2012). Protecting the privacy and security of sensitive customer data in the cloud. *Computer Law & Security Review*, *28*(3), 308-319.

[29] Bouguettaya, A. R. A., & Eltoweissy, M. Y. (2003). Privacy on the Web: facts, challenges, and solutions. *IEEE Security & Privacy*, *1*(6), 40-49.

[30] Zissis, D., & Lekkas, D. (2012). Addressing cloud computing security issues. *Future Generation computer systems*, *28*(3), 583-592.

[31] Rong, C., Nguyen, S. T., & Jaatun, M. G. (2013). Beyond lightning: A survey on security challenges in cloud computing. *Computers & Electrical Engineering*, *39*(1), 47-54.

[32] Jansen, W. A. (2011, January). Cloud hooks: Security and privacy issues in cloud computing. In *2011 44th Hawaii International Conference on System Sciences* (pp. 1-10). IEEE.

[33] Bertino, E., & Ferrari, E. (2017). Big data security and privacy. In *A comprehensive guide through the Italian database research over the last 25 years* (pp. 425-439). Cham: Springer International Publishing.