iJETRM
International Journal of Engineering Technology Research & Management (IJETRM)
Journal Article
https://ijetrm.com/issue/

DEVELOPMENT AND EVALUATION OF A MOTORCYCLE RENTAL PORTAL USING RAPID APPLICATION DEVELOPMENT

Junell P. Labmonte[1]; Cj E. Jumantoc[2]; Jenny Mae S. Maru[3]; Dino L. Ilustrisimo, Ph.D.[4]; Nathaly Pearl E. Espinosa[5]; Julienne Mar Descartin[6]; Rey Mart V. Sangutan[7]; Jaylian C. Bacolod[8]; Nhiel Joshua L. Villarino[9]; Kurt Bryan S. Alegre, MIT (c)[10]
[123]Bachelor of Science in Information Technology, Bunakan, Madridejos, Cebu, Philippines,
[4]Dean, School of Information Technology, Bunakan, Madridejos, Cebu, Philippines
[10]Instructor, School of Information Technology, Bunakan, Madridejos, Cebu, Philippines

[1]junelllabamonte@gmail.com;[2]cjjumantoc14@gmail.com;[3]marujennymae@gmail.com;
[4]dino.ilustrisimo@mcclawis.edu.ph;[5]nathalypearl.espinosa@mcclawis.edu.ph;[6]descartinjuliennemar08@gmail.com;
[7]sangutanreymart@gmail.com;[8]jaylianbacolod096@gmail.com; [9]villarinojoshua46@gmail.com;
[10]kurtbryan.alegre@mcclawis.edu.ph;

ABSTRACT
Motorcycle rental services have long relied on manual processes, which often lead to inefficiencies, long waiting times, and limited access, particularly in rural areas. Such traditional systems are unable to meet the modern demand for fast and convenient digital transactions. This study focused on developing and evaluating a Motorcycle Rental Portal using the Rapid Application Development (RAD) model to overcome these challenges. The portal connects renters with a wide range of motorcycles, offering features such as advanced search filters, secure booking protocols, and comprehensive asset management tools. The research followed a developmental approach, applying RAD methodology to support iterative design and continuous feedback from users throughout its four phases: requirements planning, user design, construction, and deployment. The system's effectiveness and usability were assessed by three Information Technology experts using a standardized evaluation questionnaire. Results showed that the portal performed very well in creating rental shops (Mean = 4.66) and adding motorcycles (Mean = 5.00). Usability metrics including usefulness (4.91), satisfaction (4.81), ease of use (4.21), and ease of learning (5.00)ranged from "Very Satisfactory" to "Excellent", with an overall mean of 4.73. The findings suggest that the portal effectively addresses the limitations of traditional rental systems by providing a secure, efficient, and user-friendly platform. It also encourages a connected community of motorcycle enthusiasts and allows owners to monetize their vehicles. By integrating mobile technology, the portal delivers real-time updates and communication, promoting responsible riding practices and offering a seamless rental experience for users across the region.

Keywords:
motorcycle rental portal, online motorcycle booking, rental management system, rapid application development, web-based system development, system evaluation, user-friendly interface.

INTRODUCTION
The development of mobile technology has significantly transformed various industries, including transportation and vehicle rental services. With the increasing use of smartphones and internet connectivity, many traditional business processes are shifting toward digital platforms to provide faster, more convenient, and more accessible services to customers. Vehicle rental services, particularly motorcycle rentals, are among the industries that benefit from digital transformation through web-based and mobile-supported systems [9].
Motorcycle rental businesses in many areas, especially in rural communities, still rely on manual processes for booking, inventory tracking, and customer management. These traditional methods often result in inefficiencies such as longer waiting times, limited accessibility, and difficulty in managing rental records [7]. As technology continues to evolve, digital solutions such as online booking systems and mobile applications have become essential tools in improving service efficiency and customer satisfaction.
Mobile applications now enable users to search for available vehicles, check availability, make reservations, and manage bookings anytime and anywhere. Studies show that digital rental platforms improve accessibility and enhance customer experience by providing real-time information and streamlined booking processes[3][1].

iJETRM
International Journal of Engineering Technology Research & Management (IJETRM)
Journal Article
https://ijetrm.com/issue/

Additionally, integrating modern technologies such as web-based systems and Internet of Things (IoT) concepts further enhances system efficiency and communication [8].
In response to these challenges, this study proposes the development and implementation of a Motorcycle Rental Portal with mobile application support. The system is designed to provide a user-friendly and efficient platform where customers can easily browse available motorcycles, check availability, and make reservations online. At the same time, it enables rental shop owners to manage motorcycle inventory and monitor rental transactions effectively, ultimately improving the overall rental experience.

OBJECTIVES

This study aims to develop a more accessible and convenient way of booking motorcycle rentals, especially in rural areas.
Specifically, this study aims to:
1. Develop a system which:
   1.1 Craft a dynamic and intuitive dashboard, serving as the cornerstone for seamless navigation and data visualization.
   1.2 Implement robust user management functionalities, enabling administrators and owners to efficiently organize and exert control over user accounts, utilizing Create, Read, Update, and Delete (CRUD) operations[9].
   1.3 Create a system capable of generating detailed and insightful booking reports, providing valuable data for informed decision-making and operational optimization.
   1.4 Conceptualize and design a mobile application that complements the web-based platform, offering users enhanced accessibility and convenience on the go.
2. Determine the usability of the developed system based on USE Questionnaire: Usefulness, Ease of use and learning, and satisfaction[1][3].
3. ISO/IEC 25010 was used as the software quality model to evaluate the developed motorcycle rental portal. The system was created using the Rapid Application Development (RAD) approach to ensure efficient and timely development. This study aims to support modern and efficient motorcycle rental operations through a user-friendly web-based solution[5][8].

METHODOLOGY

This research project entitled (DEVELOPMENT AND EVALUATION OF A MOTORCYCLE RENTAL PORTAL USING RAPID APPLICATION DEVELOPMENT) utilizes the developmental research approach. This method focuses on the systematic process of designing, developing, evaluating, and improving a system to ensure its effectiveness and reliability. Through this approach, the researchers aim to create a functional and efficient rental portal that meets the needs of users while maintaining consistency in system performance [11].
Software Development Life Cycle Model:

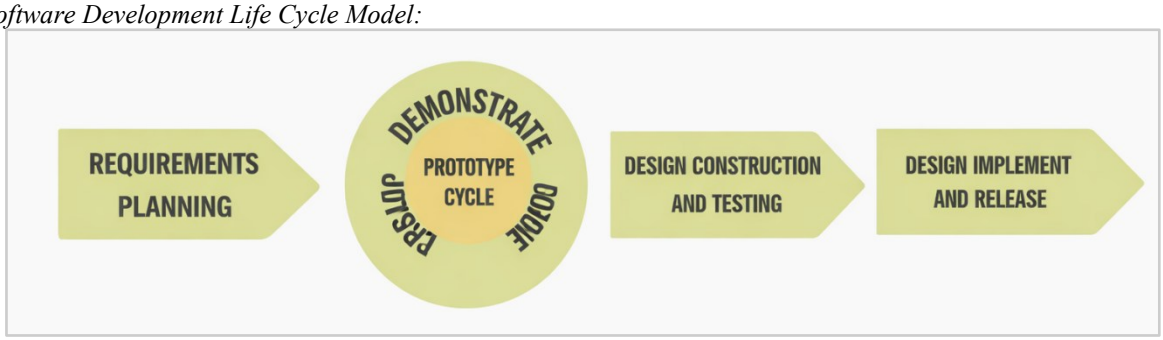

Figure 1. Rapid Application Development (RAD) Model used in the System Development

1. Requirements Planning
This phase focuses on identifying system objectives, business needs, and user requirements Developersand stakeholders work together to define the scope and expectations of the project.
2. Prototype Cycle (Demonstrate and Refine)
Quick prototypes are developed to represent system features. These prototypes are presented to users,and continuous feedback is used to refine and improve the system iteratively.
3. Design Construction and Testing
After finalizing the prototype, the system is fully developed. Coding and testing are carried out simultaneously to ensure functionality and reduce errors.

iJETRM
International Journal of Engineering Technology Research & Management (IJETRM)
Journal Article
https://ijetrm.com/issue/

4. Design Implementation and Release

The completed system is deployed for actual use. User training, system installation, and maintenance activities are performed during this phase.

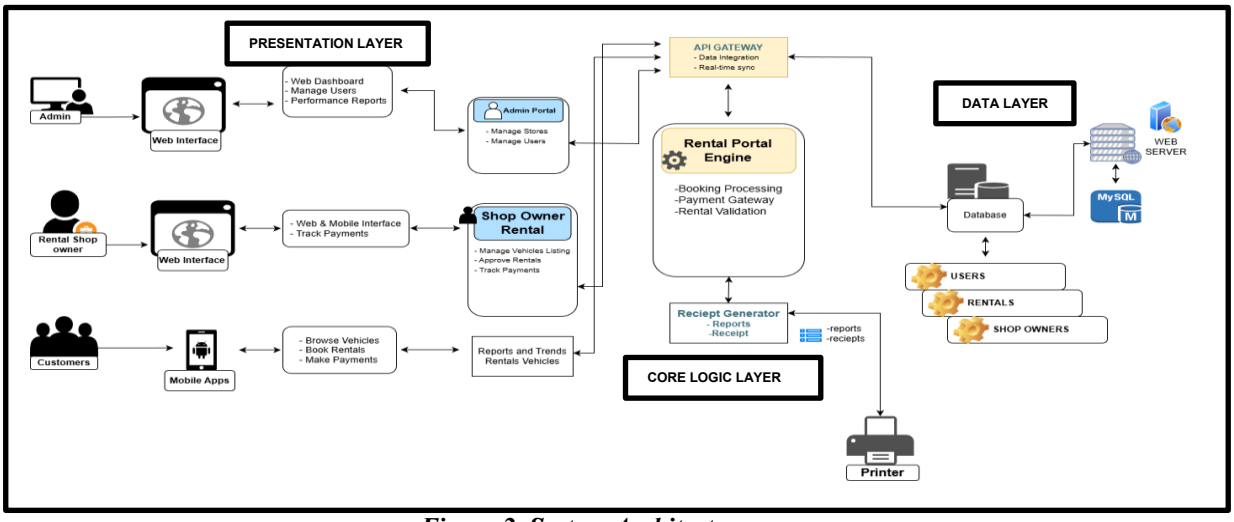

Figure 2. System Architecture

The system architecture illustrates how the rental platform operates through three interconnected layers: the Presentation Layer, where admins, shop owners, and customers interact via web dashboards and mobile apps; the Core Logic Layer, which powers the system through portals for administration, shop management, and a central rental engine that handles booking, payment, validation, analytics, and the Data Layer, which secures and stores all operational data through local servers, databases, and backup modules. This design emphasizes modular independence, real-time synchronization, and scalability, ensuring efficient data flow, adaptive functionality, and secure transactions across all user levels.

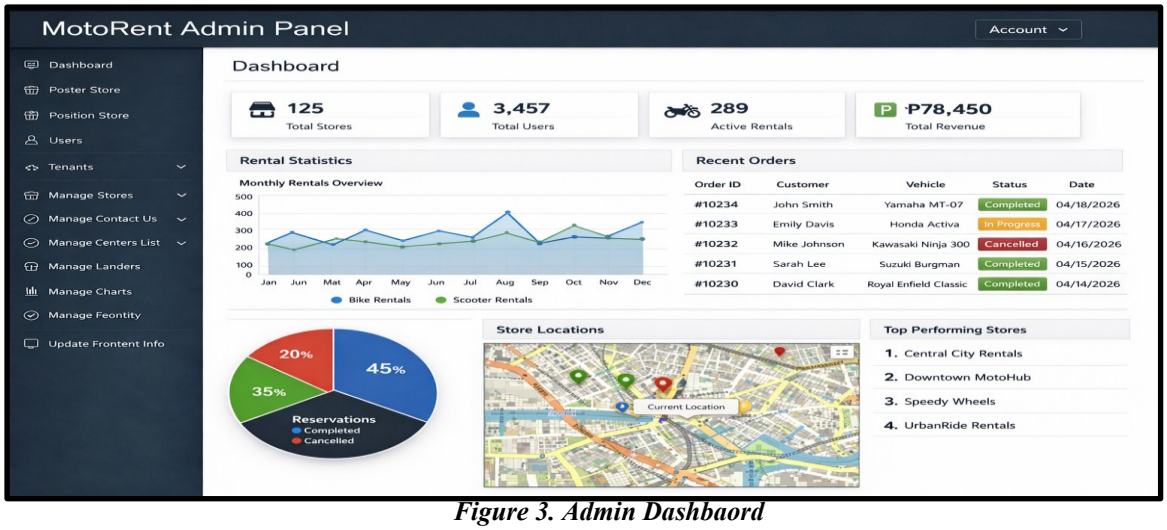

Figure 3. Admin Dashbaord

The MotoRent Admin Panel dashboard provides a comprehensive snapshot of the business's performance. It shows that the company operates 125 stores with 3,457 registered users, currently managing 289 active rentals and generating ₱78,450 in revenue. Visual charts highlight seasonal demand trends, while detailed order tables reveal both successful transactions and cancellations. Performance metrics, such as the 20% cancellation rate and identification of top-performing stores, offer actionable insights for reducing churn and replicating successful strategies across the network.

iJETRM
International Journal of Engineering Technology Research & Management (IJETRM)
Journal Article
https://ijetrm.com/issue/

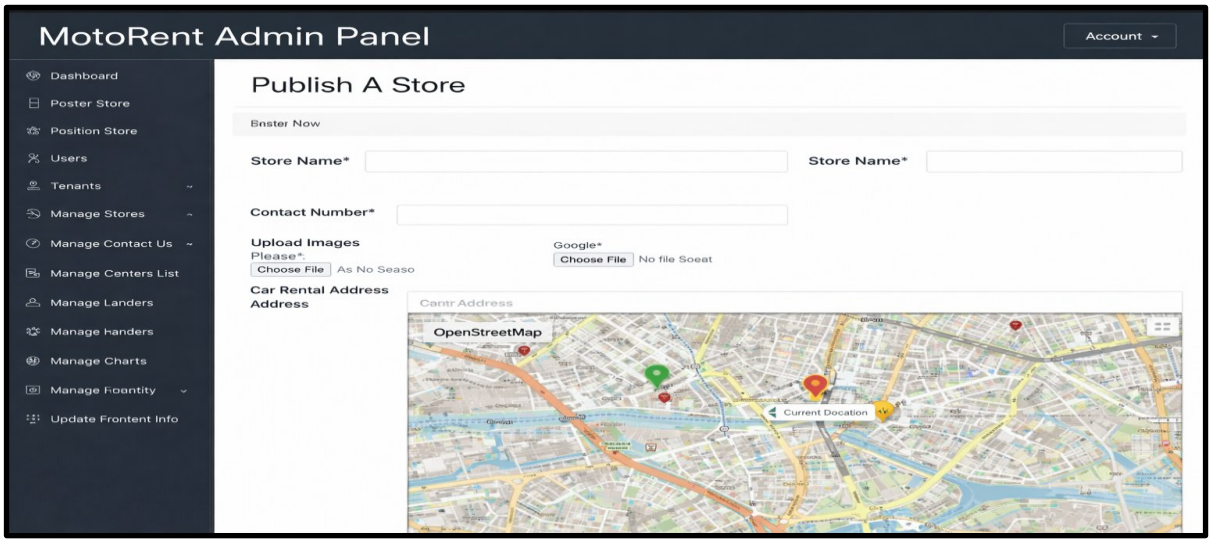

Figure 4. Adding new rental shop

Figure 4 illustrates the section of the MotoRent system where the administrator can create or add a new rental shop. This interface provides fields for entering essential shop details, ensuring that new locations are properly registered within the network. By streamlining the process of adding stores, the system supports scalability and helps maintain consistency across all branches. This feature is crucial for expanding operations, as it allows the business to quickly onboard new shops while keeping data organized and accessible for performance tracking.

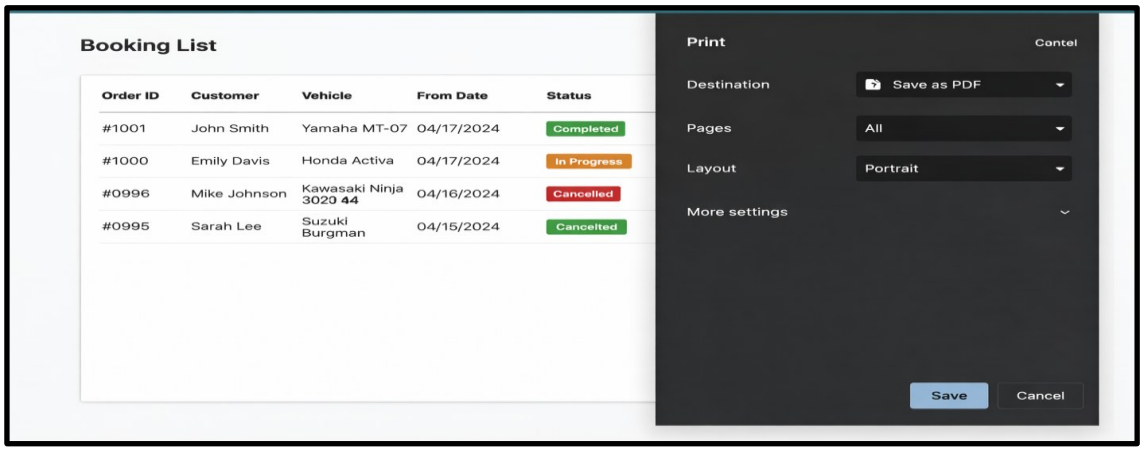

Figure 5. Generate Booking reports

Figure 5 presents the reporting feature of the MotoRent system, where administrators can generate detailed booking reports. This section allows the admin to view and analyze rental activity, including completed bookings, cancellations, and revenue trends. By providing structured data in report format, the system helps track performance across different stores and time periods. Such reporting capabilities are essential for identifying patterns, evaluating operational efficiency, and making informed decisions to improve overall business outcomes.

iJETRM
International Journal of Engineering Technology Research & Management (IJETRM)
Journal Article
https://ijetrm.com/issue/

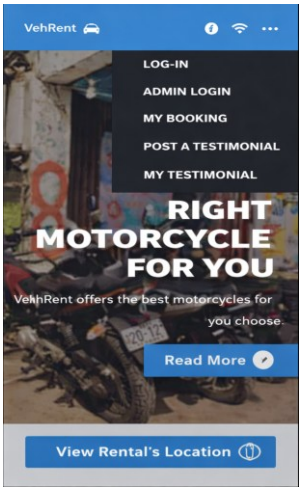

Figure 6. Mobile Application interface

Figure 6 highlights the mobile application interface of the MotoRent system, designed for both users and shop owners. Through this interface, users can log in securely and conveniently browse available motorcycles directly from their mobile phones. Shop owners also benefit from the same platform, as they can access their accounts to manage listings, monitor rentals, and oversee shop activity. This mobile integration ensures accessibility, enhances user engagement, and supports efficient management of motorcycle rentals anytime and anywhere.

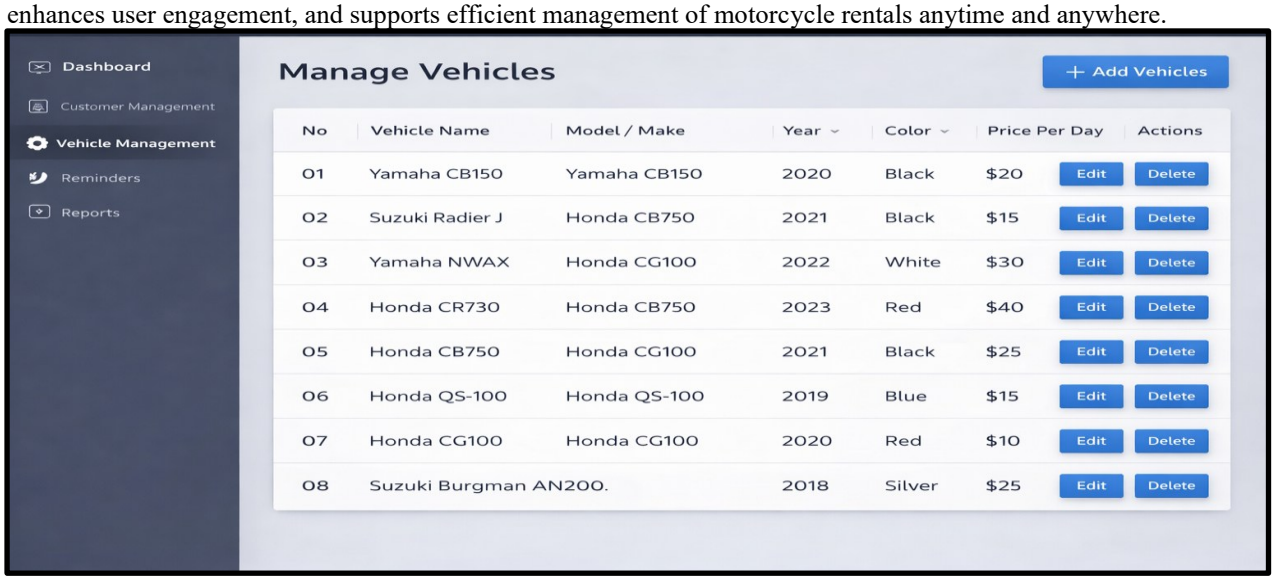

Figure 7. Adding Motorcycle

Figure 7 shows the Add Motorcycles interface of the MotoRent system, where administrators or rental shop owners can input detailed information such as the vehicle name, model, year, color, and daily rental price. This functionality ensures that each motorcycle is properly registered and cataloged within the system, supporting accurate inventory management. By streamlining the process of adding motorcycles, the interface enhances efficiency and reduces errors in data entry. Overall, this feature strengthens the motorcycle management capability of the rental portal, making it easier to maintain a complete and organized fleet database.

RESULTS

After a thorough checking and evaluating an I.T. experts, the following are the results :

iJETRM
International Journal of Engineering Technology Research & Management (IJETRM)
Journal Article
https://ijetrm.com/issue/

Table 1. Scaling Guide

Mean Range	Verbal Interpretation
4.80 – 5.00	Excellent
4.50 – 4.79	Very Satisfactory
3.50 – 4.49	Satisfactory
2.50 – 3.49	Fair
1.00 – 2.49	Poor

This table provides a standardized scale for evaluating performance or outcomes based on mean scores. Each numerical range corresponds to a qualitative description that reflects the level of achievement or satisfaction:

4.80 – 5.00 (Excellent): Indicates outstanding performance or results. The criteria are met at the highest level, showing exceptional quality and effectiveness.

4.50 – 4.79 (Very Satisfactory): Reflects strong performance with only minor areas for improvement. The outcomes are highly commendable and consistently above average.

3.50 – 4.49 (Satisfactory): Demonstrates acceptable performance. The criteria are adequately met, though there is room for further enhancement.

2.50 – 3.49 (Fair): Suggests below-average performance. The results meet minimum expectations but highlight significant areas needing improvement.

1.00 – 2.49 (Poor): Represents inadequate performance. The criteria are not sufficiently met, requiring major revisions or corrective action.

Table 2. Evaluation of the System in Terms of Functionality

Evaluation Criteria	Mean	Verbal Interpretation
In terms of crafting a dynamic and intuitive dashboard	4.70	Very Satisfactory
In terms of implementing robust user management (CRUD operations)	4.85	Excellent
In terms of generating detailed and insightful booking reports	4.75	Very Satisfactory
In terms of conceptualizing and designing a mobile application for accessibility	4.90	Excellent
Total	4.80	Very Satisfactory

Table 2 shows the system implements a dynamic dashboard that visualizes data from bookings, payments, vehicles, and users; enables robust user management through CRUD operations with roles and audit logs; generates detailed booking reports from integrated tables for decision-making; and provides a complementary mobile application that leverages app sessions, notifications, and shared data for seamless accessibility.

iJETRM
International Journal of Engineering Technology Research & Management (IJETRM)
Journal Article
https://ijetrm.com/issue/

Table 3. In terms of usefulness, satisfaction, and ease of use and learning.

Evaluation Criteria	Mean	Verbal Interpretation
Usefulness	4.91	Very Satisfactory
Satisfaction	4.81	Very Satisfactory
Ease of Use	4.21	Very Satisfactory
Ease of Learning	5.00	Excellent
Total	4.73	Very Satisfactory

The table above shows the result of the I.T. experts' feedback during the evaluation, which describes the usability of the motorcycle rental portal based on usefulness, satisfaction, ease of use, and ease of learning. Usability evaluation was conducted using the standardized USE Questionnaire, a widely recognized tool for measuring user experience dimensions such as usefulness, ease of use, ease of learning, and satisfaction [12]. This framework has been applied in multiple system evaluation studies to ensure reliability and validity of usability assessments [13]. In terms of usefulness, it was rated with a mean value of 4.91 with regards to the satisfaction, it was rated with a mean value of 4.81. Regarding ease of use, it was rated with a mean value of 4.21. With regards to ease of learning, it was rated with a mean value of 5, and all of the USE questionnaires are interpreted as very satisfactory.

Table 4. In terms of the characteristic set in ISO25010 Software Quality Model.

Evaluation Criteria	Mean	Verbal Interpretation
Functionality Suitability	4.88	Very Satisfactory
Performance Efficiency	4.88	Very Satisfactory
Compatibility	4.54	Very Satisfactory
Reliability	4.91	Very Satisfactory
Security	5.00	Excellent
Total	4.82	Very Satisfactory

Table 4 shows the system accessibility and performance received a mean score of 4.495 (Very Satisfactory), suggesting stable operation within available internet infrastructure. Overall software quality, measured through ISO/IEC 25010 characteristics, achieved a mean score of 4.84, interpreted as Satisfactory to Very Satisfactory.

DISCUSSION

The evaluation results paint a clear and human picture of how well the motorcycle rental portal performs in real world use. Users found the system not only effective but genuinely helpful in simplifying their tasks creating rental shops earned a Very Satisfactory rating (mean = 4.66), while adding new motorcycles achieved a perfect Excellent score (mean = 5.00), showing that the portal's administrative backbone works smoothly and reliably. Usability feedback through the USE Questionnaire adds a personal dimension: participants described the system as useful (4.91) and satisfying (4.81), with ease of learning rated Excellent (5.00), meaning newcomers could navigate it confidently without training. Although ease of use scored slightly lower (4.21), this only points to small opportunities for interface refinement rather than major flaws. Altogether, these results affirm that the portal successfully replaces manual processes with a responsive, automated experience one that feels intuitive and efficient for both shop owners and customers. The high ratings reflect not just technical success but genuine user

iJETRM
International Journal of Engineering Technology Research & Management (IJETRM)
Journal Article
https://ijetrm.com/issue/

appreciation, suggesting that the system has become a practical, enjoyable tool for managing rentals and could evolve further with enhancements like integrated payments and broader coverage.

CONCLUSION

The development and evaluation of the Motorcycle Rental Portal demonstrate that the system is an effective and practical solution for modernizing motorcycle rentals, particularly in rural areas. By employing the Rapid Application Development (RAD) model, the researchers were able to design a secure, efficient, and user-friendly platform that aligns with the needs of both renters and motorcycle owners [5].

Evaluation results from Information Technology experts indicated ratings ranging from “Very Satisfactory” to “Excellent” in terms of system effectiveness, usability, usefulness, and ease of use [1][3][7]. The portal successfully addresses the limitations of traditional rental systems by providing real-time updates, automated inventory management, and a streamlined booking process, thereby enhancing both operational efficiency and user experience [2][9].

For future research, the system can be further improved by integrating payment gateway functionality, expanding coverage to additional geographic areas, and incorporating features that foster a more connected motorcycle rental community [10]. Such enhancements would further solidify the portal as a comprehensive digital solution for motorcycle rentals.

REFERENCE

1) F. Y. H. Ahmed, E. B. Hazlan and M. I. Abdulla, "Enhancement of Mobile-Based Application for Vehicle Rental," *2021 IEEE 11th IEEE Symposium on Computer Applications & Industrial Electronics (ISCAIE)*, Penang, Malaysia, 2021, pp .163-168. https://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=9431820&isnumber=9431768
2) Nishad, A.K., Chowdhury, A. (2021). Designing Interface for an Online Bike Rental Service for Personified Tourism. In: Deepak, B.B.V.L., Parhi, D.R.K., Biswal, B.B. (eds) Advanced Manufacturing Systems and Innovative Product Design. Lecture Notes in Mechanical Engineering. Springer, Singapore. https://doi.org/10.1007/978-981-15-9853-1_26
3) Ashton, A. S. (2019). Tourism promotion towards improving road safety: A case study of motorcycle rental of foreign tourists in Chiang Mai. *International Thai Tourism Journal*, 15(1), 1–15. https://so06.tci-thaijo.org/index.php/utccjournalhs/article/view/190845
4) Cardow, A. (1998). Just Another Day in Paradise: Motorcycle Rental Companies in New Zealand. Small Enterprise Research, 6(2), 73–79. https://doi.org/10.5172/ser.6.2.73
5) Henderson, K. (2020). Mobile-based application development for car and motor rentals. *Journal of Critical Reviews*, 7(19), 123–130. https://www.ijsdr.org/papers/IJSDR2504196.pdf
6) Iamtrakul, P., & Chayphong, S. (2019). The Study on Impact of Road Safety by Considering Motorcycle Rental Behavior of Foreign Tourists in Chiang Mai. University of the Thai Chamber of Commerce Journal Humanities and Social Sciences, 39(2), 1–15. retrieved from https://so06.tci-thaijo.org/index.php/utccjournalhs/article/view/190845
7) Ratanarawaha, A. (2018). Monopoly rents in motorcycle taxi services in Bangkok, Thailand. *Transportation Research Record*, 2512(1), 77–85. https://doi.org/10.3141/2512-08
8) Ramdani, M. A. (2020). *Data communication on motorcycle rental based on Internet of Things*. Institut Teknologi Nasional Bandung. https://itenas.ac.id
9) Setiawan, A. C. (2020). Implementation of motorcycle rental information system at the Trans Jaya Tangerang. *Systematics Journal*, 2(2), 84–92. https://doi.org/10.35706/sys.v2i2.3847
10) Waluyo, T. A. (2022). *Designing rental business based on mobile application*. Semantic Scholar. https://www.semanticscholar.org
11) Richey, R. C. (1994). Developmental research: The definition and scope. *Educational Technology Research and Development*, 42(3), 63–70. https://doi.org/10.13140/RG.2.2.17414.73289
12) Lund, A. M. (2001). Measuring usability with the USE questionnaire. *Usability Interface*, 8(2), 3–6. https://doi.org/10.13140/RG.2.2.17082.95689
13) Sauro, J., & Lewis, J. R. (2016). *Quantifying the user experience: Practical statistics for user research* (2nd ed.). Morgan Kaufmann. https://doi.org/10.1016/C2014-0-02411-3