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An Analytics-Integrated Multi-Vendor Rental Management System for Audio Visual Equipment

Mark Stephen Alolor[1], Joenel P. Destora[2], Carlo Jhon Fulmenar[3], Dino L. Ilustrisimo, PhD.[4], Reil Dave Bawiin[5], John Nino Espliguera[6], James Napalya[7], John David Parader[8], Mharjorie Ribo[9], Kurt Bryan S. Alegre, MIT(c) [10]

[1,2,3,4,5,6,7,8,9,10] BS Information Technology, Madridejos Community College, Philippines

ABSTRACT: The Multi Vendor Rental Management System for Audio and Visual Equipment is a digital platform developed to modernize the entertainment rental industry in Bantayan Island, which includes the municipalities of Bantayan, Madridejos, and Santa Fe. Traditionally, renting audio-visual equipment in these areas involved manual processes, scattered communication, and limited access to information, causing inconvenience for both customers and service providers. This system addresses these issues by creating a centralized, user-friendly platform that connects multiple vendors into one accessible marketplace. The system's main goal is to provide a seamless and efficient rental experience from start to finish. Customers can easily browse a wide selection of videoke and disco sound systems and choose services based on their specific needs. They can filter options according to price, equipment quality, and rental duration, allowing for a flexible and personalized experience. This improves transparency, speeds up transactions, and enhances overall customer satisfaction while reducing confusion in booking processes. For equipment owners, the platform serves as a powerful management tool. It allows them to monitor bookings in real time, accept or decline requests quickly, and manage their inventory efficiently. This reduces administrative workload and minimizes common issues such as double-booking. At the same time, the system helps administrators promote local businesses by increasing their visibility and supporting the growth of small and medium enterprises. Overall, the system transforms the traditional rental process into a more organized, reliable, and modern service. It benefits customers, vendors, and administrators alike, while supporting the cultural and economic development of Bantayan Island community and strengthening local digital innovation.
KEYWORDS: booking System, Disco, Sound system, sound system owners, and Videoke

I. INTRODUCTION

This study aims to analyze the impact of digitalization on business performance through business model innovation. According to Wang et al. (2023), digital capability significantly influences company performance when mediated by business model innovation, highlighting the importance of adopting digital technologies in modern enterprises.

Effective facility and service management also plays a crucial role in improving operational efficiency. Traditional manual booking systems often result in inefficiencies, inaccuracies, and resource wastage. To address these challenges, Abdullah et al. (2025) developed a Facility Booking System (FBS) that enhances resource utilization and organizational performance.

Similarly, digital platforms have transformed the way businesses promote and manage their services. Many organizations now utilize web-based systems to advertise and reach a wider audience, improving accessibility and customer engagement (Monteverde et al., 2023).

The concept of multi-vendor platforms has also gained popularity, as demonstrated by platforms such as Trivago, which aggregates multiple service providers into a single interface. However, unlike global platforms, localized systems can better address specific community needs.

In this context, the proposed Analytics-Integrated Multi-Vendor Rental Management System for Audio-Visual Equipment focuses on videoke and disco sound system services within the municipalities of Bantayan, Madridejos, and Santa Fe. The system enables customers to conveniently browse, compare, and book services from multiple providers through a centralized platform. Additionally, it incorporates analytics to monitor booking trends, improve decision-making, and enhance user experience.

Despite its advantages, the system has certain limitations. It relies heavily on stable internet connectivity, which may affect performance in areas with limited network access.

Objectives of the Study

This study aims to develop and evaluate an Analytics-Integrated Multi-Vendor Rental Management System for Audio-Visual Equipment. Specifically, it seeks to:

1. Develop a system that:

1.1 Displays relevant information on the admin dashboard, including advertisements, earnings, and approved service providers, and on the owner dashboard, including advertisements, income, a list of bookers, and a monthly booking graph report.

1.2 Provides functionalities for creating, reading, updating, and deleting (CRUD) item information, viewing booking details, managing customer reviews and ratings, and notifying customers regarding the status of their booking requests.

1.3 Generates daily, weekly, and monthly income reports for both administrators and service providers.

2. Evaluate the system's software quality using the ISO/IEC 25010 model, focusing on key characteristics such as functional suitability, performance efficiency, reliability, and security (ISO/IEC, 2011).
3. Determine the usability of the system using the USE Questionnaire, measuring usefulness, ease of use, ease of learning, and user satisfaction (Lund, 2021).

II. Method

This study employed a **Developmental Research Design,** which focuses on the systematic design, development, and evaluation of processes and products to ensure internal consistency and effectiveness. This approach is commonly used in the development of technological and educational systems, as it allows researchers to refine and validate the product through iterative processes (Richey, 2007).

In addition, a **descriptive research method** was utilized to analyze and present the collected data, particularly in evaluating the system's performance and usability. Descriptive analysis enabled the researchers to summarize the results obtained from expert evaluations and user feedback.

For system development, the researchers adopted the **Rapid Application Development (RAD) model**, which emphasizes rapid prototyping and iterative development rather than extensive upfront planning. This model allows for a shorter development cycle and continuous user involvement, making it suitable for projects requiring quick delivery and frequent refinements (Pressman 2020).

The RAD model consists of the following phases: requirements planning, prototype development, design and testing, and implementation. These phases enabled the researchers to efficiently develop and evaluate the proposed system while incorporating feedback from stakeholders throughout the process.

Software Life Cycle Model

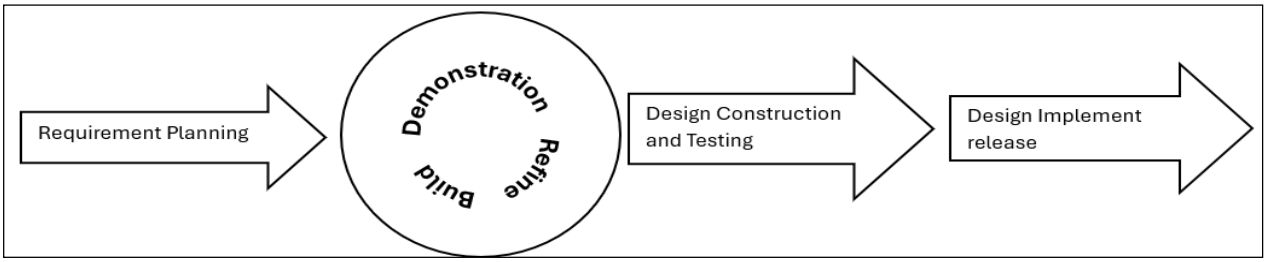

Figure 1. Rapid Application Development Model

In this study, the researchers employed the Rapid Application Development (RAD) model as the software development life cycle approach. The RAD model emphasizes rapid prototyping, iterative development, and continuous user feedback, making it suitable for projects requiring faster delivery and adaptability. This approach enables developers to produce functional systems within a shorter time frame compared to traditional models (Suwandi et al., 2022).

The RAD model consists of the following phases:

Step 1: Requirements Planning

This phase involves identifying current problems and defining system objectives. Stakeholders, including management, staff, and researchers, collaborate to determine system requirements. These requirements serve as the foundation for the overall system development.

Step 2: Prototype Cycles (Demonstration, Refinement, and Development)

In this phase, system prototypes are developed and presented to users for evaluation. Feedback is gathered and used to refine the system iteratively. Continuous collaboration between developers and users ensures that the system meets the required specifications and expectations.

Step 3: Design Construction and Testing

This phase focuses on the development and testing of system functionalities. The system is evaluated by users, and any errors or non-functional components are identified and corrected. Software testing ensures that the system meets specified requirements and operates without defects (Jia, 2023).

Step 4: Implementation and Deployment

This is the final phase where the system is deployed for actual use. It includes data migration, user training, and system monitoring. At this stage, the system becomes fully operational and is continuously monitored to ensure optimal performance.

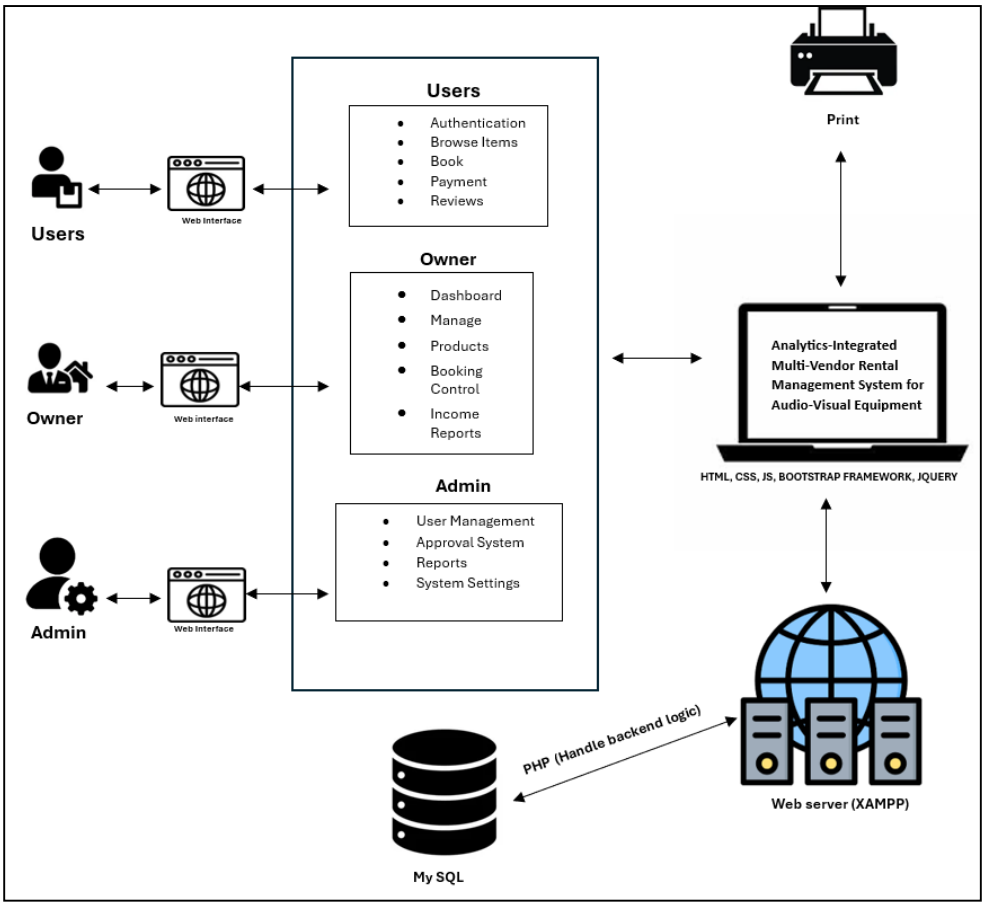

Figure 2. System Architecture and technologies

The system architecture consists of multiple users, including customers, administrators, and service providers (owners), who access the platform through laptops using web browsers (e.g., Google Chrome). These client devices send HTTP requests to a web server hosted on XAMPP.

The backend, developed using PHP, processes incoming requests, executes business logic, and interacts with a MySQL Database for data storage and retrieval. This architecture enables administrators to manage system operations, customers to The system also supports output generation, such as printable documents, through connected peripherals. Data flows from the front-end interface to the backend server for processing and storage, and the results are returned to users or rendered as physical outputs when necessary.

This architecture follows a standard client-server model, where web applications use server-side scripting and relational databases to process requests and deliver dynamic content to users, which is widely adopted in modern web development practices (Kumar & Singh, 2023).

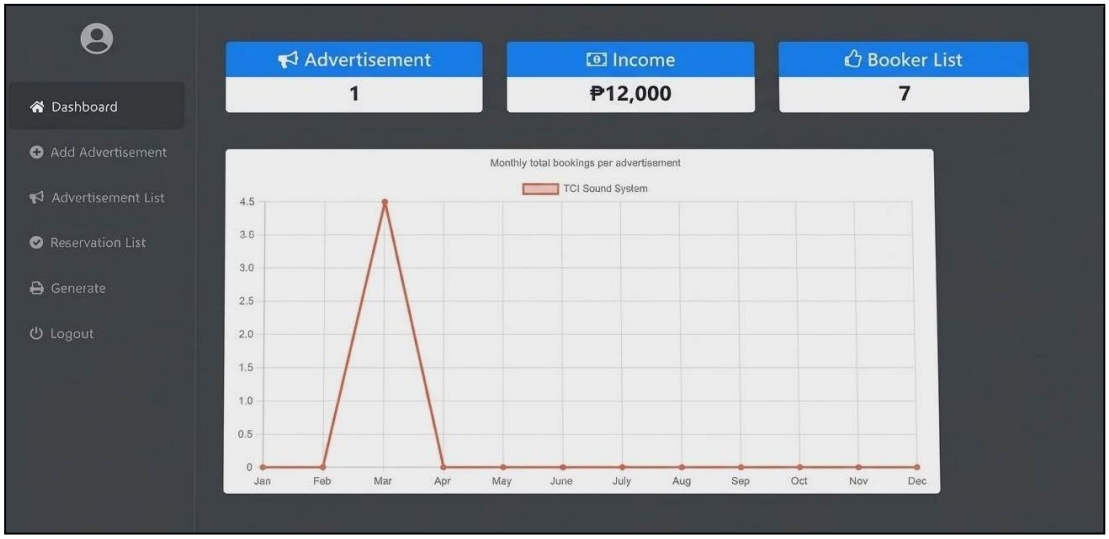

Figure 3. Display in the owner's dashboard

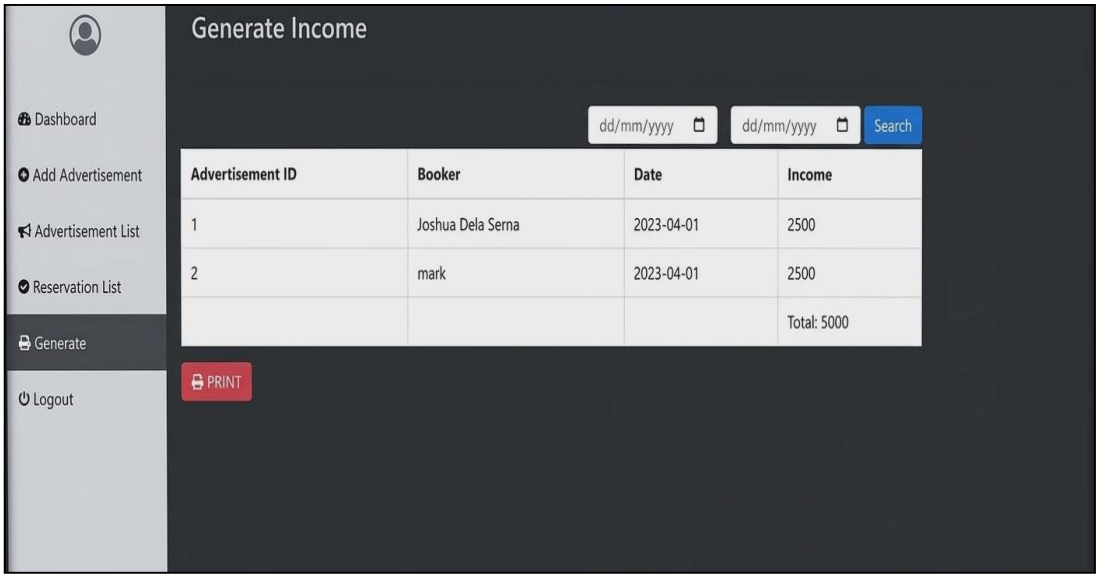

Figure 8 above depicts the section of the "Multi-Vendor Rental Management System for Audio Visual Equipment" where the owner may see monthly graphing sales as well as generate booking monthly income reports.

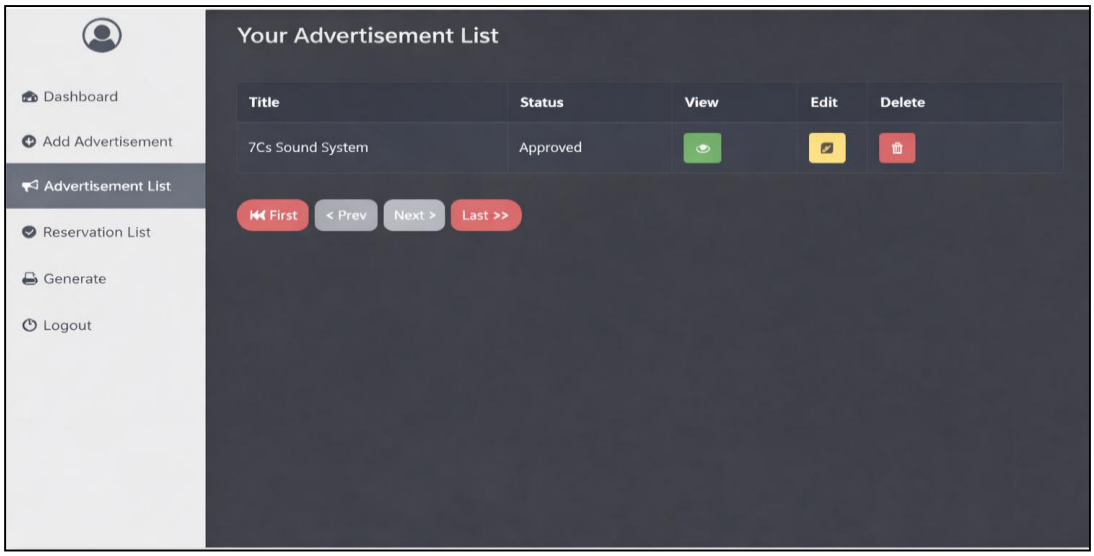

Figure 3.1. Display in the admins Dashboard

Figure 4 shows the section of the "Multi-Vendor Rental Management System for Audio-Visual Equipment" where the administrator can view all advertisements published by owners and advertisers. Additionally, the administrator can generate reports on monthly revenue from these advertisements.

Figure 4. The system provides an option to view, update, and delete advertisements

Figure 6 depicts the area of the system where users can read, change, and delete information about their advertisements.

Figure 5. The system provides an option to owner generate report monthly income

Figure 5 depicts the area of the system where the owner generates monthly revenue from bookings.

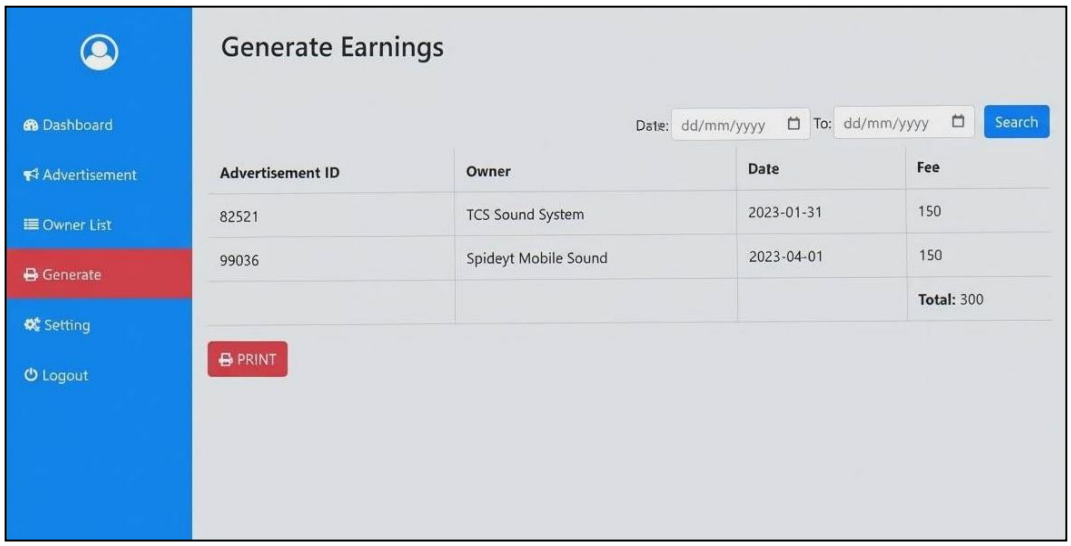

Figure 5.1. The system provides an option to create admin generate report such as monthly income

Figure 7 depicts the area of the system where the administrator generates monthly revenue from advertisements.

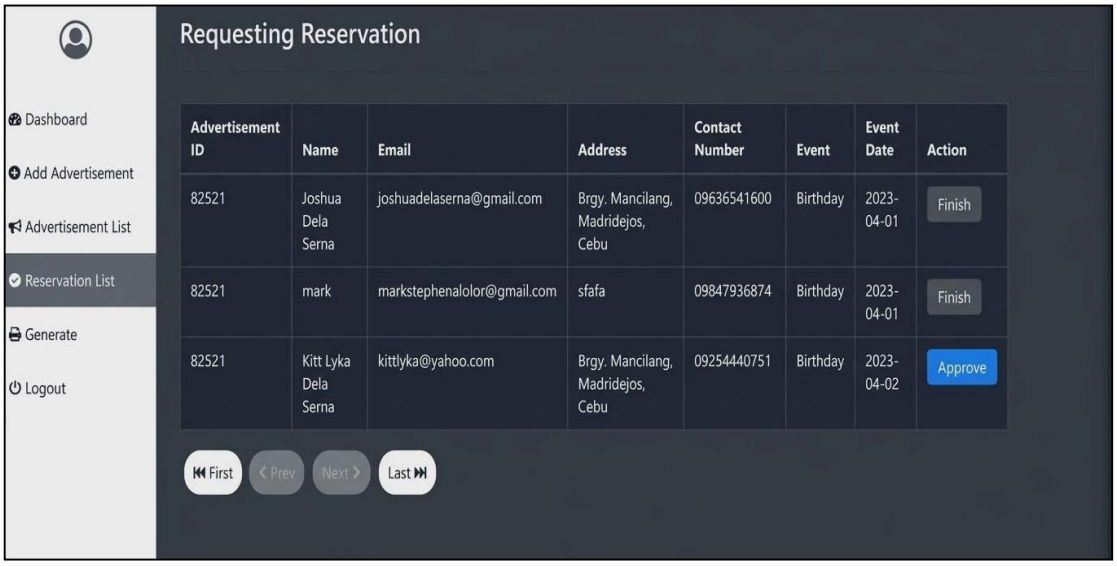

Figure 6. The system provides an option to notification booking request

Figure 3 illustrates the section of the system where the owner can approve a customer's booking request. Once the owner clicks the approval button, the system automatically sends a notification to the customer, informing them that their booking has been approved.

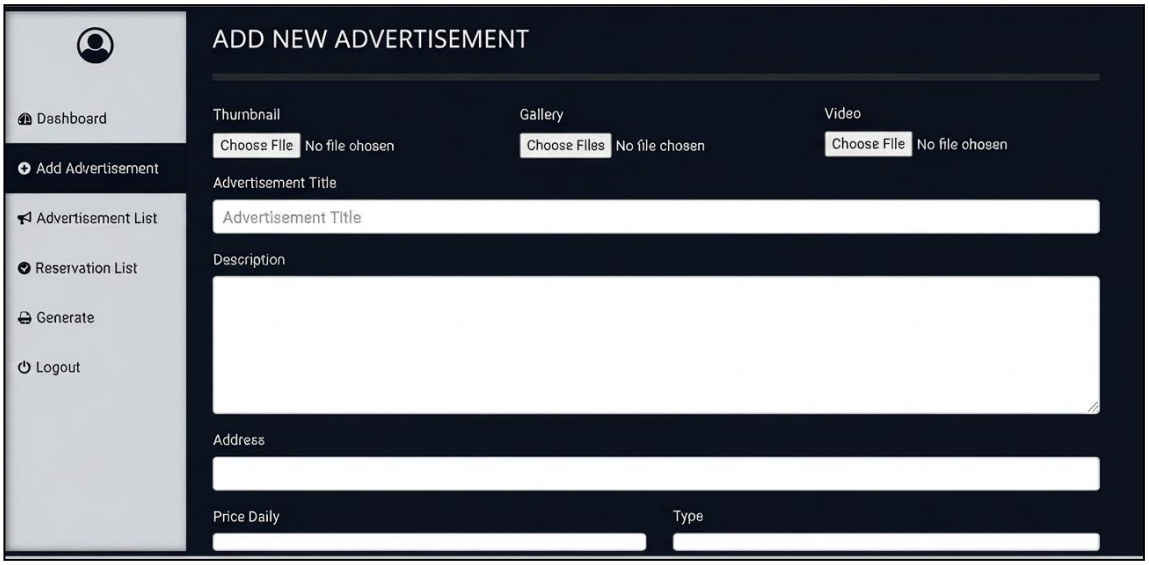

Figure 7. The System provides an option to create advertisement

Figure 7. above shows the owner of the system dashboard, which is for the Analytics-Integrated Multi-Vendor Rental Management System for Audio Visual Equipment. Here, owners may add their own data to create adverts.

IV. RESULT AND DISCUSSION

After the thorough evaluation of experts and respondents, the following are generated

Table 1. In terms of managing Multi-Vendor Rental Management System for Audio-Visual Equipment

	Mean	Verbal Interpretation
The system dashboard displays role-based information, including admin and owner data.	4.57	Very Satisfactory
The system provides CRUD functionalities, booking details viewing, review management, and customer booking notifications.	4.55	Very Satisfactory
Generates income reports daily, weekly, and monthly for administrators and service providers.	4.55	Very Satisfactory
Average of the Mean Values	**4.56**	**Very Satisfactory**

Table 1 displays the results of the computed ratings of three IT experts who used Multi-Vendor Rental Management System for Audio-Visual Equipment with Data Analysis in terms of displaying in the dashboard of the admin and owner, offering options to create, read, update, and delete the advertisement information, accepting review and rating, and generating an income monthly report by administering the system. In the table above, the total mean is 4.56 which is considered to be **Very Satisfactory.**

Table 2. In terms of the characteristics set in ISO 25010 Software Quality model

Criteria	Mean	Verbal Interpretation
Functional Suitability	4.33	Very Satisfactory
Performance Efficiency	4.44	Very Satisfactory
Compatibility	4.54	Very Satisfactory
Reliability	4.41	Very Satisfactory
Security	4.33	Very Satisfactory
Total	**4.41**	**Very Satisfactory**

Table 2 displays the outcome of the IT Experts evaluation of the Analytics-Integrated Multi-Vendor Rental Management System for Audio-Visual Equipment using data analysis based on the criteria specified in the ISO 25010 Software Quality Model.

Table 3. In terms of Usefulness, Satisfaction and Ease of Use and Learning

Criteria	Mean	Verbal Interpretation
Usefulness	4.41	Very Satisfactory
Ease of Use	4.42	Very Satisfactory
Ease of learning	4.33	Very Satisfactory
Satisfaction	4.38	Very Satisfactory
Total	**4.39**	**Very Satisfactory**

Table 3 displays the results of data analysis based on usefulness, contentment, and ease of use and learning to assess the usability of the Analytics-Integrated Multi-Vendor Rental Management System for Audio-Visual Equipment. It had a mean of rating of 4.41 for usefulness, which is considered to be very satisfactory. It has a mean by Very satisfactory. The mean rating for ease of use was 4.42, Which is considered to be Very Good. A mean value of 4.33, which is considered as very satisfactory, and a total score of 4.39, which is understood as Very satisfactory, were used to rate the ease of learning.

Conclusion

The researcher was able to present a comprehensive analysis of customer records and profiles through the owner dashboard. Based on an extensive evaluation conducted by IT experts, it is concluded that the Analytics-Integrated Multi-Vendor Rental Management System for Audio-Visual Equipment demonstrates high usability, robust security, and operational efficiency. The system provides a streamlined and convenient process for customers to book services and access contact information. Moreover, the evaluation confirms that the system functions as intended, performing all its designed tasks effectively and reliably, thereby fulfilling the requirements of both administrators and users. The system has been successfully implemented and used in real scenarios, effectively addressing the challenges it was designed to solve, including improving booking efficiency and simplifying management processes for both customers and administrators.

The research successfully addressed the existing gap in the management of audio-visual equipment rentals by developing an Analytics-Integrated Multi-Vendor Rental Management System that combines usability, security, and operational efficiency. By integrating comprehensive analytics, streamlined booking processes, and real-time management capabilities, the system effectively resolves the inefficiencies and

complexities previously faced by both customers and administrators. The implementation demonstrates that the system not only meets its functional requirements but also enhances overall service efficiency, thereby providing a practical solution to the challenges identified in prior studies and existing systems.

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