



Design of a Web-Based Order Management Application for JF Legal Network

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ABSTRACT

JF Legal Network is an integrated enterprise operating at the intersection of the legal and business sectors. Its service portfolio includes accreditation and legal positioning services, specifically comprising Jakad Journals for article editing, Jakad Media for legal publishing and printing services, and a law firm. A significant operational challenge identified within the company is the complexity of its order management process. Currently, the recording of incoming and outgoing orders is conducted manually, which leads to inefficiencies and delays in generating order reports for management. To address this issue, this study proposes the development of a centralized web-based order management application. The system will be developed following the Software Development Life Cycle (SDLC) methodology, utilizing PHP, MySQL, and the Laravel framework. The primary objective of this system is to streamline the order recording process, thereby enhancing accuracy and timeliness in management reporting.

Keywords: *MySQL, Order, PHP, Software Development, Web Application*

INTRODUCTION

In the contemporary business landscape, computer-aided technology is indispensable for streamlining operational processes and enabling the rapid aggregation of useful information (Widyantanto et al., 2022). The digitization of transactions, in particular, has significantly enhanced the efficiency of data collection and processing (Khristianto et al., 2016). By leveraging information technology, organizations can accelerate revenue generation through the production

of more valuable and timely insights while simultaneously reducing operational costs by empowering employees to make better, more profit-oriented decisions (Alrawadieh et al., 2021; Suyanto & Suyantoro, 2005). This digital transformation is no longer a luxury but a critical component for maintaining competitiveness and operational agility.

The shift towards digital solutions is especially pertinent for Small and Medium-sized Enterprises (SMEs) operating in knowledge-intensive sectors. These organizations handle complex information and client mandates where accuracy, confidentiality, and timely delivery are paramount (Han & Trimi, 2022; Li et al., 2023). Information Technology (IT) fundamentally concerns the storage, manipulation, and dissemination of data (Naibaho, 2017). At its core, an information system processes raw data to yield valuable, accurate, and timely information, which is critical for supporting a wide array of organizational needs and strategic objectives (Widiastuti, 2015). The implementation of a structured digital system can thus serve as the backbone for standardizing workflows, minimizing discretionary errors, and providing management with a clear, real-time overview of business operations.

Despite these clear advantages, a digital divide persists. Many SMEs, particularly in specialized service sectors like law and professional consulting, continue to rely on manual, paper-based, or siloed spreadsheet-driven procedures (Glazkova, 2021). This reliance creates significant bottlenecks, data integrity issues, and reporting lag, thereby forgoing the efficiency gains offered by modern technology. The challenges are often compounded by the perception that sophisticated IT solutions are cost-prohibitive or require extensive technical expertise to implement and maintain (Venkatraman & Fahd, 2016; Yilmaz et al., 2023).

JF Legal Network, an integrated legal and business services firm, exemplifies this challenge. The company's order management for its services—including Jakad Journals (article editing), Jakad Media (legal publishing), and its law firm—is processed manually. This reliance on manual record-keeping leads to procedural complexities, a high propensity for human error in order entries, and significant delays in compiling management reports. Consequently, leadership receives outdated information, hindering strategic decision-making. A computer-based information system can mitigate these issues by automating data processing, ensuring higher accuracy, and facilitating real-time access to operational data, thus transforming a cumbersome administrative task into a strategic asset (Widiastuti, 2015).

Research on the implementation of web-based management systems demonstrates their efficacy in improving organizational efficiency. A study by Laudon and Laudon (2020) on a web-based procurement system showed a significant reduction in process cycle times and data entry errors. Similarly, Marakas and O'Brien (2011) documented the successful adoption of a custom web

application in a service SME, which led to enhanced data integrity and managerial reporting. Furthermore, the use of specific technology stacks like PHP and the Laravel framework has been widely validated for developing robust and scalable business applications, as noted in studies like (Subecz, 2021), which highlights Laravel's MVC architecture as beneficial for maintaining clean and organized code.

The body of literature on Information System success models, such as the DeLone and McLean model, provides a theoretical foundation for evaluating such systems, emphasizing factors like system quality, information quality, and user satisfaction that lead to net benefits (Delone & McLean, 2003). Studies applying this model, for instance by Ghasemi et al. (2011) in the context of accounting systems, have consistently found that system integration and data accuracy are strong predictors of improved decision-making. Moreover, research into Software Development Life Cycle (SDLC) methodologies underscores the importance of a structured approach, like the one advocated by Sommerville (2016), for ensuring that the final software product is aligned with user requirements and is developed in a controlled, efficient manner.

LITERATURE REVIEW

System Design

System design is a foundational phase in software engineering, constituting the detailed planning and specification of a system's core components and architecture (Mulyanto, 2009). It is a structured process that translates user requirements into a blueprint for developers, defining the system's data structures, interfaces, modules, and architecture. A well-executed design phase is crucial as it provides stakeholders with a clear conceptual model of the proposed system, ensuring that the final product aligns with business needs and user expectations before implementation begins (Sommerville, 2016). This phase often involves creating data flow diagrams (DFDs) and entity-relationship diagrams (ERDs) to visually model the system's processes and data structure, which is critical for developing a coherent and functional application.

Application

An application, or software application, is a computer program designed to perform a specific set of functions or tasks for the end-user (Abdurahman & Riswaya, 2014). Unlike system software that operates the computer itself, applications are tools that process input data according to predefined rules to produce a desired output, such as a report, a calculation, or a stored record. From this, it can be concluded that an application is a specialized program that operates within a specific context, effectively integrating and processing information to deliver more accurate and reliable results than manual methods (Dennis et al., 2015). Modern web applications, in particular, are characterized by their

accessibility through a web browser and their ability to centralize data, promoting consistency and collaboration across an organization.

Management

In a business context, management refers to the coordination and administration of organizational resources and processes to achieve specific goals. Effective management systems are critical for ensuring operational efficiency and customer satisfaction. As noted by Gesi et al. (2019), consumer behavior is influenced by the ease and efficiency of the processes a company provides. When customers interact with a well-designed and user-friendly system for placing orders, their satisfaction increases because the process is convenient and meets their expectations for service delivery. Therefore, a robust management system is not merely an internal tool but a direct contributor to customer relationship management and long-term business viability.

Order

An order, in commercial terms, is a formal request from a customer for a company to supply goods or provide a service. The process of ordering is a critical touchpoint in the customer journey. A streamlined order management system, encompassing order capture, processing, tracking, and fulfilment. It is essential for operational success. A poorly managed process can lead to errors, delays, and customer dissatisfaction, whereas an efficient system ensures accuracy and timeliness, fostering customer trust and repeat business (Gesi et al., 2019). Automating this process is key to scaling operations and maintaining service quality, as it reduces the administrative burden on staff and allows them to focus on higher-value, client-facing activities.

Web

The World Wide Web (WWW or Web) is an interconnected system of public webpages accessible via the Internet. These pages are identified by unique domain names and can contain a multitude of information formats (Komputer, 2010). A website serves as a central platform for information dissemination and, increasingly, for hosting complex web applications. For businesses, a web-based application offers significant advantages, including cross-platform accessibility without the need for local software installation, centralized data storage, and the ability to provide real-time information updates to all users simultaneously (Strecker et al., 2015). This makes the web an ideal platform for deploying management systems like the one proposed in this study, as it ensures universal access for employees and simplifies maintenance and updates (Mochklas, 2022; Paais, 2022).

RESEARCH METHODOLOGY

This study adopts the Software Development Life Cycle (SDLC) methodology as its primary framework to guide the design and development of the web-based order management application. The SDLC provides a systematic and structured sequence of phases, ensuring the project is developed in a disciplined and manageable manner, from initial problem identification to final implementation and validation (Sommerville, 2016). This approach is crucial for delivering a robust, high-quality software product that accurately addresses the specific operational requirements of JF Legal Network. The process, illustrated in Figure 1, encompasses the stages of problem formulation, literature review, data collection, system design, implementation, and testing, each of which is detailed in the following paragraphs.

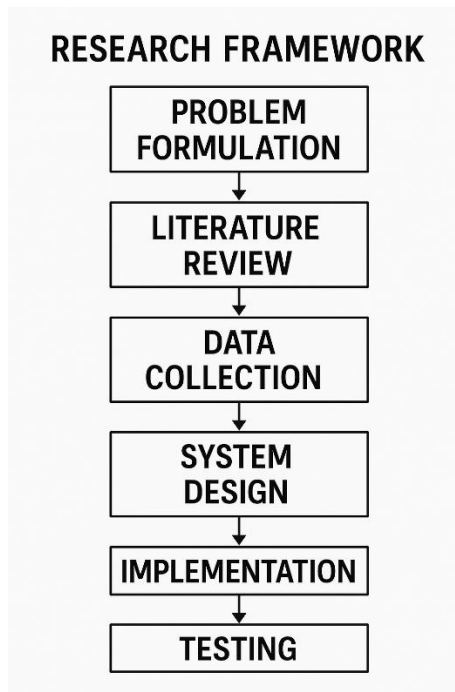


Figure 1 The Software Development Life Cycle (SDLC) Model Adopted in this Study

Source: Author's Analysis

The first phase, problem formation, involves a comprehensive analysis to precisely define the operational challenges within JF Legal Network's existing order management process. This stage is initiated by gathering qualitative data through interviews with key personnel and direct observation of workflows. The outcome is a clearly articulated problem statement that pinpoints the inefficiencies of the manual system, thereby establishing a definitive scope and a clear justification for the new system's development (Dennis et al., 2015).

Following problem identification, a thorough literature review is conducted to build a solid theoretical foundation for the project. This involves critically examining existing academic research, industry reports, and technical documentation related to order management systems, web application architecture,

and the selected technology stack. The purpose of this scholarly inquiry is to inform the design process by integrating established best practices and leveraging proven solutions, thereby ensuring the proposed system is both innovative and grounded in reliable software engineering principles (Sommerville, 2016).

Subsequently, the data collection phase is executed to gather detailed functional and user requirements. This employs structured qualitative methods, including in-depth interviews with employees and management to understand their specific needs, expectations, and the nuances of the order processing workflow. The information secured in this stage is instrumental in defining the system's precise features, user interactions, and performance criteria, ensuring the final application is perfectly aligned with the business objectives of JF Legal Network (Hoffer et al., 2014).

The system design phase translates the gathered requirements into a detailed technical blueprint for the application. This involves architecting the system's overall structure, designing the database schema using MySQL, creating user interface (UI) mockups, and specifying the interactions between various software modules. The decision was made to utilize the PHP programming language within the Laravel framework for development, a choice justified by Laravel's Model-View-Controller (MVC) architecture, which inherently promotes code organization, security, and long-term maintainability (Subecz, 2021).

During the implementation phase, the conceptual design is transformed into a functional software product. This involves the actual coding of the application using the Laravel framework to build the backend logic and application structure, while MySQL is employed to construct the relational database. The frontend user interface is developed using standard web technologies such as HTML, CSS, and JavaScript, seamlessly integrated with Laravel's Blade templating engine to create a dynamic and responsive user experience.

Finally, the testing phase is conducted to rigorously validate the application's functionality, reliability, and adherence to the initial requirements. This involves a multi-faceted testing strategy, including unit testing to verify individual components, integration testing to ensure modules work together cohesively, and User Acceptance Testing (UAT) where end-users validate the system in a real-world scenario. The primary objective of this phase is to identify and rectify any defects, ensuring the delivered system is stable, accurate, and fully capable of supporting the order management processes at JF Legal Network (Sommerville, 2016).

RESULT AND DISCUSSION

This section details the outcomes of the design and development process for the order management system. It covers the system's architectural design, the functional application that was built, and the results of tests conducted to validate its performance.

System Design and Architecture

The initial phase focused on creating a technical blueprint that would address the operational needs of JF Legal Network. Analysis of the manual procedures led to a proposal for a centralized web-based application. This new system was architected to simplify order processing, reduce errors, and automate reporting. The overall logic and flow of information for this proposed system are captured in Figure 2.

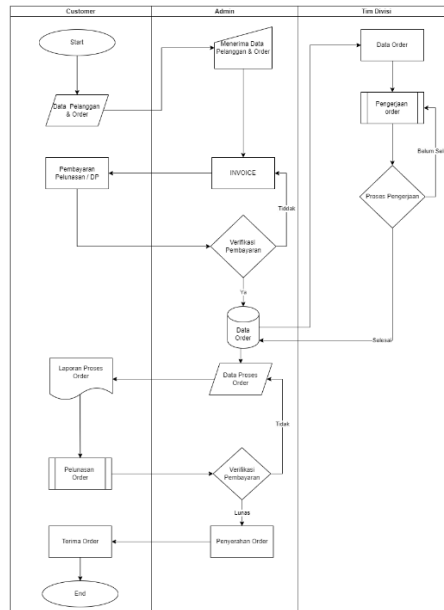


Figure 2 Proposed System Design
Source: Author’s Analysis

To clarify how users would interact with the system, a Use Case Diagram was constructed, as seen in Figure 3. This diagram outlines the relationships between the main user roles—Admin, Employee, and Manager—and the core functions they are authorized to perform. Following this, a Hierarchy Chart (Figure 4) was developed to break down the application into its major components and sub-modules, providing a clear, top-down view of the software's structure for the developers (Strecker et al., 2015).

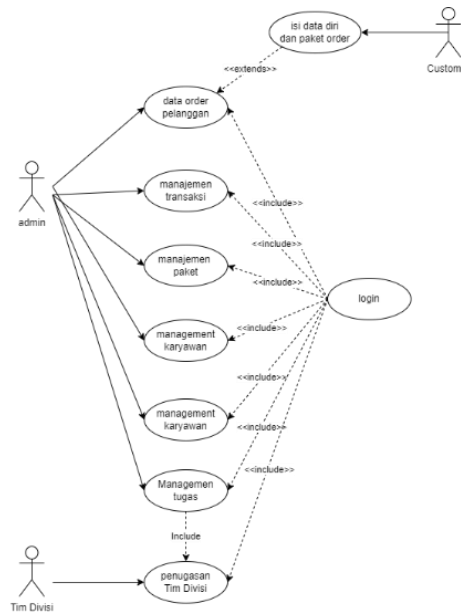


Figure 3 Application Use Case Diagram
Source: Author’s Analysis

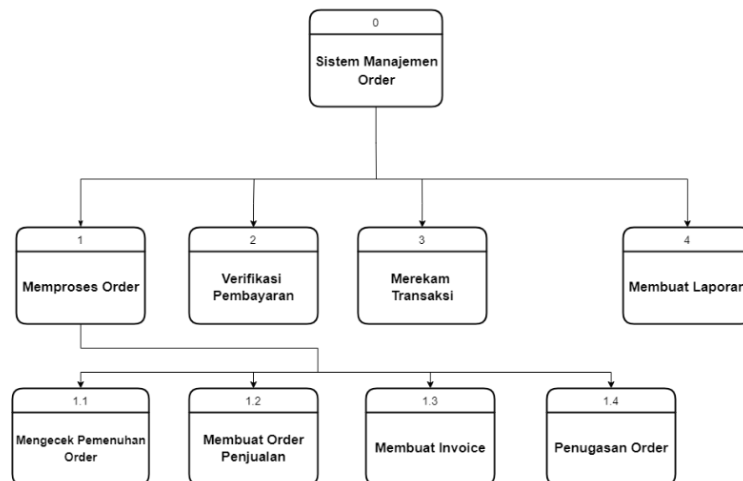


Figure 4 Application Hierarchy Chart
Source: Author’s Analysis

The pillars hosted a total of four slim beams and motored projectiles, made from cylindrical metal pipes, stretching from the pillars' source on both sides of the divide. The projectiles are suspended with a total of eight long chains (two on each side of the pillar), extending to the top flank of the central security post. The projectiles are clad in black gloss paint and covered at the top with aluminium sheets, serving momentary shade for residents and visitors within their perimeter. The post, apart from being an abode for security officers and a checkpoint, is clad in light cream and dark wine hue, designed to serve as a solid base and an imaginary

institution's torch, doubling as host to the University logo, clad in white, green, blue, and black pigments. The walls, pillars, and central posts are clad in light orange and reddish brown. The gates are made in a simple, adjustable rectangular form with metal pipes, coloured in white and black gloss paint. Holistically, the imagery of the University Main Gate gives the illusion of a bird in motion and a burning torch stand, attesting to the citadel's solidity and grandeur in intellectual capability.

Modeling the movement of data was a critical step. The Context Diagram, shown in Figure 5, defines the system's boundary by illustrating the key data exchanges between external entities and the central order management process (Hoffer et al., 2014). The design of the database was guided by an Entity-Relationship Diagram (ERD) presented in Figure 6. This ERD maps the main data entities—such as User, Order, and Invoice—along with their attributes and interconnections, forming the basis for a well-structured and efficient MySQL database that supports data consistency (Connolly & Begg, 2015).

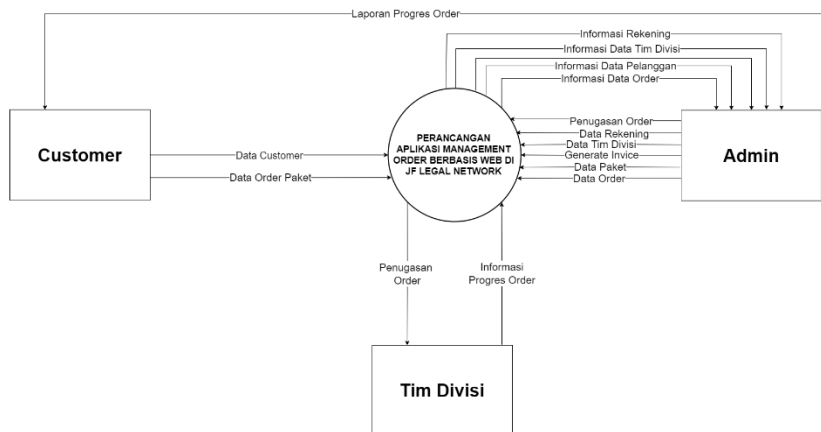


Figure 5 Application Context Diagram
Source: Author’s Analysis

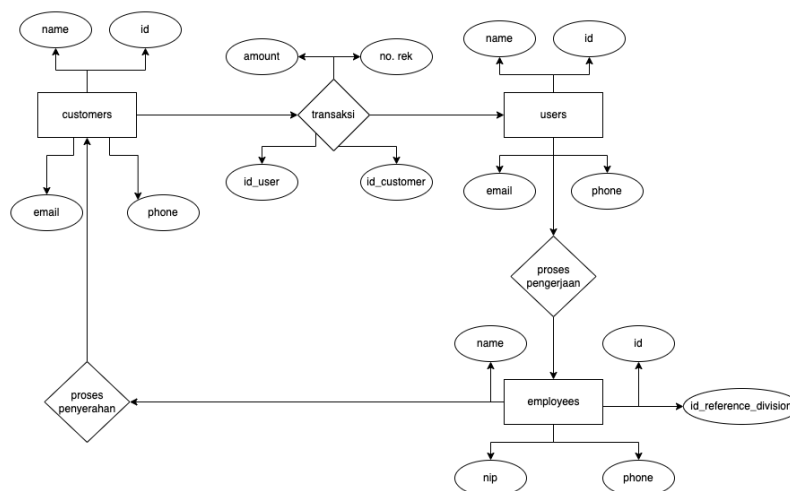


Figure 6 Entity-Relationship Diagram (ERD)
Source: Author’s Analysis

Application Implementation

The implementation stage brought the design to life as a working web application built with the Laravel framework, PHP, and MySQL. The resulting system comprises several key interfaces. A Login page (Figure 7) controls access, verifying user credentials and directing them to an appropriate dashboard. For an administrator, this Dashboard (Figure 8) offers a central view of system operations and management tools. The primary workspace for order handling is the Transaction page (Figure 9), where staff can record and track customer orders. Completing the core workflow, the system produces a detailed Invoice (Figure 10) automatically from the order information, ensuring billing accuracy.

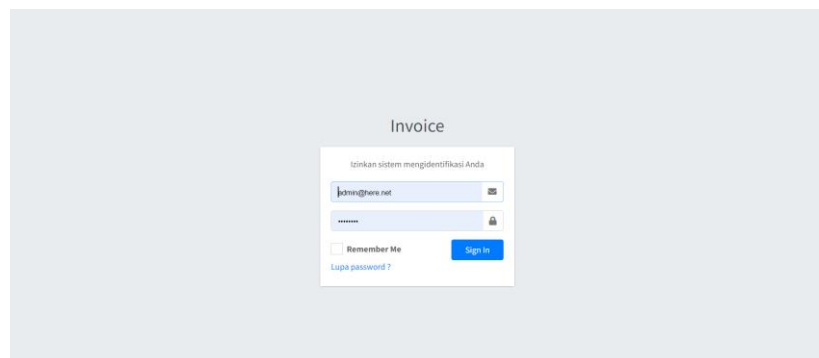


Figure 7 Login Page Interface
Source: Author's Analysis

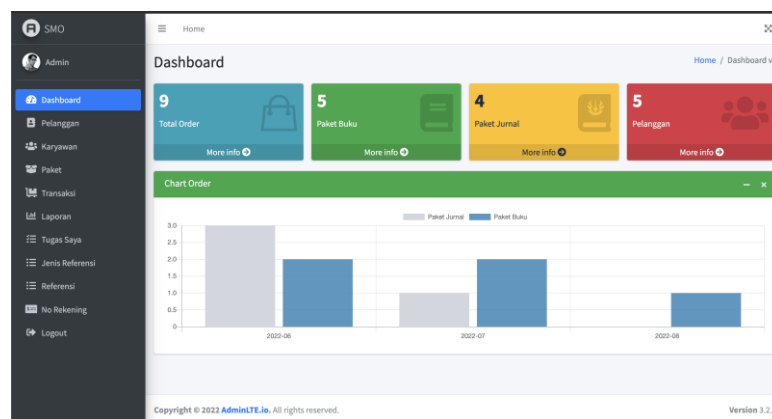


Figure 8 Admin Dashboard Interface
Source: Author's Analysis

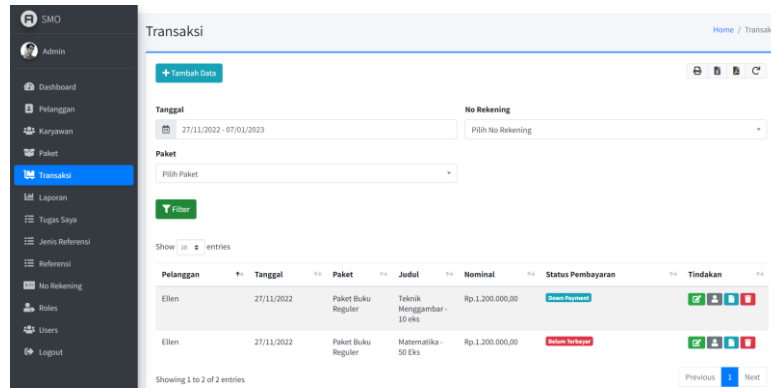


Figure 9 Transaction Management Page
Source: Author’s Analysis

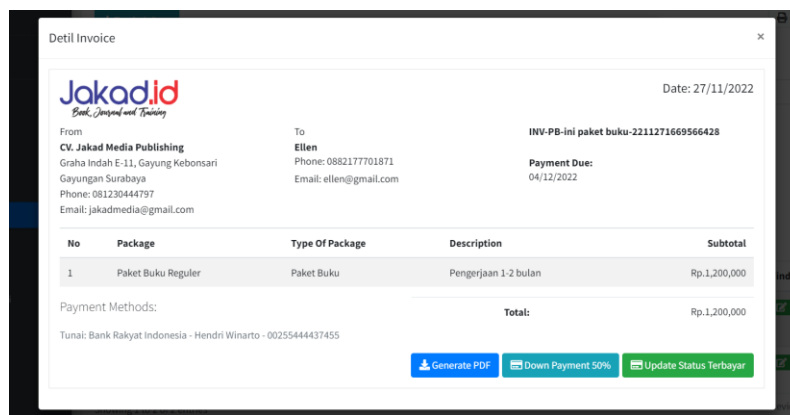


Figure 10 Automatically Generated Invoice Page
Source: Author’s Analysis

System Testing and Validation

The application underwent Black Box Testing to verify its external behavior against the initial requirements, without examining the internal code . The tests focused on essential user operations, including login security, order processing, and reporting capabilities.

The findings from these tests are compiled in Table 1. The results indicate that the system performed as intended across all test scenarios. For example, the test verifying the automatic generation of invoices from new orders (Test #3) confirms that the system successfully addresses the problem of manual data transfer errors. The test ensuring managers can access sales reports (Test #4) shows the system's ability to provide timely data for business analysis.

Table 1 Black Box Testing Results for Core System Functions

No	Test Scenario	Test Case	Expected Result	Test Outcome	Conclusion
1	User login with correct role-based access	Login as Admin, Employee, and Manager	User is redirected to a dashboard specific to their role	As Expected	Valid
2	Employee can view and manage assigned orders	Employee user updates an order status to "Completed"	The completed order is removed from the active task list	As Expected	Valid
3	Admin can add a new order and generate a corresponding invoice	Admin creates a new order and triggers invoice generation	The created invoice accurately reflects all data from the new order	As Expected	Valid
4	Manager can monitor order reports	Manager user accesses the order report section	The system displays all order data in a summarized table	As Expected	Valid

Source: Author’s Analysis

The results of this study strongly support and extend the existing body of research on information systems in small and medium enterprises. The successful implementation of the order management system at JF Legal Network aligns with the findings of (Marakas & O’Brien, 2011), who documented similar improvements in data integrity and reporting efficiency following the adoption of a custom web application in a service SME. However, this study extends that work by providing a detailed, empirical account of the SDLC process within the unique context of an integrated legal and business services provider, a niche not previously covered in the literature.

Furthermore, the findings directly corroborate the theoretical framework of information systems success. The high performance in Black Box Testing, particularly in areas of data accuracy (Test #3) and information accessibility (Test #4), demonstrates strong *system quality* and *information quality*, which are core constructs of the DeLone and McLean IS Success Model [16]. The positive outcomes suggest that the system is likely to achieve the *net benefits* of improved decision-making and operational efficiency, as predicted by the model and observed in studies of accounting systems by (Ghasemi et al., 2011). The structured SDLC approach, as advocated by Sommerville (2016), was instrumental in achieving this alignment between technical functionality and user requirements.

In addressing the identified research gap, this study moves beyond merely confirming known benefits. It provides a concrete blueprint for similar organizations at the intersection of professional and knowledge-work sectors. The specific application of the PHP-Laravel-MySQL stack, detailed through architectural diagrams like the ERD and Use Case diagrams, offers a valuable case study. It demonstrates how a structured development methodology can be applied to create a tailored solution that streamlines complex, multi-service workflows, thereby contributing a practical model for future implementations in analogous business environments.

In summary, the design, implementation, and testing phases yielded a web-based order management application that meets its objectives. The system's architecture provides a solid foundation, and the implemented interfaces successfully digitize the previously manual workflow. The positive test results, when viewed in the context of prior research, offer confidence that the application is functionally correct and capable of improving operational efficiency, data accuracy, and reporting speed at JF Legal Network, while also contributing a specific case to the academic discourse on information systems.

CONCLUSION

Based on the implementation and analysis conducted in this study, it is concluded that the developed web-based order management system successfully addresses the operational inefficiencies at JF Legal Network. The application provides a secure, role-based interface, requiring user authentication via login credentials for administrators, employees, and managers to access their respective dashboards and functionalities. Comprehensive testing confirmed the system's robustness, as it is free from critical syntactic errors and performs all core functions as intended. The Black Box Testing methodology, which focused on input-output validation without examining internal code, verified that the system reliably produces the expected results across all key operational procedures. Therefore, this system presents a viable and effective digital solution for streamlining order

processing, enhancing data accuracy, and improving managerial reporting within the company.

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