JUIT
ADMI Jurnal Ilmiah Teknik
OPEN ACCESS
JUIT Vol 5 No. 3 | September 2026 | ISSN: 2828-6936 (Print), ISSN: 2828-6901 (online), Page. 556-574

Development of a Web-Based Digital Service Record System with FIFO Queue Management at Hexen Garage

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Article History
Received : September 15, 2026
Revised : October 10, 2026
Accepted : November 19, 2026
Published : November 22, 2026

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Cite This Article *[APA Style]:*
Almaani, A. A., Juwari, J., Diantoro, K., & Rohman, A. (2026). Development of a Web-Based Digital Service Record System with FIFO Queue Management at Hexen Garage. *Jurnal Ilmiah Teknik*, *5*(3), 556–574.

DOI:
https://doi.org/10.56127/juit.v5i3.3110

Abstract: Conventional service record management in automotive workshops limits information accessibility, service transparency, and operational coordination. **Purpose:** This study aims to develop and evaluate a web-based digital service record information system incorporating the First In, First Out (FIFO) mechanism at Hexen Garage. **Methodology:** The study employed a software development research design using the Waterfall methodology, supported by descriptive qualitative analysis and quantitative functional evaluation. Data were collected through observations, interviews, and literature review, while system functionality was evaluated using Black Box Testing. **Findings:** The developed system integrates customer data, vehicle records, repair progress monitoring, and chronological queue management through three user roles: administrators, mechanics, and customers. Functional testing revealed that eight of ten scenarios (80%) satisfied the specified requirements, whereas two scenarios (20%) failed in vehicle deletion validation and administrator access restrictions. **Implications:** The system provides a technical foundation for structured service management and improved information accessibility, although further refinement is required before operational deployment. **Originality:** This study contributes to the contextual integration of digital service records, online repair progress monitoring, and FIFO-based queue management within a unified web application tailored to automotive workshop operations.

Keywords: Automotive Service Management; Black Box Testing; Digital Service Record; First In, First Out; Web-Based Information System.

INTRODUCTION

The rapid advancement of information technology has accelerated digital transformation across various industrial and service sectors, including automotive maintenance and repair services. Automotive workshops are increasingly expected not only to deliver reliable vehicle maintenance but also to provide accessible information, transparent service processes, and integrated data management. Conventional record-keeping practices may lead to administrative errors, delays in information delivery, and operational inefficiencies. Digital information systems offer opportunities to address these challenges by facilitating data integration, streamlining business processes, and supporting managerial decision-making (Sandi et al., 2021; Satzinger et al., 2020). Preliminary

observations at Hexen Garage revealed that customer information, vehicle records, service histories, and repair progress were managed through manual documentation and WhatsApp communication. Consequently, customers were required to visit the workshop or contact its personnel to obtain information regarding their vehicle repair status. The absence of an integrated digital queue management system further limited customers' access to information about service sequences and waiting times. These challenges underscore the need for a centralized web-based information system capable of supporting both operational management and customer access to service information.

Existing literature relevant to these challenges can be categorized into three major research streams. The first focuses on business process digitalization and information system development to support operational activities and service delivery (Liyando & Kusbianto, 2020; Muhajir & Maberur, 2022; Sandi et al., 2021). The second examines software development methodologies, particularly the Waterfall model and structured software engineering approaches, as systematic frameworks for translating user requirements into functional applications (Medikano et al., 2023; Pressman & Maxim, 2020; Rosa & Shalahuddin, 2021; Sommerville, 2021). The third addresses system modeling using Unified Modeling Language (UML) and database management to support information integration, application architecture, and business process representation (Dewi et al., 2021; Fahrizah et al., 2024; Nugroho, 2021; Raharjo, 2021; Ramdany, 2024). Although these studies and theoretical foundations provide valuable insights into digital information system development, the reviewed literature gives limited attention to the simultaneous integration of digital service records, online repair progress monitoring, First In, First Out (FIFO) queue management, and waiting-time estimation within automotive workshop operations. This gap highlights the need for a context-specific information system that extends beyond administrative record management to facilitate service visibility and systematic queue organization.

To address this gap, the present study aims to design, develop, and evaluate a web-based digital service record information system incorporating the FIFO method at Hexen Garage. The system is designed to consolidate customer information, vehicle records, service histories, and repair progress while providing role-specific functionalities for administrators, mechanics, and customers. The FIFO mechanism organizes vehicle service queues according to registration timestamps, establishing a consistent basis for determining service sequences. System development follows the Waterfall methodology, encompassing

requirements analysis, system design, implementation, and functional testing, with UML employed to represent system requirements and interactions. Black Box Testing is subsequently conducted to assess the conformity of implemented functionalities with predefined system requirements (Kartono et al., 2024). The principal contribution of this study lies in the contextual integration of digital service record management, repair progress monitoring, and FIFO-based queue organization within a unified web application tailored to automotive workshop operations.

Building on this integrated approach, the study advances the proposition that centralized service information combined with chronological queue management can support more structured and transparent automotive service processes. Digital service records provide a foundation for consistent information management, while the FIFO mechanism establishes an explicit rule for organizing service requests. Their integration is expected to reduce customers' dependence on manual communication by providing direct access to repair progress and queue information. Nevertheless, the effectiveness of such a system depends on the conformity of its implemented functionalities with operational requirements, particularly regarding data integrity, information accessibility, and user access control. Systematic software development and functional verification are therefore essential to establishing the technical feasibility of the proposed solution (Kartono et al., 2024; Pressman & Maxim, 2020; Rosa & Shalahuddin, 2021). Accordingly, this study evaluates the proposed system through functional testing, while broader outcomes concerning operational efficiency, waiting-time estimation accuracy, and customer satisfaction are identified as areas requiring further empirical investigation.

RESEARCH METHOD

The unit of analysis in this study was a web-based digital service record information system developed for Hexen Garage, an automotive repair workshop located at Jalan Lampiri Raya No. 5A, Pondok Kelapa, Duren Sawit, East Jakarta, Indonesia. The investigation focused on the workshop's operational processes, encompassing customer data management, vehicle registration, service order administration, repair progress monitoring, and vehicle service queue organization. The system accommodated three user roles: administrators, mechanics, and customers, each with distinct responsibilities and access privileges within an integrated database environment. These operational components were examined to identify functional requirements and establish the technical

specifications necessary for developing an information system aligned with the workshop's business processes.

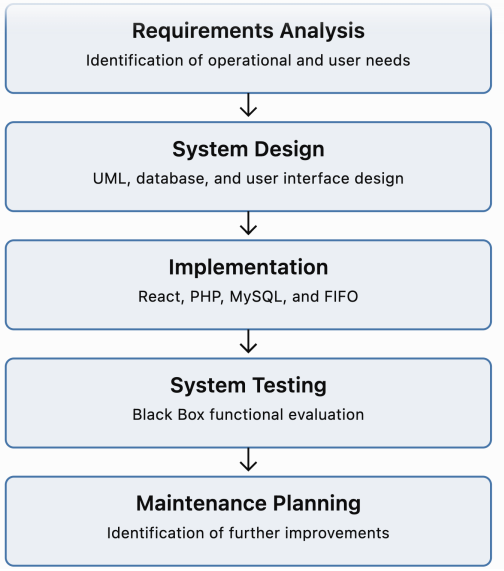


Figure 1. Waterfall-Based System Development Process

A software development research design supported by descriptive qualitative requirements analysis was adopted to address the identified operational needs. The Waterfall methodology was selected because its sequential and structured development stages facilitate the systematic transformation of user requirements into functional software through requirements analysis, system design, implementation, testing, and maintenance planning (Medikano et al., 2023; Pressman & Maxim, 2020). System modeling employed Unified Modeling Language (UML), comprising use case, activity, sequence, and class diagrams to represent user interactions, business workflows, and system architecture (Benabderrezak, 2024; Dewi et al., 2021; Ramdany, 2024; Rosa & Shalahuddin, 2021). User interface prototypes were designed using Balsamiq, while system implementation utilized React through a content delivery network (CDN) for the frontend, native PHP for server-side processing, and MySQL for database management (Raharjo, 2021; Supono & Putratama, 2020). A First In, First Out (FIFO) mechanism was incorporated to organize vehicle service requests chronologically according to their registration timestamps.

The study utilized primary and secondary data sources to establish the operational and technical foundations of system development. Primary data were obtained from direct observations of existing service activities and interviews with Hexen Garage personnel involved in workshop operations. These sources provided information regarding customer

registration procedures, vehicle data management, service documentation, repair progress communication, and operational constraints. Secondary data were derived from relevant scientific publications and software engineering literature concerning information system development, business process modeling, database management, and functional software testing. These materials provided conceptual and technical references for translating operational requirements into system specifications (Fahrizah et al., 2024; Sandi et al., 2021).

Data collection was conducted through direct observation, interviews, and literature review. Observations were undertaken at the research site to examine existing service workflows, manual documentation practices, vehicle registration procedures, and communication mechanisms used to inform customers about repair progress. Interviews with workshop personnel focused on identifying operational difficulties, functional requirements, user responsibilities, and expectations regarding the proposed digital system. The literature review complemented the field investigation by examining relevant concepts and technical approaches applicable to web-based information systems. Information obtained through these techniques was used to identify the system's functional requirements and guide the development of workflow models, database structures, and user interface designs.

Data analysis was conducted through descriptive qualitative analysis of operational information and descriptive quantitative evaluation of system functionality. Information obtained from observations and interviews was examined to identify existing process limitations, determine user requirements, and establish system specifications. The FIFO mechanism was implemented by sorting service records according to registration timestamps using the SQL statement ORDER BY created_at ASC. Following implementation, functional evaluation was performed using Black Box Testing to assess system behavior without examining its internal source code (Kartono et al., 2024; Sommerville, 2021). Ten test scenarios were evaluated, covering authentication, customer registration, vehicle data management, service order creation, repair status updates, service history presentation, and administrator access restrictions. Each scenario was classified as valid or invalid according to its conformity with the predefined functional requirements. The functional test success rate was calculated as the proportion of successful scenarios relative to the total number of scenarios tested. Failed scenarios were subsequently identified as areas requiring further improvement, particularly in relation to data integrity

and access security. This evaluation was limited to the tested system functionalities and did not constitute a comprehensive assessment of operational efficiency, waiting-time prediction accuracy, or customer satisfaction.

RESULT

System Development and Functional Architecture

The development process resulted in a web-based digital service record information system designed to address the limitations of conventional service management at Hexen Garage. The system integrates customer information, vehicle records, service orders, repair progress, spare parts management, and service queue organization within a centralized database. This integration establishes a structured information environment in which administrative activities and vehicle repair operations can be managed through a unified application.

The system architecture accommodates three user roles with distinct functional responsibilities and access privileges. Administrators manage customer records, vehicle information, mechanic assignments, service orders, spare parts, repair progress, and reports. Mechanics can access assigned service orders and update vehicle repair progress, whereas customers can register accounts, manage their vehicle information, and monitor service activities through the web interface. The functional interactions among these three user roles are illustrated in Figure 2.

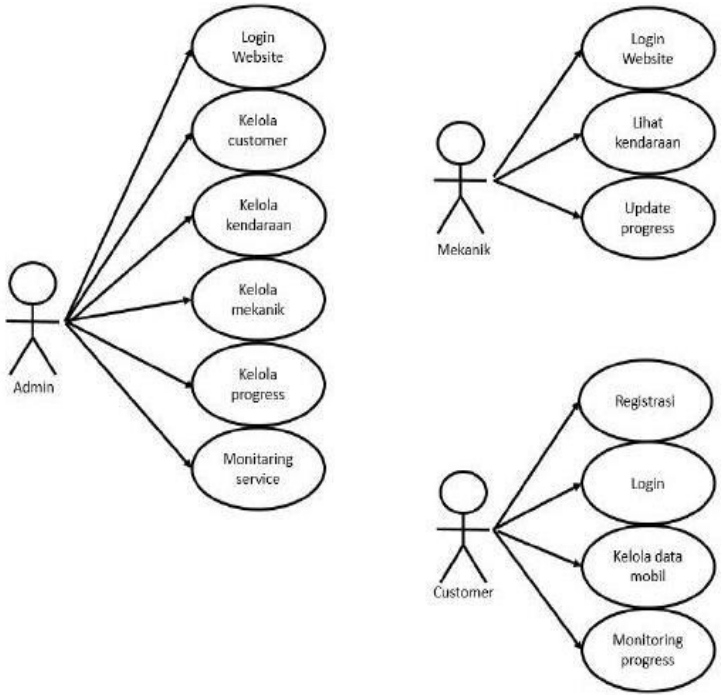


Figure 2. Use Case Diagram of the Digital Service Record Information System

Figure 2 illustrates the distribution of functional responsibilities among administrators, mechanics, and customers. The use case model establishes the boundaries of user interactions and provides a structured representation of the application's functional requirements. This approach is consistent with UML-based software development principles, which emphasize the identification of system actors, functional specifications, and interactions during the software design process (Rosa & Shalahuddin, 2021; Ramdany, 2024).

From an operational perspective, the distribution of responsibilities provides a mechanism for separating administrative activities, technical service operations, and customer information access. However, the representation of access privileges in the system design does not necessarily guarantee their successful enforcement during implementation. Consequently, functional testing remains necessary to verify the effectiveness of the implemented access control mechanisms.

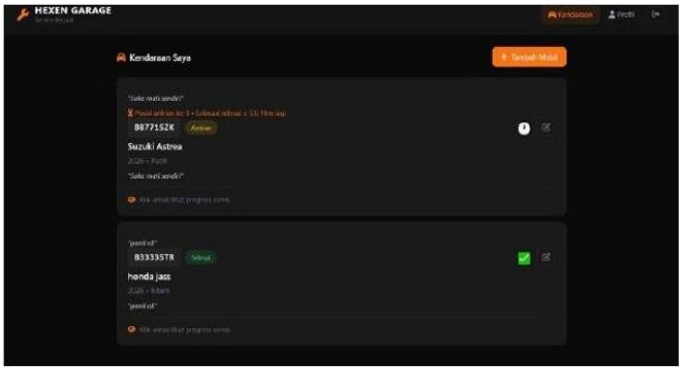
Implementation of the Web-Based Information System

The proposed system was implemented using React through a content delivery network (CDN) for the user interface, native PHP for server-side processing, and MySQL for database management. The database accommodates user accounts, vehicle information, service orders, repair progress records, progress photographs, spare parts information, and mechanic assignments. The integration of these components enables information generated during service activities to be stored and retrieved through a centralized platform.

The implemented application provides administrators with facilities for managing workshop operations, while mechanics can retrieve assigned tasks and document repair activities. Customers can independently access information concerning their vehicle service status, thereby providing an alternative to the conventional communication process previously conducted through direct visits and WhatsApp messages.



(a) Login Admin



(b) Monitoring Service (Customer)

Figure 3. Administrator Login and Customer Service Monitoring Interfaces

Figure 3 presents the administrator login interface and the customer service monitoring page. The administrator interface serves as an authentication gateway to management functionalities, whereas the customer monitoring page displays service-related information, including repair progress, queue position, and estimated waiting time.

The integration of frontend interfaces, server-side processing, and centralized database management is consistent with the principles of web-based information system development discussed by Supono and Putratama (2020) and Fahrizah, Irwan, Nasution, and Ulum (2024). Within the context of Hexen Garage, this implementation extends conventional service documentation by providing customers with direct access to information previously communicated manually. Nevertheless, the extent to which the system reduces administrative workload or information retrieval time requires further empirical evaluation.

Implementation of the FIFO Queue Management Mechanism

A First In, First Out (FIFO) mechanism was incorporated into the system to organize vehicle service requests according to their registration timestamps. Under this approach,

service records registered earlier are positioned ahead of those registered later, establishing a chronological sequence for queue organization.

The FIFO mechanism was implemented at the database level using the following SQL ordering statement:

```sql
ORDER BY created_at ASC
```

The statement retrieves service records in ascending order according to their registration timestamps. Conceptually, this mechanism establishes an explicit ordering rule that allows earlier service requests to receive higher queue positions than subsequently registered requests.

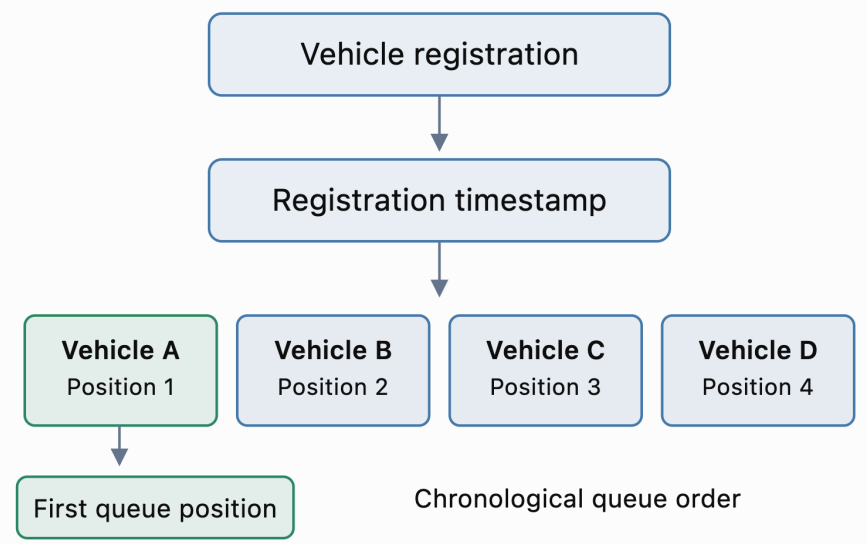


Figure 4. Conceptual Representation of the FIFO-Based Vehicle Service Queue

The chronological ordering mechanism provides a basis for displaying queue positions to customers and organizing registered service requests. However, chronological data retrieval should be distinguished from the actual execution of service activities. Operational factors such as mechanic availability, repair complexity, spare parts availability, and order cancellation may influence the sequence in which vehicles are processed.

Therefore, the implemented SQL ordering mechanism demonstrates chronological queue organization but does not independently establish that all workshop service activities consistently follow FIFO. Further testing is required to evaluate queue consistency under

different operational conditions, particularly when multiple mechanics and service orders are involved.

Waiting-Time Information

In addition to displaying queue positions, the application incorporates Average Waiting Time (AWT) as an indicator intended to provide customers with information concerning the expected waiting period before vehicle repair begins.

Conceptually, the actual waiting time of an individual service request can be expressed as:

$$W_i = S_i - A_i$$

The average waiting time can subsequently be calculated as:

$$AWT = \frac{\sum_{i=1}^{n} W_i}{n}$$

where:

Symbol	Description
W_i	Waiting time of the i-th vehicle
S_i	Service commencement time of the i-th vehicle
A_i	Registration time of the i-th vehicle
n	Total number of observed vehicles
AWT	Average waiting time

Although the developed application presents waiting-time information, the available research documentation does not provide detailed arrival timestamps, service commencement records, or numerical validation results. Consequently, the accuracy of the waiting-time estimates cannot be established from the reported findings.

Furthermore, historical average waiting time should not be directly interpreted as an accurate prediction of an individual customer's waiting time. Such predictions may require additional information concerning queue length, service duration, repair complexity, and mechanic availability. Accordingly, the waiting-time feature represents a functional component of the developed application whose predictive accuracy requires further investigation.

Functional Testing Results

Following system implementation, Black Box Testing was conducted to evaluate the conformity of application behavior with the predefined functional requirements. Ten test scenarios were examined, encompassing authentication, customer registration, vehicle data

management, service order creation, repair progress updates, and administrator access restrictions. The evaluation focused on observable system behavior rather than internal source code implementation, following the principles of functional software testing described by (Kartono et al., 2024; Sommerville, 2021). The functional testing results are presented in Table 1.

Table 1. Black Box Testing Results of the Digital Service Record Information System

No.	Test scenario	Result
1	System login using valid credentials	Passed
2	Rejection of login attempts using an incorrect password	Passed
3	New customer registration	Passed
4	Rejection of duplicate phone number registration	Passed
5	Addition of new vehicle information by customers	Passed
6	Prevention of vehicle deletion when an active service order exists	Failed
7	Creation of service orders by administrators	Passed
8	Service order status updates by mechanics	Passed
9	Presentation of repair progress history to customers	Passed
10	Prevention of administrator page access without authentication	Failed

Source: System testing results.

Based on Table 1, eight of the ten evaluated scenarios satisfied the specified functional requirements, whereas two scenarios failed to produce the expected system behavior. The successful scenarios included authentication using valid credentials, rejection of incorrect passwords, customer registration, duplicate registration prevention, vehicle registration, service order creation, repair status updates, and service history presentation. Using Equation (1), the functional testing success rate was calculated as follows:

$$FTR = \frac{N_v}{N_t} \times 100\%$$

$$FTR = \frac{8}{10} \times 100\%$$

$$\boxed{FTR = 80\%}$$

Meanwhile, the proportion of failed test scenarios was calculated as:

$$FR = \frac{2}{10} \times 100\%$$

$$\boxed{FR = 20\%}$$

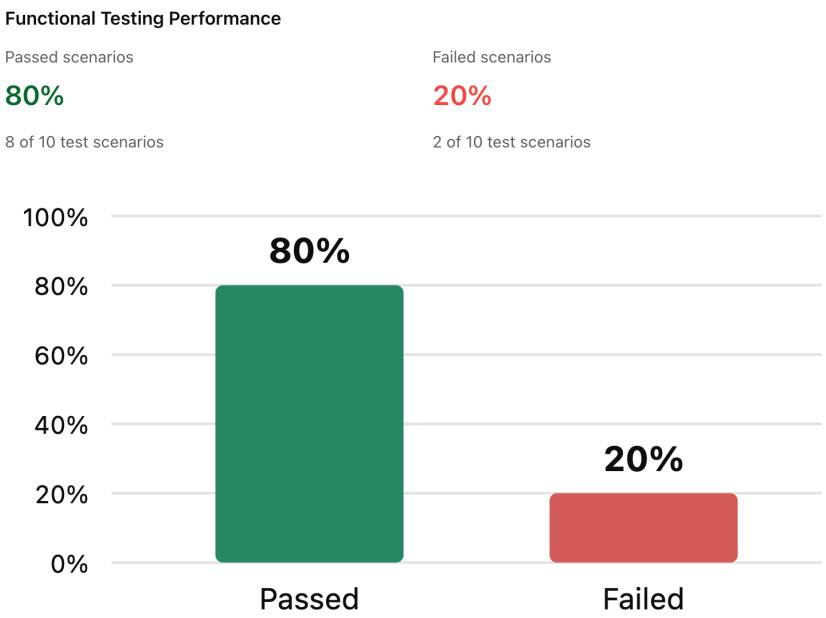


Figure 5. Distribution of Functional Testing Results

As illustrated in Figure 5, the developed system demonstrated an 80% success rate across the evaluated functional scenarios. This finding indicates that most tested functionalities operated according to the specified requirements. However, the percentage represents the proportion of successful test scenarios rather than an overall measure of software quality, operational reliability, or system security. The remaining 20% of unsuccessful scenarios reveal limitations that require particular attention because they concern data integrity and unauthorized access prevention.

Analysis of Data Integrity and Access Security

The first unsuccessful test scenario concerned the prevention of vehicle deletion when an active service order exists. The failure indicates that the implemented validation mechanism did not adequately enforce the expected relationship between vehicle information and ongoing service activities.

From a database management perspective, deleting vehicle information associated with active service orders may compromise data consistency and disrupt the accessibility of related service records. Addressing this limitation requires appropriate server-side validation and database integrity constraints to prevent unauthorized or inconsistent deletion operations.

The second unsuccessful scenario involved direct access to the administrator page without authentication. This finding indicates that the implemented access restrictions did not satisfy the expected security requirements under the tested conditions. Although the system design identifies administrators, mechanics, and customers as distinct user roles, effective separation of these roles depends on the enforcement of authentication and authorization mechanisms during application execution. The implications of the unsuccessful scenarios are summarized in Table 2.

Table 2. Analysis of Unsuccessful Functional Testing Scenarios

Test scenario	Identified limitation	Potential implication	Recommended improvement
Vehicle deletion with an active service order	Insufficient deletion validation	Data inconsistency and disruption of service records	Server-side validation and referential integrity constraints
Administrator page access without authentication	Insufficient access control enforcement	Potential unauthorized access to administrative functionalities	Session validation, authentication, and role-based authorization

The identified limitations demonstrate that successful implementation of individual application features does not necessarily ensure comprehensive system reliability. Although most functional scenarios satisfied the predefined requirements, failures involving data integrity and access security remain significant because of their potential effects on operational continuity and information confidentiality.

Accordingly, corrective implementation and subsequent regression testing are necessary before the system can be considered suitable for unrestricted operational deployment.

DISCUSSION

The findings of this study demonstrate that a web-based digital service record information system can integrate administrative management, vehicle repair documentation, and customer-oriented monitoring within a centralized application. This integration addresses the information accessibility problems identified in the conventional service management practices at Hexen Garage. Rather than relying exclusively on manual documentation and direct communication, the developed system provides a structured mechanism through which administrators, mechanics, and customers can interact with service-related information according to their respective responsibilities. These findings are consistent with the information system development principles discussed by (Sandi et al., 2021; Satzinger et al., 2020), which emphasize the importance of structured information

management and the integration of organizational processes. The results also relate to previous studies on business process digitalization conducted by (Liyando & Kusbianto, 2020; Muhajir & Maberur, 2022). Although these studies addressed different operational contexts, they provide a conceptual foundation for understanding how digital applications can support information accessibility and service management.

Beyond administrative digitalization, an important aspect of the developed system is the integration of chronological queue organization through the First In, First Out (FIFO) mechanism. By arranging service requests according to registration timestamps, the system establishes an explicit and consistent rule for determining queue positions. This functionality complements centralized service documentation by extending information accessibility to the sequence of registered service requests. Nevertheless, chronological ordering at the database level does not necessarily guarantee that vehicle repairs are performed in the same sequence under actual workshop conditions. Factors such as mechanic availability, repair complexity, spare parts availability, and service prioritization may influence operational scheduling. Similarly, the inclusion of average waiting time information provides an additional reference for customers, but its predictive accuracy remains unverified. These considerations distinguish the technical implementation of queue ordering from the operational effectiveness of a complete queue management system.

From a software engineering perspective, the adoption of the Waterfall methodology provided a structured framework for translating identified operational requirements into application functionalities. This approach is consistent with the software development principles presented by (Pressman & Maxim, 2020; Sommerville, 2021), as well as the application of Waterfall methodology examined by (Medikano et al., 2023). The use of Unified Modeling Language (UML) further supported the representation of user interactions, functional requirements, and system relationships, in accordance with established system modeling approaches (Dewi et al., 2021; Ramdany, 2024; Rosa & Shalahuddin, 2021). However, the functional testing success rate of 80% indicates that a systematic development methodology does not independently ensure complete software reliability. As suggested by the functional testing approach discussed by (Kartono et al., 2024), evaluating observable system behavior is essential for identifying discrepancies between expected and actual application performance. The unsuccessful test scenarios in

this study consequently reveal the importance of extending software verification beyond the successful implementation of basic functionalities.

Of particular significance are the deficiencies identified in vehicle deletion validation and administrator access restrictions. Although these deficiencies account for only two of the ten evaluated scenarios, their potential consequences are more substantial than their numerical proportion suggests. Inadequate deletion validation may compromise relationships between vehicle records and active service orders, while insufficient access restrictions may expose administrative functionalities to unauthorized users. These findings highlight the distinction between functional completeness and operational readiness. A system may satisfy most of its specified requirements while remaining unsuitable for unrestricted deployment because of unresolved weaknesses in data integrity and access control. Consequently, the implementation of server-side validation, referential integrity constraints, authentication, and role-based authorization should be prioritized, followed by regression testing to verify the effectiveness of corrective measures. The observed functional success rate should therefore be interpreted as an indicator of partial requirement conformity rather than comprehensive software quality or security.

The principal contribution of this study lies in the contextual integration of digital service record management, repair progress monitoring, and FIFO-based queue organization within a unified application tailored to automotive workshop operations. Unlike the broader information system applications discussed in the reviewed literature, the developed system combines administrative, technical, and customer-oriented functionalities within a specific automotive service environment. Its contribution is therefore primarily integrative and applied rather than algorithmic, as FIFO, UML, and Waterfall are established methods. From a practical perspective, the application provides a technical foundation for reducing dependence on manual information exchange and facilitating access to service records. For automotive workshop management, such integration may support more structured documentation and transparent communication. However, these potential benefits should not be interpreted as demonstrated improvements in operational efficiency, service fairness, or customer satisfaction because the present evaluation did not include direct measurements of these outcomes.

Despite its contributions, this study has several limitations. The functional evaluation was restricted to ten Black Box Testing scenarios and did not explicitly examine FIFO consistency, concurrent service order processing, or waiting-time estimation accuracy.

Furthermore, the absence of comparative measurements between conventional and digital service management prevents quantitative assessment of improvements in administrative processing time, information accuracy, and customer service performance. Customer satisfaction and application usability were also not evaluated through structured user assessments. Future research should address these limitations by incorporating broader functional and security testing, validating queue behavior under different operational conditions, and comparing estimated waiting times with actual service commencement records. Empirical evaluations involving workshop personnel and customers would further clarify the system's practical effectiveness. Such investigations are necessary to establish whether the technical capabilities demonstrated in this study can translate into measurable and sustainable improvements in automotive service management.

CONCLUSION

This study successfully developed a web-based digital service record information system that integrates customer data management, vehicle service records, repair progress monitoring, and chronological queue organization at Hexen Garage. The implementation of the First In, First Out (FIFO) mechanism establishes a systematic approach to arranging service requests according to registration timestamps, while role-specific functionalities facilitate interactions among administrators, mechanics, and customers. Functional evaluation using Black Box Testing revealed that eight of the ten test scenarios (80%) satisfied the specified requirements, whereas two scenarios (20%) failed, particularly those related to vehicle deletion validation and administrator access restrictions. These findings indicate that the developed system fulfills most of the evaluated functional requirements but requires further technical refinement before operational deployment.

The scientific contribution of this study lies in the integration of digital service record management, online repair progress monitoring, and FIFO-based queue organization within a unified information system tailored to automotive workshop operations. This integrated approach extends conventional service documentation by incorporating customer-oriented information accessibility and structured queue management into the software architecture. Consequently, the study provides a practical and methodological foundation for developing similar information systems in automotive service environments and contributes to the applied knowledge of information systems and software engineering within service-oriented industries.

Nevertheless, the study was limited by the scope of functional testing, the absence of comparative operational performance measurements, and the lack of empirical validation of waiting-time estimation and customer satisfaction. Unresolved deficiencies in data integrity and access security also restrict the system's operational readiness. Future research should prioritize strengthening authentication and authorization mechanisms, implementing comprehensive database validation, and evaluating FIFO consistency under varying operational conditions. Further investigations should incorporate comparative performance assessments, waiting-time prediction validation, and structured usability and customer satisfaction evaluations to determine the system's practical effectiveness and its potential contribution to automotive service management.

DECLARATIONS

Artificial Intelligence Use Statement

The authors acknowledge the use of ChatGPT (OpenAI) to assist in manuscript preparation, academic language refinement, structural organization, and revision of the Introduction, Research Method, Results, Discussion, Conclusion, and Abstract sections. The AI tool was used to improve the clarity, coherence, readability, and academic presentation of the manuscript. AI assistance did not involve generating research data, developing or implementing the information system, conducting functional system testing, or independently verifying the reported research findings. All AI-assisted content must be critically reviewed and verified by the authors, who retain full responsibility for the accuracy, scientific validity, originality, ethical compliance, and final content of the manuscript.

Author Contributions Statement

Abdurrahman Ali Almaani: Conceptualization, Methodology, Software, Investigation, Data curation, Formal analysis, Visualization, Writing – original draft.

Juwari: Conceptualization, Methodology, Validation, Supervision, Writing – review & editing.

Karno Diantoro: Methodology, Validation, Supervision, Project administration, Writing – review & editing.

Abdur Rohman: Validation, Formal analysis, Visualization, Writing – review & editing.

All authors have read and approved the final version of the manuscript and agree to be accountable for their respective contributions and the integrity of the published work.

Funding Statement

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Conflict of Interest Statement

The authors declare that they have no financial, professional, institutional, or personal conflicts of interest that could have influenced the design, development, implementation, testing, analysis, interpretation, or reporting of this study.

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