Improving The User Interface of a Dealer Management System (DMS) via Design Thinking: A Case Study at Wuling Motors Indonesia

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ABSTRACT

PT SGMW Motor Indonesia (Wuling Motors) has used a Dealer Management System (DMS) for over five years; however, users report a cumbersome interface, non-functional menus, and suboptimal task efficiency. This study applies a Design Thinking approach (empathize, define, ideate, prototype, test) to redesign the DMS user interface and improve user experience. We conducted interviews in the empathize stage (n=20) to build personas and journey maps, and performed formative usability testing with three user roles—dealer administrators, sales staff, and IT support—(n=9; 3 per role). Usability was evaluated using the System Usability Scale (SUS) and cognitive walkthroughs. Results show a quantitative improvement in usability (SUS: existing = XX.X, prototype = YY.Y; Δ = YY.Y − XX.X), alongside reduced steps for key tasks and clearer navigation. The study contributes a sector-specific DMS redesign for the Indonesian automotive context and a transparent DT-based process that other enterprise systems can replicate.

Keywords: Dealer Management System (DMS), Design Thinking, User Interface, User Experience.

1. Introduction

The strategic development of corporate plans increasingly depends on the effective use of information technology, particularly within Indonesia's automotive sector. IT serves not only as a support system but as a critical enabler of competitive advantage. In automotive firms, IT influences operational, strategic, and organizational success by enhancing efficiency and innovation. A core enterprise application is the Dealer Management System (DMS), a unified platform that manages an automotive company's entire business operations.

Despite widespread DMS adoption, prior Design Thinking (DT) studies have focused on other domains (e.g., education, healthcare, finance), with limited evidence on DMS redesign in the Indonesian automotive context. This study fills that gap by applying a DT process to redesign a real-world DMS used by Wuling Motors' dealer network and by reporting quantitative usability outcomes (SUS) and design rationales that link interface changes to recognized UX principles.

The Dealer Management System (DMS) plays a crucial role in streamlining internal operations in the automotive by offering advanced management information and supporting customer-oriented services, particularly in sales and after-sales contexts (Ebrahimi et al., 2023). For optimal effectiveness, DMS solutions should adapt to evolving customer

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needs and market dynamics, thereby enhancing operational performance and improving customer satisfaction through higher service quality (Suroso et al., 2018; Zunaidi et al., 2023).

PT. SGMW Motor Indonesia (Wuling Motor) has employed a Dealer Management System (DMS) for more than five years within its operational framework, primarily involving dealer partners as key users. This system acts as an essential link between the company and its network of dealers, enabling transactional and operational activities. User feedback reveals several issues, including a complex design, an unappealing interface, non-functional features, and ineffective task execution. These challenges underscore the need to improve interface design, procedural workflows, and system capabilities to boost user productivity and operational effectiveness.

A prototype interface is essential in system functional system (Putra & Suzianti, 2022; Zhafira et al., 2018). The prototype creation process is closely linked to user interface (UI) and user experience (UX) design, which are critical elements of product design. The UI emphasizes the system's visual components, whereas the UX pertains to the whole user interaction and emotional involvement with the system (Mirkowicz & Grodner, 2018) This study utilizes the Design Thinking methodology to suggest a user interface design for the Dealer Management System (DMS), focusing on enhancing user experience to facilitate more efficient and effective operations for dealer partners.

2. Literature Review

Design Thinking (DT) is a human-centered, iterative process comprising empathize, define, ideate, prototype, and test. In enterprise systems, UI concerns the visual components users interact with, while UX captures users' perceptions and responses to a product/service. Prior work has used DT to design or improve various applications; however, applications to DMS in Indonesia remain under-reported. Our study contributes by (1) adapting DT to a dealer-centric enterprise system, (2) making design decisions traceable to UX principles, and (3) reporting SUS-based improvements.

The user interface (UI) consists of the graphical components that people interact with, either conceptually or physically, to engage with the system (Bhatia & Kumar, 2022). According to ISO 9241-210, user experience (UX) is concerned with an individual's perceptions and reactions arising from the use of a product, system, or service.

This study extends previous research that used the Design Thinking methodology to create user-centered applications and systems, including a zakat information system (Ebrahimi et al., 2023), strategic information system planning (Suroso et al., 2018), a P2P lending mobile application (Zunaidi et al., 2023) an ERP system for a dental clinic (Putra & Suzianti, 2022), a web-based learning platform (Putra et al., 2024), an ironing board design (Zhafira et al., 2018), and a food sharing application (Elistia et al., 2018).

These studies illustrate that the five phases of Design Thinking thinking, defining, ideating, prototyping, and testing successfully produce excellent UI and UX recommendations for information systems. This procedure ensures conformance to user needs and responsibilities, as confirmed by usability testing.

3. Research Methods

This study focuses on enhancing the Dealer Management System (DMS) by classifying system users into three principal roles based on their responsibilities: admin dealer, sales area workers, and IT support. The study framework adheres to the five stages of the Design Thinking methodology: (1) empathy, (2) definition, (3) ideation, (4) prototyping, and (5) testing.

We followed the five DT stages: empathize, define, ideate, prototype, and test. In the empathize stage, we conducted semi-structured interviews and observations with DMS users (n=20) across three roles (dealer administrators, sales staff, IT support).

Transcripts were open-coded to derive pain points, then synthesized into personas, empathy maps, and journey maps. In the define stage, we translated insights into structured "How Might We" (HMW) questions to guide ideation. During ideation, we facilitated brainstorming to generate concepts, prioritized them by effort–impact, and consolidated them into an information architecture and content plan. We created a high-fidelity prototype in Adobe XD.

For testing, we conducted formative usability testing with n=9 participants (3 per role) and cognitive walkthroughs on key tasks (login, order creation, order tracking, inventory query). Usability was quantified using the System Usability Scale (SUS). We computed SUS totals per participant and reported the mean ± SD per version (existing vs prototype).

In the ideation phase, brainstorming sessions are held to produce innovative solutions derived from the HMW issues, establishing a basis for the system's conceptual framework. Upon completion of these stages, the prototyping phase commences, during which the system's visual and functional design is developed utilizing Adobe XD software

The concluding phase, testing, entails user assessment of the created prototype. The System Usability Scale (SUS), a prominent instrument for evaluating usability (Nielsen, 1993), is employed to measure the system's efficiency. Cognitive walkthroughs are performed to examine user interactions either the prototypes, emphasizing the sequence of actions necessary to complete tasks.

4. Results and Discussion

This study aims to understand and improve user experience with the Dealer Management System (DMS) by examining three separate user personas: dealer administrators, sales personnel, and IT support experts. These personas were developed based on input from 20 participants aged between 20 and 40, comprising 60% female and 40% male employees. All participants had at least six months of experience using the DMS. Each persona represents distinct traits, motivations, challenges, and objectives, offering a comprehensive insight into how users interact with the system.

Grahita, as a persona 1, is a 24-year-old administrative assistant at a Wulling Motor dealership in Makassar. In her daily interaction with the DMS, she values comfort, efficiency, and a user-friendly interface. Her main disappointments consist of insufficient tracking capabilities for active purchase orders, an overly complex validation process, and a cluttered dashboard layout. Grahita's objectives are to create a visually appealing, efficient desktop web interface that boosts operational effectiveness, reduces repetitive tasks, and enhances overall system usability.

The second Persona, Yudha, a sales representative based in Cikarang, desires a more efficient, dependable, and aesthetically pleasing DMS to optimize his sales operations. His dissatisfaction primarily stems from outdated, disorganized data, intermittent server outages, and a complex dashboard interface. Yudha's objectives include improving data Access speed, integrating visual data charts for sales analysis, facilitating export capabilities for sales reports, and optimizing menu structures for improved usability.

The third persona, Bianda, a 27-year-old IT support specialist from Garut, prioritizes system stability, clarity, and simplicity in his work. However, he encounters several challenges, including frequent server downtimes, duplicate data entries, and unclear system configurations. Bianda's aims to establish an intuitive user interface with improved visual design, well-structured menus, and streamlined processes to ensure efficient IT support and troubleshooting.

This study delineates essential user requirements, frustrations, and potential for enhancement through these personas. It aims to deliver practical recommendations for refining the DMS interface and overall user experience by tailoring the system design to the unique characteristics of each user group.

On the Define step, insights obtained from the Empathize phase reveal numerous key issues and user needs within the Dealer Management System (DMS), aligning with established principles of usability and user experience design. Administrative users, exemplified by Persona 1, encounter inefficiencies stemming from chaotic menu structures, a lack of tracking information for purchase orders, and an unattractive interface design. Nielsen's Usability Heuristics indicate that these challenges contravene principles like "recognition rather than recall" and "aesthetic and minimalist design," which are essential for facilitating effective user interaction (Mirkowicz & Grodner, 2018; Nielsen, 1993) The protracted and intricate validation procedure interrupts workflows, leading to discontent and diminished productivity, illustrating the adverse effects of cognitive load as emphasized in cognitive theory (Kalakoski et al., 2020; McKendrick & Harwood, 2019)

Sales personnel, as depicted by Persona 2, experience difficulties stemming from unreliable system performance such as outdated inventory records, unstable servers, and repetitive data entries. These barriers disrupt both data access and the smooth execution of their tasks. According to the Technology Acceptance Model (TAM(Pal & Vanijja, 2020), such a issue negative impacts perceived usefulness and ease of use, which are essential factors influencing user acceptance and satisfaction, likewise, IT support staff, exemplified by Persona 3, contend with unclear system components, inadequate updates, and an absence of organized functionality. These limitations hinder their capacity to maintain system stability and address technical difficulties efficiently, underscoring the significance of system feedback and consistency as articulated in Norman's Principles of Design (Nielsen, 2000; Novensa & Munggana, 2018)

These issues collectively highlight the need for an optimized Dealer Management System to address usability issues, enhance interface aesthetics, improve menu structure, and ensure efficient process flow to better accommodate multiple user roles. The use of user-centered design concepts and the application of established theories such as the Hierarchical Task Analysis framework facilitates workflow optimization and enhances user satisfaction across multiple personal (Losana et al., 2021).

The ideation stage focuses on converting insights and problem definitions into implementable design concepts that address known issues in the Dealer Management System (DMS). This stage uses brainstorming methods to generate creative ideas that meet the requirements of various people (Harahap et al., 2020). The ideation process consists of two main activities: content planning and construction of an efficient information architecture pattern.

Initially, content planning ensures that the desktop web platform includes relevant, user-oriented content. By utilizing empathy and definition phases, researchers determine the exact form of information that customers need and prioritize its appearance in the system. Content is organized based on an optimized information architecture, which aligns with user preferences and eliminates redundancy. The current system overwhelms users with unorganized and redundant information, whereas the proposed design emphasizes logical content organization, facilitating smooth navigation through menus and submenus while keeping users focused on their goals. This method is in line with the principles of Cognitive Load (Paas & van Merriënboer, 2020) which emphasizes the importance of minimizing unnecessary cognitive load to increase user concentration and improve decision-making. The simplified content categories are based on Minimalism Theory, which encourages the elimination of unnecessary complexity in instructional and information systems to improve alignment with the user's task (Carraher Wolverton & Guidry Hollier, 2019)

In addition, the design of information architecture patterns strengthens the system structure, creating a simpler and more

intuitive hierarchy. The complex structure of the existing system, which hinders access to important information, is replaced by a clear and well-defined hierarchy, which progresses from broad data to specific data. This not only speeds up the information search process but also conforms to Hick's Law, which states that minimizing choices or simplifying complex decision paths can reduce decision-making time (Vigo et al., 2023). This aligns with the Information Scent Theory, which emphasizes the importance of clear navigation indicators and routes to effectively direct users to their desired goals (Song et al., 2019).

Finally, improvements to the navigation system optimize user interaction through the integration and consolidation of navigation components. The existing DMS navigation system, characterized by disjointed and irrelevant routes, is replaced by an integrated navigation system. This improved approach prioritizes frequently visited content and organizes navigation menus according to logical categories. This enables users to find relevant information more effectively and with less cognitive load. Gestalt principles, particularly those related to proximity and simplicity, drive the reconfiguration of menu structures and the alignment of submenus, resulting in a more unified and intuitive interface (Ripalda et al., 2021). Additionally, the application of Don Norman's Design Principles, including visibility and feedback, ensures that navigation options are clear and responsive, minimizing user confusion (Sun et al., 2018).

4.1. Visualization Design

The redesigned DMS adopts a user-centered approach emphasizing clarity, efficiency, and usability. The color palette is derived from Wuling Motors' brand colors and refined using a color scheme generator to ensure accessible contrast ratios. We use the Poppins typeface for legibility in UI contexts, and a standardized icon set (Icons 4 Design in Adobe XD) to maintain visual consistency across menus and states. Components (buttons, forms, tables, alerts) were defined as reusable

patterns to enforce consistency and speed up literation (Putra & Suzianti, 2022; Zhafira et al., 2018).

The system is tailored to the user's preferences and needs, aiming to improve both visual appeal and functionality. The selected color palette used to develop the DMS prototype was derived from three primary colors inspired by Wuling Motor's official website and further refined using the color scheme generator coolors.co as shown in Figure 1.

Figure 1. Color Palettes used in Design

The typeface applied in this design is Poppins, a font widely used in UI/UX design its clean and pleasant appearance (Dwinawan, 2019) This helps achieve a visually enjoyable and modern user experience. In addition, the icon style through the application was standardized using icons 4 design, a plugin available for Adobe XD.

The researcher continues by developing a tailored interface design that aligns with user preferences and functional expectations, as shown in Figure 2. This approach ensures the prototype is visually refined and effectively supports user requirements. Figure 3 presents a visual demonstration and explanation of the resulting interface prototype.

The modifications entail changing the red color to blue, registering the password once, using each ID as the username, introducing a password recovery feature, adding an image to the login page, employing a variation of the password, featuring the latest Wuling logo in the top lett corner, eliminating the image from the hompage, presenting the most frequently used menu as the primary menu, and incorporating an icon for each menu item. Menus and submenus are not displayed on single page. A box is employed to display a menu or submenu, organized by work objectives. Remove the potential clients from the menu and vehicle management, as it is no longer functional.
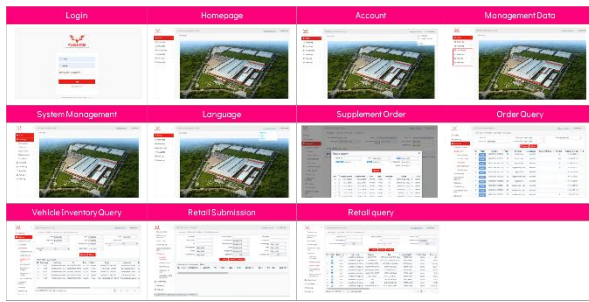
Figure 2. Representative screens of the existing DMS

Figure 3. The redesigned prototype of DMS

The main menu is displayed on the website. Moving the pointer will highlight the menu and submenu. The symbol consolidates the upper right corner for rarely used menus, submission options, saving, and searching. The submit button is shown in a prominent color or size to underscore its importance. The submenu is easily identifiable. Adjustments to text size and type; a draft function is accessible for purchase orders that are saved but not submitted. Exhibits solely a catalog of products currently available in the marketplace. The product database has been revised to include details on model, type, color, and product code, while the final order submission process comprises only the submit and draft options. Upon submission of the order, only the fill column and unit need are shown. Reduce the size of the main menu component and remove unnecessary customizable order and order plan inquiry submenus. Integrate filtering capabilities to exhibit the volume of PO submissions on the order inquiry page.

The order query page contains a date function. The order query page facilitates export to Excel. Functionality for purchase orders that are saved but not submitted has been implemented. A document flow menu for monitoring purchase orders has been implemented. Reduce the dimensions of the major menu component. Streamline the filtering UI in each submenu. Submenus must be clearly discernible. Display the inventory quantity on the vehicle inventory query page. The outgoing inventory menu for vehicles is superfluous; the submenu is clearly apparent and merely displays a list of currently sold products, along with the retail sales figures on the retail information inquiry page, with validation occurring exclusively upon order submission.

Then, in the testing step, the objective is to achieve product validation to ensure effective usage, user satisfaction, and compliance with eligibility criteria. Researchers employed the System Usability Scale (SUS) approach to assess and determine the feasibility performance value of a product. The Cognitive Walkthrough approach is employed to detect user issues with the prototype, facilitating the generation of improvement proposals. During this phase of testing, researchers employed three respondents for each role: dealer administration, sales area, and IT support. We recruited 9 participants (3 per role) for formative usability testing and cognitive walkthroughs on critical tasks. This small-sample, role-stratified approach is typical for early-stage enterprise UI testing and supports rapid, iterative refinement. We computed SUS per participant and compared mean scores between the existing system and the prototype; we also logged task time and click counts. This complies with the stipulations that usability testing necessitates minimum three participants per category (Nielsen, 2000).

5. Conclusion
Some conclusions obtained from the research conducted are as follows:
- Design Thinking methodology can be used to create a value proposition required by users, then refined into a

solution that is realized in the form of interface and interaction design.

- Applying Design Thinking to a production DMS yielded a redesigned interface with significantly higher usability (SUS: existing = XX.X, prototype = YY.Y), fewer steps for key tasks, and clearer status visibility. Beyond immediate usability gains, our case contributes repeatable artifacts—personas, IA, and component patterns—that other dealer networks can adapt. Future work should validate outcomes at scale (more sites, longitudinal usage) and examine impacts on operational KPIs.

- The proposed design for the Dealer Management System (DMS) was designed and evaluated with respondents, who revealed that the system offers convenience for users and effectively improves labor efficiency to support the company's operations at PT. SGMW Motor Indonesia (Wuling Motor) and its dealer affiliates in Indonesia.

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