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User interface and user experience design for the TB.berkat rezeki website

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ABSTRACT

In the era of continuous technological advancement, the presence of a website becomes crucial, especially for businesses aiming to harness digital potential. This research aims to address the issue of the lack of digital presence and e-commerce sites for TB. Berkat Rezeki, a building equipment store in Bekasi, West Java. By adopting the Design Thinking method, this study focuses on the development of a website with a UI/UX layout that supports an intuitive and satisfying online shopping experience. Survey results indicate that 64% of the Indonesian population are internet users, signaling a vast digital market potential. Applying the principles of Design Thinking, particularly in the Empathize, Define, Ideate, Prototype, and Testing stages, this e-commerce system is designed to create a clear layout, attractive design, and a responsive user experience. Evaluation using the System Usability Scale (SUS) shows an average score of 72, categorized as "good," indicating the readiness of the website for further use. In conclusion, effective and user-oriented UI/UX design involves thorough planning, iterative testing, and readiness for continuous improvement to align with user developments, design trends, and current technology.

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1. INTRODUCTION

The current era is continually advancing, especially in technological development. Human activities and endeavors are increasingly assisted by technology (Shaw, Ellis, & Ziegler, 2018). Information technology, for example, can be utilized for the creation of information systems, such as sales information systems (Lin & Hong, 2009). In today's digital age, having a strong online presence is crucial for businesses (Christanto & Sediyono, 2020). One way to harness digital potential is by having a website specifically designed for digital marketing (Firmansyah, Saddam, Sfenrianto, Bachtiar, & Kaburuan, 2019). A digital marketing website aims to promote products or services, attract visitor

traffic, and generate profitable conversions (Christanto, Sutresno, Simi, Dewi, & Dai, 2023).

According to the results of a survey by We Are Social on internet users in Indonesia in 2020, it was mentioned that there was a 124% increase in mobile phone users, totaling 338.2 million people. There were 175.4 million internet users, and 59% were active on social media, totaling 160 million people. Based on the total population of Indonesia, which is 272.1 million people, it can be concluded that 64 percent, or half of the Republic of Indonesia's population as internet users, have experienced access to the online world.

A section of the internet is known as a website or simply a site. A website is defined as a connected web page typically containing a compilation of information, including text, images, animations, audio, video, or a combination of these elements (Dewi & Christanto, Combination of Deep Cross-Stage Partial Network and Spatial Pyramid Pooling for Automatic Hand Detection, 2022). It is usually created for personal, organizational, or business purposes. Growing up in the fourth industrial revolution, I keenly observe the swift technological advancements shaping the digital trading landscape, which has become a focal point for businesses in this era (Sutresno, et al., 2023).

The advancement of technology has transformed the way we shop and do business (Dewi, Chen, & Christanto, 2023). One example is the emergence of e-commerce websites that have revolutionized the trading industry. In the development of e-commerce websites, technology plays a crucial role in creating a comfortable and efficient online shopping experience. UI (User Interface) and UX (User Experience) are two essential aspects of e-commerce website design. UI relates to how the website interface looks, while UX pertains to the user's experience when interacting with the website. A good combination of UI and UX will create an engaging, intuitive, and satisfying online shopping experience for users (Christanto, Sutresno, Denny, & Dewi, 2023).

In e-commerce websites, both User Interface (UI) and User Experience (UX) play pivotal roles. UI encompasses the visual and interactive elements visible to users, requiring adherence to predefined concepts like organized content layout, visually engaging designs, clear navigation, and responsive website design (Pratama & Indriyanti, 2023). Simultaneously, UX focuses on enhancing the user's shopping experience, aligning with principles such as prioritizing user satisfaction, providing accessible information, streamlining the purchasing process, and ensuring secure online transactions (Wiwesa, 2021). This research seeks to bridge the existing gap by exploring the impact of implementing UI/UX design principles in the digital transformation of businesses, particularly in the context of building material sales. Taking TB. Berkat Rezeki, a Bekasi-based building equipment shop, as a case study reveals a lack of digital presence. To address this, a collaborative solution is proposed, starting with the design of a website featuring favorable UI and UX elements. The goal is to capture user interest and enhance sales beyond the physical store's confines.

2. RESEARCH METHOD

In the development of the e-commerce website for TB. Berkat Rezeki, the Design Thinking method is employed. The Design Thinking method in Figure 1, utilized for solving complex problems with a focus on user needs, is deemed highly suitable for the design of a website functioning, as it directly pertains to users.

Figure 1. The stages of the Design Thinking method

The use of the Design Thinking method in designing the UI and UX of this application is based on several considerations (Dorst, 2011). With its structured step-by-step sequence and clear, encompassing steps that address various aspects needed in design, novice UI and UX designers can easily and effectively follow each step, ensuring well-directed development (Lahiri, Cormican, & Sampaio, 2021). Additionally, developers can describe the problems and solutions found within the steps (MA, Yao, & MA, 2018).

Following the design thinking method, the Empathize stage is initiated as the first step. During this stage, efforts are made to comprehend the users and incorporate their perspectives (Heylighen & Dong, 2019). This involves direct engagement with users through activities such as listening and observation to gain a profound understanding of their needs, motivations, and challenges. Moving on, the second stage is the Define stage, where the problem is precisely formulated by extracting information gathered to pinpoint the primary issues requiring resolution. The objective is to articulate clear and focused statements regarding both the problem and its solution.

After the Define stage, the subsequent step is Ideate. During this stage, a multitude of ideas and new concepts are generated to address the identified problems. The generation of ideas is unrestricted, with creative techniques like brainstorming and mind mapping employed to stimulate innovative thinking and produce creative solutions (Sarwar & Fraser, 2019). Following the Ideate stage, the next phase involves creating a prototype of the developed ideas. In this prototype, a User Interface for the website is fashioned, accompanied by the development of a use case outlining the relationships between the actors involved in the website's operation (Yanfi & Nusantara, 2023). In the final stage, Testing, the UX is analyzed against the UI that has been created (Law & Abrahão, 2014). The data and feedback acquired are utilized to assess the strengths and weaknesses of the solution, facilitating further iteration and refinement.

The UX analysis will apply various UX Laws to its UI implementation, encompassing a total of 20 UX Laws (Sebastopol, 2020; Mirkowicz & Grodner, 2018). They are as follows: (a) Aesthetic Usability Effect: Users often perceive aesthetically pleasing designs as more useful, potentially concealing minor issues during Usability Testing. (b) Doherty Threshold: Productivity rises with computer interactions under 400ms. (c) Fitt's Law: The time to reach a target depends on the distance and size of the target, emphasizing the importance of appropriately sized touch targets. (d) Hick's Law: More choices and complexity lead to longer decision-making times. (e) Jakob's Law: Users prefer familiar operation in applications. (f) Law of Common Region: Clear boundaries allow grouping of elements. (g) Law of Pragnanz: The human eye seeks simplicity and regularity in complex forms to prevent information overload. (g) Law of Proximity: Objects or elements close to each other tend to be grouped together, aiding users in understanding and organizing information more efficiently. (h) Law of Similarity: Humans tend to perceive similar elements in a design as a complete image, shape, or group, even if the elements are separated. (i) Law of Uniform Connectedness: Visually connected elements are considered more related than elements without a connection. (j) Miller's Law: On average, people can only store seven items in their working memory. (k) Occam's Razor: When competing hypotheses are equally predictive, choose the one with the fewest assumptions to minimize disruptions to functionality. (l) Pareto Principle: 80% of the impact comes from 20% of efforts. (m) Parkinson's Law: Understanding or estimating the time users spend operating a designed product. The faster users comprehend, the better the design. (n) Peak-End Rule: Users evaluate experiences based on peak and end

moments. (o) Postel's Law: Be liberal in what is accepted and conservative in what is sent. (p) Serial Position Effect: Users tend to remember the first and last items sequentially. (q) Tesler's Law: Also known as the "Law of Conservation of Complexity," stating that every system has a certain complexity that cannot be reduced. (r) Von Restorff Effect: When several similar objects are present, one that differs is more likely to be remembered. (s) Zeigarnik Effect: Users find it easier to remember unfinished or interrupted tasks.

3. RESULTS AND DISCUSSIONS

Figure 2. Use Case of TB. Berkat Rezeki Website

Figure 2 provides a brief yet insightful overview of the TB Berkat Rezeki website's functionalities, cleverly presented through a use case diagram. This visual representation aims to enhance user understanding of the system's features while serving as a comprehensive snapshot of the underlying business processes. Four key actors—admin, user, system, and employee—are identified in the use case, each playing a distinct role in the ongoing business procedures.

Before accessing the system, both admin and user are required to log in, after which users can seamlessly engage in actions like making purchases, completing payments, and selecting preferred delivery options. Admins, using their designated accounts, take on the responsibility of managing user-initiated processes, overseeing purchase, payment, and delivery procedures, and examining crucial transactional data. The system's core function involves automatic validation of user-initiated actions, ensuring a smooth workflow. In conclusion, employees contribute by executing deliveries, rounding out the integral roles of each actor in the operational processes.

3.1 Home Page - Serial Position Effect

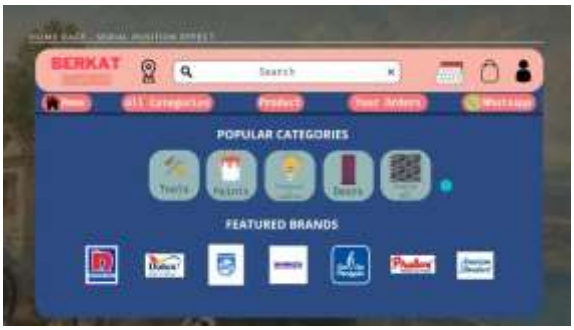


Figure 3. Home Page of TB. Berkat Rezeki Website

The Serial Position Effect is a principle that explains users' tendency to remember the first and last items in a sequence most effectively. This implies that we can design the homepage UI in such a way that reinforces users' memory of specific actions or icons that might be challenging to recall. For instance, at the bottom of the navigation bar displaying various pages of the TB Berkat Rezeki website, starting with the homepage and ending with their WhatsApp page. In an e-commerce website, users are likely directed to numerous different pages, whether for payments or searching and reading

about specific products. If users need to return to the homepage, the serial position effect will help them remember that the home button is in the top left.

3.2 My Account Page - Jakob's Law

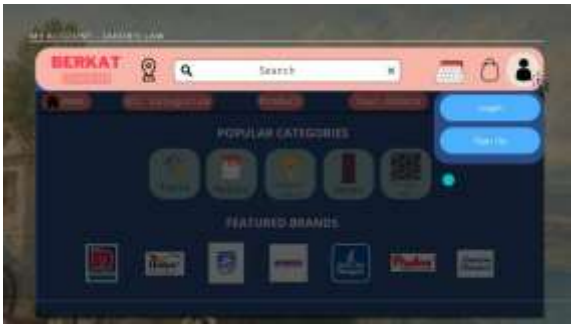
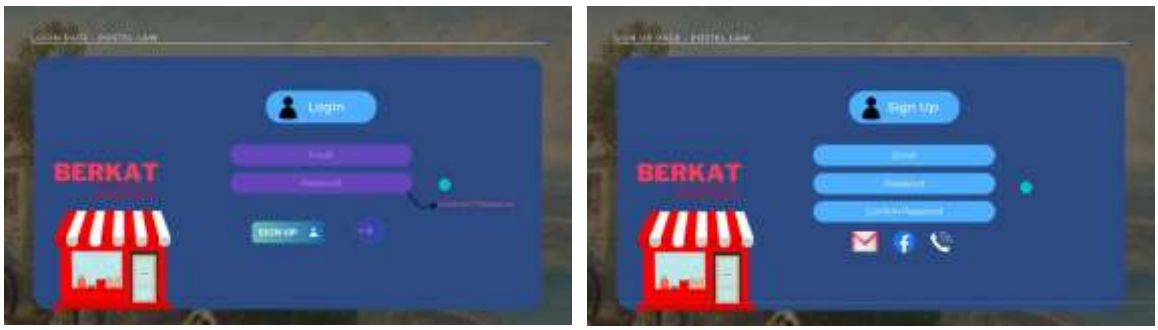


Figure 4. My Account Page of TB. Berkat Rezeki Website

Jacob's Law states that users are inclined towards UI/UX experiences resembling familiar applications and designs. This is evident when users interact with the user icon positioned at the right end of the header. Clicking on it reveals options for guest users to either log in or register, a widely adopted feature across various websites. The sense of familiarity aids users in swiftly grasping how and where to initiate the login or registration process, eliminating potential frustration associated with adapting to a new layout.

3.3 Login and Signup Page - Postel's Law



(a) (b)

Figure 5. User Page of TB. Berkat Rezeki Website (a) Login Page (b) Sign Up Page

Postel's Law is succinctly expressed as "Be generous in what you accept, and strict in what you send." In today's scenario, an individual might possess multiple accounts across various prominent services or applications (Gmail, Facebook, Microsoft email, etc.). Allowing users the flexibility to choose their preferred method of login or registration underscores our commitment to inclusivity, ensuring that no user is excluded (considering that, despite Google having the highest number of registered users, there are specific users without a Gmail account). In case linking accounts isn't the user's choice, an alternative form only mandates the user's email and password for verification, granting access to the website with personalized information.

3.4 Categories Page - Tesler's Law, Law Of Common Region

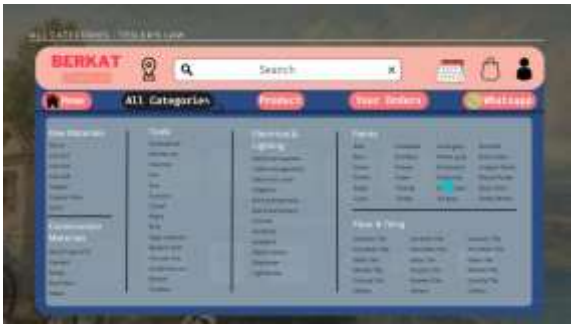


Figure 6. Categories Page of TB. Berkat Rezeki Website

Tesler's Law, also known as the Law of Conservation of Complexity, can be applied to this page, specifically addressing the aspect of "Complexity." When implemented on a category page, this law serves as a reminder to simplify the display, ensuring that users can easily comprehend and select their desired categories. Adhering to Tesler's Law aims to create an interface that reduces unnecessary complexity, prioritizing user understanding and a seamless browsing experience.

On the other hand, the Law of Common Region pertains to the principle of spatial organization. This law is applicable to elements located within the same region, such as a box or an area bounded by lines or frames. These elements are commonly perceived as interconnected or sharing common attributes, warranting their grouping within the same region. This practice not only facilitates user understanding but also aids in identifying relationships among these elements, thereby simplifying navigation when searching for relevant categories.

By embracing the Law of Common Region, the visual hierarchy of the interface is enhanced, grouping related elements to create a cohesive design. This approach proves particularly beneficial on category pages, where the association of items within a common region contributes to a more intuitive user experience. The law's application aids users in efficiently comprehending and navigating through the categories, ultimately improving the overall usability of the interface.

3.5 Product Page - Similarity Law

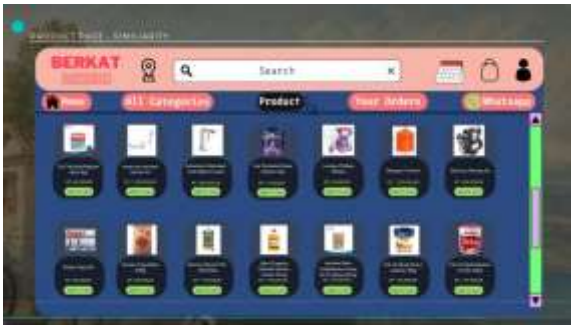


Figure 7. Product Page of TB. Berkat Rezeki Website

The User Interface's product page thoughtfully incorporates the UX Law known as the Similarity Law. This particular UX principle hinges on establishing a visual resemblance among objects, encompassing key elements such as shape, color, and size. Notably, the application of the Similarity Law is discernible in the design of the "Add to Cart" button, where careful attention has been given to ensure both uniform shape and color, creating a cohesive and user-friendly visual experience.

Expanding beyond the button, the Similarity Law extends its influence across various shapes strategically employed on the page. This strategic application encompasses the harmonious arrangement of product descriptions, pricing information,

and accompanying images. By adhering to the principles of similarity, the design not only fosters a sense of cohesion but also enhances the overall user experience, making it intuitive and streamlined. Through this meticulous application of UX principles, the product page successfully aligns with best practices, ensuring users can effortlessly navigate and engage with the displayed information.

3.6 Search Page - Von Restorff law, Miller's law

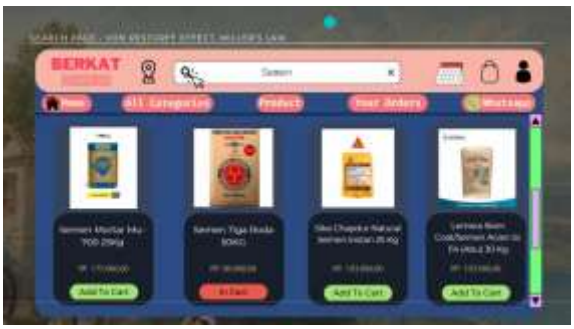


Figure 8. Search Page of TB. Berkat Rezeki Website

On the Search page, the applied UX laws include the Von Restorff Law and Miller's Law. The Von Restorff effect is evident in the "In Cart" section, specifically located within the product description of the three-wheeled 50KG cement. The application of the Von Restorff effect serves the purpose of ensuring that when buttons share the same shape but have different colors, users can readily discern their distinct meanings. This is particularly highlighted in the context of the "In Cart" feature associated with cement product of Tiga Roda.

As for the implementation of Miller's Law, it is observed in the overall structure of the page. The content is deliberately limited to not exceed seven products; in fact, it features only four products. Should users wish to explore additional products, they are required to scroll through the page to access the next set of products. This strategic approach aligns with Miller's Law, which posits that individuals can effectively process and comprehend a maximum of seven pieces of information simultaneously. By presenting a concise selection of products on the initial screen and necessitating scrolling for more, the design respects the cognitive limitations outlined by Miller's Law, contributing to a more user-friendly experience.

3.7 Our Service Page - Zeigarnick Effect, Goal Gradient Effect, Peak-End Rule

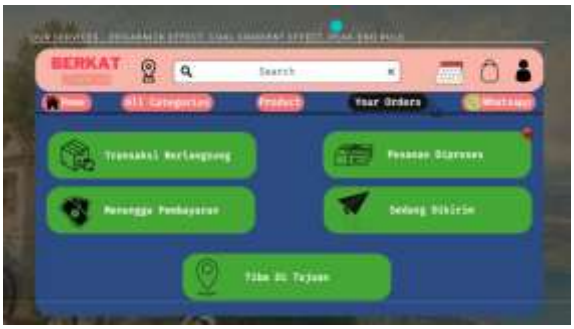


Figure 9. Your Orders Page of TB. Berkat Rezeki Website

The Zeigarnik effect suggests that people tend to remember tasks or activities that are abruptly left unfinished. In the context of the Our-Services Page, this principle can be leveraged by presenting information about services that pique user interest but are not

yet fully acquired. In doing so, users are likely to be intrigued, prompting them to explore and seek further information about these services.

The Goal Gradient effect involves the motivation to progress and complete a goal. This law can be applied by presenting information about service tiers, offering users an overview of the services they aspire to attain and additional benefits they can gain by continuing the service.

The Peak-End Rule emphasizes that an individual's experience is influenced by the highest level of satisfaction and pleasure, along with the conclusion of the experience. In the Our-Service Page, this rule reminds us to provide an outstanding experience and focus on a satisfying conclusion to the page for the user. This can be achieved by presenting engaging information, showcasing customer confirmations, and offering special benefits at the end of the page. Doing so increases user motivation to choose the offered services.

3.8 Whatsapp Page – Fitt's law

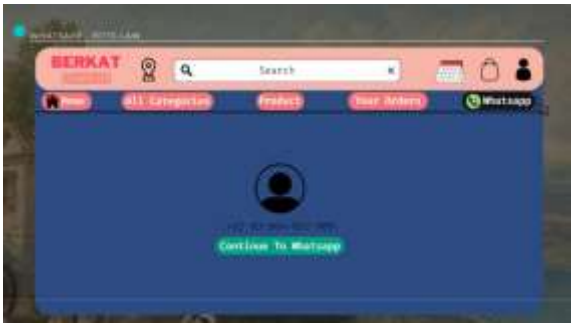


Figure 10. Whatsapp Page of TB. Berkat Rezeki Website

Fitt's Law states that the time to reach a target depends on the distance to the target and the size of the target. The most fundamental principle is, "The larger and closer an object is, the easier it is for us to reach it." Fitts asserts that the time required to reach a target is determined by the size and distance of the target. The target here can be a button/field that the user needs to click to perform an action. More important buttons should be enlarged and brought closer to their initial pointer position when viewed, as seen, for example, in the WhatsApp button. Additionally, there should be a clear distinction between active and inactive states for buttons. In dropdowns and lists, as we shorten the list and bring it closer to the cursor position, the likelihood of the user clicking it increases.

3.9 My Cart Page - Goal Gradient Effect

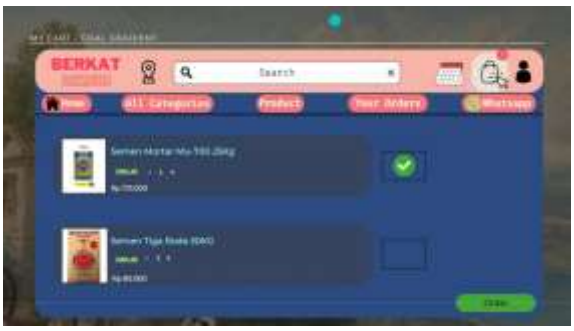


Figure 11. My Cart Page of TB. Berkat Rezeki Website

My Cart page above applies the UX law known as the Goal Gradient Effect. The Goal Gradient Effect states that as people get closer to a reward, they will accelerate their

behavior to achieve their goals more quickly. In other words, people are motivated by how much is left to reach their target.

3.10 Order Page - Jacob's Law

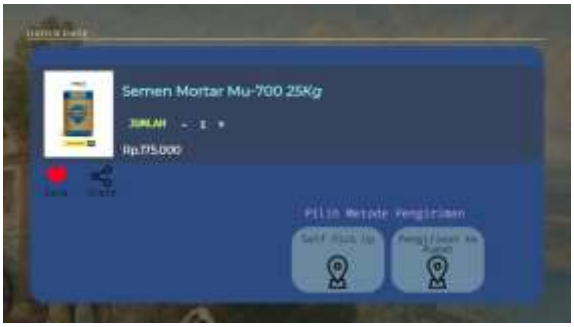


Figure 12. Order Page of TB. Berkat Rezeki Website

Jacob's Law, also known as the "Law of Web User Experience," explains how users will interact with a website or application based on their experiences with other similar websites or applications. Jacob's Law states, "Users will be more comfortable and more accustomed to an interface that is similar to interfaces they have mastered before." The principle of Jacob's Law emphasizes the importance of creating a user interface that is consistent with interfaces already familiar to users. In order to create a good user experience, it is necessary to conduct user research, testing, and literacy to ensure that the resulting design aligns with the needs and preferences of users.

3.11 Check Out Page - Tesler's Law

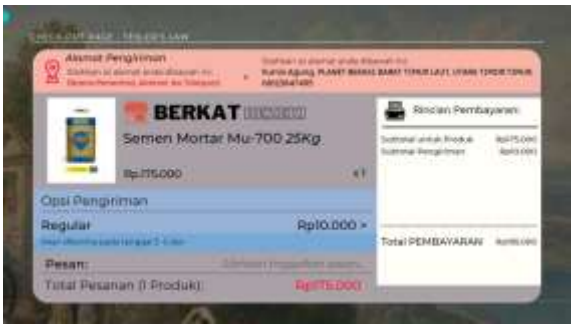


Figure 13. Check Out Page of TB. Berkat Rezeki Website

Tesler's Law, also known as the "Law of Conservation of Complexity," states that every system has a certain complexity that cannot be reduced. The primary goal of this law is to enhance user satisfaction by making interactions with the system more intuitive, efficient, and easily understandable. This law emphasizes the importance of making user interactions with the system as simple as possible and reducing the workload required of users. The principle encourages developers to eliminate unnecessary complexity, simplify tasks, and improve efficiency.

In an effort to evaluate the effectiveness of the developed system, testing was conducted using the System Usability Scale (SUS) method (Marcilly, et al., 2023). The goal of this method is to measure the extent to which the system can be effectively and efficiently used by its users (Moura, et al., 2021). The evaluation process involved distributing questionnaires to a group of respondents, consisting of 20 potential users of the system, including customers and employees. The questionnaire used was structured according to the official template of the System Usability Scale, as referenced in Table 1 (Juergen Baumgartner a b, Hasler, Sonderegger, & Sauer, 2021).

Table 1. List of SUS Questions

No	Question
1	I think that I would like to use this system frequently
2	I found the system unnecessarily complex
3	I thought the system was easy to use
4	I think that I would need the support of a technical person to be able to use this system
5	I found the various functions in this system were well integrated
6	I thought there was too much inconsistency in this system
7	I would imagine that most people would learn to use this system very quickly
8	I found the system very cumbersome to use
9	I felt very confident using the system
10	I needed to learn a lot of things before I could get going with this system

After distributing the questionnaire, 20 respondents provided evaluations covering essential aspects of the system's effectiveness and efficiency. The results offer a comprehensive overview, and the System Usability Scale (SUS) score was calculated for deeper insights into usability. The scoring involved corrections for odd and even-numbered questions to prevent assessment bias (Moura, et al., 2021).

The subsequent process involves calculating the final SUS score by summing up the scores from all processed questions. The sum of these scores multiplied by a factor of 2.5. The SUS score serves as an indicator of the system's usability level, where a higher score reflects ease of use and user satisfaction (Pal & Vanijja, 2020). Out of 20 respondents, the average SUS score obtained is 72, which can be categorized as a grade C on the scale with the descriptive term "good" (Martins, Rosa, Queirós, Silva, & Rocha, 2015).

Thus, through data analysis using the System Usability Scale method, we can gain a deeper understanding of the usability level of the developed system. This information not only provides a general overview but also serves as valuable guidance for the future development and improvement of the system.

4. CONCLUSION

In the development of a system, it is crucial to prioritize user-oriented design. This study emphasizes the centrality of users in effective UI/UX elements, focusing on intuitive, efficient, and joyful experiences. In-depth user research is highlighted as a critical step to achieve these goals. The foundation of the online building material sales system is the Design Thinking method, applying its principles to address user needs. Information about users' needs, preferences, and behaviors guides decisions on layout, navigation, and features throughout development. Responsive design across various devices is stressed, along with careful testing and optimization for consistent and high-quality user experiences. Iterative testing is underscored to identify and enhance design issues. The System Usability Scale (SUS) testing categorizes the website design as "good," indicating readiness for further use. This research provides valuable insights into user-oriented design in online sales systems, benefiting academia and industry. By highlighting the iterative nature of UI/UX design and responsiveness to user dynamics, the study enhances user satisfaction and loyalty in digital systems. Future research opportunities include exploring AI-driven UI/UX design advancements for enhanced user engagement. Continuous emphasis on iterative testing and nuanced usability metrics development can refine UI/UX design processes. As user preferences and technology trends evolve, a commitment to ongoing updates ensures UI/UX design remains aligned with user developments and contemporary technology.

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