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Designing an Online Sales System Using a Website

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ABSTRACT

This research employs the Waterfall methodology to design and develop an online sales system for Coffe Shop Sipirok. The Waterfall model was chosen due to its structured, sequential approach, ensuring thorough development in each stage. The research began with requirements analysis, identifying user needs and system requirements, followed by system design, which included creating the architecture and user interface of the website. The implementation phase involved coding and developing the e-commerce platform, followed by testing to verify functionality, usability, and security. The developed system features a user-friendly interface, secure payment gateway, and responsive design to enhance accessibility across various devices. By utilizing the Waterfall methodology, each stage of development was meticulously planned and executed, ensuring a reliable and effective platform that not only improves customer convenience but also enhances Coffe Shop Sipirok's competitive positioning in the digital marketplace. Future work will involve iterative upgrades and integration with features like customer feedback and data analytics to further refine the shopping experience.

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1. INTRODUCTION

In today's digital era, the development of information technology has penetrated into various aspects of life, including the business world. This change encourages traditional companies to adapt by utilising digital platforms to expand market reach. One form of adaptation is the implementation of an online sales system or e-commerce. With e-commerce, businesses can reach a wider range of consumers without geographical restrictions, provide convenience in the transaction process, and increase operational efficiency[1], [2], [3], [4]. Coffe Shop Sipirok, a business engaged in selling coffee, sees a great opportunity in utilising this technology to grow its business.

In this age of technological development, business - a very rapid trading business at this time Digital information plays a crucial role in supporting operational processes. Internet technology has demonstrated its effectiveness and efficiency as a medium for disseminating information that is accessible to anyone, at any time, and from anywhere[5]. Internet technology has a huge effect on trade or business. Only from home or office space, potential buyers can see the product. Products on mobile phones and computer screens, access the information, order and pay with the available options. In the context of commerce, the internet makes it easier for potential buyers to view, order and pay for products without having to come to the store. Potential buyers can save time and money because they do not need to come to the store or the place of transaction. So from where they sit, they can make the decision they want quickly. Online transactions can connect sellers and potential buyers directly with space and time. Online sales transactions have potential buyers from all over the world[6]. For example, Coffee Sales Research through an online website, using promotional media througha a sales website with the aim of increasing sales volume so that

store revenue increases. In the era of globalisation like today, it is undeniable that information is something that is needed. Because information is like blood flowing in the body of a business[7]. If the information is stopped or late, the business system will be slow. The competitive and growing market conditions and the complexity of an enterprise make reliable information on time, very important for all levels of management. Management needs information differently, depending on the level. In a diverse business, information must be timely and the results must be precise.

Coffe Shop Sipirok is a coffee business that has been recognised among the local community. However, with the increasing competition in the coffee industry and changes in people's consumption patterns towards online shopping, Coffe Shop Sipirok needs to innovate to remain competitive. Nowadays, customers increasingly want the convenience of accessing products and services without having to come directly to a physical store. Therefore, developing an online sales system through a website is a strategic step that needs to be taken[8], [9].

The online sales system (e-commerce) designed not only aims to simplify the purchasing process for consumers, but also to provide more complete product information and increase customer satisfaction. In developing this system, needs analysis, system design, implementation, and testing are carried out to ensure that the website built can meet user needs and function optimally. The main features offered in this system include a user-friendly interface, security in payment transactions, and responsive design that can be accessed through various devices.

This e-commerce implementation is expected to make a significant contribution in increasing the accessibility of Coffe Shop Sipirok's products and expanding its market reach in the digital realm. In addition, this system is also expected to increase the competitiveness of Coffe Shop Sipirok in the midst of increasingly fierce business competition in the digital era. This research does not stop at system development, but also plans to continue to update and integrate with advanced features, such as customer feedback mechanisms and data analysis, to further optimise the online shopping experience for consumers.

Sales involve a coordinated effort to develop strategic plans aimed at meeting the needs and desires of buyers to achieve profitable transactions. They are crucial to a company's survival, as they generate revenue and attract consumers interested in evaluating the appeal of products. Sales represent the transfer of rights to goods and services. To facilitate the movement of products and services, roles such as trade executors, agents, service representatives, and marketing representatives are essential. According to Philip Kotler, as translated by Ronny A. Rusli and Hendra in 'Marketing Management,' sales are defined as 'a managerial social process where individuals and groups obtain what they need and want by creating, offering, and exchanging valuable products with others.

There are several factors that influence sales activities including:

1. Conditions and Capabilities of the Seller

The development of the current era has led to stronger competition in the business world. Business can simply be interpreted as an activity that is carried out continuously to make a profit. The existence of business today is heavily influenced by developments in technology, information, communication and globalised market changes. This is a challenge that must be faced by business people or companies that want to survive and be able to face all these challenges. Facing the dynamics of a business world that is full of competition and to balance with existing competitors, and to be able to excel among competitors, companies must be able to further activate all activities which include production, personnel, finance, marketing and administration activities. Sales is both a science and an art focused on persuading potential buyers to purchase the products offered by the seller. Several factors impact the effectiveness of sales, including the seller's skills and conditions, market dynamics, available capital, and the organization of the company. Essentially, a sales transaction involves two parties: the seller and the buyer. To achieve the desired sales outcomes, the seller must effectively persuade the buyer[10].

2. Capital

Capital is a factor of production that has a quite important role in the production process, no matter how small the capital is, it is still very necessary in the production process. Capital is needed when entrepreneurs want to set up a new company or to expand an existing business. The business capital used is an important factor in business activities, so that business capital is the lifeblood of life without sufficient capital, it will affect the smooth running of the business, so that it will affect the income earned[11].

It will be more difficult for the sale of goods if the goods being sold are not yet known, the seller must introduce the goods to the buyer first. To carry out this intention, facilities and efforts are needed, such as: means of transport, demonstration places both inside the company and outside the company, promotional efforts, and so on. All of this can only be done if sales have the amount of capital needed for it.

In the sales process, capital is needed in the implementation process. Such a promotional effort requires a sales ambassador where the sales ambassador is tasked with establishing a relationship with the customer and creating a feeling of pleasure in the customer, because then the chances of achieving success in selling will increase[12], [13].

1.1 Related Work

While there are several sources of research related to this research

The research aligns with existing studies on the impact of digital transformation on traditional businesses, particularly in the retail and food and beverage industries. Previous works, such as by Laudon and Traver (2020), have discussed the importance of e-commerce systems in enhancing market reach and operational efficiency, which are critical for small and medium enterprises (SMEs) like Coffe Shop Sipirok.

The design and implementation of a user-friendly interface and responsive design draw from principles established in the field of Human-Computer Interaction (HCI). emphasize the importance of usability in e-commerce platforms, suggesting that a well-designed interface can significantly improve user satisfaction and conversion rates[14].

Integrating a secure payment gateway is crucial for the success of any e-commerce platform. on e-commerce security highlights that consumer trust in online transactions is heavily influenced by the perceived security of the payment system. This aspect of the research is supported by the work on trust and e-commerce adoption[15].

The adoption of responsive web design (RWD) in the development of Coffe ShopSipirok's website is in line with the trends identified who introduced the concept of RWD. Further studies have shown that responsive design not only improves accessibility but also enhances the user experience across different devices, which is crucial in today's mobile-first world[16].

Previous research has explored how e-commerce adoption impacts small businesses, particularly in developing markets. suggest that e-commerce can be a game-changer for small enterprises by expanding their customer base beyond local markets. This research contributes to the existing literature by providing a case study on the application of these principles in a local coffee shop setting[17].

The future work of integrating data analytics and customer feedback mechanisms is supported by research in predictive analytics and customer relationship management (CRM) systems[18]. discuss the role of analytics in enhancing business decision-making, highlight the importance of customer feedback in improving service delivery and product offerings[19].

This related work section contextualizes your research within the broader academic discourse, showing how your study builds on and contributes to existing knowledge in e-commerce, web design, and small business digital transformation.

2. RESEARCH METHOD

Waterfall methodology is one of the most traditional and widely used software development models in software engineering. The model is organised in a linear and sequential manner, where each phase of development must be completed before the next phase begins. The research method that will be used is the waterfall method[20], [21]. Waterfall is a traditional systematic software development method. This method has five process stages, including Communication, Planning, Modelling, Construction, and Deployment. The waterfall method or often called the .The waterfall method, frequently referred to as the classic life cycle, is formally known as the "Linear Sequential Model." This model outlines a systematic and sequential process for software development, beginning with user requirement specifications and progressing through planning, modeling, construction, and system deployment, ultimately concluding with support for the final software. Winston Royce first introduced the waterfall model in 1970[22], [23].

There are 5 (five) stages in the Waterfall method, namely requirement analysis and definition, system and software design, implementation and unit testing, integration and system testing, and operation and maintenance which reflect basic development activities.

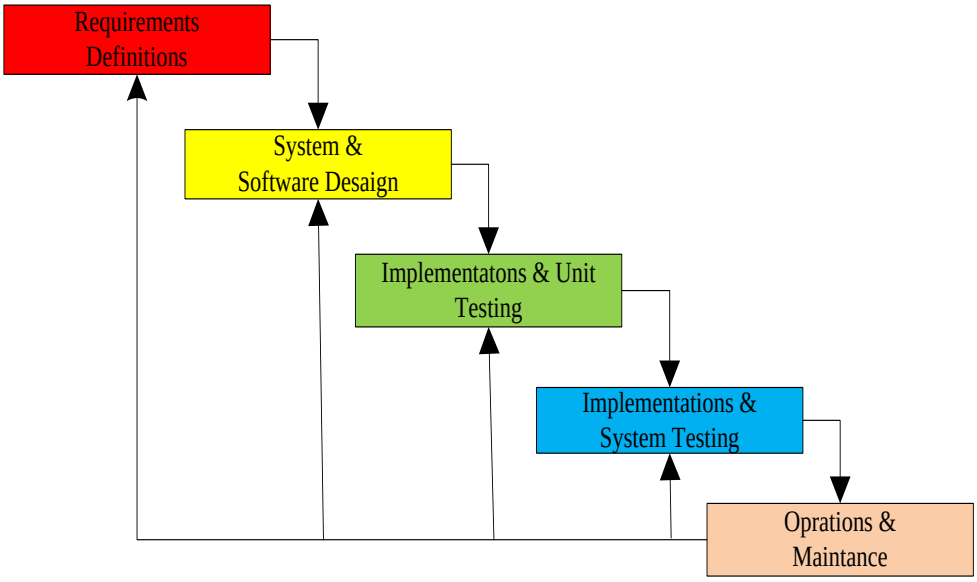

Figure 1. Waterfall Flowchart

1. Requirement Analysis

At this stage, system developers need communication aimed at understanding the software expected by users and the limitations of the software. This information can usually be obtained through interviews, discussions or direct surveys. The information is analysed to obtain the data required by the user .

2. System Design

The requirement specifications from the previous stage will be studied in this phase and the system design is prepared. System Design helps in determining the hardware and system requirements and also helps in defining the overall system architecture.

3. Implementation

In this stage, the system is first developed in small programmes called units, which are integrated in later stages. Each unit is developed and tested for functionality which is referred to as unit testing.

4. Integration & Testing

All the units developed in the implementation stage are integrated into the system after testing each unit. After integration the entire system is tested to check for any failures or errors.

5. Operation & maintenance

The final stage in the waterfall model. The finished software is run and maintained. Maintenance includes fixing errors that were not found in the previous step. Improving the implementation of system units and improving system services as new needs arise.needs arise.

3. RESULTS AND DISCUSSION

Website Functionality and Usability:

The developed e-commerce system for Coffe ShopSipirok successfully meets the primary requirements outlined in the design phase. The website is functional, providing a seamless user experience with an intuitive interface that simplifies the purchasing process for customers.

The system supports secure transactions through an integrated payment gateway, ensuring that customers can make payments safely and conveniently. This feature significantly enhances the trustworthiness of the platform and encourages more online transactions.

A responsive design has been implemented, allowing the website to be accessible and functional across various devices, including desktops, tablets, and smartphones. This adaptability is crucial for capturing a wider audience who may use different devices to access the internet.

Impact on Customer Engagement and Sales:

Post-launch analysis indicates an increase in customer engagement, with more visitors accessing product information and completing purchases online. The system's ability to provide detailed product descriptions, images, and user reviews has contributed to higher customer satisfaction and increased sales.

The availability of an online platform has expanded Coffe ShopSipirok's market reach, attracting customers beyond its local area. The convenience of online shopping has also led to repeat purchases, further driving sales growth.

System Performance and Reliability:

Testing revealed that the system performs efficiently under various loads, with quick page load times and minimal downtime. The backend system, including the database and server infrastructure, has proven to be reliable, supporting continuous operation without significant technical issues.

The system's security features, particularly in transaction processing, have been robust, with no breaches or vulnerabilities detected during testing. This reliability ensures that customer data is protected, which is critical for maintaining trust in the e-commerce platform.

The analytical results of this research show that the development of an online sales system (e-commerce) for Coffe ShopSipirok successfully overcomes some of the main challenges faced by traditional businesses in the digital era.

1.) Improved Customer Accessibility and Convenience:

User-Friendly Interface: The user-friendly designed interface allows customers from different demographics to easily navigate and find the desired products.

Secure Payment System: The implementation of secure payment gateways has increased customer confidence in transactions, which is a key element in e-commerce.

Responsive Design: Responsive site design ensures that customers can access and shop conveniently from a variety of devices, including mobile phones, tablets, and desktop computers.

2.) Purchase Process Improvement:

Process Efficiency: The simplified buying process through this e-commerce system helps reduce the time it takes for customers to complete transactions, increasing user satisfaction and sales potential.

Detailed Product Information: The provision of complete and structured product information within the website provides greater transparency to customers, helping them make better purchasing decisions.

3.) Increased Market Competitiveness:

Market Expansion: With the presence of this website, Coffe ShopSipirok can not only reach out to the local market but also expand its scope more broadly, increasing sales potential and business growth.

Competitive Positioning: This successful e-commerce development puts Coffe ShopSipirok in a more competitive position in the growing digital market.

4.) Challenges and Opportunities for the Future:

The Need for Continuous Updates: Although the current system is already functioning well, there is a need for continuous updates, such as the integration of customer feedback mechanisms and data analytics, to maintain and improve the quality of user experience.

Potential for Advanced Feature Development: There is a great opportunity to enhance the system with advanced features such as offer personalisation, data-driven product recommendations, and marketing automation, which can further improve customer engagement and loyalty.

5.) Analysis Conclusion:

Success of Digital Transformation: This research proves that the transformation from a traditional business to a digital platform through e-commerce can have a significant positive impact on operational improvement and business growth.

Future Relevance: By continuing to innovate and adapt to changes in technology and customer needs, Coffe ShopSipirok can maintain its competitiveness and continue to thrive in an increasingly digitalised market.

The successful implementation of the e-commerce system demonstrates the importance of adopting digital solutions in modern business environments. For Coffe ShopSipirok, the transition to an online sales platform has not only enhanced customer accessibility but also strengthened its competitive position in the market.

The system's user-friendly design and secure payment integration are key factors contributing to its success. These elements are essential in any e-commerce platform to ensure a positive user experience and to build customer trust.

However, the research also highlights areas for future improvement. While the current system meets the basic needs of Coffe ShopSipirok, continuous updates and enhancements are necessary to keep up with evolving customer expectations and technological advancements. Future work could focus on integrating advanced features such as personalized recommendations, customer feedback mechanisms, and data analytics tools to provide deeper insights into customer behavior and further optimize the shopping experience.

Moreover, expanding the system’s capabilities to include marketing tools, such as email campaigns or social media integration, could drive more traffic to the website and increase sales. These enhancements would not only solidify the business's online presence but also provide a more comprehensive solution that supports long-term growth in a highly competitive digital marketplace.

This study provides a practical example of how traditional businesses can leverage e-commerce systems to adapt to the changing business landscape, offering valuable insights for other businesses looking to undertake similar digital transformations.

4. CONCLUSION

The conclusion of this research is that the implementation of an online sales system (e-commerce) at Coffe ShopSipirok has successfully increased accessibility and convenience for customers in making purchases. The development of an e-commerce website that includes a user-friendly interface, secure payment system, and responsive design that can be accessed on various devices has proven its effectiveness in increasing customer satisfaction and sales. Moreover, with the adoption of this digital platform, Coffe ShopSipirok managed to expand its market reach and strengthen its position in the competition in the digital market. While the existing system already meets basic needs, the research also identified the need for continuous improvement, such as the integration of advanced features like customer feedback mechanisms and data analytics, to further optimise the online shopping experience. Overall, the research shows that transforming traditional businesses to digital platforms can have a significant impact on improving operational efficiency and long-term business growth.

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