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"Digital Transformation and Sustainable Business: Challenges and Opportunities for Higher Education Research and Development"

Design of Web-Based Information System for Sales of Food Materials at Jaya Anugerah Shop

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Abstract

Jaya Anugerah Store operates as a retail enterprise specializing in essential consumer goods and household necessities. The establishment has gained considerable recognition within the Kapten Muslim district, with its primary location at Jalan Kapten Muslim No.206, Helvetia Tengah, attracting a substantial regular customer base. Despite its market presence, the store continues to depend on conventional manual systems, resulting in various operational limitations. This research addresses these challenges by developing a web-based sales platform enabling customers to place orders digitally and complete transactions through cashless payment methods without requiring physical store visits. The implemented solution delivers multiple benefits including streamlined transaction workflows, broader market accessibility, enhanced sales monitoring capabilities, improved customer confidence, while simultaneously advancing the researcher's competencies in web-based system development. Research methodology incorporated direct observational studies and structured stakeholder interviews.

Keywords: *Information System Design, Sales, Web*

Introduction

Contemporary technological evolution demonstrates unprecedented acceleration, fundamentally transforming global business landscapes. Computerization advancements yield substantial positive influences across human endeavors, particularly within commercial sectors, facilitating swift, accurate, and precise strategic decision-making processes (Martinez & Thompson, 2021). Technology integration within business operations enables enhanced process efficiency, elevated productivity levels, and significant reduction in data processing errors (Chen et al., 2022). These technological capabilities represent primary catalysts for organizational improvement initiatives, offering comprehensive solutions to operational challenges while streamlining diverse commercial activities (Anderson & Roberts, 2023).

Information systems constitute pivotal technological infrastructure fundamentally influencing modern commerce through integrated digital frameworks. Through proper technological utilization, information distribution becomes instantaneous and universally accessible, enabling stakeholders to leverage digital resources for varied operational requirements (Kumar & Singh, 2020). Internet connectivity provides seamless access to academic literature, scholarly publications, and global knowledge repositories from diverse geographical locations, supporting informed decision-making processes (Williams & Davis, 2021). Educational sector technological advancement has introduced innovative instructional methodologies and diversified learning platforms, reflecting accelerating technological development trajectories (Peterson & Miller, 2022).

Internet adoption demonstrates exponential expansion patterns, enabling enterprise information systems to facilitate integration across multiple digital ecosystems including electronic commerce platforms, social networking services, and mobile payment solutions, thereby streamlining transactional workflows and extending market penetration (Garcia & Lee, 2023). Enhanced digital connectivity empowers commercial operators to maintain customer relationships, implement inventory control protocols, and track business performance metrics with superior effectiveness (Brown & Wilson, 2021). These technological progressions not only accelerate operational processes but also deliver substantial advantages in market intelligence capabilities and strategic promotional implementations (Johnson & Turner, 2022). Through systematically organized and readily accessible data architectures, business practitioners can formulate informed decisions supporting sustainable

enterprise development (Laudon & Laudon, 2020). Consequently, information system deployment within commercial establishments, specifically at Toko Jaya Anugerah, represents an imperative requirement for maintaining contemporary competitive positioning (Hassan & Park, 2023).

Toko Jaya Anugerah is a trading business that sells basic necessities and daily necessities located at Jalan Kapten Muslim No.206, Helvetia Tengah, Medan, North Sumatra. Toko Jaya Anugerah still uses manual recording by utilizing books. Therefore, the implementation of a web-based sales information system can help business operations and provide convenience to consumers.

The implementation of this system not only provides efficiency in business management, but also improves customer experience. Consumers can easily find out the availability of goods, make orders online, and get information related to prices and promotions more transparently. Thus, the use of a web-based information system can increase customer satisfaction and strengthen Toko Jaya Anugerah's competitiveness in the midst of increasingly competitive business competition. In this case, the sales information system can also help calculate and manage financial reports to improve business quality and performance.

From the explanation, it is known that technology and information are very necessary in a business, so the author conducted a study entitled "Designing a Web-Based Sales Information System for Basic Necessities at Jaya Anugerah Store". This case, the sales information system can also help calculate and manage financial reports to improve business quality and performance. From the explanation, it is known that technology and information are very necessary in a business, so the author conducted a study entitled "Designing a Web-Based Sales Information System for Basic Necessities at Jaya Anugerah Store".

Literature Review

System Design

System design encompasses comprehensive activity frameworks that articulate detailed operational specifications for system functionality. The fundamental objective involves creating software solutions that satisfy user requirements and operational expectations (Satzinger et al., 2020). Effective system design necessitates thorough examination of existing workflows, identification of enhancement opportunities, and systematic development of technological solutions addressing identified operational challenges (Morgan & Phillips, 2021).

System

A system constitutes an organized framework for conveying intricate operational conditions or establishing references to prevailing control mechanisms (Rodriguez & Carter, 2020). Systems represent interconnected components operating collaboratively to achieve specific organizational objectives through structured processes and defined relationships (Freeman & Patterson, 2021).

Information

Information represents processed data that yields enhanced significance and actionable insights for recipients (Harrison & Mitchell, 2022). It reflects actual occurrences and facilitates informed decision-making processes. Quality information delivers substantial value to stakeholders utilizing it for strategic planning, operational coordination, managerial decision-making, and performance evaluation activities (Thompson & Wallace, 2023).

Information System

Information systems constitute the practical implementation of integrated information technology and communication frameworks organized within business enterprises (Simangunsong et al., 2022). These systems represent amalgamations of diverse information technology elements functioning synergistically to generate meaningful intelligence, thereby establishing communication networks throughout organizational hierarchies and stakeholder groups (Seah, 2020). Contemporary information systems facilitate seamless data flow, support collaborative workflows, and enable real-time information access across organizational boundaries (Clarke & Barnes, 2021).

Sales Management
Sales activities encompass comprehensive marketing operations involving product distribution to end consumers, executed through strategic delivery mechanisms ensuring consumer accessibility and satisfaction (Tjiptono, 2021). Modern sales management requires thorough understanding of consumer behavior dynamics, competitive market forces, and strategic positioning approaches (Harrison & Scott, 2022). Contemporary sales methodologies integrate advanced digital technologies to enhance customer engagement effectiveness and optimize transactional processes (Wang & Liu, 2023).

Website Technology
Websites serve as digital platforms facilitating information presentation through internet connectivity, incorporating diverse multimedia elements including visual imagery, video content, textual information, and audio components with interactive features through hypertext connections accessible via browser applications (Yuhefizar, 2021). Contemporary web development emphasizes responsive design principles, user experience optimization, cross-platform compatibility, and accessibility standards (Bennett & Hughes, 2020). Modern web technologies continue evolving rapidly, incorporating sophisticated features including real-time data processing capabilities, cloud service integration, mobile responsiveness, and progressive web application functionalities (Stevens & Moore, 2022).

PHP (Hypertext Preprocessor)
PHP represents a predominant server-side programming language extensively utilized in web application development environments (Richards & Watson, 2021). The language facilitates dynamic web page generation and enables direct bidirectional interaction between user interfaces and server infrastructure. Through intuitive and adaptable syntax structures, PHP empowers developers to construct information systems with operational efficiency, supporting dynamic content generation, database integration, and session management (Campbell & Turner, 2020). Contemporary PHP frameworks provide robust security features, horizontal scalability options, extensive library ecosystems, and object-oriented programming paradigms suitable for complex application architectures (Henderson & Gray, 2023).

XAMPP Development Environment
XAMPP constitutes comprehensive local web server software widely adopted by web developers across experience levels, particularly those initiating programming careers (Murphy & Collins, 2020). The platform delivers integrated feature sets including Apache web server, MySQL database management system, PHP programming language, and Perl scripting language within unified installation packages, substantially simplifying development environment configuration and deployment procedures (Fischer & Ryan, 2021). This integrated development environment supports rapid prototyping capabilities, local testing functionalities, and streamlined debugging processes prior to production deployment (Armstrong & Bell, 2022).

MySQL Database System
MySQL represents an open-source relational database management system (RDBMS) extensively employed in developing dynamic web applications with complex data requirements (Carter & Lewis, 2021). The system supports comprehensive Structured Query Language (SQL) implementation and demonstrates exceptional compatibility with PHP programming environments, enabling efficient data storage, retrieval, manipulation, and transaction management operations (Powell & Reed, 2020). MySQL offers enterprise-grade scalability, reliability features, performance optimization capabilities, and ACID compliance suitable for various application scales ranging from small business systems to large-scale enterprise solutions (Davidson & Marshall, 2023).

Data Flow Diagram (DFD)
Data Flow Diagrams serve as visual analytical instruments employed in system analysis to illustrate information flow patterns and data transformation processes within system architectures (Sanders & Porter, 2022). DFD methodology facilitates comprehension of data movement through system processes, originating from diverse external entities and undergoing various processing transformations before reaching destination points. DFD hierarchical level structures describe progressively detailed system perspectives, with each level providing

incremental process decomposition represented through diagrammatic notations connected via directional flow indicators (Riswan, 2024). These visual representations assist stakeholders in understanding system architecture, identifying potential process bottlenecks, and recognizing opportunities for operational improvements (Griffin & Hayes, 2021).

Entity Relationship Diagram (ERD)

Entity Relationship Diagrams represent specialized conceptual data modeling instruments utilized to perform abstract data structure modeling with objectives of articulating or depicting database schema configurations intended for system implementation (Mulyani, 2020). ERD provides comprehensive graphical representations of entities, their attributes, and relationships within database ecosystems, facilitating systematic database design processes and ensuring data integrity maintenance (Burton & Walsh, 2021). The methodology supports normalization processes, helps prevent data redundancy issues, maintains referential integrity, and establishes clear cardinality relationships between entities (Fletcher & Shaw, 2022).

Flowchart Methodology

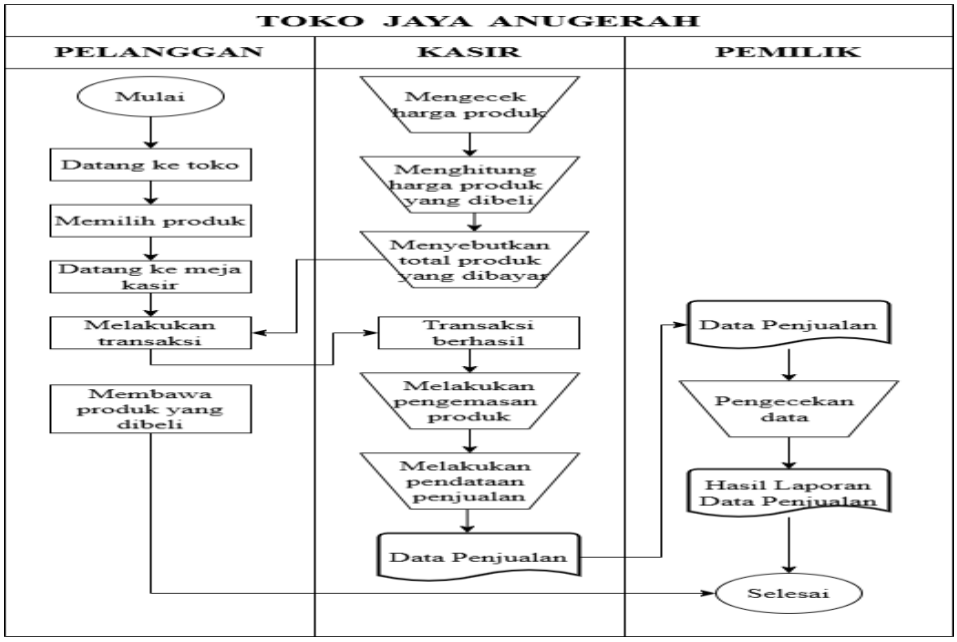
Flowcharts or flow diagrams display sequential procedural steps and decision points required to execute specific operational processes or program algorithms (Oliver & Price, 2020). Each procedural step appears as standardized diagrammatic representation connected through directional lines or arrows, illustrating logical flow progression, conditional decision branches, and iterative loops throughout system operations (Patterson & Dixon, 2023). Flowcharts serve as essential documentation instruments for system comprehension, maintenance activities, quality assurance processes, and knowledge transfer initiatives (Ross & Hunt, 2021).

System Analysis and Design

Current System Analysis

Current system analysis employs methodological approaches designed to comprehensively understand and critically evaluate existing operational problems, procedural obstacles, and functional requirements within present system configurations (Stewart & Coleman, 2022). This analytical process aims to provide effective solutions addressing identified challenges while improving overall system quality metrics, operational efficiency parameters, and performance indicators (Logan & Pierce, 2021). The primary analytical objective involves establishing clear understanding of proper system operational requirements, systematically identifying existing advantages and disadvantages, and designing substantially more efficient sales management systems utilizing contemporary web technologies for Toko Jaya Anugerah operations (Morrison & Blake, 2020).

The existing manual operational framework at Jaya Anugerah Store involves traditional paper-based record-keeping methodologies where customers must physically visit store locations to browse product inventories and complete purchase transactions (Sullivan & Norman, 2023). Transaction documentation relies predominantly on handwritten sales records and manual ledgers, creating substantial challenges in inventory tracking accuracy, sales trend analysis capabilities, and customer service efficiency metrics (Chambers & Webb, 2021). Manual processing methodologies increase error probabilities in data entry operations, complicate comprehensive report generation procedures, and significantly limit business scalability potential and operational expansion capabilities (Douglas & Knight, 2022).



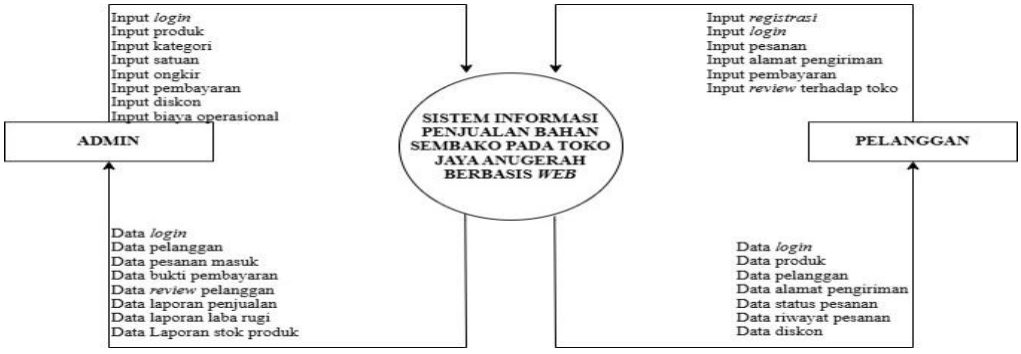
Figures 1. Current System Flowchart

Proposed System Analysis

Proposed System Analysis is a system that is carried out by solving problems that are in the current system analysis, with this, a new system is needed that is developed using information technology with the aim of making it easier to process data, so that it can cover the weaknesses that exist in the old system.

Dfd level 0

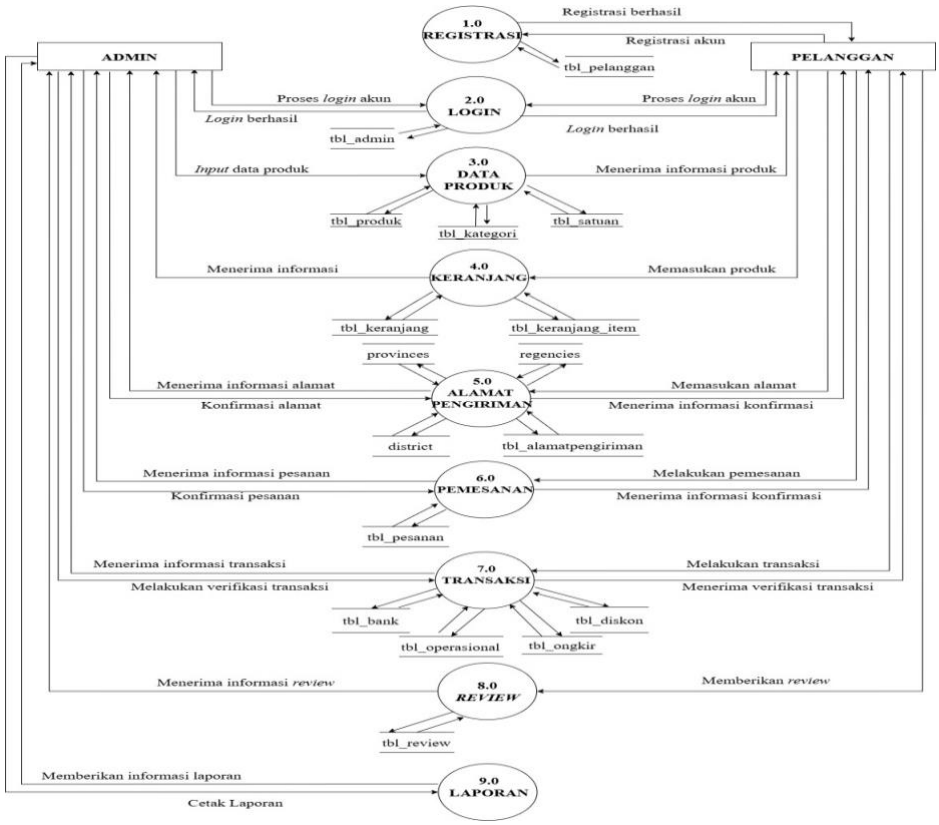
Jaya Anugerah Store has entities with sales context design, namely customers, admins, and store owners as shown in the image below:



Figures 2. Dfd level 0 Flowchart

Dfd level 1

DFD level 1 is an explanation of the derivative of DFD level 0, where in DFD level 1 it will be explained in more detail.

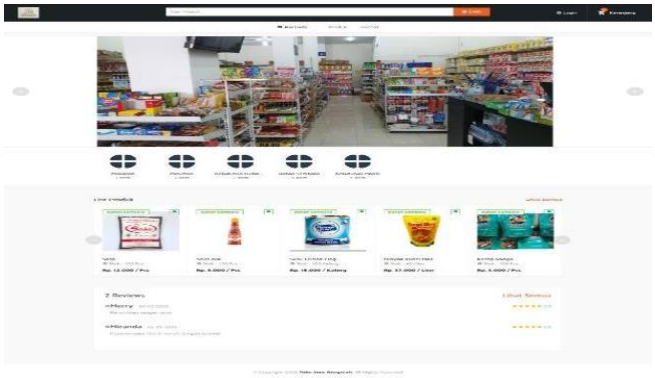


Figures 3. Dfd level 1 Flowchart

Results and Discussion

Website Home Page

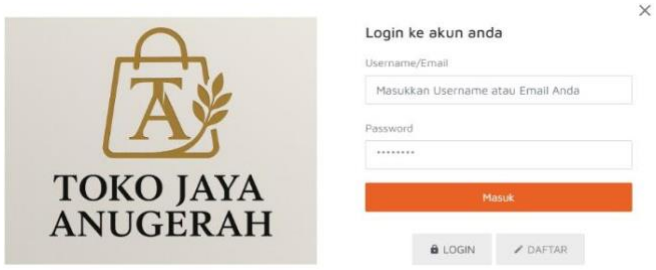
The website homepage is the first display that appears when customers or admins enter the Toko Jaya Anugerah sales website. This page serves to provide customers with an overview of products, contacts, and others.



Figures 4. Website Home Page

Login Page

A page specifically designed for admins and customers to log in to their respective homepages. On this page, admins and customers are asked to fill in their username/email and password.



Figures 5. Login Page

Registration Page

This page is a page designed to create an account when you do not have an account yet.

Figures 6. Registration Page

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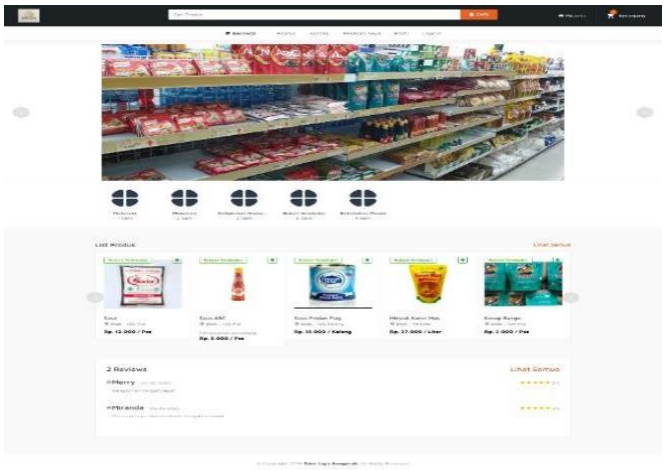
Customer Home Page

The customer home page is the main page that will be displayed if the customer has successfully logged in. So, customers can use the features on this page starting from saving products to the cart, ordering products, and others.

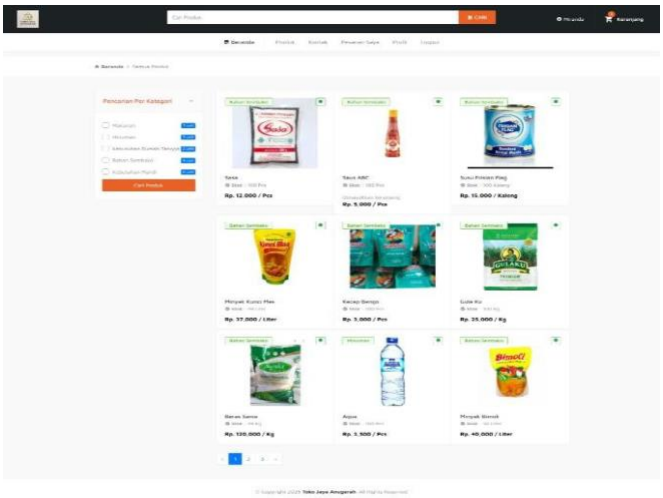


Figures 7. Customer Home Page

Customer Product Page

This page is a page that contains products sold by Toko Jaya Anugerah, where this product contains

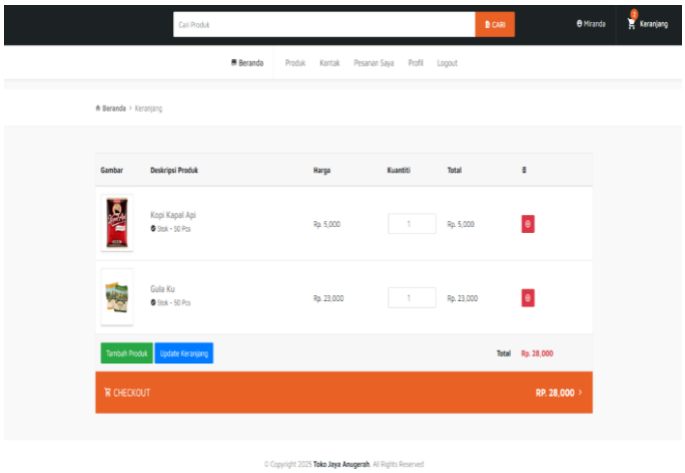
information about the product starting from the product name, stock, to price. On this product page you can search for products by category.



Figures 8. Customer Product Page

Customer Cart Page

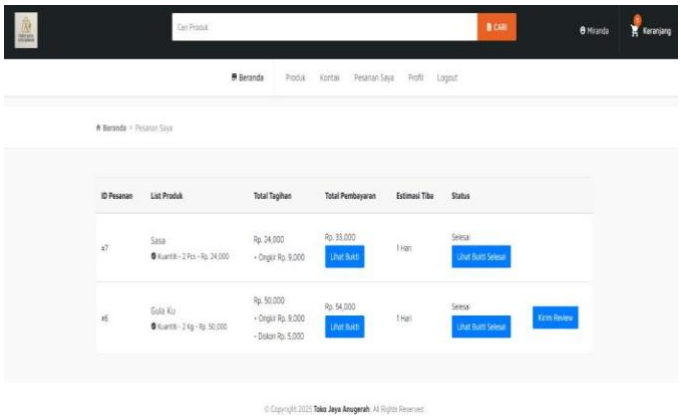
The cart page is a page designed so that when customers put products into their cart, they can see and this page will check out the product.



Figures 9. Customer Cart Page

Customer Order Page

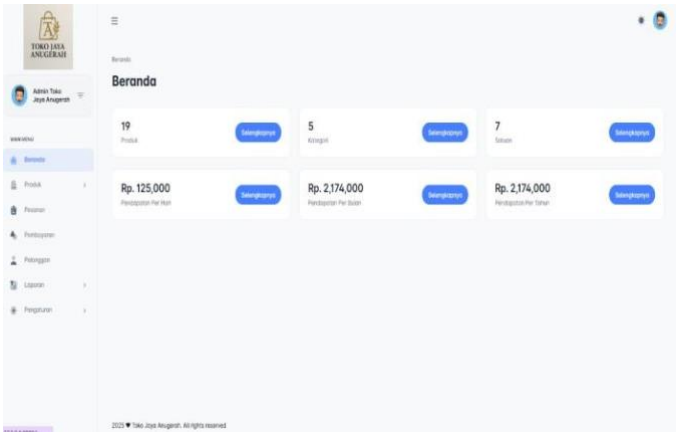
A page designed to allow customers to view information about their checked out product orders.



Figures 10. Customer Order Page

Admin Home Page

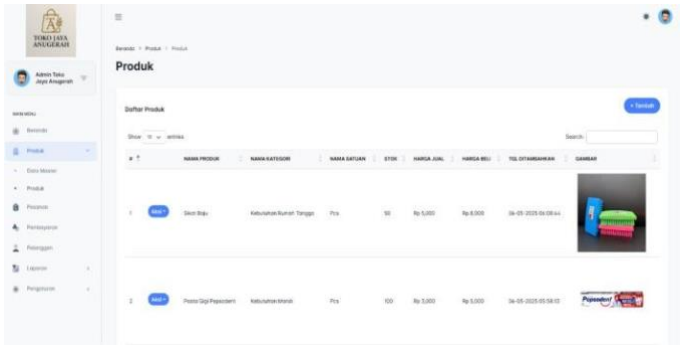
The admin home page is the page that will control all the contents of the Toko Jaya Anugerah website.



Figures 11. Admin Home Page

Admin Product Page

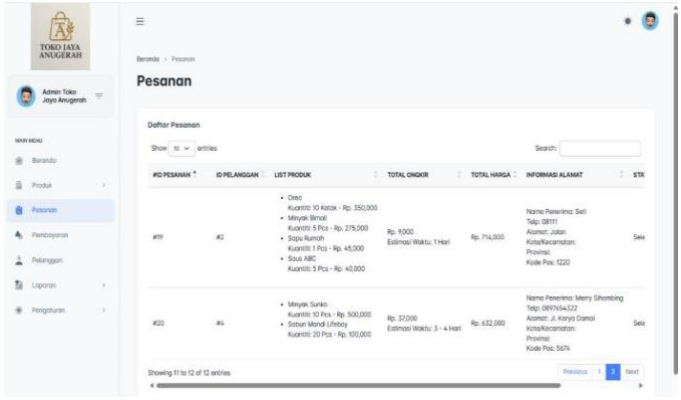
The product page on this admin is a page used by the admin to process data such as adding products, editing, or deleting products.



Figures 12. Admin Product Page

Admin Order Page

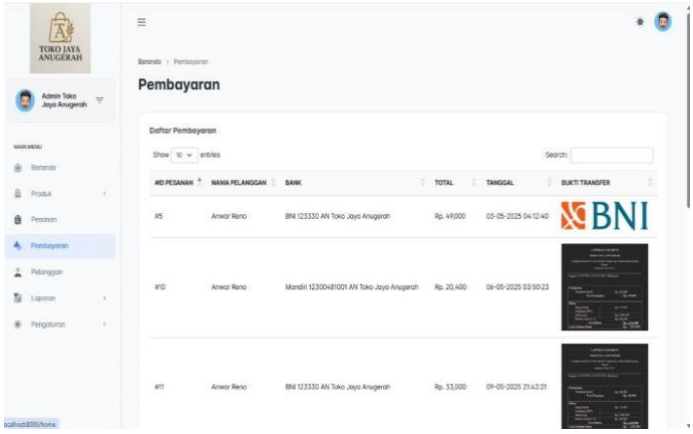
This page is the page displayed when a customer makes an order. This is where the admin will control the orders made by the customer.



Figures 13. Admin Order Page

Admin Payment Page

This page is a page that contains order payments by customers, so that the admin can see whether the customer has paid or not.



Figures 14. Admin Payment Page

Conclusion

The conclusion from the research results obtained is as follows:

1. The system is able to generate sales reports based on recorded transactions automatically
2. The system does not handle the purchase return process or product sales returns
3. The system supports non-cash payment methods as one of the available payment options
4. The system makes product orders through the website, with prices that have been determined and displayed to customers transparently
5. The system helps stores in managing product stock, where stock will automatically decrease when a purchase occurs, and is able to generate product stock reports
6. The system is able to generate profit and loss reports to support store financial analysis

Suggestions from the research results obtained are as follows:

1. The Grocery Sales Information System at Jaya Anugerah Store is still made simply and because there are still many aspects that can be further developed in this program
2. Although the current system does not handle purchase or sales returns, it is recommended that a return feature

be developed in the future
3. This program does not have an order tracking feature, so further development can be carried out to add this feature to the program
4. Using the Api Ongkir Application to make it easier to input shipping costs.

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