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DESIGN AND DEVELOPMENT POINT OF SALE SYSTEM WITH DSS (DECISION SUPPORT SYSTEM) USING SDLC RESEARCH METHOD

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ABSTRACT

The study was conducted to provide a complete and easy-to-use cashier service for MSMEs in Indonesia, because almost eighty percent of basic food stores in Indonesia are still done manually when entering data, causing the resulting data cannot be developed properly, and errors often occur. recording, and searching for data is difficult because every time you look for data, the seller must look for it from the general ledger. There is no special information that informs about the amount of stock of goods so that it is not uncommon when the stock runs out, the new shop owner finds out when the transaction process occurs so that it disappoints customers. With these weaknesses, a web-based cashier application is needed that can facilitate data management once it produces valid data so that it can be used to develop the company in the future. The method used is the waterfall method, in making the application starting from the analysis, design, coding, testing, evaluation, and maintenance stages.

Keywords : *Web, Point of Sale, Waterfall, Dashboard, UMKM*.

INTRODUCTION

The development of technology is getting more advanced nowadays. There are a lot of things that rely on technology, so does economic aspects. Most of the company, especially the major ones, have implemented a transaction recording system. This transaction recording system can help the user to monitor the transaction activities. The system is also known as financial report. These financial reports can then be used as a reference to design a corresponding marketing strategy in order to increase the company's future income. According to (Pradana 2016) companies must now shift or prioritize their business by using the internet so that they can reach more customers, interact with cost-effective or low-cost payments, be more efficient in conveying a change made, in terms of price and information changes, get good and complete feedback from the customers, operating time can reach 7x24 hours a week, which means at any time they can serve the customers and disseminate information more effectively and efficiently.

Micro-enterprises in Indonesia are combined into MSMEs (Micro, Small and Medium Enterprises), the number of MSMEs that do not record transactions that occur is due to a lack of knowledge about the importance of writing financial reports which function to see the condition of the company and also monitor the development of the company. The manual sales system has many weaknesses, most of which occur in recording errors, and finding data is difficult because every time you search for data, the seller must look in the general ledger. There is no specific information that informs about the amount of stock of goods so that it is not uncommon when the stock runs out, the shop owner only finds out when the transaction process occurs so that it disappoints the customers. Therefore, we created a web-based cashier application program to facilitate the operation of sales and purchases, thus requiring a system that is suitable and useful for micro-enterprises, namely Decision Support System (DSS). A Decision Support System (DSS) is an information system that requires a strategic level of an organization that is made to be used when making structured decisions through graphics

and communication. all information from various parts into information logically, so that companies can easily get the information they need for the company's business management needs(Aco and Endang 2017).Based on this, it is necessary to have a cashier system that is able to meet the needs of data management, point of sale, valid data that can be used as an aspect of development in the future so that with this cashier system it will make it easier for users to meet their needs and increase the growth of companies which then that are able to increase the growth of the digital economy in Indonesia (Ramadhan 2020).

Website

The website is one type of facility that is used by using the internet network and is also widely used as a platform to increase buyer brand awareness of the products offered to the public without having to meet face to face (Nuriman et al. 2019), the website is a collection of pages that contain certain information that can be accessed by many people through the help of the internet (Trimarsiah and Arafat 2017). The beginning of the emergence of the website was by an inventor named Tim Berners lee in the 1980s, and the official website was published in 1991. The initial reason the inventor planned to create a website was to make it easier for researchers to exchange the information they got at that time. With this website, everyone can start to realize the importance of the internet so that more and more internet users, and people will find it easier to get information or news in the future.

The initial organization that developed a website for free was by the CERN company in 1993, the website can be used for individual, group or entrepreneur policies to develop a website which requires 3 important elements that must be completed so that the website can be accessed or found by users via the internet, these 3 elements in the form of: domain, hosting and design content.

- Domain is the full address of your website in the browser, to be able to reach your website, browser users must know the domain name you have so they can find the website you are using. Hosting is a service that provides a place for grouping your data into one database, the data can be in the form of scripts, images, videos, text, and so on, so hosting is very influential either on the good or bad of a website, hosting reaches the speed of the browser process, database security, and browsing experience for users.

Decision Support System (DSS)

Decision Support System is a system that provides a platform to produce an analysis that functions so that every decision taken by entrepreneurs can bring benefits to the company for the current state of the business (Saliman 2018), In accordance with its objectives, this management information system is expected to be able to assist companies in making more precise and accurate decisions in an effort to solve a problem, it is necessary to provide various kinds of decisions, decisions are a series of actions that must be carried out so as to reduce or avoid losses.

Decision Support Systems can be based on several characteristics,

1. Assist the decision-making process and focus more on management based on existing perspectives.

2. There is a human or machine interface design, where humans or users still have control over a series of decision-making processes.

3. Supporting all decision-making processes on the explanation of problems that are more structured, unstructured or semi-structured.

4. Have a subsystem that is already integrated and functions properly when needed.

5. Requires a more comprehensive data structure in order to be able to meet the information needs of all levels of company management.

In the decision-making process, there are several stages that are owned by the results of the Decision Support System such as the understanding stage, the design stage, the choice stage, and the implementation stage. Sprague et. Al (1993) states that a system that deserves to be called a decision support system must have characteristics such as:

1. The system must be integrated through a computer.
2. The system is made to help solve problems that are difficult to solve through human labor.
3. The component elements must consist of a collection of data and analysis results.
4. Has a function so that it can be used to make decisions.
5. The system can generate interactive simulations.

RESEARCH METHODOLOGY
SYSTEM DEVELOPMENT LIFE CYCLE (SDLC)

SDLC is short for Systems development life cycle or in Indonesian it is called the systems development life cycle. SDLC is a cycle used in the creation or development of information systems that aim to solve problems effectively. In another sense, SDLC is a work stage that aims to produce a high-quality system that is in accordance with the wishes of the customer or the purpose for which the system is made. SDLC is a framework that contains the steps that must be taken to process the development of a software. This system contains a complete plan for developing, maintaining, and replacing specific software. SDLC is used to build an information system so that it can run as expected. SDLC (Systems Development Life Cycle) or Systems Life Cycle, in systems engineering and software engineering, is the process of creating and modifying systems and

the models and methodologies used to develop those systems. This concept generally refers to a computer or information system. SDLC is also a pattern taken to develop a software system, which consists of the following stages: planning, analysis, design, implementation, testing and maintenance. In software engineering, the concept of SDLC underlies many types of software development methodologies. These methodologies form a framework for planning and controlling the creation of information systems, namely the software development process. There are 3 types of system life cycle methods that are most widely used, namely: the traditional system life cycle, the life cycle using prototyping, and the object-oriented system life cycle. . In the process, several processes need to be carried out, namely:

1. **Step Planing & Analysis**

The first stage, namely system Planing and analysis. At this stage, the system will be analyzed how it will be run later. The results of the analysis are in the form of system strengths and weaknesses, system functions, to applicable updates.This section is included in the planning section. Other parts included in planning are resource allocation, capacity planning, project scheduling, cost estimation, and assignment. Thus, the results of the planning stage are project plans, schedules, cost estimates, and provisions. Ideally project managers and developers can work optimally at this stage.

2. **Step Design**

Once the requirements are understood, designers and developers can start designing the software. This stage will produce a prototype and several other outputs including documents containing designs, patterns, and components

needed to realize the project. After the specifications, the system design is carried out as the next stage. This stage is the stage where all the results of the analysis and discussion of system specifications are applied to a design or blueprint for a system. This stage is referred to as a blueprint, where the system is ready to be developed starting from implementation, system analysis, to the support personnel for the system to be developed.

3. Step Implementation

System development is the stage where the design is started, created, or implemented into a complete and usable system. If likened to a building, this stage is the stage of building. This stage takes a long time because there will be new obstacles that might hinder the development of the system. At this stage, the design may change for one or more reasons.The next stage is to produce software under the development process. According to the methodology already used, this stage can be done quickly. The output produced at this stage is software that has been functioning and is ready to be tested.

4. Step Testing & Integration

After the system has been developed, the system must go through testings before being used or commercialized. The system testing phase must be run to make sure whether the developed system can work optimally or not.

At this stage, there are several things that must be considered, such as ease of use to achieving the goals of the system that has been prepared since the system design was carried out. If there are errors, stages one through four must be updated, redone, or completely overhauled. The SDLC test stage is the most important part in the series of software development. Because it is impossible to publish a software without going through the test first. Some of the tests that must be passed include code quality, functional tests, integration tests, performance tests, and security tests. To ensure that tests run regularly and that no sections are skipped, tests can be performed

using Continuous Integration tools such as Codeship. From this stage, software that has been tested will be produced and is ready to be deployed into the production process.

5. Step Maintenance

Implementation and maintenance is the final stage in the creation of the SDLC. At this stage the system has been created, tested, and confirmed to work optimally. After the manufacturing stage is complete, implementation and maintenance is carried out by the user. Maintenance is very important to ensure the system works optimally at all times.

For implementation, the steps that must be taken are as follows :

- Conduct a survey and assessment of the feasibility of the system that has been developed.
- Analyze and study existing and ongoing systems.
- Perform problem solving in system development.
- Determine the use of appropriate hardware and software.
- Design and develop new systems.
- Maintain and improve the new system if necessary.

This phase is also known as the deployment phase. At this stage, the software is deployed after going through a process that involves several manual approvals. This stage is carried out before lowering the software to production. The deployment process can be carried out using Application Release Automation (ARA) before entering the production process. The output obtained from this stage is software that is ready to be mass-produced. Maintenance of the system that has been made is very important for future reference. Maintenance is the final stage which becomes the beginning of a new phase, namely use. The SDLC is not over at this stage. The

resulting software must be continuously monitored to ensure it runs flawlessly. Cracks and defects found in the production process must be reported and resolved. If it was discovered before it was mass produced, it would be better than solving it by overhauling everything from start to finish.

Research Tool

The hardware used by the author during application development is an Asus UX331UN laptop with Core I7-8550U specifications up to 1.9Ghz, 512GB SDD, Windows 10 OS, 16GB Ram. The author will also be assisted by several software during the process of planning and developing web applications such as Visual Studio Code, Mysql Database, and Browser. Not only that, during development, the author will use programming languages that have been mastered or are being studied by the author such as HTML, PHP, JavaScript, and CSS.

RESULT AND DISCUSSION

The result of this research is a website designed using the PHP and Javascript programming languages. The web pages contained in the website are generally divided into 2 (two) parts, namely:

• Dashboard page used by admins to manage content to be displayed on the website.

• Point of Sales page (cashier system) which is used to place orders and transactions between users and clients.

Server Application Installation

The first step in developing this application is to install the application server using *XAMPP*. After completing the installation then run the *XAMPP* application, then make sure Apache and *MySQL* can be connected marked with the words

running. The server application installation screen can be seen on **Figure 1**.

Figure 1.1 Running Apache and MySQL on XAMPP.

Database Creation

After making sure that the Apache and MySQL connections have been successfully executed,

the next step that must be done is to create a database by opening a browser and then typing localhost/phpmyadmin. On the system that has been built, the database is named dbkampuskompany which contains many tables. Database creation can be seen at **Figure 2**.

Figure 1.2 Making Database with phpMyAdmin
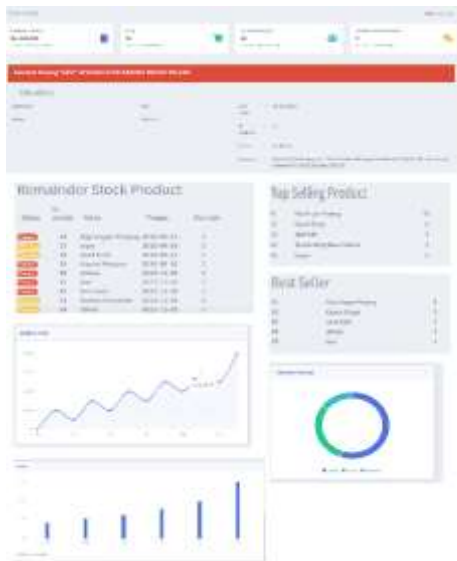
Admin Login Page

Figure 2.1 Admin Login Page.

Figure 2.1 is the initial page to enter the admin login page, the user must enter a username and password to enter the admin page.

Dashboard Page

Gambar 2.2 dashboard page.

The picture above shows a page that is only available in the admin section, because the dataset is private so it is limited specifically to admins, on this page it shows a lot of datasets generated from sales that occur in the store, the amount of income, the amount of stock available, the number of sales, and there are also DSS elements, such as top selling products which serves to display the number of the best-selling products, and is also set by month so that this dataset can be used as useful data for the DSS system, and there is also a best seller which functions to display the most sought-after products in stores, displayed in the form of a percentage so that it is clearer to know the preferred product especially for customers who have shopped at our market.

Product Stock Page

Gambar 2.3 Product Stock Page

The picture above is a display form of the product data page which contains data that has been inputted by the admin, containing the product name, product quantity, input date, price etc., this page contains CRUD options for the items you want to manage.

Transaction Page

Gambar 2.4 Transaction Page

This page displays all sales data that has occurred, every successful transaction will be displayed here, this page can also perform CRUD data.

Report Page

Gambar 2.5 Report Page (before)

In the picture is the display of the report recap page when you have not done a data search, there is an option to set the start and end date of a successful transaction, after searching the data that has been selected will appear via the database.

Gambar 2.6 Report Page (after)

In the picture is a display of data that has been inputted by the admin, the data displayed is in accordance with the data stored in the database, the data is in the form of transactions that have successfully occurred in the brackets that have been determined by the admin.
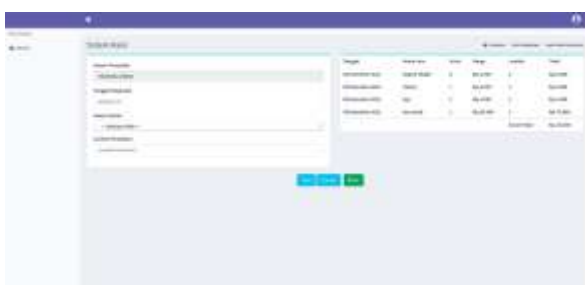
POS Page.
POS login page.

Gambar 2.7 Pos Login Page.

In the picture is the initial page to enter the cashier section, for the cashier section has a function to perform Point Of Sales and buying and selling between buyers and sellers, the user must enter a username and password to be able to login to the cashier dashboard page.

Point of Sale Page

Gambar 2.8 Point of sale Page

In the picture is the cashier system page of this project, this page is used to carry out transactions, so it requires accurate calculations and data entry, because it will be saved to the database and affect the final database data.

LIMITATION
As for the limitations of the design and implementation that the author is working on, such as the cashier system that may take a lot of space for storing data, but mysql only provides up tp 1024 mb , so that is beyond its limit.

CONCLUSION
There are still many *Micro, Small and Medium Enterprises* (MSMEs) engaged in basic food stores that still use the system manually in payment transactions which are managed by the cashier in service to buyers. This results in frequent accumulation of buyer payment queues. For this reason, the shop owner will convert the old manual system to a new website-based system, which has the following advantages:

- Make it easier for cashiers to input goods using a computer,
- Make it easier to make reports on stock of goods, and reports on transactions carried out every day,
- Assist shop owners to supervise and manage employee data,
- Save time and maximize employee performance.

In the future, if the system used can run and be managed properly, the application system will be developed even better, including developing this program in order to make it easier for cashiers to input goods quickly and accurately, not only for cashiers but the system will be developed for customers as well. make purchases online.

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