

Dashboard Design For Dimsum 20 Sales Report Using Waterfall Model

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Abstract

Dimsum 20 is a food and beverage business founded in early 2020. At Dimsum 20, 16 menus consist of 14 foods and two drinks. Since its opening, Dimsum 20 does not yet have a record of sales transactions and stock data. Starting from mid-2020, the Badan Pusat Statistik recorded a significant increase in the food and beverage business sales. This escalation resulted in many transactions so that the owner of Dimsum 20 could not control the stock and demand from customers. In managing stock, Dimsum 20 currently purchases raw materials when the supply of each product has run out. The Dimsum 20 only buys a stock when the stock runs out. Therefore, it will cause a lack and inefficiency in meeting customer demand. In addition, Dimsum 20 does not record every sale that occurs. Meanwhile, the sales records can be processed as new information and strategies for Dimsum 20.

Dimsum 20 can do monitoring sales and stock reports efficiently if this business uses a web-based dashboard. Generally, a model is needed to build the required dashboard system in dashboard design. The Waterfall model is necessary to design the dashboard. The Waterfall model helps solve problems in detail because the model is created by identifying needs first to match the issues that occur.

The dashboard can solve the Dimsum 20 problem by recording all transactions. Then, the dashboard will process the recorded transactions into a sales report. Besides, the dashboard provides real-time stock data so that Dimsum 20 owners can monitor to meet customer needs.

Keywords: Knowledge Management System, Database, waterfall method, System

I. PRELIMINARY

Nowadays, the use of advanced information technology integrated with business processes in organizations has become an absolute necessity. This is because the organization needs to improve its ability to analyze problems and determine decision-making capabilities. The availability of data and information that is valid and related to one another, accurate, and complete is an essential requirement for the survival of an organization. In today's technological era, data is very numerical, which requires technology to handle it and knowledge possessed by users. Currently,

business competition in the food and beverage world is getting tougher. The emergence of new businesses resulting in intense competition between selling different ideas, values and experiences is an important thing to consider.

In this technology era, information is precious for business people, from those new to doing business to even professionals. In terms of doing business, tools are needed to collect data that will later be useful for use as important information.

According to (Jannah and Muqorobin 2021), a management information system is a system that is a series of organized parts/components that work together or move to generate information for company management. Management information system integrates human or machine system that provides information to support operations, management, and decision-making functions within the organization. A system is a set of elements combined with the same goal to achieve a goal. The organization comprises many humans, material, machine, money and information resources. These resources work together to achieve specific goals set by the owner or management. Information System (IS) involve a spread of information technologies like computers, software, databases, communication systems, the web, mobile devices and far additional, to perform specific tasks, move with and inform numerous actors in several structures or social contexts of general interest to the sphere of IS thus all aspects of the implementation, event, deployment, use and impact of IS in organizations and society.

The dashboard is an information system application model provided for managers to present performance quality information from a company or organizational institution. (Irmansyah 2016). The dashboard display is straightforward because the strategic department is not responsible for direct interaction with the user (Anggoro and Aksani 2015).

Dimsum 20 is a food and beverages (F&B) business that requires an information system and the application of sales reports. This shop sells food based on processed chicken, shrimp, various seafood, and others, or it can also be called Dimsum. The Dimsum 20 is located on Karadenan, Cibinong, Bogor. This location is a strategic location considering that it is located in Bogor, which has a variety of culinary tours, one of which is in the Karadenan area. The Dimsum 20 has 14 food menus and 2 drink menus to attract visitors to come to taste the various dim sum provided. There are three primary human needs, namely clothing, food and shelter. The Dimsum 20 business runs in the food and beverage business, one of the immediate human needs. According to (Kurniawati

2021), one of the areas of business that has increased in recent times is food. Because the Badan Pusat Statistik (BPS) has also recorded a significant increase of 1070 per cent in April 2020, this increase continues to grow until now. This impacts the sales of Dimsum 20, which increase every month. On the other hand, the rise in Dimsum 20 causes the sales report to be uncontrolled at Dimsum 20. This is because previously until now, Dimsum 20 did not have the tools to record and collect sales data. Dimsum 20 only has a record in the form of a sales note that is not even complete, so no information can be taken from sales and cannot find out reports on sales, stock, and monthly income. Another problem with Dimsum 20 is that it cannot determine what products are the best-selling products each month and choose to control product stock to continue to meet consumer needs according to previous sales. Quoted from (Nurhaliza 2021), the absence of a sales report will have a significant impact on losses.

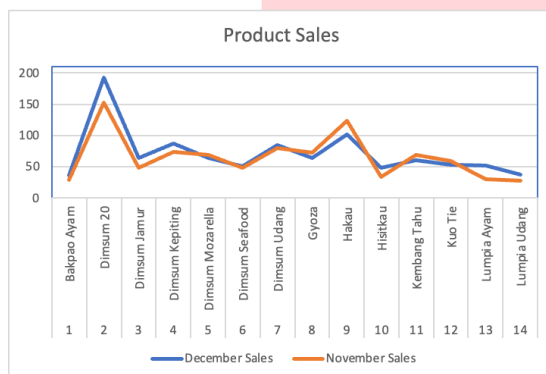


Figure 1 Dimsum 20 Product Sales in 2 months

The product sales figure above illustrates how Dimsum 20 increased in December 2021. Unfortunately, this caused Dimsum 20 not to control and record all transactions because Dimsum 20 only recorded these transactions manually. Based on the problems above, what Dimsum 20 needs are a sales information system that can record sales transactions and turn them into useful information, in this case, Dashboard. The dashboard will record all sales transactions and enter them into a database and show sales charts, which will later be processed into reports and charts that can be understood by Dimsum 20.

II. THEORETICAL BASED

A. Systems

According to (Djahir, Yulia and Pratita 2015), a system is a collection/group of any subsystems/parts/components, either physical or non-physical, interconnected and working together in harmony to achieve a particular goal. The system can be interpreted as a collection of subsystems,

components that work together with the same purpose to produce a predetermined output (Sri 2016).

B. System Information

Information systems are components and elements of an organization that provide information to users by processing financial events. The purpose of an information system is to produce knowledge. Information is data processed into a form that is useful for its users. To be applicable, information must be supported by three pillars: the right to the person or relevant, timely and the correct value or accurate. Outputs that are not supported by these three pillars cannot be said to be helpful information (Purnama 2016).

C. Dashboard

One form of computer application commonly used to support decision making is a dashboard system. One form of computer application commonly used to support decision making is a dashboard system. The dashboard is a new name for the Executive Information System, first developed in the 1980s. At the beginning of its development, the dashboard experienced a hibernation phase because the supporting methods for providing data, namely data warehousing and business intelligence, had not yet evolved to provide a data handling methodology. This hibernation lasted until when data warehousing and business intelligence methodologies became quite mature in the 2000s. One form of computer application commonly used to support decision making is a dashboard system (Anggoro and Aksani 2015).

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D. OLAP (Online Analytical Processing)

OLAP is a technology that meets analytical needs. Any database associated with OLAP is called an OLAP database. OLAP databases are databases that maximize reading speed. Data warehouse processing in OLAP uses fact and dimension tables to display various forms of reports, analysis, and queries (Mulyana 2014). The data presented is an aggregate function, such as sum, max, min, etc.

The following are the features included in OLAP, namely:

1. Users can view data from a logical and multidimensional perspective in the data warehouse.
2. Users can perform complex queries and analysis with ease.
3. Allow users to scroll to view data in more detail, or scroll up to summarize one or more dimensions.
4. There is a process of calculating and comparing data.
5. Display results in digital form, including tables and graphs.

E. Waterfall Model

According to (Sasmito 2017), The waterfall method is a systematic and sequential information system development model. The Waterfall method has the following stages:

1. Requirement analysis and definition
System services, constraints, and objectives are defined by the results of consultation with users which are then defined in detail and serve as system specifications.
2. System and Software Design
The system design stage allocates system requirements both hardware and software by forming the overall system architecture. Software design involves identifying and delineating the basic system abstractions of software and their relationships.
3. Implementation and Unit Testing
At this stage, the software design is realized as a series of programs or program units. Testing involves verifying that each unit meets its specifications.
4. Integration and System Testing
The individual units of the program or programs are combined and tested as a complete system to ensure whether they meet the software requirements or not. After testing, the software can be sent to the customer.
5. Operation and Maintenance
This stage is the longest stage. The system is installed and used for real. Maintenance involves correcting errors that were not found in the previous stages, improving the implementation of the system unit, and improving system services as new requirements.

F. Database

According to (Indrajani 2015), a database is a collection of logically interconnected data designed to obtain the data an organization needs. While (Jayanti and Sumiari 2018) explains that database is an integrated data, which is organized to meet the needs of users within an organization. Based on the above statement, it can be concluded that the database is data that can be designed and integrated so that it can meet the needs of users in a company or organization.

G. Business Process

A business process is a set of activities in an organizational and technical environment that work together to achieve business goals, in other words, a business process is an important element in a function that runs an organization. Good business process modeling will be able to improve overall organizational performance and satisfaction of organizational actors. (Weske 2007).

H. User Acceptance Test

User Acceptance Test (UAT) is a testing process by users intended to produce documents that are used as evidence that the user has accepted the software developed if the test results can be considered to meet the user's needs. The UAT process is based on a mutually agreed requirements document. A requirement document is a document that contains the scope of software work that must be developed. Thus, this document should be a reference for testing. The process in UAT is the examination and testing of the work results. Checked whether the items in the requirements document already exist in the software being tested or not. Tested whether all existing items have been able to meet the needs of users (Wicaksono 2008).

III. METHODOLOGY

This study aims to help Dimsum 20 create a sales report information system, either in the form of data or charts that are easy to understand. This solution was created because Dimsum 20 does not have a good sales record. After all, it only has a sales note that does not even have complete information in it.

So, this dashboard will be beneficial to solve this problem. The use of the Waterfall model is also very suitable because it is by the needs of the proposed business processes. From the waterfall model, it will be adjusted how the dashboard will be formed. In addition, because the project for this dashboard is not too large or still small, the waterfall method is very suitable for developing this dashboard application. The waterfall method is carried out in stages. Therefore, this work process starts from the first stage, defining requirements, and continues with other techniques.

IV. INTEGRATED SYSTEM DESIGN

A. Integrated System Research

A complete or integrated system is an entity or object composed of multiple interrelated components that operate together to achieve a purpose. The only five components or subsystems mentioned in the overall system of the research are people/man, time, procedures, machines or equipment, and information. The purpose of these five components is to specify, forecast, and evaluate the outputs of the integrated system. The system is intended to increase the worth of tuition services.

B. Business Requirement Definition

Requirements are statements defining what the site or application needs to do. Ideally, a business needs to do several things:

1. Provides insight into overall needs.
2. Representing and consolidating needs provided by different stakeholders.
3. Provides direction for the design, without being too specific about how it will be achieved.
4. Serves as distinct units of work for priority and tracking purposes.

Determine the same idea from several different business stakeholders. This is the basis for needs, i.e.

G. Information System

starting by asking questions all the way to the details of needs.

E. Business Process Identification

F. Actual Business Process

The actual business process at Dimsum 20 is like street food in general. The flow is simple, such as ordering food, paying for the order, waiting for the order, and the food is ready to be served. However, in the flow, transactions that occur just pass without being recorded to the system. The copy of the sales note that was previously made just becomes a useless note paper.

E. Proposed Business Process

The incoming Customers are still the same as the previous Actual Business Process; the difference is that the Customer gets a detailed purchase receipt. After the Customer makes an order, the Cashier's job is to carry out sales transactions and enter the database. After the transaction has been made, the flow to the Kitchen section, which only accepts orders from the Cashier, will then be made orders that have been created. After the kitchen prepares the order, the order can be served or taken home by the Customer.

Admin in this flow is the user who has the highest access rights. Admin tasks control stock, sales transactions, purchase transactions to suppliers, update stock data, and view sales reports.

Table 1 Proposed Process of Cashier

Proposed Process of Cashier		
No.	Problems	Solutions
1.	The cashier only makes transactions with the customer by calculating the amount of payment that must be paid by the customer through the customer's order paper.	The cashier makes transactions with customers by entering data into the dashboard, and the total of the transactions made can be seen.
2.	The cashier confirmed to the Kitchen to immediately make the order received.	The kitchen confirms the order (stock is available), and the stock will be automatically updated.
3.	The cashier accepts payment and confirms the order.	The cashier receives the payment and finishes entering the transaction. After that, the bill will be printed and given to the customer.

In Table 1 it can be seen that there is a change in the flow in the cashier and kitchen. These two users will enter data and update transaction data into the database.

Table 2 Proposed Process of Kitchen

Proposed Process of Kitchen		
No.	Problems	Solutions
1.	The kitchen can only see the stock when checking it in the freezer.	The kitchen can see real-time stock on the dashboard without the need to check it directly, and can immediately confirm orders.
2.	Kitchen could not record the total product per item to know the amount of stock.	Kitchen can find out the total of each remaining item by looking at the remaining stock per item.

In Table 2 we can see that the kitchen does not only have the role of cooking and checking the stock of products directly. But the kitchen could input purchase transaction, and check product stock in real-time via the dashboard.

Table 3 Proposed Process of Admin

Proposed Process of Admin		
No.	Problems	Solutions
1.	There is no admin user role in this case to control sales and has the highest user rights in managing the database and dashboard.	The existence of an admin role helps Dimsum 20 in monitoring sales and making purchases of products whose stock has run out to suppliers.

In Table 3 there are a new role, namely admin, to control and supervise all transaction events and product stock.

H. Analysis and Implementation

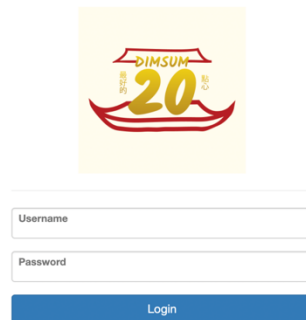
I. Integrated System

At Dimsum 20, the integrated system is critical to operating a business so that it may perform properly and produce an output that is valuable to business people. This study's integrated system analysis will focus on five components or subsystems: man, time, method, machine or equipment, and information.

E. User Interface

User interface analysis aims to link and communicate information between users and operating systems so that the website can work. This study examines all elements of computer user interactions with the system.

Login Page

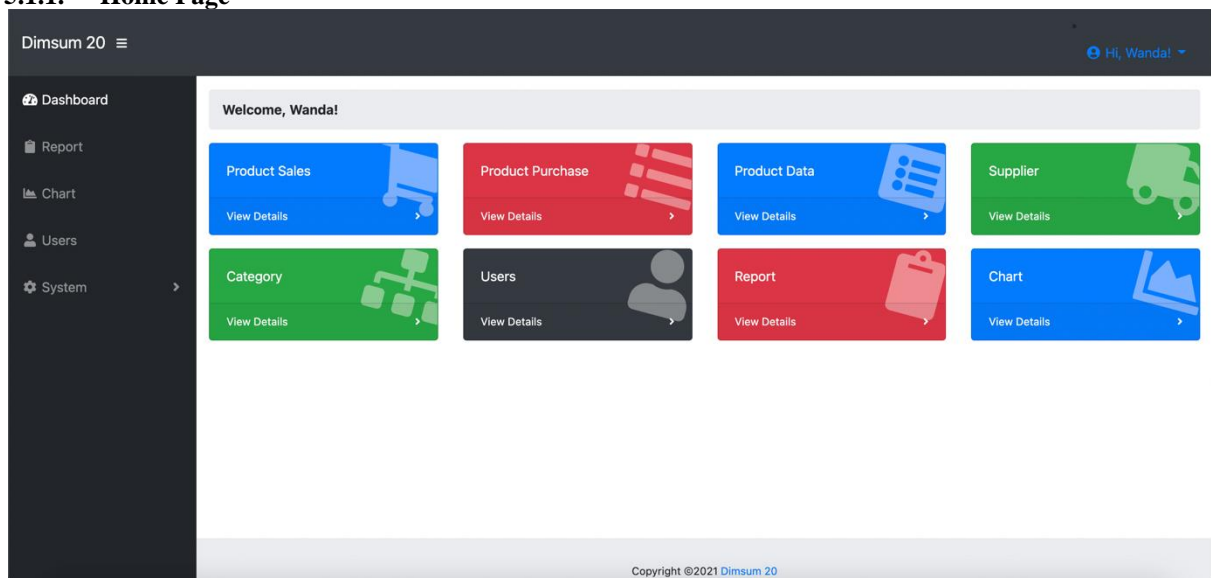


The login page features a central logo for 'DIMSUM 20' with '2020' and '2021' on either side, set against a yellow background with a red border. Below the logo are two input fields: 'Username' and 'Password'. A blue 'Login' button is positioned at the bottom of the form.

Figure 2 Login Page

The login page is the main page displayed when you want to access the dashboard. Each user has an account with a different level, namely Admin, Kitchen, and Cashier. In addition, each user can access a separate Home page when logged in.

5.1.1. Home Page



The home page dashboard for 'Dimsum 20' features a dark sidebar on the left with navigation options: Dashboard, Report, Chart, Users, and System. The main content area displays a 'Welcome, Wanda!' message and a grid of eight colorful cards, each with a title and a 'View Details' link. The cards are: Product Sales (blue), Product Purchase (red), Product Data (blue), Supplier (green), Category (green), Users (dark grey), Report (red), and Chart (blue). The footer contains the text 'Copyright ©2021 Dimsum 20'.

Figure 3 Home Page

The Home page displays several menus, including Product Sales, Product Purchase, and others. This menu is displayed to make it easier for users to navigate in this dashboard.

5.1.2. Product Sales Page

Figure 4 Product Sales Page

The Product Sales page displays a form that can be filled in with the current sales transaction. The form provided is also complete starting from the product code to the discount and the total price of the transaction. This page can be accessed by Admin and Cashier. Admin accessing this page aims as a backup from the cashier because the admin has the highest access rights.

5.1.3. Product Purchase Page

Figure 5 Product Purchase Page

The Product Purchase page displays a form that can be filled in with the purchase transaction. The form provided is complete starting from the product code, bill number, supplier, date, to the total price of the transaction. This page can be accessed by Admin and Kitchen. Admin accessing this page aims as a backup from the cashier because the admin has the highest access rights. Meanwhile, Kitchen can access the page to update the purchase of Dimsum 20 raw materials.

5.1.4. Product Data Page

Product Data

Show 10 entries

Search:

No	Product Code	Product Name	Unit	Cost of Goods Sold	Selling Price	Stock	Min Stock	Category	Action
1	PJ000001	Dimsum 20	Porsi	Rp 7,500	Rp 15,000	207	20	Food	Edit Delete
2	PJ000002	Dimsum Udang	Porsi	Rp 7,500	Rp 15,000	200	20	Food	Edit Delete
3	PJ000003	Dimsum Kepiting	Porsi	Rp 7,500	Rp 15,000	200	20	Food	Edit Delete
4	PJ000004	Dimsum Mozarella	Porsi	Rp 9,000	Rp 18,000	200	20	Food	Edit Delete
5	PJ000005	Kuo Tie	Porsi	Rp 7,500	Rp 15,000	200	20	Food	Edit Delete
6	PJ000006	Dimsum Jamur	Porsi	Rp 7,500	Rp 15,000	200	20	Food	Edit Delete
7	PJ000007	Kembang Tahu	Porsi	Rp 7,500	Rp 15,000	200	20	Food	Edit Delete
8	PJ000008	Hakau	Porsi	Rp 8,500	Rp 16,500	200	20	Food	Edit Delete
9	PJ000009	Lumpia Ayam	Porsi	Rp 7,500	Rp 15,000	200	20	Food	Edit Delete
10	PJ000010	Lumpia Udang	Porsi	Rp 7,500	Rp 15,000	200	20	Food	Edit Delete

Showing 1 to 10 of 16 entries

Previous 1 2 Next

Figure 6 Product Data Page

The Product Data page displays all product data and details of each product that has been inputted into the database. This page also features add, edit, and delete products. Then the user will quickly edit the product data.

5.1.5. Supplier Page

Data Supplier

Show 10 entries

Search:

No	Supplier Name	Address	No Handphone	Product	Action
1	Toko Sumber Food	Jl. Ps. Ciluar No.9, Cijujung, Kec. Sukaraja, Kabupaten Bogor, Jawa Barat 16710	0821-2606-1871	Beverages	Edit Delete
2	Dimsum Mbledos	Jl. Dr. Ir. H. Soekarno No. 53, Mulyorejo, Surabaya	0813-5710-4846	Food	Edit Delete

Showing 1 to 2 of 2 entries

Previous 1 Next

Figure 7 Supplier Page

The Supplier page displays all suppliers who are related or have transacted with Dimsum 20. This page is also equipped with add, edit, and delete features.

5.1.6. Product Category Page

Dimsum 20 Sales Transaction Report Logout

Product Category

+ Add Category

Show 10 entries Search:

No	Category	Action
1	Beverages	Edit Delete
2	Food	Edit Delete

Showing 1 to 2 of 2 entries Previous 1 Next

Figure 8 Product Category Page

The Product Category page displays Product Category data in Dimsum 20 product. This page is also equipped with add, edit, and delete features.

5.1.7. User Data Page

Dimsum 20 Sales Transaction Report Logout

User Data

+ Add User

Show 10 entries Search:

No	Name	Username	Password	Level	Status	Action
1	Wanda	oneda	a1161649629e2e36252e203ebba4d3b0	1	0	Edit Delete
2	kasir	kasir	c7911af3adbd12a035b289556d96470a	2	1	Edit Delete
3	admin	admin	21232f297a57a5a743894a0e4a801fc3	1	1	Edit Delete
4	Dani	dani	55b7e8b895d047537e672250dd781555	3	1	Edit Delete

Showing 1 to 4 of 4 entries Previous 1 Next

Figure 9 User Data Page

The Users page displays all users who have access to the dashboard. Each user has different access rights, therefore only Admin can access this page. Equipped with add, edit, and delete features.

5.1.8. Report Data Page

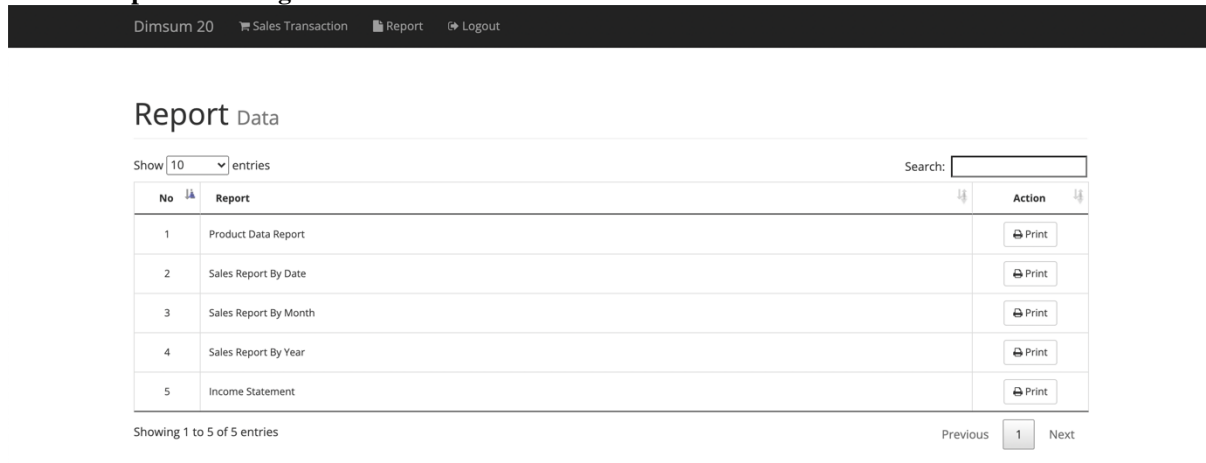


Figure 10 Report Data Page

The Report Data page contains any reports that the dashboard can display. The Admin can choose what information needs to be said in this case.

5.1.9. Chart Page

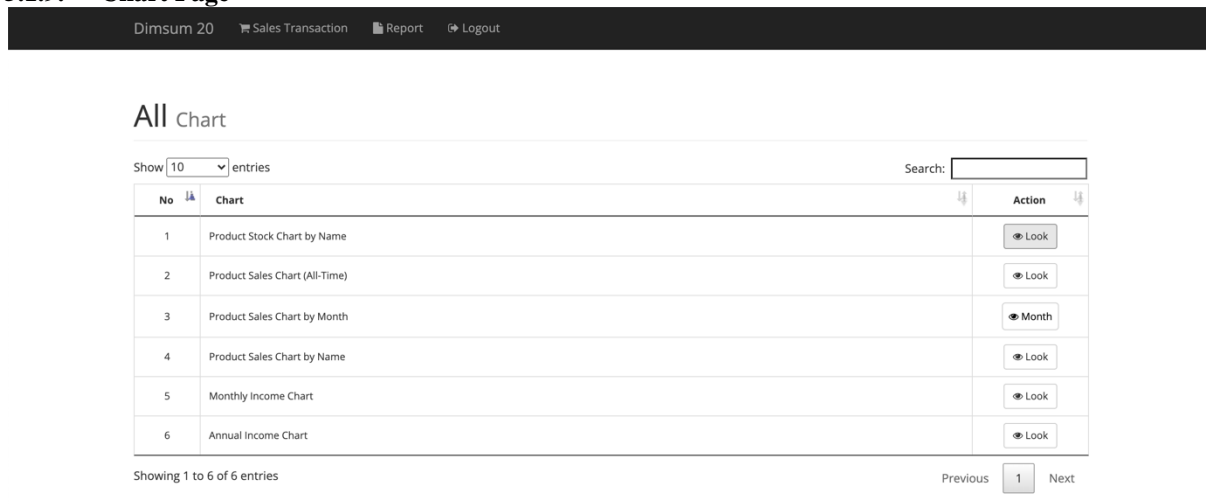


Figure 11 Chart Page

The Chart Page displays any chart options that the Admin can choose. Has six different charts so that Admin gets clear information from each chart choice.

5.2. Comparative Analysis

The actual business process is described in this study, and the recommended business process improvement. The author compared people, infrastructure, and time as three different aspects of business process improvement.

Table 4 Comparative Analysis

Category	Actual Business Process	Proposed Business Process
People	The owner of Dimsum 20 and his workers only record manual transactions with sales notes which cannot be done.	By using the dashboard, Dimsum 20 owners and their workers such as cashiers and kitchens can input/update data in the database so that the dashboard can help

Category	Actual Business Process	Proposed Business Process
		generate useful information such as sales reports.
Infrastructure	The owner and cashier of Dimsum 20 did not record sales transactions. In addition, Dimsum 20 does not have any information on transactions that have occurred. Transactions that are stored are only in sales notes or orders from customers.	With the dashboard, Admin, Cashier, and Kitchen can access information or update data in the database. Therefore, the dashboard can help Dimsum 20 in making report information and knowing real-time stock.
Time	The time required for ordering and recording transactions takes longer because customers and cashiers have to record manually.	The dashboard can shorten transaction time and the dashboard can automate transaction recording.

5.3. Dashboard Implementation

Several components of the dashboard system are altered throughout the implementation stage. Infrastructure, resources, and technology are all affected by changes made during the implementation stage of web development.

Table 5 Dashboard Implementation

Aspect	As-Is	To-Be	Consequences
Infrastructure	The owner and cashier of Dimsum 20 did not record sales transactions. In addition, Dimsum 20 does not have any information on transactions that have occurred. Transactions that are stored are only in sales notes or orders from customers.	With the dashboard, Admin, Cashier, and Kitchen can access information or update data in the database. Therefore, the dashboard can help Dimsum 20 in making report information and knowing real-time stock.	1. With the dashboard, an active database is needed, so a local server must be active when used. 2. Admin must monitor all transactions entered into the database to avoid errors.
Human Resources	Human Resources at Dimsum 20 have not used the dashboard.	Dimsum 20 owners and their employees, such as cashiers and kitchen, may utilize the dashboard to input/update data in the database, allowing the dashboard to provide relevant information such as sales reports.	1. A brief guide is needed for using the dashboard 2. Disseminate the dashboard system to all users
Technology	Transactions that are stored are only in sales notes or orders from customers.	The dashboard can help Dimsum 20 in making report information and knowing real-time stock. The making of dashboard requires: <ol style="list-style-type: none"> 1. Windows 10 (64-bit) 2. Internet 3. XAMPP 4. MySQL 5. Hypertext Processor Language (PHP) 6. Draw.io 7. Adobe XD 	1. Sales transaction data, stock, product details are integrated in the dashboard 2. Users have access rights of their respective users
Time	The time required for ordering and recording transactions takes longer because customers and cashiers have to record manually.	The dashboard can shorten transaction time and the dashboard can automate transaction recording.	Admin can speed up the process of recording sales transaction data.

V. SYSTEM STRENGTH AND WEAKNESS

A. Strength

1. The dashboard system in Dimsum 20 is accessible to all users with authorized access. Actual business process problems become recommended business process changes with the aid of a dashboard system.
2. The dashboard system design has different difficulties, powers, functions, and authority for user access rights.
3. Password data, sales data, purchase data, payment transaction data, report, chart, and dashboard system user privacy data will be protected by security measures.
4. Users can use a PC or laptop to view the web-based dashboard system.
5. Dashboard systems use a database to record documents and save data in real-time.

B. Weakness

1. The dashboard system can only be accessed using the local server.
2. The dashboard cannot display a printed sales receipt.
3. The dashboard only displays sales reports in the form of text and charts. Besides, it only displays stock data which is monitored by the Admin.

C. Dashboard System

After testing the dashboard system using all levels of user accounts, everything went smoothly and successfully.

VI. Conclusion

The result of the web-based dashboard framework design displays the design needs of the Admin, Cashier, and Kitchen. The admin framework designs the login, input product sales and purchase, product data, supplier data, category data, user data, report data, and chart. Each user has different access rights. Admin is the highest user because it can monitor, edit, add, delete, and display reports and charts on the dashboard. The cashier has access rights which are limited to entering sales transaction data. Meanwhile Kitchen can only monitor the stock data. The waterfall model was also utilized in the dashboard framework design implementation. It is an excellent way to describe each research step, such as system requirements analysis, design, implementation (coding), and dashboard testing. Five key system components are built into the dashboard framework's architecture. Each part contains a man, time, technique, machine, or piece of equipment, and the information interacts to create a dashboard system.

This final project results from the proposed business process that uses a dashboard to display sales reports and monitor product stock. This is a problem that Dimsum 20 can solve.

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