DESIGN AND CONSTRUCTION OF A WEBSITE-BASED GARMENT PRODUCTION INFORMATION SYSTEM

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Abstract

Garment is a specialist production in producing various types of clothing such as ready-to-wear clothing, sportswear, clothing accessories, etc. by utilizing information technology. As time goes by, there are now more and more companies operating in the garment sector and as technology advances, garment companies are now starting to intensively use a system in their production flow. The Garment Industry is a company that operates in the garment manufacturing sector. However, in its operation there are still many problems such as slow operation, less effective data management, manual reporting, missing range data and many more. Administrative activities in garments such as processing order data, order allocation and preparing reports still do not meet operational achievements.Because of this, an information system is needed which is expected to help garment companies solve the problems they face. The role of this information system is the right solution to deal with the problems faced by the company so that everything runs effectively and efficiently. The method that the author used in writing this final assignment was by observing the company premises, conducting interviews with people related to the company, and studying literature from several journals and guidelines for writing this final assignment. Thus, this system is expected to increase the productivity and service quality of garment companies, as well as make a positive contribution to their business growth. The system proposed by the author is web-based, built with a sequence of steps, namely problem identification, needs analysis, coding, design and testing.

1. Introduction

Garment Production is a company that has been operating for 23 years and is located in Petemon, Surabaya. (purwanto,2020) This company specializes in producing various types of clothing such as ready-to-wear clothing, sportswear, clothing accessories, and others. However, as previously explained, administrative activities still rely on standard office applications such as Microsoft Office for their operations. The use of this application still encounters several obstacles, such as ineffective data management, tracking production status and data security that is not guaranteed. This problem has the potential to hamper the company's overall administration process, and can slow down daily operations and cause disruptions in workflow.[Aditya, P., & Nugroho, S. (2017)]
Based on the problems explained above, it is clear that a production information system is needed that is able to

simplify and speed up the administration to production process. Therefore, the author proposes a system called "Website-Based Garment Production Information System Design". This system is designed to support various important aspects of company operations, including order receipt, order data management, order allocation, report generation, and monitoring production processes.[Sari, D. P., & Rahman, F. (2018)]
By implementing this system, it is hoped that companies will experience significant benefits, ranging from efficiency in order handling to increased productivity in the clothing production process. Apart from that, this system is also expected to make it easier for business actors to manage various administrative and operational aspects of the company more effectively.

1.1 Literature Review

This chapter discusses reviews of previous journals of a similar nature, and several studies that have been conducted previously.
Based on the journal I read with the title " The Influence of Production Information Systems on Operational Efficiency in the Garment Industry. A production information system is a system used to plan, control and monitor the production process in a company. In the garment industry, this system has a very important role in ensuring smooth production flow, resource management, as well as controlling quality and production time. This system usually includes modules such as raw material management, production scheduling, inventory control, and production results reports.
For other journals with the title "Case Study of Implementing a Website-Based Production System in a Garment Company". The design of a website-based information system for garment production involves several important stages, starting from system requirements analysis, database design, user interface (UI) programming, to testing and implementation. Some of the design models used in developing this system include: Waterfall Model: Suitable for projects with clear and stable needs, but less flexible to change. Agile Model: More flexible and able to adapt to evolving needs over time. Development of information systems with this model allows for gradual system updates. Choosing the right design and construction method will influence the successful implementation and operation of the garment production information system.
And the last journal with the title " Development of Web-Based Information Systems in the Garment Industry". Several case studies show that website-based production information systems have been successfully implemented in the garment industry, resulting in higher efficiency in the production process and inventory management. For example, in a large garment company, a website-based information system can reduce the processing time for ordering raw materials by up to 30% and speed up the inventory checking process significantly.Other studies highlight the importance of training for system users, especially for staff unfamiliar with web-based technologies

1.2 Design

System design is an activity/process carried out to describe how a business process works by creating diagrams such as use case diagrams. One of the design processes or system development processes that already exists and is widely known by developers is the System Development Life Cycle (SDLC), the steps in this SDLC consist of 5 parts, namely Investigation, Analysis, Design, Implementation and Maintenance and Assessment.[Gunawan, A., & Syafrudin, F. (2019)] Design and construction is the process of creating a new system or replacing or repairing an existing system either in whole or in part.[Hidayat, A. (2020)]

1.3 Engagement

The word engagement etymologically means involvement in something. In terminology, engagement is defined as a concept of social relations that is multidimensional, dynamic, which includes various psychological attributes and social behaviors such as forms of connection, interaction, participation, and involvement. The purpose of these forms of relationships is to achieve or obtain the expected results both individually, organizationally, and socially.[Setiawan, B., & Wijaya, A. (2021)]

Advertising engagement consider the effectiveness of advertising campaigns in attracting attention and maintaining consumer interest. Media engagement encompasses consumer engagement with a variety of media channels, from social media to traditional platforms, and states that user engagement (online activities is the quality of user experience that focuses on positive aspects of interaction, and that interaction is collected and tied to a web application, and is also accompanied by motivation to use it.[Prasetyo, A., & Nugraha, E. (2022)]

1.4 garment production information system

Garment production as Garment production information system is an information technology-based application used to manage and monitor the entire production process in the garment industry. This system includes raw material management, production scheduling, production status monitoring, and finished goods inventory management.[Kurniawan, R., & Sari, A. (2019)]

The goal is to improve operational efficiency, reduce manual errors, and accelerate reporting and decision making. With this system, the production process can be carried out in an integrated and real-time manner, facilitating coordination between departments, and increasing the speed of product delivery to customers.

1.5 Information Systems

An information system is a series of systems grouped in an organization consisting of a set of components, both computer-based and manual, created to collect and prepare data containing output information for users, or a set of hardware and software connected to create and process data into useful information.[Wulandari, S., & Santoso, R. (2020)]

Meanwhile, according to other experts, an information system is a collection of components that include people, hardware, software, communication media/networks and data resources, which work by collecting, changing and delivering information in an organization. [Gunawan, A., & Syafrudin, F. (2019)]

1.6 DFD (Data Flow Diagram)

Data Flow Diagram (DFD) is a graphical representation of the flow of data in a system. DFD describes how data moves from one process to another in a system, including the inputs and outputs of each process and where the data is stored. [Putra, H., & Ibrahim, M. (2018)]

Data Flow Diagram (DFD) is a diagram that uses notation in the form of symbols to describe data flow in a system. DFD is described starting from level 0, level 1 to level 2. DFD level 0 is at the highest level, which describes a large circle that represents a system that interacts with external entities. [Ramadhani, D., & Nugroho, Y. (2019)]

1.7 ERD (Entity Relationship Diagram)

Entity Relationship Diagramis a network that has a data structure stored in the system abstractly ERD is a design tool for modeling a database. The purpose of creating ERD in an organization is for modeling that shows the relationship between data that has a relationship, also documenting existing data by explaining each data and its relationship. Cardinality of Relationship is the maximum number of entities that can relate (connect) to an entity in another entity set. [Purwanto, A., & Suryanto, R. (2021)]

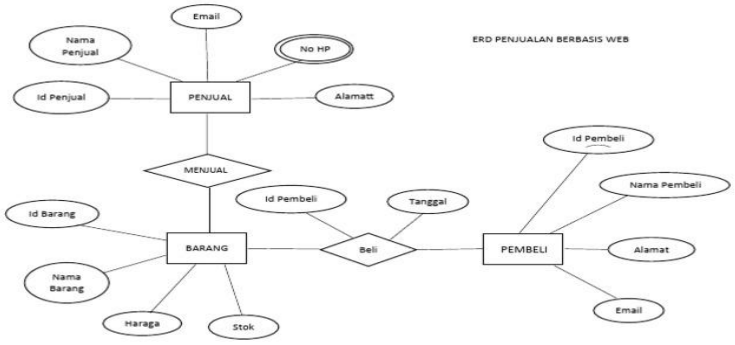

Fig. 1 Examples ERD

1.8 Conceptual data model (CDM)

Conceptual Data Model (CDM) A model created based on the assumption that the real world consists of a collection of basic objects called entities and relationships between the entities in the system. Usually represented in the form of Entity Relationship [Anggoro, H., & Rizki, S. (2020)]

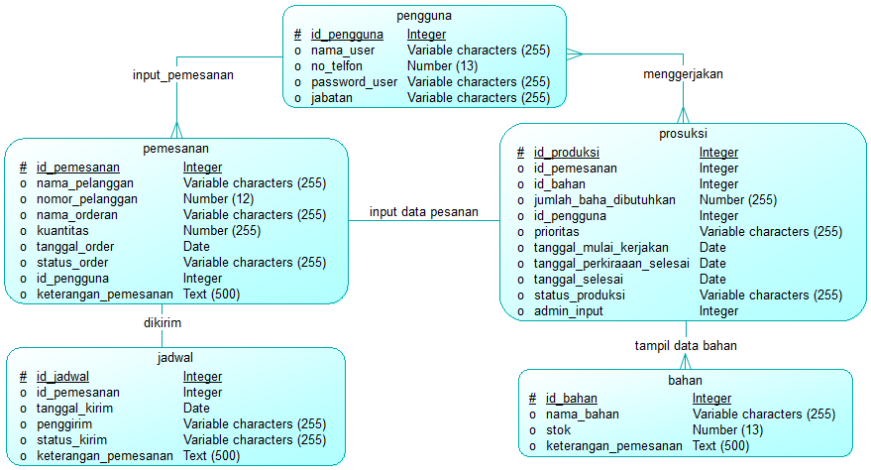

Fig. 2 Examples CDM

1.9 Physical Data Model(PDM)

After the CDM concept has been created, it is then generated into PDM, which is a model that uses a number of tables to describe data and the relationships between the data. Each table has a number of columns where each column has a unique name. [Anggoro, H., & Rizki, S. (2020)]

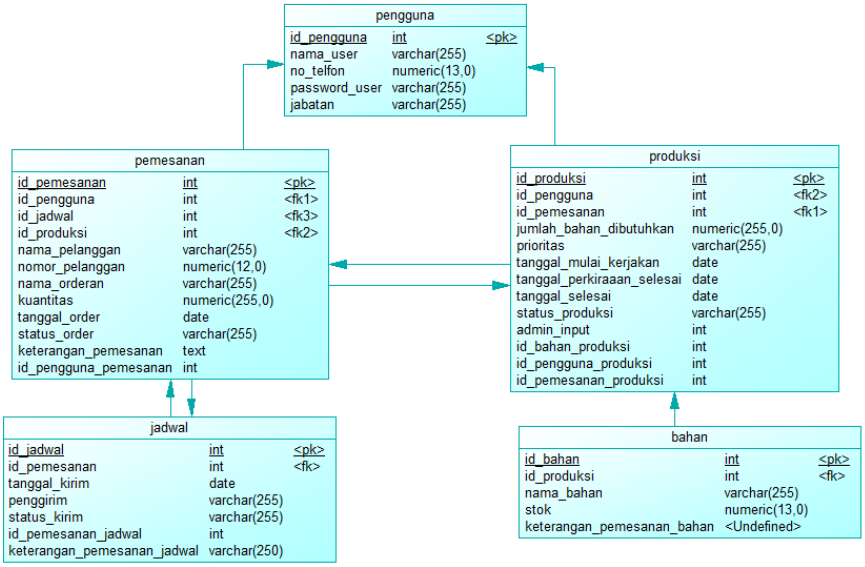

Fig. 3 Examples PDM

1.10 Instructional Media

Learning media is defined by Gagne and Reiser as physical tools where instructional messages are communicated. So an instructor, printed book, film show or tape recorder and other physical equipment that communicates instructional messages are considered as media. Teaching and learning activities with the intention that the process of educational communication interaction can take place appropriately and effectively. Learning media can help improve understanding, present data in an interesting and reliable way, facilitate data interpretation and condense information. [Kurniawan, R., & Sari, A. (2019)]

2. Research Methods

In completing this, the researcher obtained various data and information through several methods.

2.1 Running System Analysis

The system currently running in creating an English learning website for 4th grade elementary school studentscan be described in the form of Figure 4.

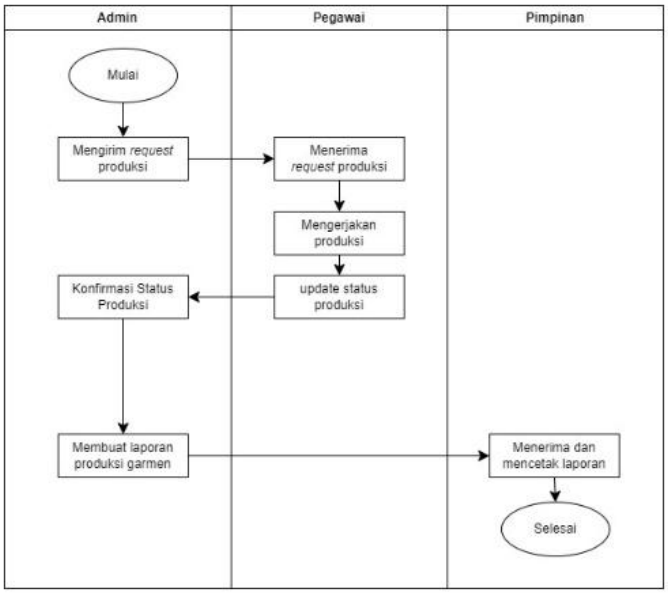

Fig. 4 Business process system website

From the image above, the following is the business process flow that is depicted:

1. Start: Process started.
2. Accessing website (Admin): admin sends production rikwes to employees.
3. Selecting the menu (Company): Employees receive production allowances from admin.
4. Displaying (Company): employees work on production materials
5. Taking the website (Company): Student takes the quiz that is displayed.
6. save production status (Company): employees update production status to admin.
7. make a report (Admin): admin confirms production status to admin
8. make a report (Admin): Admin makes production reports to management.
9. End: Process ended.

This flow diagram illustrates the interaction between admin, employees and leaders in website-based garment production. system, that is the process starting from the admin accessing the website, selecting the production rikwes, receiving, working on and updating the production results and confirmed into a report led

2.2 Research methods

The application of the method to the website system that will be implemented by the author is below:

1. Implementation Methods in Website Management

Fig. 5 Implementation method

Figure 5 Explains the implementation of the method used in the management of garment production website.

• This method will appear while waiting for the process of the login stage, then the admin will manage the Members and then the admin will set the existing ones.

• Next, the admin will determine whether the answer is Right or wrong on the result.

• The admin will display points if the answer is correct and will return to the main page.

This method will display garment production, orderers, production materials and shipping

2.3 Research Flow Diagram

Below is the process flow from researching methods to creating a web-based garment production.

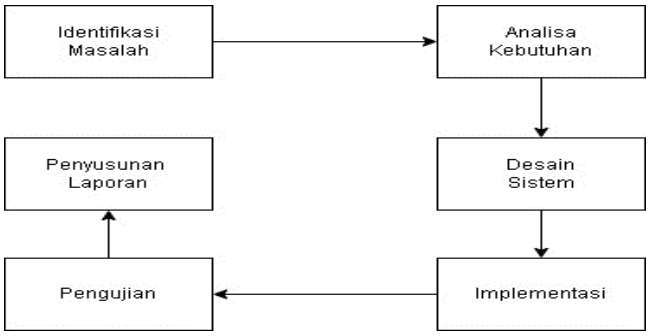

Fig. 6 Research Flow Diagram

Figure 6 shows the flow of the research method from the beginning:

- First, identify the problem to collect problem data on the web-based garment production information
- Second, conduct a production literature by collecting data related to the problem topic that has ever been found.
- Third, analyze functional and non-functional needs.
- Fourth, carry out system design with Context Level DFD.
- Fifth, Implementation by building an information creation system about the website-based garment production information
- Sixth, Conduct system testing using the black box testing method.
- And the last one is documenting the making of the research report.

2.4 Identification of problems

Without a structured method, the process of creating a garment production website. Therefore, the author determines the problem formulation based on the results of observations for research purposes.

1. Website Designed to meet the needs of the production system so that it can print reports easily
2. Create an interactive website by using value points for website users.

2.5 Needs Analysis

After carrying out the problem identification steps, the next step that the author will take is to identify the needs or analyze the needs to obtain information, models, and system specifications that users want.

Below is an analysis of functional and non-functional requirements that can make it easier to determine user needs.

Functional Requirements

Functional needs are a form of needs that have points about a process that is then carried out by the system. These needs have points about the information that exists and is produced by the system. Here are various functional needs from this study:

- Learning website admin requirements:
  1. Admin is producing a website. Can log in and log out on that website.
  2. Admin website is in production process. Can input, update and delete
  3. Website Admin Currently in production Can monitor And the material is coming in or out.Need
- Website users production:
  1. Users currently producing a website can log in and log out on the website.
  2. Website users in production can provide information or notes out
  3. Website Users Currently in production Can monitor new inquiries of materials that are coming in or

2. Non-Functional Needs

The definition of non-functional requirements is an analysis to determine various system requirements specifications. Non-functional requirements contain various things that are needed by users. The following are the non-functional requirements of this production:

1. The system can be run as follows:
    1. Personal Computer(PC), Laptop and Windows operating system, Mobile phone minimum RAM 8 GB.
    2. Softwareto access (Google Chrome, Mozilla Firefox, Opera and others).
2. The system has security, namely by using A last name And password When logging in. The research instruments used in garment production are:
    2. The hardware used to create this system is as follows: an MSI laptop with the following specifications: 11th Gen Intel(R) Core(TM) i5-11260H @2.60GHz 2.61 GHz Processor, 16.0 GB RAM.

The software used to create and run this website is as follows: laptop, Operating System, Windows 64 Bit, Visual Studio Code, Power Designer, Google Chrome, Mysql, Php, and Html.

2.6 System Design

In this phase, the author uses a system design based on the needs that will later be used to build a ranking system. The software used in this system design is Power Designer and Visio.

1. ERD Entity Relationship Diagram

Database design is designed in the form of an entity relationship diagram to help the database creation process. database from the website to be designed. ERD Garment Production Website.

- This system has 4 entities, namely User, Admin, Login, and Content. For the first flow starting from the User entity, the user has several attributes, namely 'user id', 'password', 'name', and 'username'. Users can do the 'login' process. Namely by entering the 'last name' and 'user password' to login, then the system verifies the login data. Verified users can access the website.
- Next is the Admin entity, which has attributes, namely 'admin id', 'password', 'name', 'username'. Admin can carry out processes, which may involve creating or managing production, namely by filling in material data, selecting content, adding and deleting content.
- Next is the login entity, which has attributes, namely 'login id', 'user password', 'name', 'username'. Entity login is related to the admin and user, meaning that the admin and user must register in if they want to access the website. If the login data is valid, it will be verified and given access according to the role (admin or regular user).
- Next is the shipping entity, which has the attributes 'order id', 'shipper', 'ship date', 'ship status'. Then verified users can access the content. And the content accessed by the user is identified by the 'content identifier'. Admin can organize and manage the content to be presented to the use.

2. DFD (Context Level Data Flow Diagram)

Designing this system, the author uses Context Level DFD with the aim of describing the system flow. web-based garment production system creation production. Below is the context level design system DFD in this garment production:

- The website management system has 1 entity, namely admin. This system has a flow that the first Admin can log in then input data on the number of goods and production, find out information uploading the contents of the question, then the Admin has full control over the system.

2.7 Implementation

At this stage the author conducted the implementation of the research "Implementation of Methods to create a learning website for garment production information". This calculation system was built using Indonesian: PHP language and various software such as Indonesian: Adobe Visual Studio Code.

This system displays various information on the website platform about calculations that have been determined criteria. Data and criteria are input by the admin and each user will get the results of the information.

2.8 System Testing

Next is the system testing stage, at this stage the author will carry out testing of the design system that has been created with the aim of seeing...outputThe system and function of the system run as desired through 2 things, the first is the information system and the engagement process.

2.9 Report Creation

At the stage of making a report, the author compiles a report on the results of the research that has been carried out correctly so as to produce a report in the form of a manuscript.

2.10 Research Schedule

Research on Implementation of Website Creation of garment production information on the website is held in six months. The research schedule is in table 1.

Table. 1 Implementation production

N	Activity	Month					
		1st	2nd	The 3rd	4th	The 5th	The 6th
1.	Identification of problems						
2.	Literature study						
3.	Functional and Non-Functional Requirements Analysis						
4.	System design						
5.	Implementation						
6.	System testing						

3. Result and Discussion

Table. 2 System Process

Entity	Activity	Data/Information Needs
	Login account	Username and Password
	Inputting Material	Add new customer name, phone number, order name, quantity, unit price, description or notes.
Admin	Order data	customer name, order name, phone number
	production data	order name, priority, materials required, staff, amount done, description or notes
	Delivery schedule	order name, shipping date, sender, shipping status, description

3.1 User Interface Implementation

In the implementation of this interface design, PHP programming code is used andframeworkcss or bootstrap. At this stage the website has been completed and can be used by users for existing problem needs. In the Implementation contains several contents including.

1. **User Login Page**

On the login page, the admin can access the website by entering a username and password.

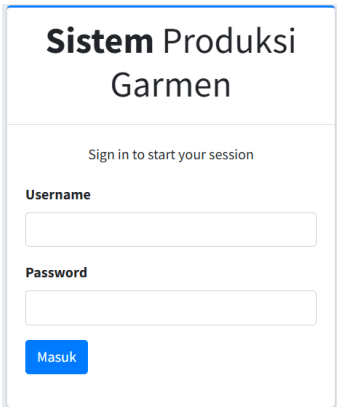

Fig. 7 Login Page

2. Home Page

On the main page used by the admin. Displays the menu on the sidebar to move pages, namely dashboard, ordering, production, shipping schedule, profile, in addition he can display points obtained by the admin and to display the points obtained by the admin each point

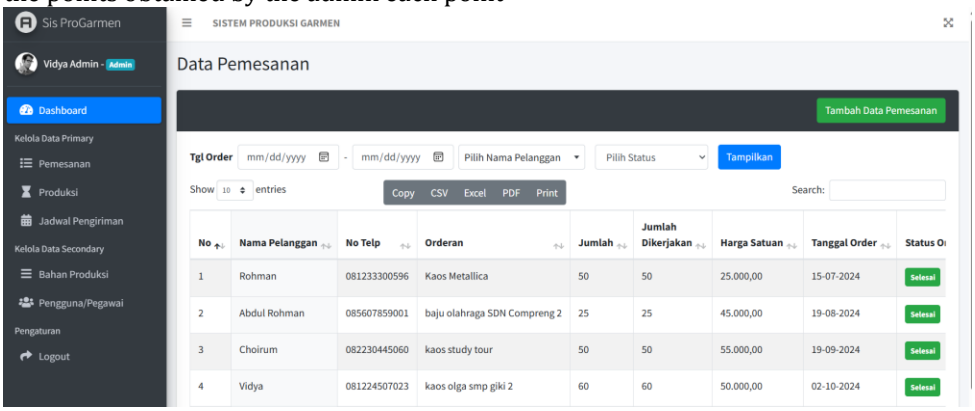

Fig. 8 Main Page

3. Material Page

On the material page, it is used by the admin to enter material data. In addition, the add button is useful for deleting the material you want to delete, a table that displays material data, and there are action buttons, namely change, notes, delete.

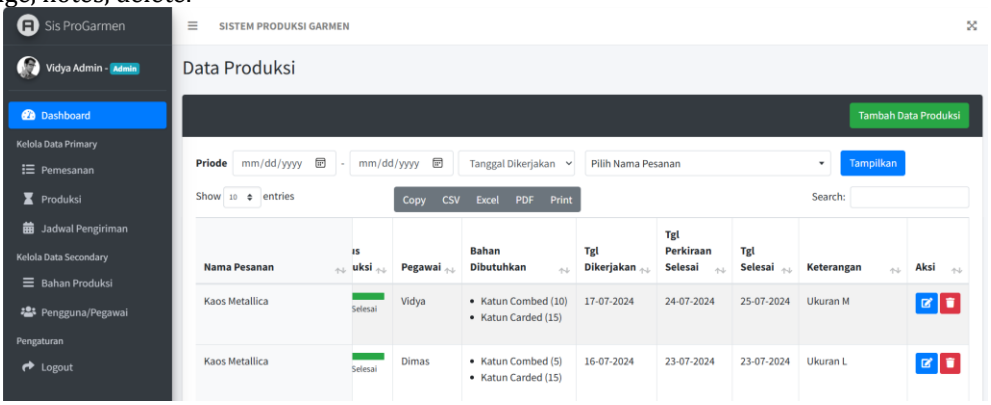

Fig. 9 Material Page

4. production material testing

This page is used to see the increase and decrease in production materials. On this page you can also note the materials that will be displayed. The production materials are recorded on this page.

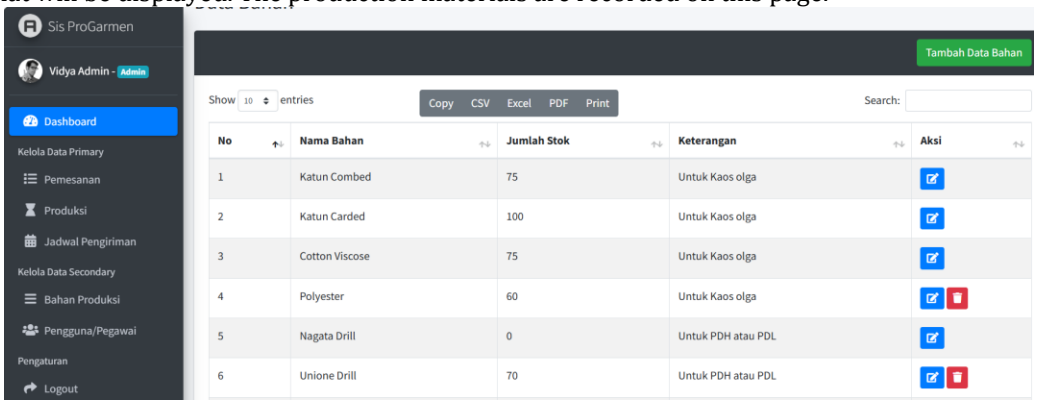

Fig. 10 production material testing

5. Points page

On the point page, it is used by the admin to enter point data and its amount. In addition, that displays point data along with the name, and the amount cannot be changed and deleted.

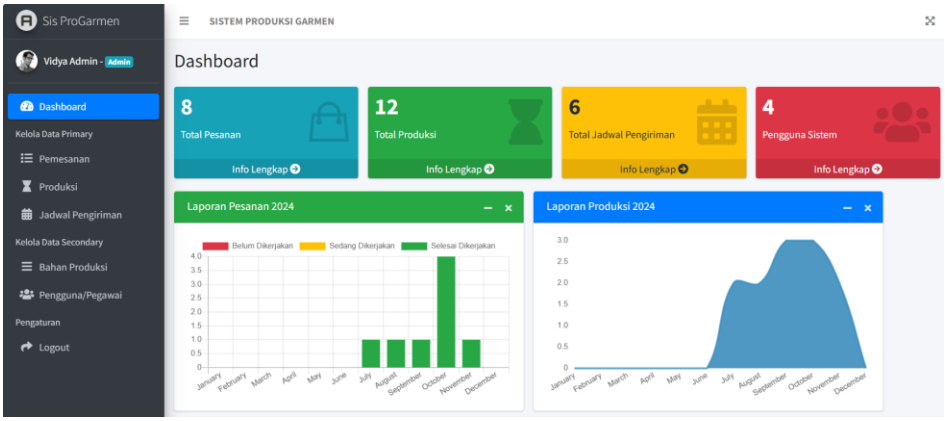

Fig. 11 Point page

6. Member page

On the member page, the admin uses it to see the number of new members and active members on the website until the login process is finally complete.

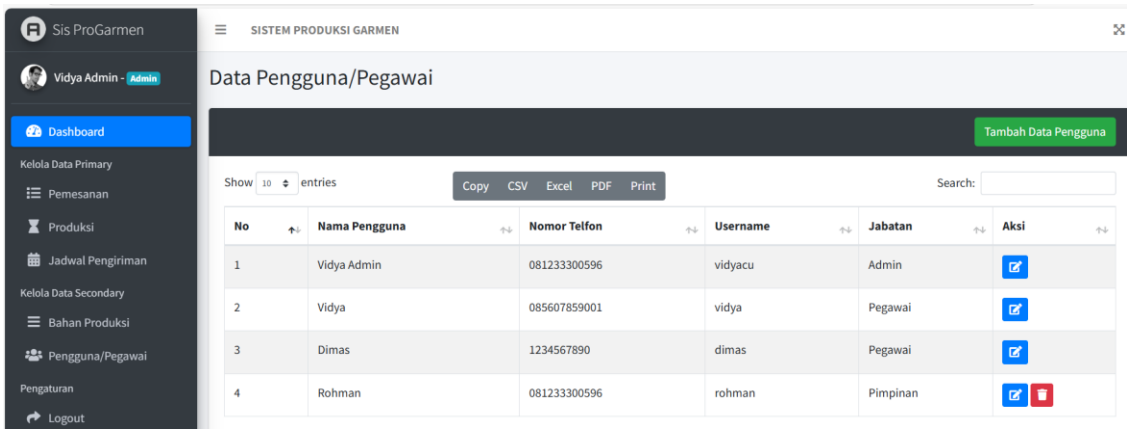

Figure 3.6 Member page

3.2 System Testing

1. Login Page Testing

In the login page test, the admin must be able to fill in the username, password. The test scenario is carried out and the results obtained are then confirmed whether the system is running as it should.

Table. 3 Login Page Testing

No	Test Scenario	Results Obtained	Conclusion
1	If you fill in the username,password	So the system cannot log in to themain page of the website.	Valid
2	If you fill in the username and password correctly	Then the system can successfully log in and then go to the main page.	Valid

2. Testing of Material Pages

In the material page test, the admin must be able to add, edit and delete materials. The test scenario is carried out and the results obtained are then confirmed whether the system is running as it should.

Table. 4 Testing of Material Pages

1	If adding new material	Then the system displays the newmaterial data that has been added.	Valid
2	If editing existing material	Then the system can display theedited material.	Valid
3	If deleting existing material	Then the system can delete thedeleted material.	Valid

3. production material testing

In that production material, the admin can see the data of the material name, stock amount, description, and can edit the material data, has been brought out and the results are obtained then confirmed whether the system is running as it should.

Table. 5 Testing of production materials

No	Test Scenario	Results Obtained	Conclusion
1	Press the add data button	The system will display the add data page	Valid
2	Press the "change data" icon	The system will display the change data page	Valid
3	press the "delete data" icon	The system will delete the material data	Valid

4. Point Page Testing

In the point page test, the admin must be able to enter points. The test scenario is carried out and the results obtained are then confirmed whether the system is running as it should.

Table. 6 Page Testing points

No	Test Scenario	Results Obtained	Conclusion
1	If adding a new point	Then the system displays the points that have been added.	Valid
2	If editing an existing point	Then the system can display the points that have been edited.	Valid
3	If you delete an existing point	Then the system can delete the deleted points.	Valid

5. Member Page Testing

In testing the member page, the admin is directed to see new members, there are several inputs that mustbe filled in which will be mentioned below.

Table. 7 Add Production Page Testing

No	Test Scenario	Results Obtained	Conclusion
1	If you fill in the data in the register	Then the system will save all the forms that have been filled in the database.	Valid

4. Conclusions

4.1 Conclusion

1. The system that has been designed is a website-based production information system that aims to make it easier for management to manage production, from ordering raw materials to shipping finished goods.
2. The system's main features include production management, raw material management, production status monitoring, and production performance reporting. The system allows real-time access by related parties, improving coordination and operational efficiency by reducing manual recording and stock errors

4.2 Suggestion

from the analysis results Regular user training is also important to minimize operational errors. The system should be integrated with other management systems to strengthen efficiency. Routine system maintenance and updates are essential to keep up with technological developments. Feature evaluation and development need to be done to adapt to dynamic business needs.

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