PRODUCT DISTRIBUTION INFORMATION SYSTEM DEVELOPMENT WITH SUPPLY CHAIN MANAGEMENT METHOD IN KPS OF GUNUNG GEDE SUKABUMI

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ABSTRAK

KPS of Gunung Gede is a co-operation that produce milk-based product. KPS of Gunung Gede has marketing agent that spread across the town. KPS of Gunung Gede doing their raw material stocking through supplier to fulfill their agent's need. Determining the number of the raw material, often causing difficulties as a result of the uncertainty of the order by the agent. The time that needed to provide the raw material to the supplier until the demanded material is received it takes about a week, as a result it did not met the product's order.

Based on the problem resides at the moment, a product information distribution system development with Supply Chain Management method approach in KPS of Guning Gede Sukabumi is needed. The aim is to ease the raw material number determining process up that ordered to the supplier to fulfill the product demand that ordered by agent and to ease the product's distribution scheduling to every agent. The forecasting method is using single exponential smoothing. The calculation in determining the product stock's number is using safety stock.

Based on the test result came to a conclusion that this development system have eased the manager of the milk-processing at the KPS of Gunung Gede Sukabumi in determining the number of the ordered raw material, controlling the raw material and product data, gain the product delivery information and doing the product's order agreement as well as raw material stocking.

Keywords : Supply Chain Management, Single Exponential Smoothing, Safety Stock

1. PRELIMINARY

KPS of Gunung Gede Sukabumi is a cooperation that produces dairy. KPS of Gunung Gede Sukabumi have marketing agent that spread across the city. KPS of Gunung Gede Sukabumi doing levying to supplier to fulfill the product need that has been ordered by agent. Determining the number of raw material, often lead to the difficulty as a result of the uncertainty of the order by agent. It takes a week to get the raw material from levying to received, as a result it did not met the product order.

1.1 Formulation of the Problem

Based on the stated background of the problem, the problem resides in KPS of Gunung Gede Sukabumi is how to build a product distribution information system using Chain Management approach in KPS of Gunung Gede Sukabumi

1.2 Intent and Aim

The intent of this research is to build a product distribution information system using Chain Management approach in KPS of Gunung Gede Sukabumi There are also the aims that meant to be achieved:

To ease the Dairy Manager Unit to determine the raw material number that has to be ordered to the supplier to fulfill the product demand of agent.

1. Dairy processing in KPS of Gunung Gede Sukabumi in scheduling the product distribution to every agent that ordered.
2. Milk Processing Unit Manager, enables KPS of Gunung Gede Sukabumi in the scheduling of product distribution to every agent who has placed orders for products.

.Limit of the Problems

The problems that brought was so wide so it has to be limited in order to be more directional and accurate to achieve the desired result.

1. This Distribution Information System is web based and accessed via internet.
2. Production system that used is push supply chain, because the company determine the produced product (make to stock)
3. The Distribution System that used in the distribution is intensive distribution.

4. The sample of the data used is a 250ml yoghurt product.
5. The processes in this system are:
   a. Order Receive

      The management of order by agent.

   b. Forecasting

      Forecasting from the previous product order data for the next raw material levying period using single exponential smoothing.

   c. Stock Controlling

      Doing raw material and product stock controlling in order to prevent shortage. This controlling done when the stock is less than the safe number so then the company will reorder the warehouse good using Safety Stock and Reorder Point.

   d. Raw Material Levying

      KPS of Gunung Gede Sukabumi ordering the number of the raw material based on the forecasting calculation.

   e. Receiving Raw Material

      Receiving raw material sent by the supplier.

   f. Product Distribution

      KPS of Gunung Gede Sukabumi scheduling product distribution, determining the vehicle type, the person in charge, and adjusting order by the agent to be sent to the agent. The marketing region are Sukabumi, Cianjur, Bandung, Banten, and Bekasi.
6. Based on the product demand data analysis from January to December 2014 can be concluded the method used was single exponential smoothing because the data flow showed uncertain fluctuation.
7. The product availability calculation prediction in KPS of Gunung Gede Sukabumi using Safety Stock and Reorder Point.
8. The analysis model that used in this system Design is structured analysis consists of ERD (Entity Relation Diagram) and DFD (Data Flow Diagram)
9. The Distribution Information System in KPS of Gunung Gede Sukabumi built using PHP programming language and using MySQL as Database Management System (DBMS)
10. The Operating System used is Microsoft Windows 7 and Mozila Firefox and Google Chorme as the web browsers.
11. The Web Server used was Wamp.

1.3 Research Method

Research Methodology is a process that used to solve a logically problem. In creating this research, the descriptive research method depicting the facts and information systematically, factual, and accurate, as seen in Image 1.

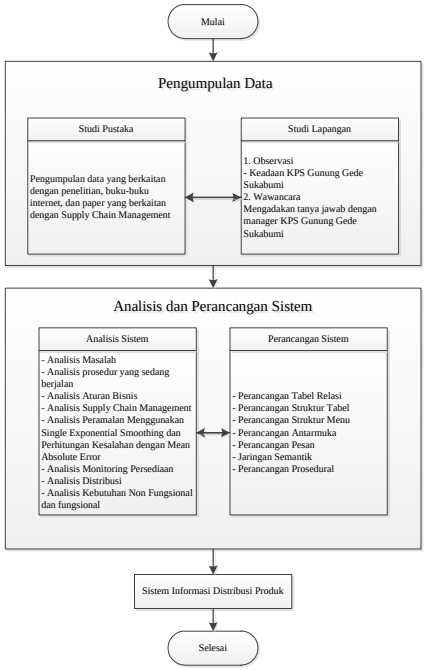


Image 1 Research Methodology Stages Flowchart

Below are the stages:

1. Data Gathering

In this stage of data gathering by doing meeting with Mrs. Neneng Siti Rahma, S.E the Unit Manager of result processing of KPS of Gunung Gede Sukabumi then the analysis that'll built.

a. Book Study

Order management that ordered by agent. This stage of data gathering done by learning, researching, and studying various literature from library gathered from books such as books, erudite journals, internet websites dan other relevant readings.

b. Field Study

In this data gathering stage done by researching and inspecting directly in KPS of Gunung Gede Sukabumi that consists of observation and interview with Mrs. Neneng Siti Rahma, S.E the Unit Manager of result processing of KPS of Gunung Gede Sukabumi

2. Analysis and System Building

In this stage, the analysis and system building built then the software will be created appropriately.

a. System Analysis

In this step, done by doing analysis towards system that suited with the problem and from the previously decided build. Those are:

1) Problem Analysis
2) Running Procedure Analysis
3) Business Rules Analysis
4) Supply Chain Management Analysis
5) Forecasting Analysis Using Single Exponential Smoothing and Error Calculation with Mean Absolute Error.
6) Supply Monitoring Analysis.
7) Distribution Analysis
8) Functional and Non-functional Needs Analysis.

b. System Analysis

This stage worked after system analysis and demand identification in KPS of Gunung Gede Sukabumi gathered. After data gathering done, next the system building will commence and which software that'll be used, System building consists of:

1) Table Building
2) Table of Structure Building
3) Menu Menu Structure Building
4) Interface Building
5) Message Building
6) Semantic Network
7) Procedural Building

3. Product Distribution Information System.

This Product Distribution Information System is the end of this research.

2. RESEARCH CONTENT

2.2 Data Basis Analysis

Entity Relationship Diagram (ERD) from product distribution information system of KPS of Gunung Gede Sukabumi can be seen in image 2.

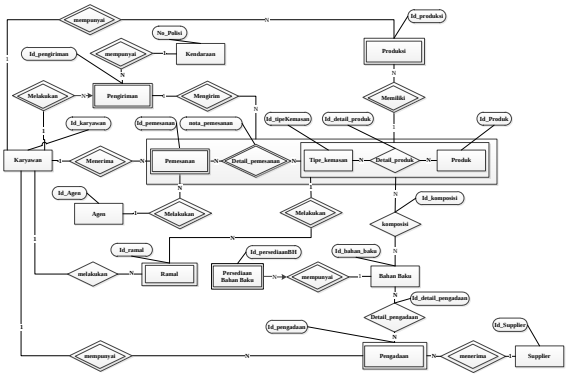


Image 2 Product Distribution Information System ERD with Supply Chain Approach method in KPS of Gunung Gede Sukabumi

2.3 Context Diagram

There is also Context Diagram in Product Distribution Information System in KPS of Gunung Gede Sukabumi which can be seen in image 3.

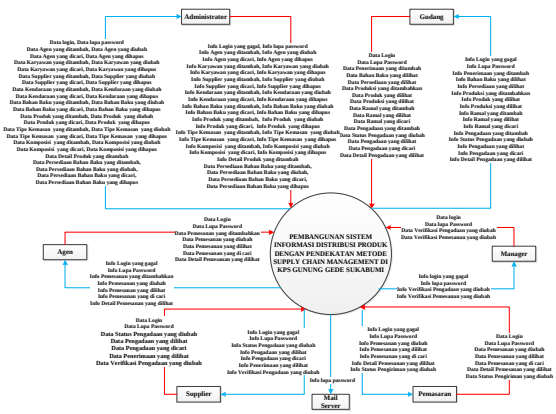


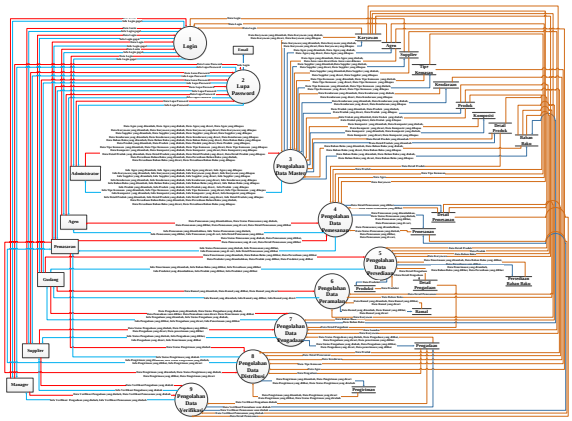
Image 3 Context Diagram of Product Distribution Information System with Supply Chain Approach method in KPS of Gunung Gede Sukabumi.

2.4 Data Flow Diagram

Data Flow Diagram (DFD) is one of the medias used to depict data flow on an information system.

2.4.1 Level 1 DFD

There is also Level 1 DFD Product Distribution Information System in KPS of Gunung Gede Sukabumi which can be seen in image 4.



Gambar 4 Level 1 DFD Product Distribution Information System with Supply Chain Approach method in KPS of Gunung Gede Sukabumi.

2.5 Code Building

There is also coding process that built into information system of KPS of Gunung Gede Sukabumi which is employee, agent, order note, and product sending code.

1. Employee Coding

Employee Coding can be seen in image 5

99999

→ 99999 : No Urut Karyawan

Gambar 5 Employee Code Format

Example: 00001, stating that the respective employee has 00001 as the code number.

2. Agent Coding

Agent Coding can be seen in image 6.

99999

→ 99999 : No Urut Agen

Image 6 Agent Coding Format

Example: 00001, stating that the respective agent has 00001 as the code number.

3. Order Note

Order Note Coding can be seen in image 7.

AA-99999

→ 99999 : No Urut dari Pemesanan

→ AA : Kode dari Nota Pemesanan

Image 7 Order Note Coding Format

Example: NT-001, stating that the respective order note with 001 as the note number.

4. Product Sending Note

Product Sending Code can be seen in image 8

AA-999

→ 999 : No Urut dari Pengiriman Produk

→ AA : Kode Dari Pengiriman

Image 8 Product Sending Note Coding Format

Example: KR-001, stating the product sending note with 001 as the note number.

2.6 Relation Diagram

Relation Diagram will be explained in image 9.

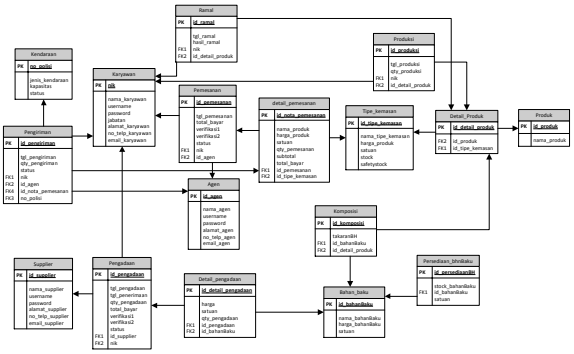


Image 9 Relation Diagram of Product Distribution Information System with Supply Chain Approach method in KPS of Gunung Gede Sukabumi.

2.7 Interface Building

The interface building in Product Distribution Information System with Supply Chain Approach method in KPS of Gunung Gede Sukabumi are:

1. Login Interface Building

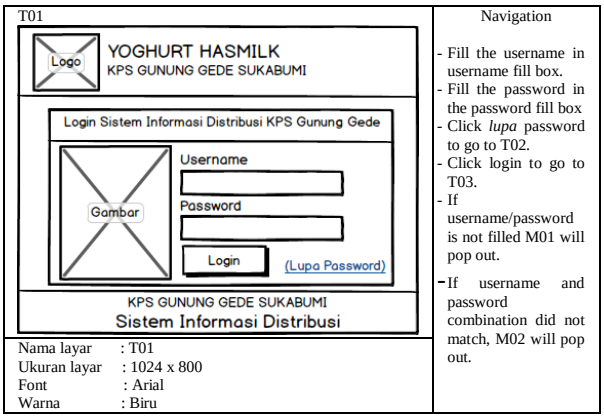


Image 6 Login Page Interface Building

2. *Lupa Password* Interface Building

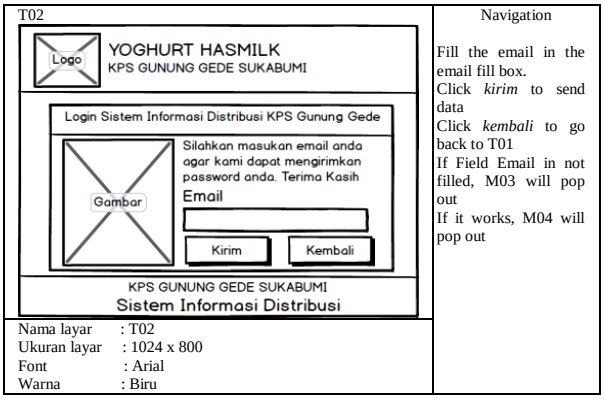


Image 7 *Lupa Password* Page Interface Building

3. *Lupa Password* Page Interface Building

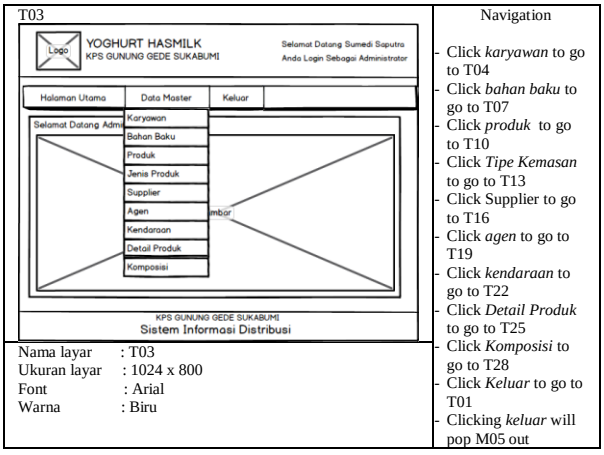


Image 8 *Lupa Password* Perancangan Antarmuka Halaman Lupa Password

4. *Agen* Main Page Interface Building

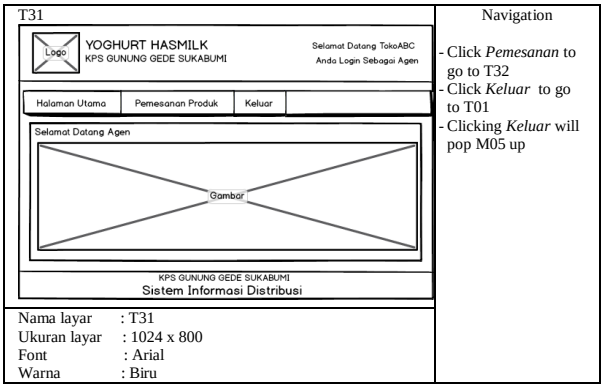


Image 9 *Agen* Main Page Interface Building

5. *Pemasaran* Main Page Interface Building

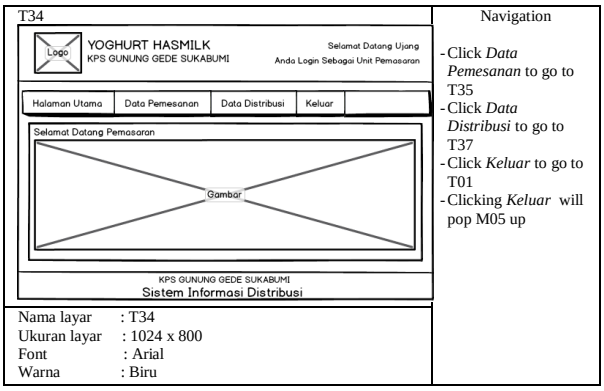


Image 10 *Pemasaran* Main Page Interface Building

6. *Gudang* Main Page Interface Building

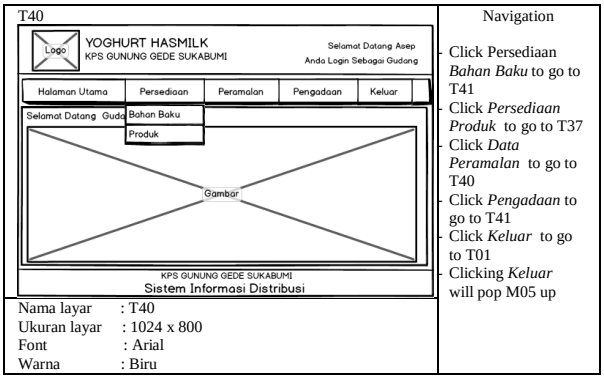


Image 10 *Gudang* Main Page Interface Building

6. Supplier Main Page Interface Building

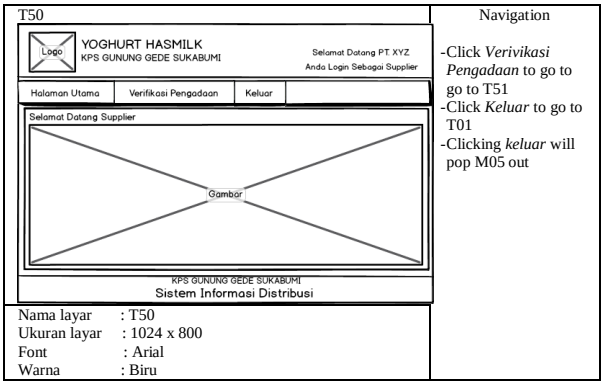


Image 11 Supplier Main Page Interface Building

8. Supplier Main Page Interface Building

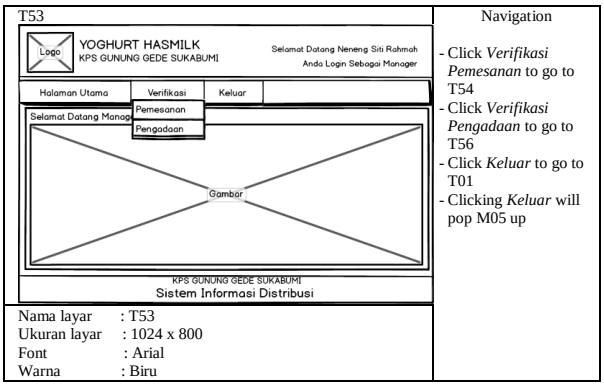


Image 12 Manager Main Page Interface Building

2.8 Interface Implementation

Interface Implementation in Distribution System Information in KPS of Gunung Gede Sukabumi with Supply Chain Management approach are:

1. Login Page Interface Building



Image 13 Login Page Interface Building

2. *Lupa Password* Page Interface Building



Image 14 *Lupa Password* Page Interface Building

3. Administrator Page Interface Building



Image 15 Administrator Page Interface Building

4. *Agen* Main Page Interface Building



Image 16 *Agen* Main Page Interface Building

5. *Pemasaran* Main Page Interface Building



Image 17 *Pemasaran* Main Page Interface Building

6. *Gudang* Main Page Interface Building



Image 18 *Gudang* Main Page Interface Building

7. **Supplier Page Interface Building**



Image 19 Supplier Page Interface Building

8. **Manager Page Interface Building**



Image 20 Manager Page Interface Building

3. TEST RESULT

3.1 Administrator Interface

The interface in the software for administrator can be seen in Table 1.

Table 1 Implementasi Antarmuka Adminstrator

Menu	Description	File Name
Login Page	Used as Login Page	index.php
Main Page	Used to show the user's main page	index.php
Employee's Data	Page to be used to manage employee's data	karyawan.php
Raw Material Data	Page to be used to manage raw material data	bahan_baku.php
Product Data	Page to be used to manage the product data	produk.php
Vehicle Data	Page to be used to manage vehicle data	kendaraan.php
Agent Data	Data to be used to manage agent data	agen.php
Supplier Data	Page to be used to manage Supplier Data	supplier.php
Package Type Data	Page to be used to manage package type data	tipe_kemasan.php
Ingredient Data	Page to be used to manage the ingredient data	komposisi.php
Logout	Menu to be used to exit from the system to login page	index.php

3.2 Manager Interface

The interface on the software for the manager can be seen in Table 2.

Table 2 Manager Interface Implementation

Menu	Description	File Name
Login Page	Used as login page	index.php
Main Page	To be used to show the user's main page	index.php
Levying Verification	To be used to manage levying verification	verifikasi_pengadaan.php
Logout	Menu to be used to exit from the system to login page	index.php

3.3 Warehouse Unit Interface

The interface on the software for warehouse unit can be seen in Table 3.

Table 3 Warehouse Unit Interface Implementation

Menu	Description	File Name
Login Page	Used as the login page	index.php
Main Page	To be used to show warehouse unit main page	index.php
Raw Material Stock	Page to be used to see raw material stock	persediaan_bahan baku.php
Product Stock	Page to be used to show product stock data	persediaan_produk.php
Forecasting	Page to be used to process the forecasting data	peramalan.php

Levying	Page to be used to manage raw material levying data	pengadaan.php
Logout	Menu to be used to exit from the system to login page	index.php

3.4 **Marketing Unit Interface**

The interface on the software for the Marketing can be seen in Table 4.

Table 4 Marketing Interface Implementation

Menu	Description	File Name
Login Page	Used as login page	index.php
Main Page	To be used to show the marketing unit main page	index.php
Order Data	Digunakan untuk mengelola data Pemesanan Produk	data_pemesanan. php
Data Distribusi	To be used to manage product distribution data	distribusi.php
Logout	Menu to be used to exit from the system to login page	index.php

3.5 Agent Interface

The interface on the software for agent can be seen in Table 5.

Table 5 Agent Interface Implementation

Menu	Description	File Name
Login Page	Used as the login page	index.php
Main Page	To be used to show agent main page	index.php
Product Order	To be used to manage product order data	pemesanan.php
Logout	Menu to be used to exit from the system to login page	index.php

3.6 Supplier Interface

The interface on the software for supplier can be seen in Table 6.

Table 6 Implementasi Antarmuka Supplier

Menu	Description	File Name
Login Page	Used as the login page	index.php
Main Page	To be used to show the supplier main page	index.php
Levying Verification	To be used to do raw material verification	verifikasi_pengadaan.php
Logout	Menu to be used to exit from the system to login page	index.php

4. CLOSING

4.1. Conclusion

Based on the research regarding product distribution information system with supply chain approach method, concluded as bellow:

1.1 This information system can ease the Dairy Unit Manager in KPS of Gunung Gede Sukabumi in determining the number of raw material that has to be ordered to supplier to fulfill the agent's demand.

1.2 This information system can ease the Dairy Unit Manager in KPS of Gunung Gede Sukabumi in scheduling product distribution to every agent that have ordered.

4.2. Suggestion

There are also suggestions for the development such as:

1. There has to be a better development and management for the built system, so that the system can leverage to a whole new level in the future.
2. There has to be a better development in the interface section to be more attractive because the interface at the moment is pretty much simple.

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