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*Original Article*

# Database Design of Raw Materials Information Systems in Bread Company

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***Abstract*** *- This study aims to Design an Information System for the needs of Raw Materials in Bread Companies using the Material Requirements Planning method. In carrying out its production activities, this Bread company requires a lot of raw materials such as sugar, bread developers, yeast, cheese, chocolate, flour, milk. To meet the needs of raw materials for bread production, ideally, the bakery plans as well as possible so that the continuity of production at the company can be achieved. One of the solutions to this problem is to make the design of information systems requirement of raw materials in the bread production process with the Material Requirements Planning method. Designing information systems requirements for Raw materials in the bread production process is developed using Personal Home Page and MySQL as a database.*

***Keywords*** *- information system design, raw material requirements, material requirements planning.*

## I. INTRODUCTION

Bread Company In carrying out its production activities, it requires a lot of raw materials such as sugar, bread developers, yeast, cheese, chocolate, flour, and milk. To meet the needs of raw materials for the sake of production, bread companies should plan their best so that the continuity of production at the company can be achieved. The most important function of a company is the planning and control of the production of raw materials. The task of the section is to coordinate parts such as raw materials, workers, and equipment in such a way that they can produce effectively and efficiently. The benefit of planning is to plan the right products so that shortages and excess goods can be minimized. The purpose of the production planner is trying to develop an appropriate strategy and is expected to minimize production costs excess materials and try to anticipate the demand for raw materials.

From the above background, as well as anticipating or preventing the occurrence of excess or lack of supply of raw materials in the company due to the number of requests that tend to be erratic, it is necessary to design a system of raw material requirements in the Bread Company.

The number of methods in material management that can be used to determine the time and volume of material procurement requires decision-makers to master each method of material procurement in material management, knowing the advantages and disadvantages of each method so that they can use the right method according to the situation at hand. One method in material management is Material Requirement Planning, a method of ordering materials by planning raw material inventory. Therefore in this thesis, a program will be made to handle the planning of material requirements needed in the production process so that the production process can run smoothly and not get obstacles.

It is expected that in the application of this system, it can help the procurement of goods and production so as to facilitate the company's activities so that for the achievement of good production, planning for controlling the supply of raw materials is needed. This inventory control can evaluate the optimal raw material requirements planning and minimize the existing inventory costs in accordance with the company's production capacity.

Based on the existing background, the formulation of the problem in this study is: "How to design a system of raw material requirements for the continuity of the bread production process properly? ".

While the purpose of this research is to design a system of raw material requirements for the continuity of the bread production process.

## II. LITERATURE STUDY

### *A. Information System*

Simply put, a system can be interpreted as a collection or set of elements, components, or variables that are organized, interact with each other, are interdependent, and integrated [1]. The system is a collection of interrelated elements that are responsible for processing input so as to produce the output [2].

Information is one of the resources that are needed in an organization. A system, if it does not get enough information, of course, will not last long. Information that is useful for a system will avoid entropy, which is a situation where a system has not run according to its purpose or a situation where a system is almost dead.

Information is data that is processed into a form that is more useful and more meaningful for those who receive it, while data is a source of information that describes a real event. Information is knowledge from the results of the processing of related data into a conclusion. Some data can be stated as information if from a small amount of data it can be concluded [9].

An information system is a component that consists of people, information technology, and work procedures that process, store, analyze, and disseminate information to achieve a goal [9].

### *B. Unified Modelling Language*

UML is a visual language for modelling and communication about a system using diagrams and supporting texts[15].

UML diagrams are**:**

***a) Use Case***

The use case diagram is modelling for the behaviour of the information system that will be created. A use case describes an interaction between one or more actors with the information system created.

***b) Activity* Diagram**

The activity diagram illustrates the workflow or activity of a system or business process.

***c) Class* Diagram**

A class diagram illustrates the structure of the system in terms of defining the classes that will be created to build the system.

***d) Sequence* Diagram**

Sequence diagrams illustrate the behaviour of objects and messages sent and received between objects

### *C. Database*

A database system is a computerized system whose main purpose is to maintain processed data or information and make information available when needed. In essence, a database is a medium for storing data so that it can be accessed easily and quickly [15].

#### *a) Database Design*

Database Design is the process of determining the content and data settings needed to support various system designs [4].

#### *1) Database design goals*

1. To fulfil information containing specific user needs and their applications.
2. Facilitate understanding of information structure.
3. Supports processing needs and multiple object appearance.

### *D. PHP*

PHP is a scripting language that is designed for web development in creating dynamic web pages. PHP is the most widely used script programming language today. PHP is widely used for programming a website, although it is also possible to be used for other uses. PHP is a server-side scripting language that is inserted between HTML languages to create dynamic web pages. And because it is based on the server-side, then PHP will be executed on a server, so what will be sent to the web browser is the result in HTML and PHP code that will not be seen. One of the functions of PHP is to receive, process and display data from and to the website. The data received will be processed in a database server program, and then the results are displayed back to the web browser screen of a website.

PHP is a server-side-scripting language that integrates with HTML to create dynamic web pages. Because PHP is a server-side-scripting, the syntax and PHP commands will be executed deserver then the results will be sent to the browser with HTML format.

### *E. Inventory Planning*

"According to Rangkuti [11], inventory control is one of the management functions that can be solved by applying quantitative methods". Inventory control techniques are very important in calculating the optimal amount of inventory required and when to reorder.

Inventories are stored materials or goods that will be used to fulfil certain purposes, for example, for use in the production or assembly process, for resale, or for parts of equipment or machinery.

#### *a) Inventory Purpose*

According to [13], the purpose of controlling inventory is stated as the company's business, too.

1. Can meet the needs or demands of consumers quickly (satisfying consumers).
2. Maintaining the continuity of production or keeping the company from running out of inventory resulting in the cessation of the production process is because:

- The possibility of goods (raw and auxiliary materials) becoming scarce makes it difficult to obtain.
- The possibility of suppliers being late sending goods ordered
- Maintain and, if possible, increase sales and company profits

***F. Raw Material Planning***

Raw material planning and control are one of the activities in the sequence of activities that are closely linked to each other in the entire company's production operations in accordance with what has been planned in advance both in time, quantity, quality and cost. Overall interpreted as an effort to determine the level of inventory and control it effectively and efficiently.

Material requirements planning is a concept in production management that discusses the right way in planning the material needs of products in the production process so that the needed goods can be available according to needs.

## III. SYSTEM DESIGN

System design that will be designed using Unified Modeling Language consisting of Use Case Diagrams, Activity Diagrams, and Class Diagrams.

***A. Use Case Diagram***

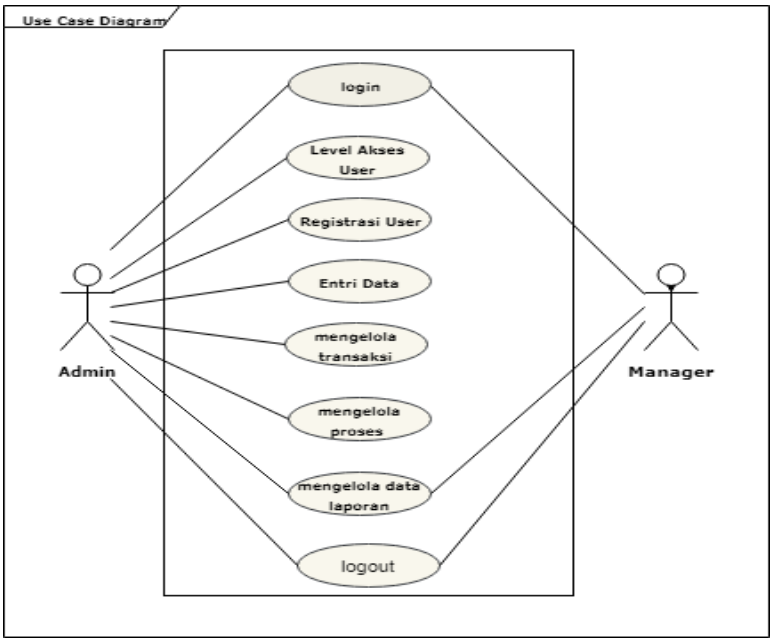


**Fig. 1 Use Case Diagram**

Figure 1 description :
User and Admin activities *:*

***a) Admin***

1. Admin to login
2. Admin does data entry
3. Admin to input transactions
4. Admin through the input process
5. Admin can see the report results from the process
6. Admin can process user access level data
7. Admin registers users
8. Admin can process user authority
9. Admin logout

***b) Manager***

1. Manager logged in
2. The manager can see the report results from the process
3. Manager logged out

### *B. Class Diagram*

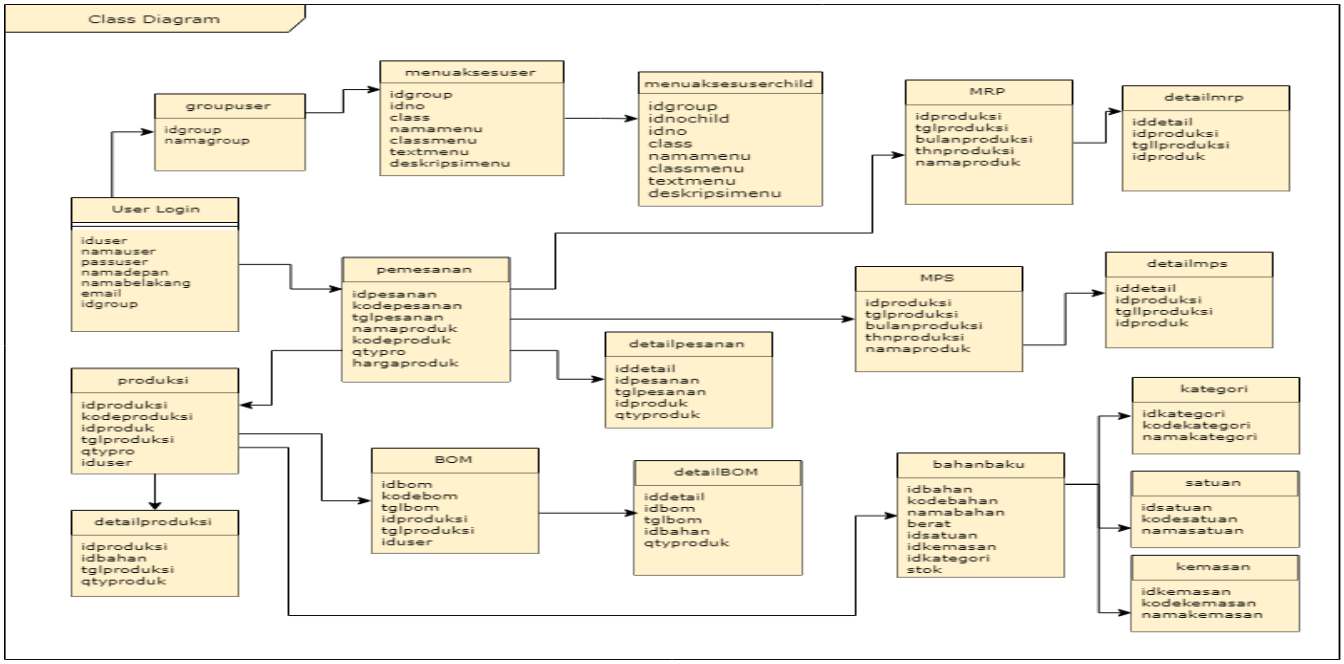


**Fig. 2 Class Diagram**

#### *a) Figure 2 description*

The database has interconnected classes. Each class has attributes and methods in the above diagram class populated user login class, group user class, user access menu class, user child access menu class, order class, order detail class, production class, production detail class, material class, criterion class, unit class, packaging class, Bill of Material class, BOM detail class, MPS class, MPS detail class, MRP class, MRP detail class.

### *C. Activity Diagram*

Activity Login

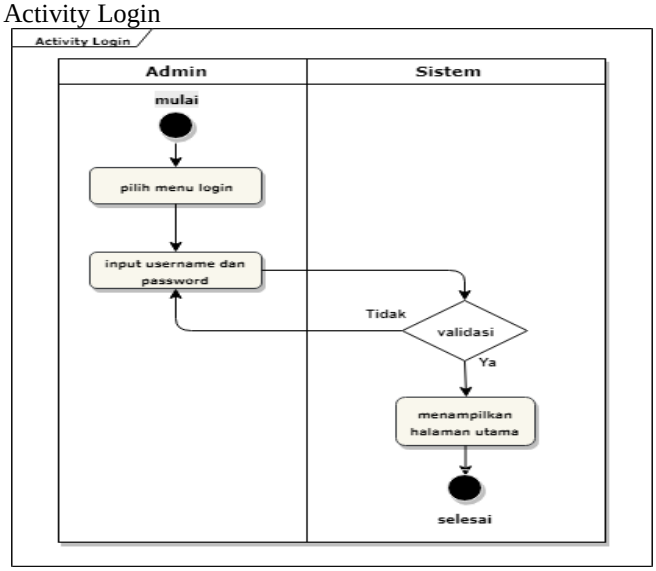


**Fig. 3 Login activity diagram**

#### *a) Figure 3 description*

The picture above explains the login flow performed by the admin. Admin selects the login menu, then admin inputs username and password, the system receives data and validates the process. If the process fails, then the system will return to the username and password input process. If the process is successful, it will enter the system. Done.

### *D. User-level access activity*

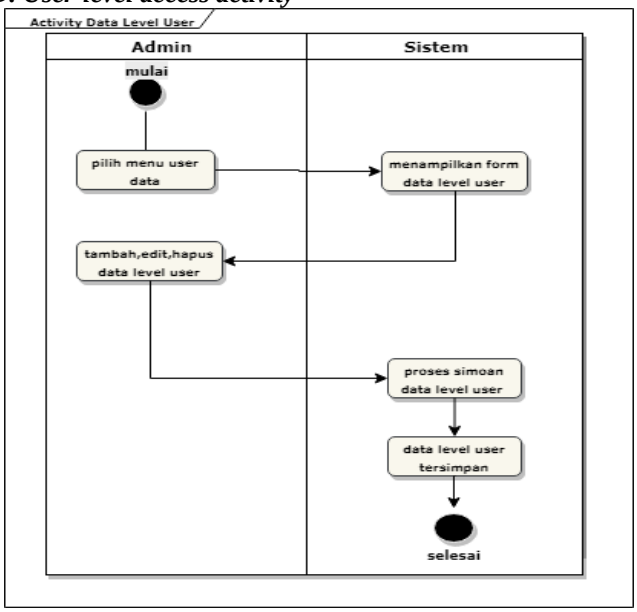


**Fig. 4 User Level activity diagram**

***a) Figure 4 description***

The picture above explains the flow of user access level activities. Activities undertaken by the admin are adding, changing and deleting data. The first admin selects the user access level menu. The system displays the user access level form. Then input data, the system processes the user access level data store, the user access level data is stored, the system saves the data to the database, and processes. Done.

***E. User register activity***

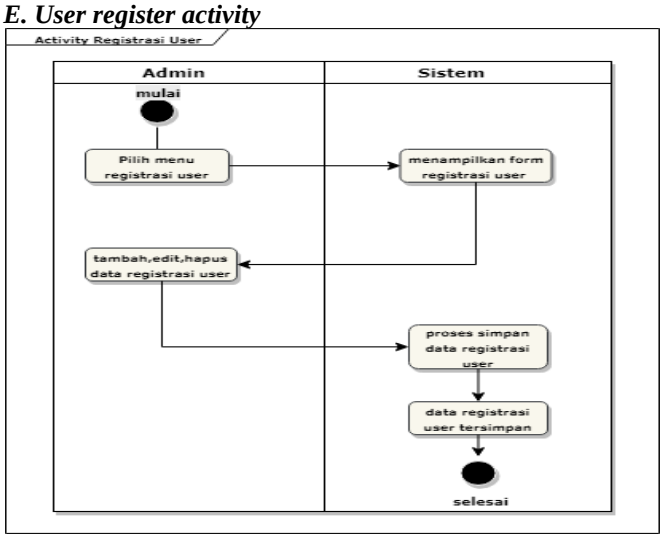


**Fig. 5 User registration activity diagram**

***a) Figure 5 description***

The picture above explains the flow of user registration activities. Activities undertaken by the admin are adding, changing and deleting data. The first admin selects the user registration menu, and the system displays the user registration form. Then input data, the system processes the save user registration data, stored user registration data, the system will save the data to the database, and process. Done.

***F. Data entry activity***

***Raw material data entry activity***

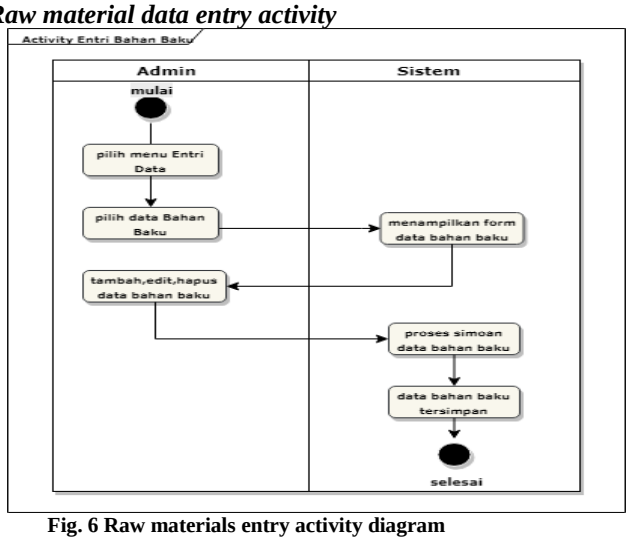


**Fig. 6 Raw materials entry activity diagram**

***a) Figure 6 description***

The picture above explains the flow of raw material entry activities. Activities undertaken by the admin are adding, changing and deleting data. First, the admin select the data entry menu, then select the raw material data, the system displays the raw material data form, then the input data, the system processes the raw material data, the raw material data is stored, the system will save the data to the database, and the process. Done.

***G. Product data entry activity***

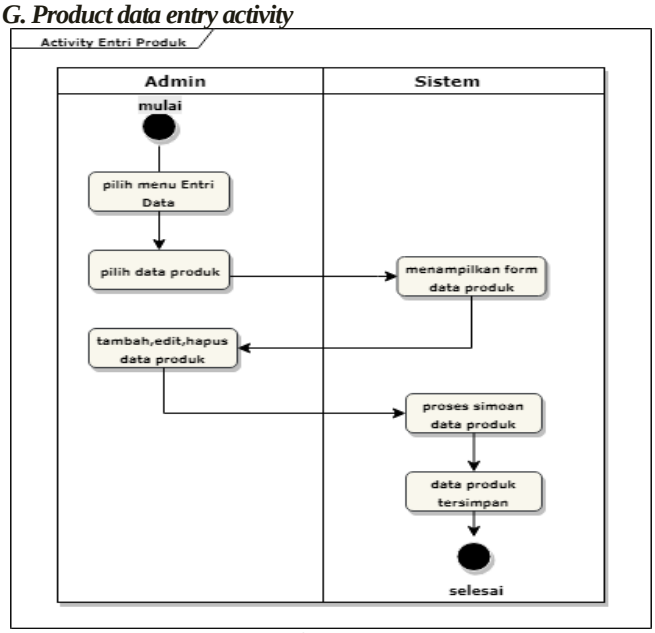


**Fig.7 Data Entry of Product activity diagram**

***a) Figure 7 description***

The picture above explains the product data entry activity flow. Activities undertaken by the admin are adding, changing and deleting data. First admin selects the data entry menu, then selects product data, the system displays the product data form, then input data, the system processes the product data store, the product data is stored, the system will save the data to the database, and the process. Done.

Below is the result of the implementation of the designed Information System. Starting the main page, the list page as admin, until the raw material data.


**Fig. 8 Display the main page of the Information System Requirements for raw materials**

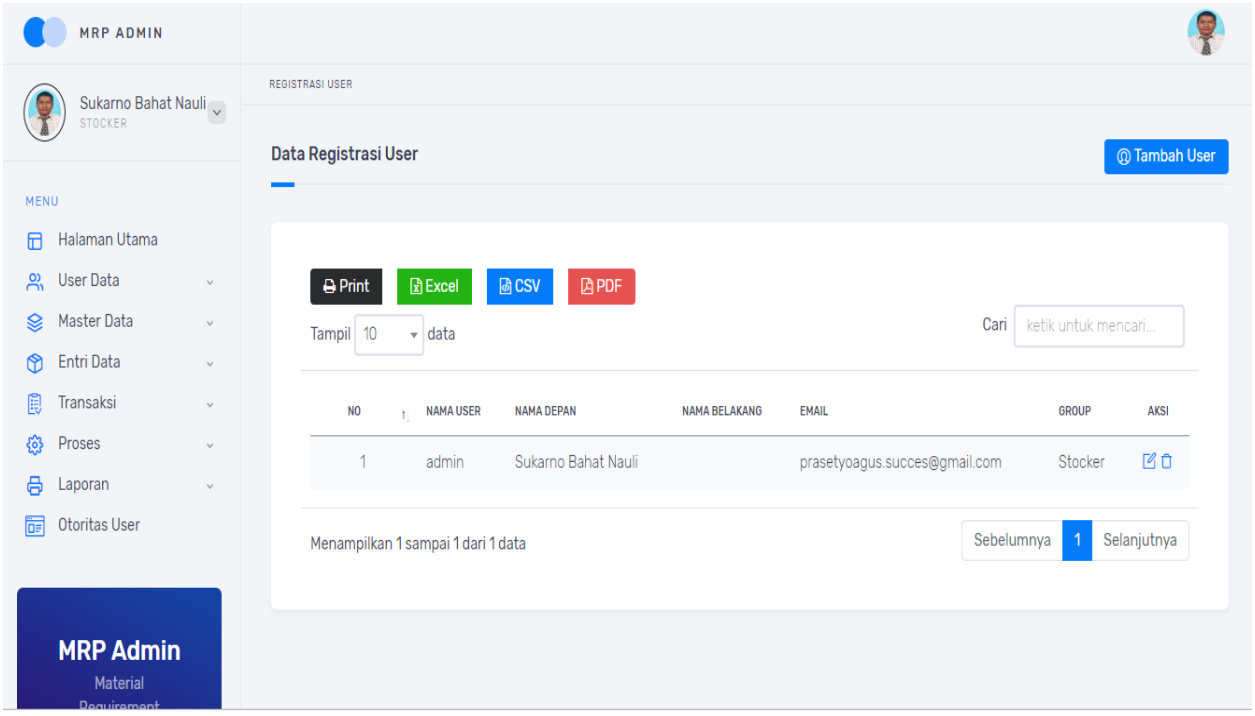


**Fig. 9 Display User Register Data from the Information System Raw material requirements**

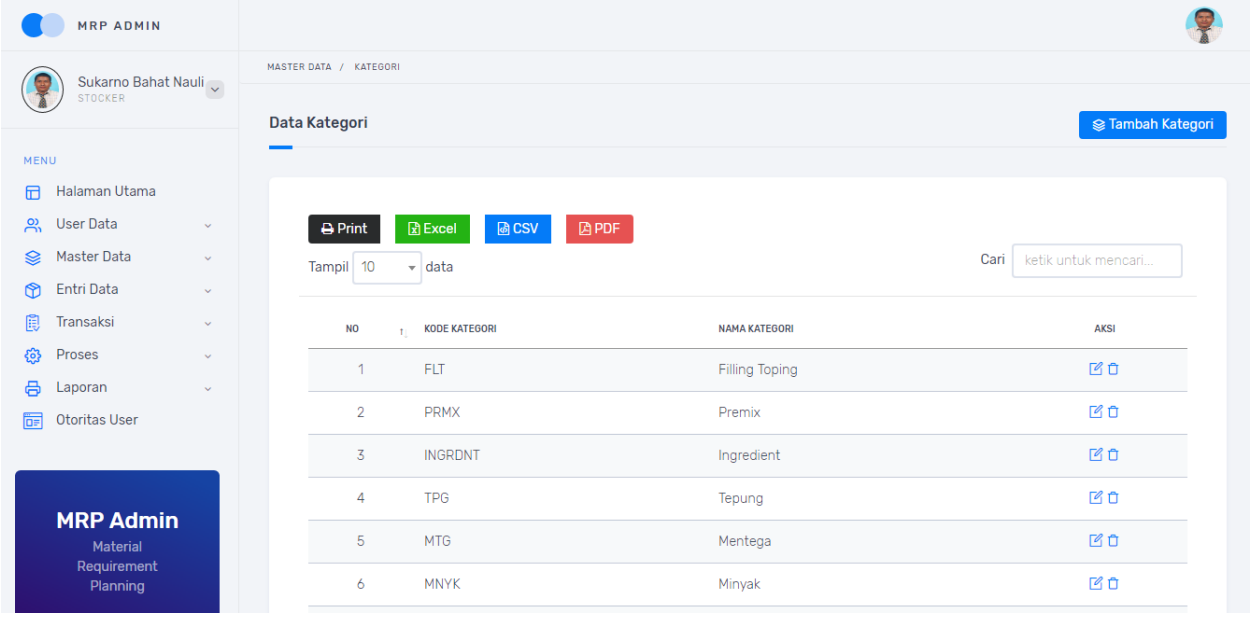


**Fig. 10 Display Data Categories of Information Systems Raw material requirements**

## IV. CONCLUSION

Has succeeded in Designing the information system needs of raw materials for the continuity of the bread production process properly, using the Personal Home Page and MySQL.

It is recommended in implementing this system, in order to use the latest computer hardware and software and be connected to the internet for connection between the personal computer in the bread-making room, the personal computer in the leadership room, and the cashier.

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