

# Build sorghum database for developing SEU digital network on sorghum website of Wijaya Kusuma Surabaya University

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**Abstract.** As the center of the sorghum entrepreneur, Wijaya Kusuma Surabaya University has many units of sorghum entrepreneurs is named SEU (Shorghum Entrepreneurship Unit). Each SEU has a variety of activities. The production of processed sorghum is unique. Therefore, need to build an SEU network. This research will be build a digital SEU network. In order that as a center of entrepreneur sorghum, Wijaya Kusuma University Surabaya is able to monitor and evaluate activity and sorghum products of SEU. There are 7 stages done in this research. First, activity for analysis of data needs, process needs, and information needs analysis in conducting monitoring and evaluation activities in SEU. Second, data flow analysis activities that occur in the process of monitoring and evaluation of activities in the SEU. Third, activity of storage analysis to store the data and information. Fourth, design of the entity relationship diagram of the database. Fifth, transformation activity on Entity Relationship Diagram to generate Entity Relationship Schema for the database. Sixth, create the Database Sorghum Script using Structured Query Language. Seventh, testing of database engine using MySQL.

## 1. Introduction

The Sorghum website named ifasorgum.com is a web used for the improvement of Wijaya Kusuma University Surabaya as a center for sorghum research and development [1]. In the process of sorghum development process, finally Wijaya Kusuma University became the Center of Entrepreneurship Sorghum (CES). As a CES, until now Wijaya Kusuma University Surabaya has several Sorghum Entrepreneurship Unit (SEU). SEU under the guidance of the University of Wijaya Kusuma Surabaya which provides a variety of foods and drinks based on sorghum with sweeteners also made from sorghum [2]. By having some SEU, then website ifasorgum.com need to be added a feature of digital network which will be used for development activity every SEU.

To support the digital network feature, this research will build a shorghum database. The sorghum database will be used as data storage of sorghum processed products and its processed types, SEU data, processed data of SEU owned products, and stock data of sorghum processed products owned by each SEU.



## 2. Theory review

Database conceptually defined a collection of interacting entities to achieve a certain goal [3]. The database is indispensable to many enterprises and their current uses vary. Almost every computerized application uses a database name. In building a database that is done first to do system modeling. Many methods are performed, one of which uses structured methods described by using Data Flow Diagrams commonly abbreviated as DFD [4].

From the DFD will be obtained Data Storage, then Storage data is used as a reference for designing a database. The design of the database itself begins with making Entity Relationship Diagram. Entity Relationship diagrams are transformed into Entity Relationship Schema [3]. The form of Entity Relationship Schema is what will be the foundation to build a Database.

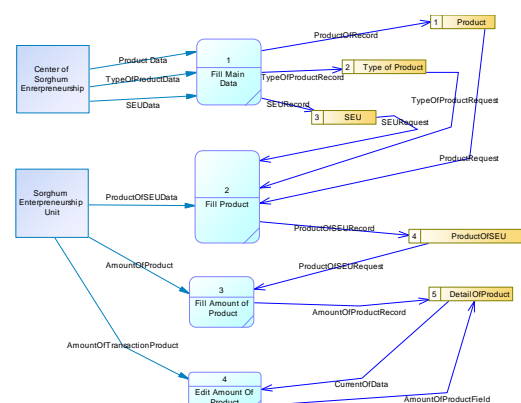
One method that will be used is the sorghum database method which will be used by using Software Development Life Cycle (SDLC) 4 Phase [4] method, which consists of: System Analysis, System Design, System Implementation, and Testing System [4]. In that method, each run is a recurring cycle, then this method will become more flexible by using other methods [5].

## 3. Discussion

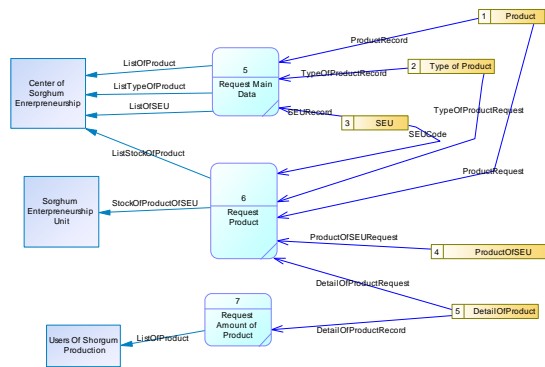
Referring to the SDLC method to be used [4], in this study each phase is described again into several stages, so in the next discussion using the stages that have been described in sequence namely: phase Analysis System consists of 3 stages, hereinafter referred to as the first stage, second, and third stage. Phase Design System consists of two stages, hereinafter referred to the fourth and fifth stages. The system implementation phase consists of 1 stage, hereinafter referred to as the sixth stage. Phase Testing System consists of 1 stage, hereinafter referred to as the seventh stage.

The first stage in this research is to analyze the data, process, and information needs in performing monitoring and evaluation activities in SEU. From the research results obtained data as shown in Figure 1 and Figure 2, namely:

- Data Requirement: Product Data owned by Center of Sorghum Entrepreneurship, SEU Data, Data Types of products owned by all SEUs, Data types of products owned by each SEU, Production Stock Data owned by each SEU.
- Process Requirement: Process to fill the main data, Process fill product data in each SEU, Process to fill amount of product produced by each SEU, and Process to fill change of product result data at each SEU.
- Information Requirement: List of Product Information, List of product type information, List of SEU information, List of stock of product, Stock of SEU product, List detail of product



**Figure 1.** Data flow in data entering activity.



**Figure 2.** Information required.

The second stage in this research is data flow analysis that occurs in conducting monitoring and evaluation activities at SEU. From the research results obtained data as shown in Figure 1 and Figure 2, namely:

- Data product: contains the results of sorghum processed products proclaimed by the University of Wijaya Kusuma Surabaya as a sorghum processed center
- Product type data: contains the type of product produced by SEU based on the classification of the product.
- SEU Data: SEU data which is a business incubator owned by UWKS Surabaya.
- SEU production data: production data produced by each SEU
- Total Production Data: The amount of production data produced by each SEU.
- Data on the number of production transactions: changes in data on the stock of production amounts in each SEU resulting from the sale of products and the addition of the number of products

The third stage of this research is data storage needs analysis. Where data storage is later that will be used to build the Sorghum Database. From the research results obtained data as shown in Figure 1 and Figure 2, namely:

- Data storage of Products: used to store data sorghum processed products that have been proclaimed by the University of Wijaya Kusuma Surabaya as a center of entrepreneurial shorgum
- Data storage of Type of Product: used to store various sorghum processed products classified by product type.
- Data storage of SEU: used to store SEU data.
- Data Product of SEU: used to store data products owned by each SEU.
- Data Storage of Detail of Product: used to store transaction data of processed products on each SEU masin. The data includes stock data that is influenced by the presence of new processed products and the sale of the product.

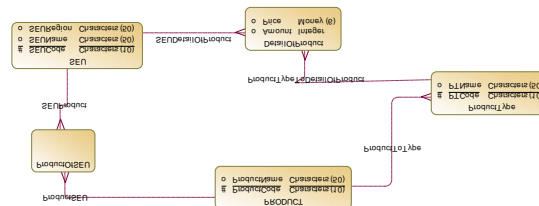
The fourth phase of this research is the Database design process which begins by designing Entity-Relationship Diagram. The basis of the database design is done by referring to the storage requirements shown in Figure 1 and Figure 2. From the research results obtained Entity-Relationship Diagram as shown in Figure 3, with the following components:

1. Entities: Product, ProductType, ProductOfSEU, SEU, DetailOfProduct

2. Relationship:

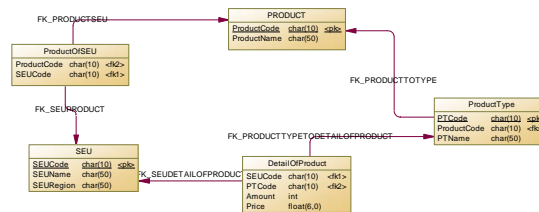
- ProductSEU: Relation between Entity ProductOfSEU and Entity Product with cardinalities many to one
- SEUProduct: Relationships between SEU Entities and ProductOfSEU Entities with one to many cardinality

- ProductToType: Relationship between Product Entities and ProductType Entities with one to many cardinalities
- SEUDetailOfProduct: Relationships between SEU Entities and Entities DetailOfProduct with one to many cardinalities
- ProductTypeToDetailOfProduct: Relation between ProductType Entities and Entities DetailOfProduct with one to many cardinalities



**Figure 3.** Conceptual model of sorghum database.

The fifth stage in this research is transformation process from Entity-Relationship Diagram which has been designed into a Physical model named Entity Relationship Schema. From the research results obtained Entity-Relationship schema as shown in Figure 4.



**Figure 4.** Physical model of sorghum database.

#### 4. Result

The sixth stage is the implementation of the sorghum database by creating a structured query language script adapted to the database engine that will be used on ifasorghum.com [6].

Component forming the database adapted to the physical model database sorghum as shown in Figure 4. The results of the script are as follows:

```

create table DETAILOFPRODUCT
(
    SEUCODE          char(10),
    PTCODE           char(10),
    AMOUNT           int,
    PRICE            float(6,0)
);

create table PRODUCT
(
    PRODUCTCODE      char(10) not null,
    PRODUCTNAME      char(50),
    primary key (PRODUCTCODE)
);

create table PRODUCTOFSEU
(
    PRODUCTCODE      char(10),
    SEUCODE          char(10)
);

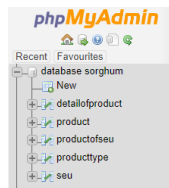
create table PRODUCTTYPE
(
    PTCODE           char(10) not null,
    PRODUCTCODE      char(10),
    PTNAME           char(50),
    primary key (PTCODE)
);
    
```

```

create table SEU
(
  SEUCODE      char(10) not null,
  SEUNAME      char(50),
  SEUREGION    char(50),
  primary key (SEUCODE)
);

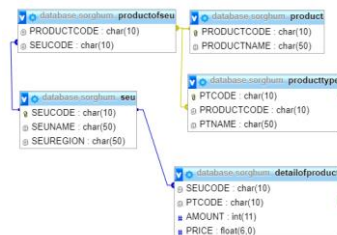
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The seventh stage is the testing of the sorghum database script into the database engine, which is MySQL. Figure 5 shows the components of the sorghum database consisting of 5 tables, namely Table of SEU, Table of Product, Table of ProductType, Table of ProductOfSEU, and table of DetailOfProduct.



**Figure 5.** Database of sorghum using MySQL.

Figure 6 shows the structure of all tables owned by the sorghum database and the designer of the sorghum database tested on the MySQL database engine.



**Figure 6.** Designer of database sorghum using MySQL.

## 5. Conclusion

From the research results obtained some conclusions in outline is as follows:

- Building a sorghum database requires as many as seven steps to become a database that is testing on the MySQL database engine.
- The Sorghum database built has 5 interrelated tables which can be used to support SEU digital network activities owned by Wijaya Kusuma University Surabaya.

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