DATA MINING APPLICATION OF BEVERAGE PRODUCTS MARKETING IN PEPSI COLA INDOBEVERAGES COMPANY USING CLUSTERING METHOD

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ABSTRACT

In the dynamic and very competitive world of commerce or business, the people involved have to be fully prepared of the ways to surviving and developing their business range.

Pepsi Cola Indobeverages Company is a consumer products company focused on beverages. Pepsi Cola Indobeverages Company is not the only one company that focused on beverages in Indonesia, there are several companies with similar direction. It is surely arising business competitions among the companies.

To be up against the business competitions and to improve company financial rewards, the company must have an ability to take the appropriate decision of definitive marketing strategies of their beverage products. The availability of abundant data, the necessity of information (or knowledge) as the proponent to take the appropriate decision of establishing business solutions, and the infrastructure supports in information technology are the pioneers of data mining technology. Data mining purpose is to give the real solution for the decision maker of business, and to developing their business range.

The one of data mining method that used in this research is Clustering, it is identify object with the similarity of certain characteristics, and then using those characteristics as the "vector characteristic" or "centroid".

The result of this research is an application that will make analyze of huge data set easier then helpful to give information as a basic feature of company's decision makers.

Keywords : *business competition, business solution, information technology, data mining, clustering*

1. INTRODUCTION

1.1 Background

In the dynamic and very competitive world of commerce or business, the people involved have to be fully prepared of the ways to surviving and developing their business range. To reach that ability, three requirements have been summarized are addition of product types also increasing product capacities, reduction of company's operational cost, and increasing marketing efficacy and profit. To fulfill these requirements, many ways that can endure, one of those is analyze company's data.

Pepsi Cola Indobeverages Company is a consumer products company focused on beverages. As a big company, Pepsi Cola Indobeverages Company seeks to produce various beverage products with different names and packages. Pepsi Cola Indobeverages Company is not the only one company that focused on beverages in Indonesia, there are several companies with similar direction. It is surely arising business competitions among the companies.

To be up against the business competitions and to improve company financial rewards, the company must have an ability to take the appropriate decision of definitive marketing strategies of their beverage products. To take that appropriate decision, the company needs some adequate information to be analyzed further.

The availability of abundant data, the necessity of information (or knowledge) as the proponent to take the appropriate decision of establishing business solutions, and the infrastructure supports in information technology are the pioneers of data mining technology. Data mining purpose is to give the real solution for the decision maker of business, and to developing their business range.

The one of data mining method that used in this research is Clustering, it is identify object with the similarity of certain characteristics, and then using those characteristics as the "vector characteristic" or "centroid". This clustering has been used by several companies to make report of general characteristic of different consumer groups. The clustering process that will be conduct is Agglomerative Hierarchical Clustering Algorithm (AHC algorithm).

1.2 Problem Identification

Referring to the background, the identifying and researching problem is:
How to applying Data Mining on beverages product selling in PEPSI COLA INDOBEVERAGES COMPANY using the clustering method.

1.3 The Aim and The Purpose

Based on the identifying problem, the aim of this final assignment is to build the Data Mining application on beverages product selling in Pepsi Cola Indobeverages Company using the clustering method.
While the purposes that willing to be reached are:

1. To make analyze of huge data set easier.
2. Helpful to give the information from processed selling data.
3. To give the basic feature of company's decision makers.

2. MODEL, ANALYSIS, DESIGN, AND IMPLEMENTATION

2.1 Model

Data analysis technique of software construction using software modeling with waterfall paradigm as shown in Picture 1.1, consist of several process which are:

a. System / Information Engineering
It is a part of the biggest system in a project construction, begin with determine various requirement from the entire element that necessary for the system and allocated it into software construction.

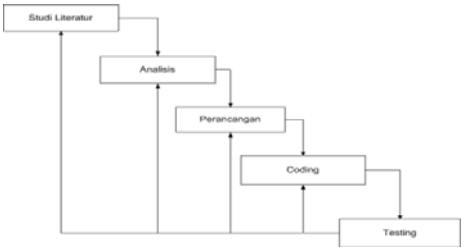
b. Analysis
It is analysis stage of materials that necessary to perform the software construction project.

c. Design
It is translation stage of analyzed data into comprehensible form for user.

d. Coding
It is a stage of translation data or problem solving that has been designed into specific programming language.

e. Trial
It is a trial of the constructed software.

f. Maintenance
It is a final stage where the settled software may have any modification or addition congruent with the user demand.



Picture 1. Waterfall Paradigm

2.2 Analysis

A. System Analysis

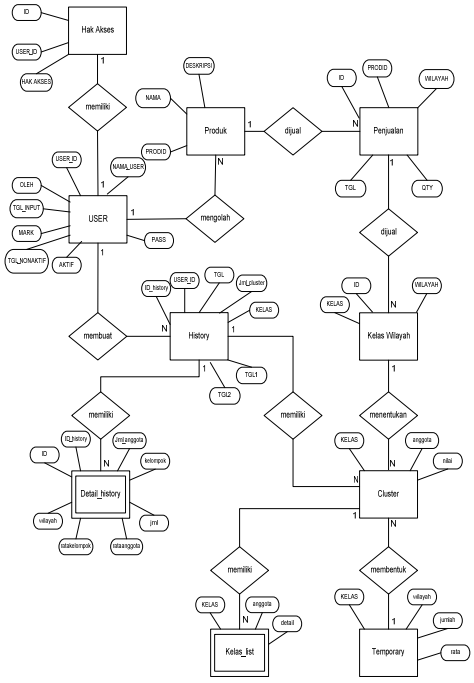
System analysis defines as disperse of an intact information system into parts of its component as the objective is to identifying and evaluating the problems, opportunities, obstructions that happened and the requirements so the improvements can be suggested. Or in easy way, system analysis is a research on the existed system with purpose is to design a new system or renew it. This analysis system stage is a very critical stage and very important, because any mistake in this system will also causes

mistake in the next stage. The main task of analysis system is to find the weakness of performing system so the improvement can be suggested.

B. Basis Data Analysis

The logic structure of basis data is drawn into a graphic using Entity Relationship Diagram (ERD). ERD is a relationship between entities that used in the system to describe the relationship between entities or data structure and relation among files.

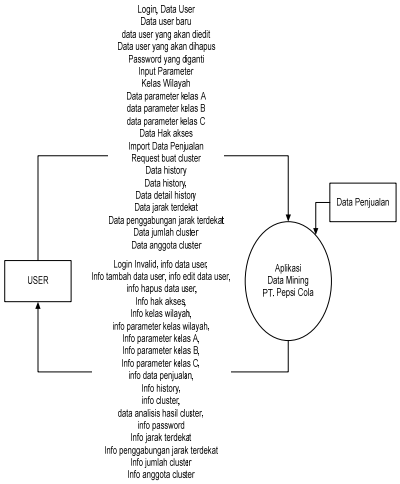
The main component ERD formation are Entity and Relation then in this item ERD are components of entity complex and relation complex that showed more specific by several properties describing the entire facts of the following system. The ERD of constructed application are below:



Picture 2. Entity Relationship Diagram (ERD)

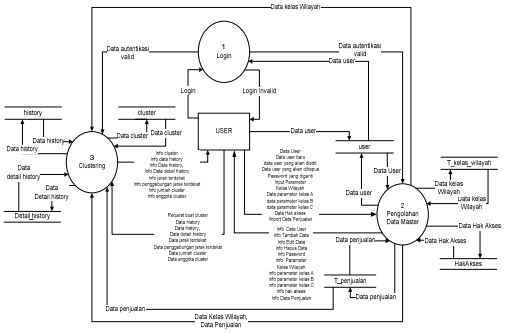
C. Functional Requirement Analysis

1. Context Diagram



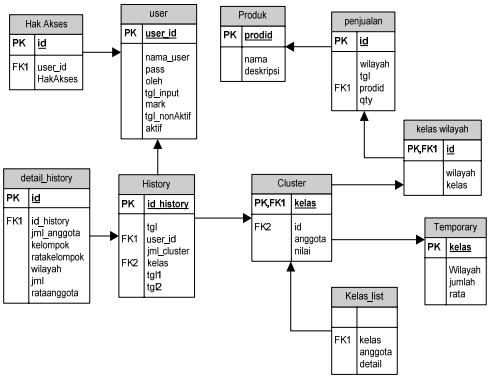
Picture 3. Context Diagram

2. DFD Level 1



Picture 4. DFD Level 1

3. Relation Scheme

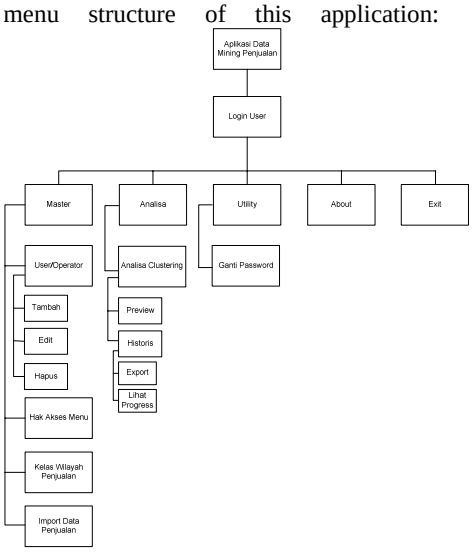


Picture 5. Relation Scheme

2.3 Design

A. Menu Structure Design

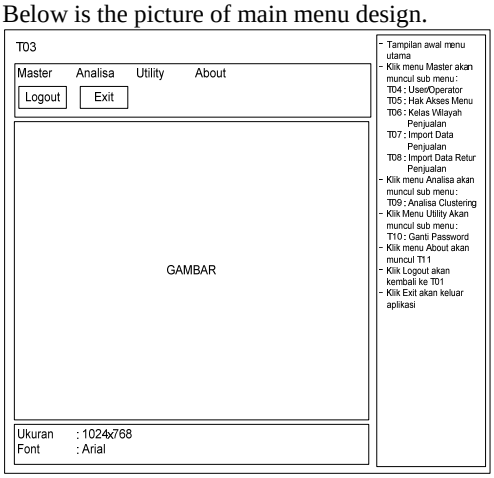
Designing an application need a menu structure contains of menu and submenu with function is to make user applying the application easier. Below is showing of menu structure of this application:



Picture 6. Menu Structure Design

B. Application Main Menu Design

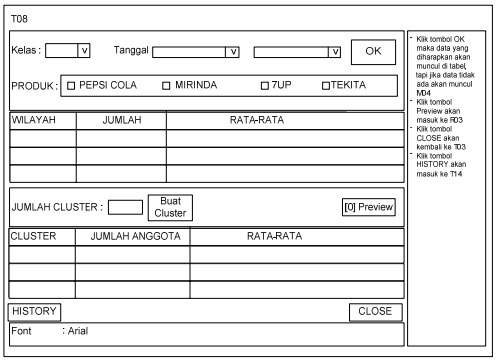
Below is the picture of main menu design.



Picture 7. Main Menu Appearance

C. Clustering Process Appearance Design

Below is the picture of clustering analysis design.



Picture 8. Clustering Analysis Appearance

2.4 Implementation

The implementation of the constructed system will be done in this stage after analyzing and designing has been finished. Then will be implemented to the utilized programming language.

A. System Implementation

The implementation purpose is to confirm the designing program module to the performer system so that user can give the input to the system builder.

B. Hardware Implementation

The hardware that used to implementing the system are below:

1. *Processor* : Pentium 4 2,66 GHz
2. *Harddisk* : 80 Gb
3. *Memory* : DDR 256 Mb
4. *Monitor* : 15”

C. Software Implementation

The software that used to implementing the system are below:

1. *Windows XP* Operational System
2. MySQL 5
3. WAMP 5
4. SQLyog Enterprise – MySQL GUI v7.14
5. Delphi 7
6. Component Delphi 7

D. Form Implementation

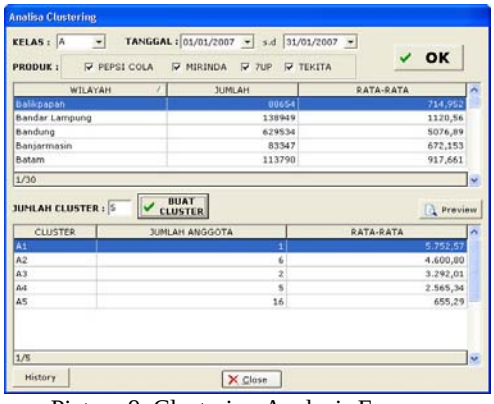
Form implementation is performed to know each program page that has been made. Below is the form implementation:

Table 1. Form Implementation

Menu	Description	Nama File
Beginning Appearance	Program file to show the beginning page of application	unPra_Login.pas
Login User	Program file to handle user login	unLogin.pas
Main	Entire system process	unMain.pas
Data Master	The processing user data, authorization access, selling zone class parameter input	unUser.pas, unUser_Input.pas, unTrustee.pas, UnKelasWilayah.pas
Password Change	Program file to change user password	unGantiPassword.pas
Import Data	Program file to import data	unImportPenjualan.pas, unImportReturPenjualan.pas
Clustering	Cluster making process, history, export, and progress	UnAnalisaPeringkatPerBulan.pas Unit1.pas UnProgress.pas
Module Data	Program file to collecting component connection, table, query, data source	UDM.pas

3. RESULT AND DISCUSSION

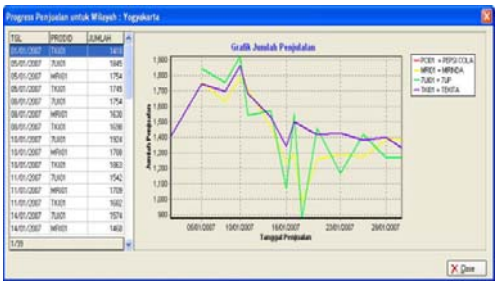
From the analysis and the designing that has been done, the result of the constructed application shown as these appearances below:



Picture 9. Clustering Analysis Form



Picture 10. The Report of Clustering Analysis Result



Picture 11. Progress Look Form

4. CONCLUSION AND SUGGESTION

4.1 Conclusion

After the analysis, designing, and trial, the conclusions obtained are:

1. The constructed application is helpful for PEPSI COLA INDOBEVERAGES COMPANY as a feature of decision maker in the framework of gaining selling product pattern result.
2. Data processing is resulting adequate information to be analyzed further.
3. The constructed application decreasing the stack of data which useless before.

4.2 Suggestion

Based on the conclusion above, the expectation next is this application can be more developed further with more huge data processing so that the application truly can be used as one of the more accurate and more useful company's decision maker feature.

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