

# Developing Sales Information System Application using Prototyping Model

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**Abstract:** This research aimed to develop the system that be able to manage the sales transaction, so the transaction services will be more quickly and efficiently. The system has developed using prototyping model, which have steps including: 1) communication and initial data collection, 2) quick design, 3) formation of prototyping, 4) evaluation of prototyping, 5) repairing prototyping, and 6) the final step is producing devices properly so it can used by user. The prototyping model intended to adjust the system in accordance with its use later, made in stages so that the problems that arise will be immediately addressed. The results of this research is a software which have consumer transaction services including the purchasing services, sale, inventory management, and report for management needed purpose. Based on questionnaires given to 18 respondents obtained information on the evaluation system built, among others: 1) 88% strongly agree and 11% agree, the application can increase effectiveness and efficiently the organizations/enterprises; 2) 33% strongly agree, 62 agree, and 5% not agree, the application can meet the needs of organization/enterprise.

**Keywords:** transaction; transaction system; sales; prototyping model

## 1. INTRODUCTION

At this time, the recording process of purchasing and selling transactions is important to support the effectiveness and efficiently in services to consumer. Furthermore, many software has developed by organizations or enterprise to support many aspect including to increase sales, consumer satisfaction, other positive impact on profitability [1], which using various media, such as desktop personal computer, web-based, and also mobile application [2]. This research aimed to develop sales transaction information system using a prototyping model. The basics task based on functionality aspect, an information system can be identified meets [3]:

- Gathering information,
- Storing information,
- The processing of information,
- The transmission of information,
- Presenting information

Nowadays, Information systems exist because they are an integral part of a modern organization [4]. The information system is composed of humans, machines, and methods. A company running an operating activity relevant companies uses the data to generate information, information systems can connect a computer with machine storage media, office machines (fax, copy machine), communications equipment (controllers, routers), and other storage media [5]. Culture plays an important role in affecting software piracy, and individual behavior in general [6].

Some of the research that previously successfully created and have almost the same problems with this system, including research about problems of sales system that includes sales, sales reports and inventory reports [7]. In this work the agency rewrite of an existing file into the computer so making the report takes a long time at the end of the month, therefore the researchers designed a sales system that directly fill in the data transaction and sales reports every day in a system and then develop applications a sales system that will provide service in sales, especially in making monthly reports.

Other researcher has developed a web-based application for motorcycle sales to solve the problems of the existing sales system and purpose to increase income of selling [8], web-based automobile sales management system [9]. Web-

based information for the purchase and sale also has developed before to simplify the consumers to obtain information about the goods and increase the efficiency and speed of consumers service [10].

Basically, such research has been able to solve the problems of selling, but fundamental differences with the system to be built there is the scope of sales which emphasizes the aspects.

## 2. METHOD

In the designing the system to be developed can use prototyping models. Prototyping is something is not complete, but something that should be evaluated and modified again. Any changes can happen when prototyping created to fulfill of user needs and at the same time allows developers to better understand the needs of users [11]. Prototyping is not a complex thing, but something that must devaluation and modified again. The steps of prototyping model, described as [11].

1. Communication and initial data collection. An analysis of user needs.
2. Quick design. A design in general to redevelop.
3. Formation of prototyping, the manufacture of the device prototyping testing and refinement.
4. Evaluation of prototyping. Evaluating and refine the analysis of the program were needed.
5. Repair prototyping. The manufacture of the actual types based on results of the prototyping evaluation.
6. The final step is producing devices properly so it can use by user.

Implementation of an application to the database in the development of this system used Entity Relationship (ER) data model and Relational data model. ER diagram express entire logical structure of a graphical database. ER diagram has a quality that is clear, simple and allows to explain most of the database structure or the extension of the use of the ER model [12]. ER data model must be reduced to Relational data mode if it will be implemented to database management systems.

### 3. RESULTS AND DISCUSSION

Analysis of systems has important function in the details and design of a new information system. This analysis process is a step in understanding problems before taking an action or decision of completion the main results. Next on the stage of system design purpose to provide an overview of the system being designed. Illustration interface design of applications that are built as in the figure 1.

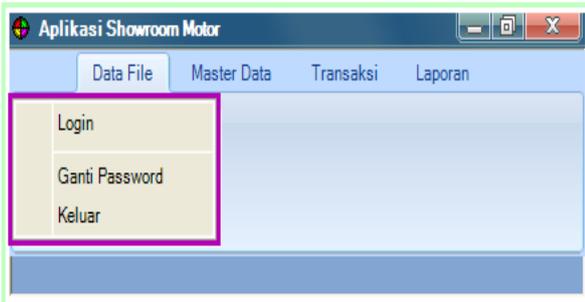


Figure 1. Design of program's main form

To design a database used the Entity Relationship (ER) Model and Relational Model. With ER model describes the real world data model ER model is very useful in mapping the meaning and the company's interaction to a conceptual schema so many database design tool draws on the concepts from the ER model [12]. Model E-R data using three basic concepts:

1. Entity Sets (ES). ES is objects/thing in the real world that can be distinguished from all other objects/thing.
2. Relationship Sets (RS). Several entities can be associated each others.
3. Attributes are properties that having by Entity Sets. Each attribute have domain to describe a set of values that allowed.

Results of the ERD will contain several Entity sets that describe the relationship among others (Figure 2). The rectangle is divided into two parts to represent entity. To design the ERD follow to Sileberschatz et. al. [12], in this case we used several object, such as: 1) The rectangle contains the name of the entity set and all the attributes of the entity set, 2) diamonds to represent relationship, 3) a line used for connected among entities and relationships.

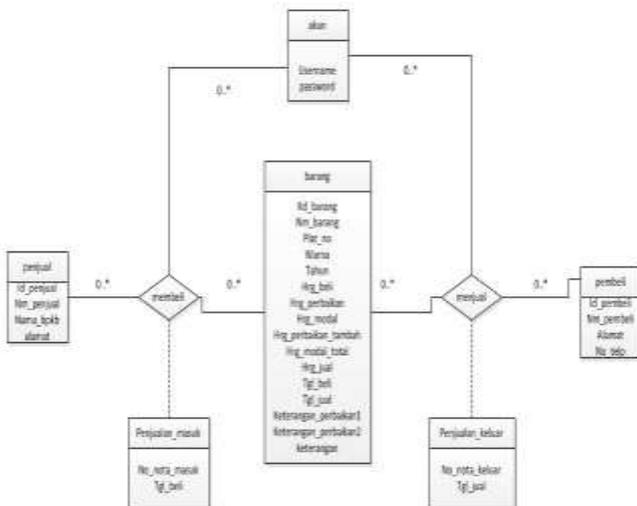


Figure 2. ERD sales transaction systems

Figure 3 shown a Relational data model which resulting from ERD (Figure 2), called database schematic diagram which describe tables in a database and the relationship among others. Relational data model suitable to be implemented in database management system (DBMS).

The database is a collection of data that contains information [12], it appears to be computerized data management to allow users to manipulate information that stored to supply the organization needed.



Figure 3. Schematic design database

The process for each process and data flow at the system is used Data Flow Diagram (DFD). DFD is a graphical representation which describes the flow of information and the transformations are applied as data moves from input to output. Data flow diagrams can be used to represent a system or software at any level of abstraction. DFD provide an additional of information used as long as domain analysis of information and serves as a basis for modeling of functions [11].

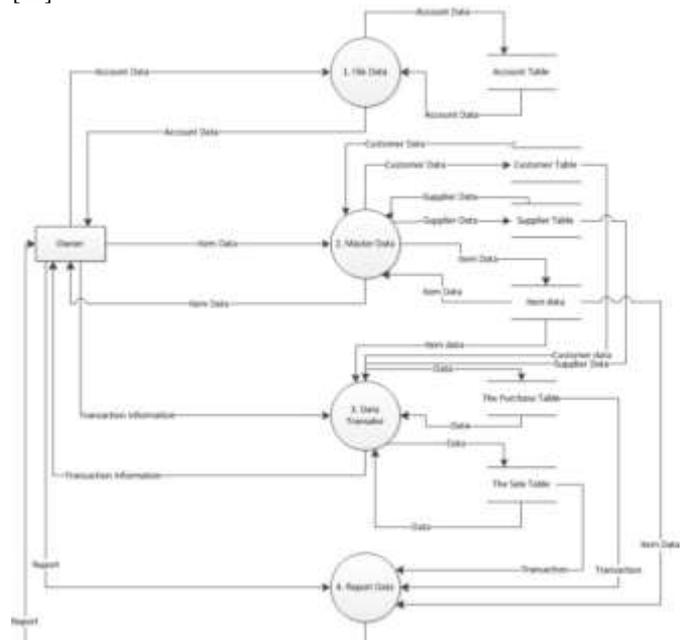


Figure 4. DFD level 1

In this research we created several level DFD including : DFD level 0 or context diagram, DFD level 1, DFD level 2 process 1 for file data, DFD level 2 process 2 for master data, DFD level 2 process 3 for transactions process, and DFD level 2 process 4 for reports process. The DFD Level 1 shown in Figure 4, which it describes the all system process developed.

In the relational database SQL commands (Structure Query Language) which includes DDL (Data Definition Language) and DML (Data Manipulation Language) [12]. DDL associated with specification of the structure of the database including the relation schemas, domains, constraints (constraints),etc. Example of DDL about account table (Figure 5).

```
CREATE TABLE 'akun' ('username'
varchar(50) NOT NULL, ON PRIMARY KEY
'password' varchar(50) NULL
```

Figure 5. DDL CREATE TABLE

Next DML is used to query information includes select, add, update, and delete. Example DML in Borland Delphi applications for account table can view in figure 6.

```
Sql.Text:='SELECT * from akun where
username='+QuotedStr(Edit1.Text)+'and
password='+QuotedStr(Edit2.Text);
```

Figure 6. DML for Account Table

In this interface, we can see a button entry, which when the account data is entered, the data is checked in the database, if it is found then the user can access the program, but if it is not found, it will display a warning message that the account does not exist, Interface design for information systems account is presented in Figure 7.



Figure 7. Account Form

The system information sale, overall include some form application. Main Form in the figure 8. In the Main form has menu from file data, master data, transaction, and report.

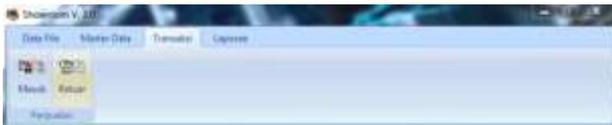


Figure 8. Main menu

In the form of purchase will be seen data that must be filled, the data that has been filled will be stored in the database. In the form of purchase, there are two main buttons is save button and change, which if it was wrong data entry

will still be replaced, but the date and number of nota could never be modified, is used as a reference if there is a change so the purchase history can still be seen.

Interface design for transaction system has 2 form, purchase and sale. The Form purchase can view in figure 9.

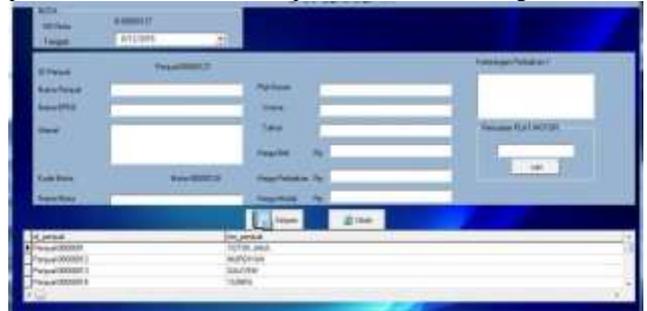


Figure 9. Form Purchase

Form of selling a form to enter sales data, which when a sale is the first thing to do is find code of product to be sold, then you will see the data which cannot be edited, but can still fill in the data of people which will buy. To direct nota will be automatically filled. In the search, which has sold product code cannot be done again because the sales transaction data in the database automatically updates the product data in the master data. Selling Form can be seen in the figure 10.

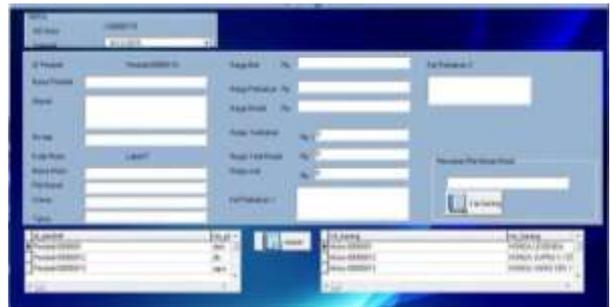


Figure 10. Selling Form

The sales transaction system will direct can be used to print a report purchases, sales, and inventory for each month. Furthermore, the transaction and reporting services will be faster. The sales report shown in Figure 11, the date of report can be adjusted to determine period of report. The system will be looking for the data in the database accordance with that date perform transactions on period date.



Figure 11. Sales report form

Based on questionnaires given to 18 respondents obtained information on the evaluation system built, among others: 1) 88% strongly agree and 11% agree, the application can increase effectiveness and efficiently the organizations/enterprises; 2) 33% strongly agree, 62 agree, and 5% not agree, the application can meet the needs of organization/enterprise.

#### 4. CONCLUSION

The results of this works including:

1. An information system that can be used to purchases report, sales, inventory information, and reporting information based on management needed.
2. Entity Relationships data model produces four entities, and in Relational data model produces seven tables that have relationship among others, and one table not have relationships.
3. The process can be serve by the system are: 1) account management; 2) master data of items, costumer, and producer; 3) Purchase and sales transaction; and 4) report transactions.
4. Based on questionnaires given to 18 respondents obtained information on the evaluation system built, among others: 1) 88% strongly agree and 11% agree, the application can increase effectiveness and efficiently the organizations/enterprises; 2) 33% strongly agree, 62 agree, and 5% not agree, the application can meet the needs of organization/enterprise.

## 5. ACKNOWLEDGMENTS

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