THE USE OF WATERFALL MODEL IN APPLICATION DESIGN WEB-BASED *MARYAM* DEPARTMENT STORE

Indarti[1], Dewi Laraswati[2], Adi Supriyatna[3]
[1]Sistem Informasi, Universitas Bina Sarana Informatika
[2]Teknologi Komputer, Universitas Bina Sarana Informatika
[3]Sistem Informasi Akuntansi, Universitas Bina Sarana Informatika
Jl. Kramat Raya No.98, Senen, Jakarta Pusat

Article Info	ABSTRACT
	Maryam Department Store is a groceries sales business. Cause of high demand for groceries needed by consumers, it also needed to notes the report fast. In increasing the service and ease of transactions, so thats way the system design in selling at Maryam Department Store. The implementation of this information system is expected to be a solution in solving problems and progress at Maryam Department Store. The system design model used is prototyping. The result of this research is a programming application for Maryam Department Store based on Web

Corresponding Author:

Indarti
Sistem Informasi
Universitas Bina Sarana Informatika
Jl. Kramat Raya No.98, Senen, Jakarta Pusat
Email: indarti.ini@bsi.ac.id

1. Introduction

The development of computer has a lot of benefits and advantages, because the sophistication of computer make everything fast process. The use of computerization is efficient in various aspects of life, there are business, education or government. It can increase productivity in time and up-to-date.Computers and cell phones are used in supporting internet to search, process and obtain information on variety of applications [1].

According to [2] in Hendry Jaya, "Sales are activities carried out by seller in selling goods or services to earn a profit from these transactions or transfering the goods and services from seller to buyer. Many businesses use internet to operate the company activities both in marketing or selling process [3] it called e-marketing. E-marketing able to expand the market network and able to make customers easier to find the product information and transaction online.

Sales transactions at Maryam Department Store still manually, it has not been computerized so it requires accuracy in big transaction in managing data [4]. On the other hand, a computerized system makes the information received about the stock of goods easily and quickly [5].

Website-based sales information system facilitate easy transactions and information received by customers quickly and real time [6]. A web-based computerized system is be able to accommodate customer needs in searching, able to give ease ordered process supporting the professionalism of all employees and data processing automaticly [7]

The department store sales application program includes incoming goods transactions, stock goods, and outgoing goods transactions to customers. This applications included in the point of sale application and can be applied in department stores or store warehouses.

With the existing problems to be more optimally, the management of goods sales at stores through website includes admin pages, it contain Master Data Suppliers, Goods, Units, Stocks, Users, Sales Transactions and report.

Table 1.
Literature Research

Author	Research Problem	Methods	Result of the Research
Frieyadie, Ummi Fatayat	The process of ordering and selling cosmetics is still manually by using telephone or coming directly to the shop then it will be recorded in the order book so that it is possible for errors record	Waterfall	Mobile applications using the Android platform with Augmented Reality technology and be able to display brochures in an attractive and realtime manner.
Ratih Wahyuningrum	To find out the reason of interest and un-interest in online buying towards e-commerce website and to analyze e-marketing strategies to increase people's online buying interest in fashion products.	Qualitative and quantitative research methods with a descriptive approach	Analisis dan perancangan strategi e-marketing sebuah perusahaan pada produk fashion sangat diperlukan untuk mengetahui titik kekuatan dan kelemahan competitor demi meningkatkan omzet perusahaan Analyse and design of a company's e-marketing strategy on fashion products is needed to determine the strengths and weaknesses of competitors in to increase company's omzet.
Amelia, Joni Devitra	Inventory data management is still manually	Prototype	Inventory management information system prototype at Advan Service Center Jambi
Dewi Laraswati, Marlina	Information is still limited and conventionally, the ordering process is not flexible and data processing is not automated	Waterfall	Produce a web-based wedding package information system to accommodate customer needs in finding wedding or catering information
Dewi Laraswati	The sales system is still manually or there is no automation process in processing sales data for heavy tools at PT. HKP. The factors of main problem include data,	Waterfall	Sales information system design is expected to solve the existing problems at PT.HKP

documents, methods and
human resources

2. Research Method

This research used case study method by conduct the investigation at Maryam Department Store and several similar stores, especially in sales sector, until the existing problems are found. The system development model used is the waterfall model. The steps of this model are divided into five steps:

a) System Requirements Analysis

At this step, system requirements analysis is the first step to collect data, problem identification, problem solving suggestions, and system requirements analysis focused on making an application.

b) Design

Design is the step where design is provided into the expected design by using UML, Entity Relational Diagram (ERD).

c) Code Generation

In this step, the application of the design results is implemented into a program computer system by using OOP programming (object-based orientation).

d) Testing

In testing step, the program must be tested and focused on ensuring that all existing commands have been tested and external functions by using black box testing.

e) Support

Support is maintenance of data in applications regularly.

3. Result and Discussion

3.1. Software Requirements Analysis

A. Phase of Analysis

The department store sales system is made on a web-based in cash. It consists of customer table, goods table, user table and sales transaction table. In running program, the cashier can use a media browser. The following is described the needs of the Department Store sales system:

1. Needs User Pages

A1. Users can login by entering email and password

A2. User can process User data

A3. Users can process goods data

A4.User can process Customer data

A5.User can process sales transaction data

B. Use Case Diagram

1. Use Case Diagram of Department Store Sales Information System
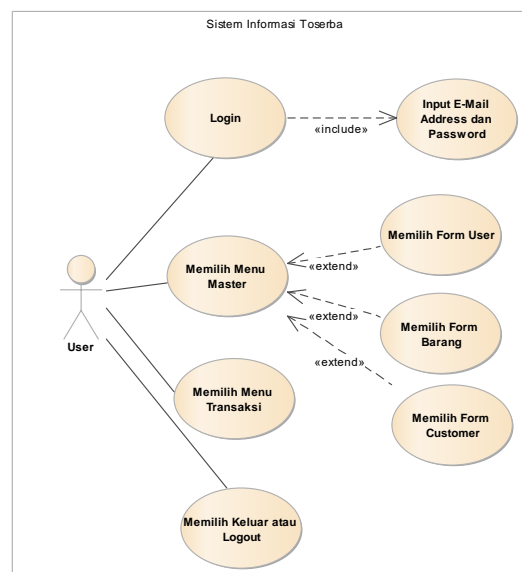

Figure 1. Use Case Information System of *Toserba Maryam*

39

The use case diagram in the image above can be explained in the scenario table for use case login into the system:

<div align="center"><i>Tabel 1</i></div>
<div align="center">Description Use Case Page Login</div>

Use Case Name	Login
Requirements	A1
Goal	User can enter into Toserba Information System
Pre-Conditions	User enters email and pasword
Post-Conditions	User can access main menu
Failed end Condition	User invalid to enter email or password
Primary Actors	User
Main Flow / Basic Path	1. User enter email and password 2. System will make to email and password 3. It repeats if wrong input 4. If valid, system will display main menu
Invariant	1. System reads valid or invalid email or pasword

C. Activity Diagram

Activity diagram describes the flow of a system, almost the same as flowcharts, but the difference is can support parallel behavior. The following is the activity diagram used in describing the flow of the *Maryam* Department Store system.

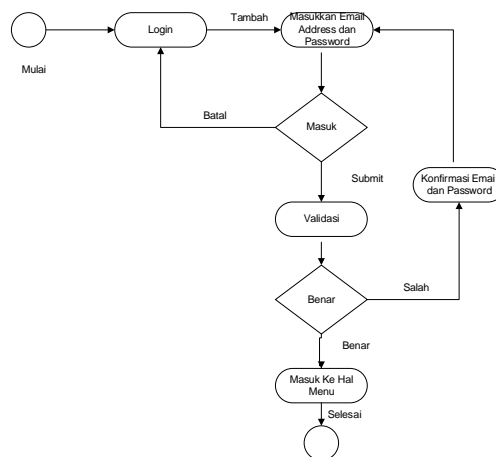1. Activity Diagram Login Page

Figure 2 Activity diagram login.

In Figure 1 above illustrates a diagram of the activity of the user when loggin by entering their email and password.

D. Entity Relationship Diagram (ERD).

ERD is used to describe a data model from a database into a system. It consists of entities, attributes and relationships. The image below is an ERD model from the database used in Information System for Implementation in database design in sales system application at *Maryam* Department Store by using MySQL
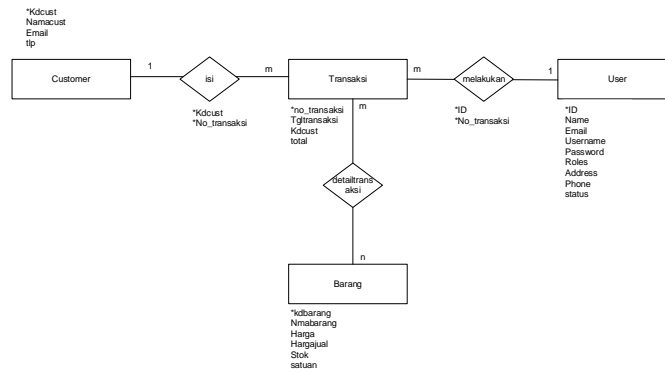
Figure 7 Model of ERD

E. Logical Record Structure (LRS)

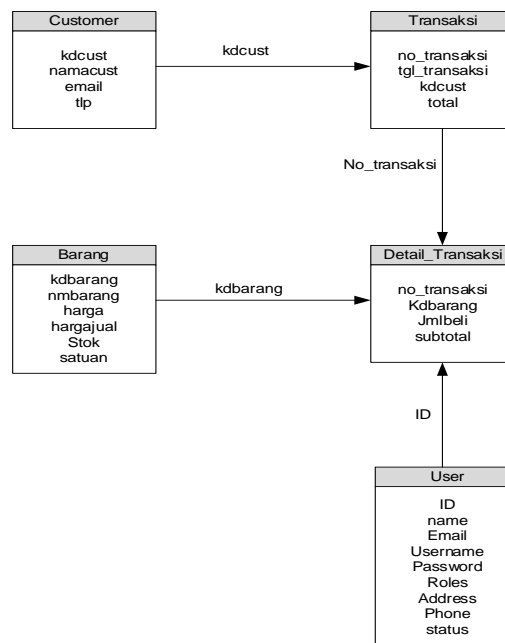In the Logical Record Structure image below shows the logic flow of a record in the system design.

Figure 8. Logical Record Structure Model.
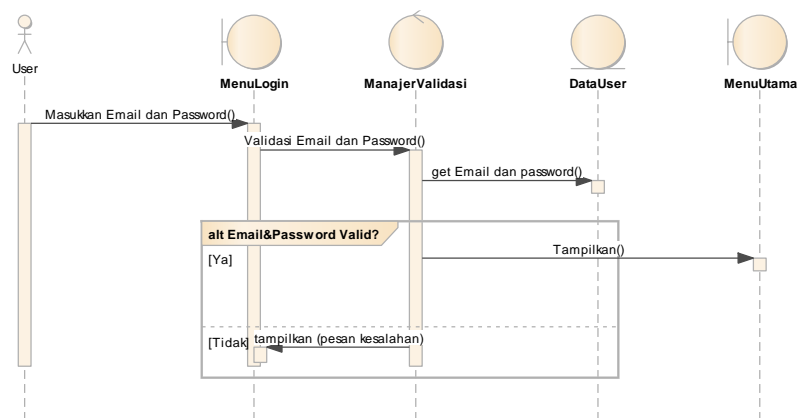
D. *Sequence Diagram*

Figure 9. Sequence Diagram.

In the picture above is a sequence diagram for the login menu. It describes the interaction between the user and objects in the system in the form of a message.

I. *Admin Interface*

1. Display Form Login User

Figure 11. Display of Form Login User
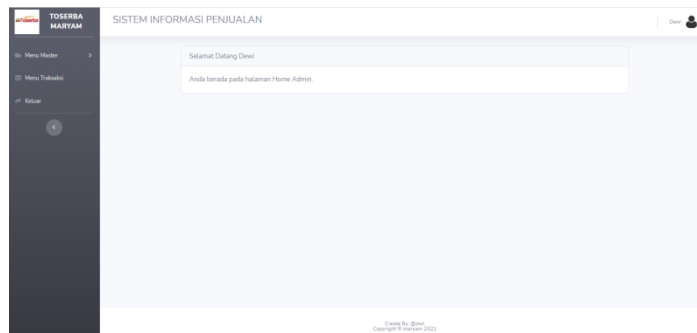
2. Display Home User Admin
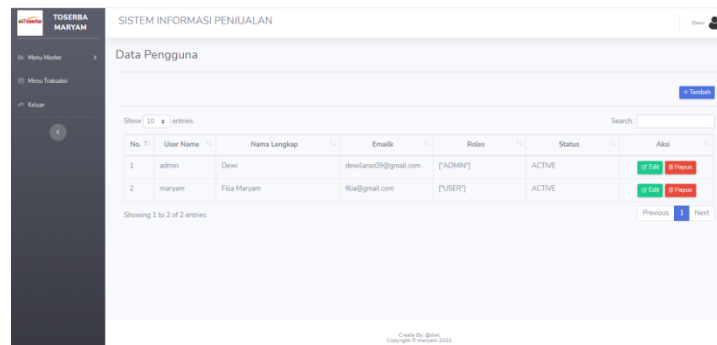

Figure 12. Display Home

3. Display Form User

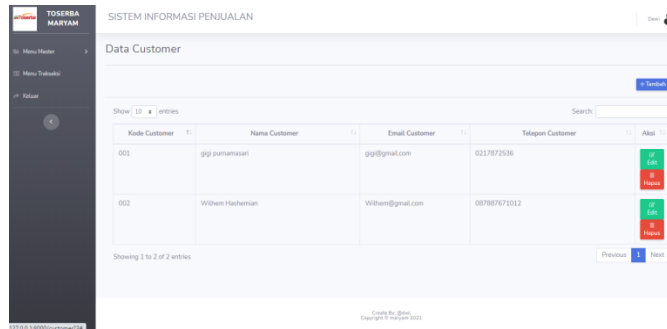*Figure 13*. Display Form User

4. Display Page Customer Data

Figure 14 Display Page Customer Data
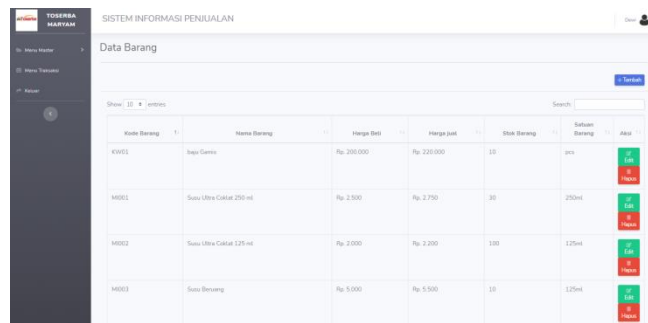
5. Display Page of Products Data

Figure 15 Display *Halaman* Form *Barang*

6. Display Page Menu of Selling Transaction
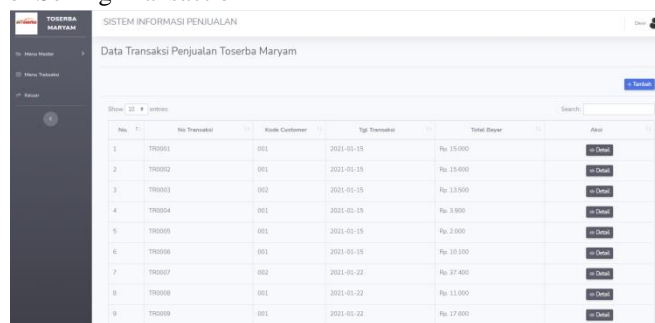
Figure 16 Display Page Transaction

4.4. Testing

Testing of programs is using blackbox testing focused on the process of program input and output.
A. Testing of the User Login Form.

Tabel 10
Testing Result of Black Box *Testing* Page Login User

No.	*Skenario Pengujian*	Test Case	*Hasil yang diharapkan*	*Hasil Pengujian*	*Kesimpulan*
1.	User Name *dan* password *tidak diisi kemudian klik tombol login*	*Pelanggan* Name *:* *(kosong)* Password*:* *(kosong)*	*Sistem akan menolak akses User dan menampilkan* "Please fill Out this field"	*Sesuai Harapan*	Valid

2.	*Mengetikkan* User Name *dan* password *tidak diisi atau kosong kemudian klik tombol login*	*Pelanggan* Name: User Password : *(kosong)*	*Sistem akan menolak akses* User *dan menampilkan* "Please fill Out this field"	*Sesuai Harapan*	Valid
3.	User Name *tidak diisi dan* password *diisi kemudian klik tombol login*	*Pelanggan* Name: *(kosong)* Password: password	*Sistem akan menolak akses* User *dan menampilkan* "Please fill Out this field"	*Sesuai harapan*	Valid
4.	*Mengetik* User Name *dengan benar dan Mengetikkan salah satu kondisi salah pada* Password *dan kemudian klik tombol login*	*Pelanggan* Name: User *(benar)* Password: *1 (salah)*	*Sistem akan menolak akses Pelanggan dan menampilkan* "These credentials do not match our records."	*Sesuai Harapan*	Valid
5.	*Mengetikkan* User Name *dan* password *dengan data yang benar kemudian klik tombol login*	*Pelanggan* Name: User *(benar)* Password: password *(benar)*	*Sistem menerima akses* login *dan kemudian masuk ke halaman utama Sistem Informasi* Catering Wedding	*Sesuai Harapan*	Valid

B. Testing of the User Data Form

Tabel 11
Testing Result of Black Box Testing Page Data User

No.	*Skenario Pengujian*	**Test Case**	*Hasil yang diharapkan*	**Hasil Pengujian**	*Kesimpulan*
1.	*Semua* Textbox *tidak di isi.*	User Name, Nama User, Email, *Telpon,* Roles, *Alamat, Status Dikosongkan*	*Sistem tidak menyimpan data* User *dan menampilkan pesan konfirmasi* "Please fill Out this field"	*Sesuai Harapan*	Valid
2.	*Salah satu* textbox *tidak diisi.*	User Name *Diisi, Nama* User, Email, *Telpon,* Roles, *Alamat, Status Dikosongkan*	*Sistem tidak menyimpan data* user *dan menampilkan pesan konfirmasi* "Please fill Out this field"	*Sesuai Harapan*	Valid

No.	Skenario Pengujian	Test Case	Hasil yang diharapkan	Hasil Pengujian	Kesimpulan
3.	*Semua* textbox *terisi dengan lengkap*	User Name, *Nama* User, Email, *Telpon,* Roles, *Alamat, Status Diisi lengkap*	*Sistem menampilkan data* user *yang ditambahkan*	*Sesuai harapan*	Valid

C. Testing of Customer Data Forms

Tabel 12
Testing Result of Black Box Testing *Halaman Data Pelanggan*

No.	Skenario Pengujian	Test Case	Hasil yang diharapkan	Hasil Pengujian	Kesimpulan
1.	*Semua* Textbox *tidak di isi.*	*Kode Pelanggan, nama Pelanggan, Alamat, Nomor Telpon Dikosongkan*	*Sistem tidak menyimpan data Pelanggan dan menampilkan pesan konfirmasi "Please fill Out this field"*	*Sesuai Harapan*	Valid
2.	*Salah satu* textbox *tidak diisi.*	*Kode Pelanggan, nama Pelanggan, Alamat Diisi, Nomor Telpon Dikosongkan*	*Sistem tidak menyimpan data Pelanggan dan menampilkan pesan konfirmasi "Please fill Out this field"*	*Sesuai Harapan*	Valid
3.	*Semua* textbox *terisi dengan lengkap*	*Kode Pelanggan, nama Pelanggan, Alamat Diisi, Nomor Telpon Dikosongkan*	*Sistem menamplkan data Pelanggan yang ditambahkan*	*Sesuai harapan*	Valid

D. Testing of the Package Data Form

Tabel 12
Testing Result of Black Box Testing Page Package Data

No.	Skenario Pengujian	Test Case	Hasil yang diharapkan	Hasil Pengujian	Kesimpulan
1.	*Semua* Textbox *tidak di isi.*	*Kode Paket, Nama paket, Harga, Deskripsi Dikosongkan*	*Sistem tidak menyimpan data paket dan menampilkan pesan konfirmasi "Please fill Out this field"*	*Sesuai Harapan*	Valid

2.	*Salah satu* textbox *tidak diisi.*	*Kode Paket, Nama paket, Harga Diisi, Deskripsi Dikosongkan*	*Sistem tidak menyimpan data Pelanggan dan menampilkan pesan konfirmasi* "Please fill Out this field"	*Sesuai Harapan*	Valid
3	*Pengisian* textbox *tidak sesuai tipe data*	*Harga diisi menggunaka n huruf*	*Sistem tidak bisa meng*input *textbox*	*Sesuai harapan*	Valid
4.	*Semua* textbox *terisi dengan lengkap*	*Kode Paket, Nama paket, Harga, Deskripsi Diisi lengkap sesuai tipe data*	*Sistem menamplkan data Pelanggan yang ditambahkan*	*Sesuai harapan*	Valid

E. Testing of the Cooking Menu Form

Tabel 13
Testing Result of Black Box Testing Form Menu Ordered

No.	**Skenario Pengujian**	**Test Case**	**Hasil yang diharapkan**	**Hasil Pengujian**	**Kesimpulan**
1.	*Semua* Textbox *tidak di isi.*	*Pilih Paket, Jumlah, Pelanggan, Tanggal kirim, Uang Muka, dikosongkan*	*Sistem tidak menyimpan pesanan dan menampilkan pesan konfirmasi* "Please fill Out this field"	*Sesuai Harapan*	Valid
2.	*Salah satu* textbox *tidak diisi.*	*Pilih Paket, Jumlah, Pelanggan, Tanggal kirim Diisi, Uang Muka dikosongkan*	*Pilih Paket, Jumlah, Pelanggan, Tanggal kirim, Uang Muka, dikosongkan*	*Sesuai Harapan*	Valid
3.	*Pengisian* textbox *tidak sesuai tipe data*	*Jumlah dan Uang Muka diisi memakai huruf*	*Sistem tidak bisa menginput textbox*	*Sesuai harapan*	Valid
4.	*Semua* textbox *terisi dengan lengkap dan sesuai tipe data*	*Pilih Paket, Jumlah, Pelanggan, Tanggal kirim Diisi, Uang Muka Diisi lengkap sesuai tipe data*	*Sistem akan menyimpan data pesanan*	*Sesuai Harapan*	Valid

4. Conclusion

The conclusions of this research are:

1. The running system is less effective and requires a long time in processing data on sales of goods at Maryam stores.

2. Sales data processing system designed consists of seven processes related the process of selling goods and the process of making reports.

3. The design of selling data process system of goods at Maryam store includes the design of input documents such as data on goods equipped with data dictionaries, output designs such as reports and printed report forms.

4. In the procedure for documenting the data, the data has not been carried out properly, so it's difficult to find the data.

5. Delay information in reports.

Acknowledgement

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