Chapter 5

New system Testing and Implementation

The new system testing and implementation will cover the hardware and software require for the developer to build the new system and client to run the new system, alpha and user acceptance testing.

5.1 System Requirements

In this section, author will elaborate the hardware and software specification used in the new system.

5.1.1 Hardware Specification

The hardware specification of the developer is the developer computer specification when the developer made the new system. The hardware specification of the client is the client's minimum computer specification for the new system to be installed.

5.1.1.1 Developer

Category	Minimum Requirement
Processor	Intel® Core™ i3-2370M Processor (3M Cache, 2.40 GHz)
Memory	2GB
Hard Drive	512 GB

Table 5.1 Developer Hardware Specification

5.1.1.2 Client

Category	Minimum Requirement
Processor	Intel® Pentium® Dual-Core Processor 2020M (2.40 GHz, Cache 2MB)
Memory	2GB
Hard Drive	256 GB

Table 5.2 Client Hardware Specification

5.1.2 Software Requirements

Software requirements cover the important software for developer's computer to develop the new system and client's computer to implement the new system.

5.1.2.1 Developer Software

Software stated are the main software for developing the new system:

- Microsoft Windows XP or 7

- Microsoft Visual Basic 6

- Microsoft SQL Server 2005

- Crystal Report 8.5

5.1.2.2 Client Software

Software stated are the main software implementing the new system:

- Microsoft Windows XP or 7

- Microsoft SQL Server 2005

- Crystal Report 8.5

5.2 Testing

5.2.1 Alpha Testing

The alpha testing done by the programmer and author in order to find any bugs or errors before handling the program to the end user. All bugs and errors should be fixed by the programmer to make the program work properly as expected. Bugs found in several module that cause the program cannot retrieve data from the database. There are no documentation recorded for this testing phase.

5.2.2 User Acceptance Testing

The user acceptance testing done by testing the user to use the program with several test case and the author testing to two user and one manager. The purpose of this testing is to make sure that the system meet the user requirements. This testing is focus on the main function of the system that created from the user requirements.

From the acceptance testing, overall the users satisfied with the new system. The users felt that the system already met with the requirement and user expectation and suggest of some improvement for the future development.

5.2.2.1 Test Case

No.	Test Cases for Manager Page	Expected Result	Result
1	Open the Program	Show the login page of the system	Pass
2	Login to the system	Login successful and redirect to the home page	Pass
3	Choose Barang	Open the Barang Form	Pass

4	Adding New Item	New Item saved in the database and can be display when search	Pass
5	Choose Simpan Button	The changes that made before already save in the database	Pass
6	Choose Hapus Button	The item delete from the database	Pass
7	Choose Kosong button	Clear all the field of the form	Pass
8	Choose Customer	Open the Customer Form	Pass
9	Add New Customer	New Customer Saved in the database and can be display when search	Pass
10	Choose Tambah Button	Save New "Alamat Kirim" into the database.	Pass
11	Choose Supplier	Open the Supplier Form	Pass
12	Add New Supplier	New Supplier saved in the database and can be display when search	Pass
13	Choose Sales Order	Open the Sales Order Form	Pass
14	Make A New Sales Order	New Sales Order saved in the database and can be search in Invoice	Pass
15	Choose Search Button at No Bukti	Open Available Previous Sales Order	Pass
16	Choose Penjualan	Open the Penjualan Form	Pass
17	Make A New Invoice	New Invoice saved in the	Pass

		database	
	Choose Search Button at Kode Customer	Open Available Customer in database	Pass
18	Choose Search Button at No Sales Order	Open the selected sales order	Pass
19	Choose Hapus No Bukti Button	Delete the Invoice	Pass
20	Choose Simpan Button	Save the Invoice	Pass
21	Choose Cetak Button	Print the Invoice	Pass
22	Choose Kosong Button	Clear the Invoice form	Pass
23	Edit Invoice	The changes in the invoice saved in the database	Pass
24	Make A Retur Invoice	The Retur Form	Pass
25	Choose Search Button at Kode Customer	Open the selected Customer	Pass
26	Choose Search Button at no Bukti Penjualan	Open the selected Bukti Penjualan	Pass
27	Choose Hapus No Bukti Button	Delete the Retur Form	Pass
28	Choose Simpan Button	Save the Retur Form	Pass
29	Choose Cetak Button	Print the Retur Form	Pass
30	Choose Kosong Button	Clear the Retur form	Pass
31	Choose Purchase Invoice	Open Purchase Invoice Form	Pass
32	Choose Retur Purchase	Open Retur Purchase Form	Pass
33	Choose Payment Invoice	Open Payment Invoice Form	Pass

34	List all the customer	Show the List of customers	Pass
35	List all the supplier	Show the List of Suppliers	Pass
36	View Purchase Data	Show the purchasing items for a period of time	Pass
37	View Sales Data	Show the sales items for a period of time	Pass
38	View Inventory History	Show the changes of the inventory for a period of time	Pass
39	View Inventory Condition	Show the current inventory in the warehouse	Pass
40	Create Profit & Loss Report	Show the Profit & Loss Report	Pass
41	Reset Password	Show the message box for changing the password	Pass
42	Log In with different user	Show the login message box	Pass
43	Make New User	Show "Hak Akses" Windows	Pass

Table 5.3 Test Cases for Manager

No.	Test Cases for Staff Page	Expected Result	Result
1	Open the Program	Show the login page of the system	Pass
2	Login to the system	Login successful and redirect to the home page	Pass
3	Choose Barang	Open the Barang Form	Pass
4	Adding New Item	New Item saved in the database and can be display when search	Pass

5	Choose Simpan Button	The changes that made before already save in the database	Pass
6	Choose Hapus Button	The item delete from the database	Pass
7	Choose Kosong button	Clear all the field of the form	Pass
8	Choose Customer	Open the Customer Form	Pass
9	Add New Customer	New Customer Saved in the database and can be display when search	Pass
10	Choose Tambah Button	Save New "Alamat Kirim" into the database.	Pass
11	Choose Supplier	Open the Supplier Form	Pass
12	Add New Supplier	New Supplier saved in the database and can be display when search	Pass
13	Choose Sales Order	Open the Sales Order Form	Pass
14	Make A New Sales Order	New Sales Order saved in the database and can be search in Invoice	Pass
15	Choose Search Button at No Bukti	Open Available Previous Sales Order	Pass
16	Choose Penjualan	Open the Penjualan Form	Pass
17	Make A New Invoice	New Invoice saved in the database	Pass
	Choose Search Button at	Open Available Customer in	Pass

		database	
18	Choose Search Button at No Sales Order	Open the selected sales order	Pass
19	Choose Hapus No Bukti Button	Delete the Invoice	Pass
20	Choose Simpan Button	Save the Invoice	Pass
21	Choose Cetak Button	Print the Invoice	Pass
22	Choose Kosong Button	Clear the Invoice form	Pass
23	View Inventory Condition	Show the current inventory in the warehouse	Pass
24	Reset Password	Show the message box for changing the password	Pass
25	Log In with different user	Show the login message box	Pass

(Note: the first visible row above continues a prior row: "Kode Customer" | "database")

Table 5.4 Test Cases for Staff

5.2.3 Usability Testing

The purpose of the usability testing was to assess the usability testing of the user interface design, system functionality, and access to information provided.

Total of 4 users participated in this both task-related and post-task overall survey. Each individual session lasted for approximately 10 minutes. All participants are member of Moro Seneng and have little experience using the program. There are one user act like manager and three act as staffs that will use the system after the implementation. Manager will do task 1 – 13 and staff will do task 14 – 18.

For this testing, author developed a set of test cases derived from the use case incorporated with the programs form that need to be input.

No	Actor	Task	Details
1	Manager	User Login	User Name : TestAdmin Password : test
2	Manager	Add New Item	Kode Barang : YA7-FHX Nama Barang : Vitara/Escudo/Sidekick 97 KcDp Satuan : Pc Group Barang 1 : Szk Group Barang 2 : YA7 Minimal Stock : 5 Quantity Awal : 10 HPP Satuan : 550000 Harga Jual : 810000
3	Manager	Edit Item Details	Kode Barang : Previous Item Input Minimal Stock : 10 Quantity Awal : 20
4	Manager	Create New Cash Invoice	Sales Order Kode Customer : Cash Tambah Kode Barang : Previous Saved Item Quantity : 2 Discount : 15% Penjualan Saler Order : Use the previous made

			Click Simpan Button
5	Manager	Check Item Availability	Sales Order Kode Customer : Cash Tambah Kode Barang : Previous Input Item
6	Manager	Add New Customer	Kode Customer :SS-PDG Nama Customer : SiSiang Contact Person :SiSiang Alamat: Jln. Jondul Blok GG Rawang Barat Padang No. Telp : 0751-123245902 No. Fax : 0751-123245902 HP : 08159442082 Kota : Padang
7	Manager	Edit Customer Details	Kode Customer : SS-PDG Provinsi : Sumatera Barat
8	Manager	Add New Supplier	Kode Supplier : AMFG-JKT Nama Supplier : Asahimas Alamat: Jl. Ancol IX/5 Ancol Barat Jakarta No. Telp : 021-6904041
9	Manager	Edit Supplier Details	Kode Supplier : Previous Input Data No. Fax : 021-6918709

10	Manager	Create New B2B Sales Invoice	Sales Order Kode Customer : Previous Data Input Tambah Kode Barang : Previous Saved Item Quantity : 10 Discount : 20% Penjualan Saler Order : Use the previous made Jenis Pembayaran : K Click Simpan Button
11	Manager	Edit B2B Sales Invoice	Sales Order No Bukti : Previous Data Input Tanggal Pengiriman : 25/06/2013 Simpan
12	Manager	Create New Purchase Invoice	PPN : T Kode Supplier : AMFG-JKT Tambah Kode Barang : YA7-FHX Quantity : 10 Simpan Kode Barang : NGL-FHX Quantity : 15 Simpan

13	Manager	Edit Purchase Invoice	No. Bukti : Previous Data Input Tambah Kode Barang : NGL-FHX Quantity : 10 Simpan
14	Manager	View Sales Data	Periode : 04/2013 – 06/2013
15	Manager	Create Purchase Order	'Pemesanan Barang' Kode Supplier : AMFG-JKT Tambah Kode Barang : YA7-FHX Quantity : 20
16	Manager	Edit Purchase Order	No. Bukti : Previous Data input Quantity : 25
17	Staff	User Login	User Name : TestUser Password : Test
18	Staff	Add New Item	Kode Barang : TA04-FHX Nama Barang : Avanza/Xenia 04 KcDpn Asahimas Satuan : Pc Group Barang 1 : Tyt Group Barang 2 : D38 Minimal Stock : 5 Quantity Awal : 10 HPP Satuan : 250000 Harga Jual : 420000

			Kode Barang : NT04-FHX Nama Barang : XTrail 04 KcDpn Asahimas Satuan : Pc Group Barang 1 : Nis Group Barang 2 : NT04 Minimal Stock : 3 Quantity Awal : 5 HPP Satuan : 1040000 Harga Jual : 1300000 Kode Barang : C24-FHX Nama Barang : Serena 04 KcDpn Asahimas Satuan : Pc Group Barang 1 : Nis Group Barang 2 : C24 Minimal Stock : 3 Quantity Awal : 5 HPP Satuan : 1100000 Harga Jual : 1400000
19	Staff	Edit Item Details	Kode Barang : Previous Item Input Minimal Stock : 10 Quantity Awal : 20

20	Staff	Create New Cash Invoice	Sales Order Kode Customer : Cash Tambah Kode Barang : Previous Saved Item Quantity : 2 Discount : 15% Penjualan Saler Order : Use the previous made Click Simpan Button
21	Staff	Check Item Availability	Sales Order Kode Customer : Cash Tambah Kode Barang : Previous Input Item

Table 5.5 Usability Test Scenario

Task Completion Rate for Manager

Participant	Task 1	Task 2	Task 3	Task 4	Task 5	Task 6	Task 7	Task 8
1	√	√	√	√	√	√	√	√
Success	1	1	1	1	1	1	1	1
Completion Rates	100%	100%	100%	100%	100%	100%	100%	100%

Participant	Task 9	Task 10	Task 11	Task 12	Task 13	Task 14	Task 15	Task 16
1	√	√	√	√	√	√	√	√
Success	1	1	1	1	1	1	1	1
Completion Rates	100%	100%	100%	100%	100%	100%	100%	100%

Table 5.6 Task Completion Table for Manager

For the completion task rate, the participant did all the task. The error is not happen in the test. There is need of guidance about the hotkey that must be learned first before.

Task Completion Rate for Manager

For the completion task rate, the participant did all the task. The error is not happen in the test. Like the manager, there is need of guidance about the hotkey that must be learned first before.

Participant	Task 17	Task 18	Task 19	Task 20	Task 21
1	√	√	√	√	√
2	√	√	√	√	√
3	√	√	√	√	√
Success	3	3	3	3	3
Completion Rates	100%	100%	100%	100%	100%

Table 5.7 Task Completion Table for Staff

Task Ratings

After each task, the author asked the participant to rate the interface on a 5-point scale with measure range from Strongly Disagree to Strongly Agree. Post-task scenario subjective measures are:

- How easy it was to perform tasks

Most of the participants agree that all the tasks are easy to perform. However, some of the task must get some guidance since the program use special hotkey to make the inputting the field easier.

- Accurate information provided

The participants can get accurate of information from each task. Some of the might have the information that not used by the participants but the required information can be found in the report.

- Time matters

Participants found that they took the longest time are adding new item and create new invoice. The field for adding new item task have field that long to be type. For create new invoice, the participant need to fill two forms sequentially instead of one

form. The rest is can be completed in shorter time because the number information

input is not much.

Task	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Percent agree
Weight	1	2	3	4	5		
1	0	0	0	0	1	5.00	100.00%
2	0	0	0	1	0	4.00	100.00%
3	0	0	1	0	0	3.00	0.00%
4	0	0	0	1	0	4.00	100.00%
5	0	0	0	0	1	5.00	100.00%
6	0	0	0	1	0	4.00	100.00%
7	0	0	1	0	0	3.00	100.00%
8	0	0	0	1	0	4.00	100.00%
9	0	0	1	0	0	3.00	0.00%
10	0	0	0	0	1	5.00	100.00%
11	0	0	0	1	0	4.00	100.00%
12	0	0	0	0	1	5.00	100.00%
13	0	0	1	0	0	3.00	0.00%
14	0	0	0	1	0	4.00	100.00%
15	0	0	0	1	0	4.00	100.00%
16	0	0	0	0	1	5.00	100.00%
17	0	0	0	0	3	5.00	100.00%
18	0	0	0	1	2	4.67	100.00%
19	0	0	2	1	0	3.33	33.33%
20	0	0	0	2	1	4.33	100.00%
21	0	0	0	0	3	5.00	100.00%

Table 5.8 Ease of Finding Information

Task	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Percent agree
Weight	1	2	3	4	5		
1	0	0	0	0	1	5.00	100.00%
2	0	0	0	0	1	5.00	100.00%
3	0	0	0	0	1	5.00	100.00%
4	0	0	0	0	1	5.00	100.00%
5	0	0	0	0	1	5.00	100.00%
6	0	0	0	0	1	5.00	100.00%
7	0	0	0	1	0	4.00	100.00%

Task							
8	0	0	0	1	0	4.00	100.00%
9	0	0	0	1	0	4.00	100.00%
10	0	0	0	0	1	5.00	100.00%
11	0	0	0	1	0	4.00	100.00%
12	0	0	0	0	1	5.00	100.00%
13	0	0	0	0	1	5.00	100.00%
14	0	0	0	1	0	4.00	100.00%
15	0	0	0	1	0	4.00	100.00%
16	0	0	0	0	1	5.00	100.00%
17	0	0	0	0	3	5.00	100.00%
18	0	0	0	1	2	4.67	93.33%
19	0	0	0	3	0	4.00	100.00%
20	0	0	0	2	1	4.33	100.00%
21	0	0	0	0	3	5.00	100.00%

Table 5.9 Accurate Finding Provided

Task	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Percent agree
Weight	1	2	3	4	5		
1	0	0	0	0	1	5.00	100.00%
2	0	0	1	0	0	3.00	0.00%
3	0	0	0	1	0	4.00	100.00%
4	0	0	1	0	0	3.00	0.00%
5	0	0	0	0	1	5.00	100.00%
6	0	0	0	1	0	4.00	100.00%
7	0	0	0	1	0	4.00	100.00%
8	0	0	0	1	0	4.00	100.00%
9	0	0	0	1	0	4.00	100.00%
10	0	0	0	0	1	5.00	100.00%
11	0	0	0	1	0	4.00	100.00%
12	0	0	0	0	1	5.00	100.00%
13	0	0	0	1	0	4.00	100.00%
14	0	0	0	0	1	5.00	100.00%
15	0	0	0	1	0	4.00	100.00%
16	0	0	0	0	1	5.00	100.00%
17	0	0	0	0	3	5.00	100.00%
18	0	0	1	2	0	3.67	66.67%
19	0	0	2	1	0	3.33	33.33%
20	0	0	0	3	0	4.00	100.00%
21	0	0	0	0	3	5.00	100.00%

Table 5.10 Time Matters

Task	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Percent agree
Weight	1	2	3	4	5		
1	0	0	0	0	1	5.00	100.00%
2	0	0	0	1	0	4.00	100.00%
3	0	0	0	1	0	4.00	100.00%
4	0	0	0	1	0	4.00	100.00%
5	0	0	0	0	1	5.00	100.00%
6	0	0	0	1	0	4.00	100.00%
7	0	0	0	1	0	4.00	100.00%
8	0	0	0	1	0	4.00	100.00%
9	0	0	0	1	0	4.00	100.00%
10	0	0	0	0	1	5.00	100.00%
11	0	0	0	1	0	4.00	100.00%
12	0	0	0	0	1	5.00	100.00%
13	0	0	0	1	0	4.00	100.00%
14	0	0	0	1	0	4.00	100.00%
15	0	0	0	1	0	4.00	100.00%
16	0	0	0	0	1	5.00	100.00%
17	0	0	0	0	3	5.00	100.00%
18	0	0	0	2	1	4.67	100.00%
19	0	0	0	2	1	4.67	100.00%
20	0	0	0	2	1	4.33	100.00%
21	0	0	0	0	3	5.00	100.00%

Table 5.10 Overall Result

Task	Ease to Perform Task	Accurate Information	Time Matters	Overall
1- User Login	5 (100%)	5 (100%)	5 (100%)	5 (100%)
2 – Add New Item	4 (100%)	5 (100%)	3 (0%)	4 (100%)
3 – Edit Item Details	3 (0%)	5 (100%)	4 (100%)	4 (100%)
4 – Create New Cash Invoice	4 (100%)	5 (100%)	3 (0%)	4 (100%)
5 – Check Item Availability	5 (100%)	5 (100%)	5 (100%)	5 (100%)
6 – Add New Customer	5 (100%)	5 (100%)	4 (100%)	4 (100%)
7 – Edit Customer Details	3 (0%)	4 (100%)	4 (100%)	4 (100%)
8 – Add New Supplier	4 (100%)	4 (100%)	4 (100%)	4 (100%)
9 – Edit Supplier Details	3 (0%)	4 (100%)	4 (100%)	4 (100%)
10 – Create B2B Sales Invoice	4 (100%)	4 (100%)	4 (100%)	4 (100%)

11 – Edit B2B Sales Invoice	3 (100%)	4 (100%)	4 (100%)	4 (100%)
12 – Create Purchase Invoice	5 (100%)	5 (100%)	5 (100%)	5 (100%)
13 – Edit Purchase Invoice	4 (100%)	4 (100%)	4 (100%)	4 (100%)
14 – Create Purchase Invoice	4 (100%)	4 (100%)	5 (100%)	4 (100%)
15 – Edit Purchase Invoice	4 (100%)	4 (100%)	4 (100%)	4 (100%)
16– View Sales Data	5 (100%)	5 (100%)	5 (100%)	5 (100%)
17 – User Login	5 (100%)	5 (100%)	5 (100%)	5 (100%)
18 – Add New Item	4.67(100%)	4.67 (93.33)	3.67 (66.67%)	4.67 (100%)
19 – Edit Item Details	3.33 (33.33%)	4 (100%)	3.33 (33.33%)	4.67 (100%)
20 – Create New Cash Invoice	4.33 (100%)	4.33 (100%)	4 (100%)	4.33 (100%)
21 – Check Item Availability	5 (100%)	5 (100%)	5 (100%)	5 (100%)

Table 5.11 Mean Task Ratings and Percentage Agree

Time on Task

The time that participants testing processes are recorded by the author. Some of the task were inherently more difficult to complete and reflected by the average time on task.

From the table, tasks that are adding new item took the longest time to complete. The shortest time to complete is user login to the system.

Task	User 1	User 2	User 3	User 4	Average
1	22.47	-	-	-	**22.47**
2	218.19	-	-	-	**218.19**
3	46.38	-	-	-	**46.38**
4	120.75	-	-	-	**120.75**
5	61.74	-	-	-	**61.74**
6	196.29	-	-	-	**196.29**
7	81.09	-	-	-	**81.09**

8	126.21	-	-	-	**126.21**
9	66.6	-	-	-	**66.6**
10	178.5	-	-	-	**178.5**
11	93.09	-	-	-	**93.09**
12	117.36	-	-	-	**117.36**
13	99.81	-	-	-	**99.81**
14	115.39	-	-	-	**115.39**
15	93.55	-	-	-	**93.55**
16	30.11	-	-	-	**30.11**
17	-	14.12	33.10	20.77	**22.66**
18	-	71.31	248.4	155.78	**158.5**
19	-	32.42	145.4	48.78	**75.53**
20	-	71.67	124.6	135.12	**110.46**
21	-	42.71	90.5	63.78	**65.66**
Total	1667.53	232.23	642	424.23	

Table 5.12 Time on Task (in seconds)

Errors

Author recorded no big error happen during the testing. There is just need some guidance from the author when the participant struggle with the task such as edit item details and create new sales invoice. Therefore no modification needed on the user interface of the system.

Summary on Data

Task	Task Completion	Errors	Time on Task (in seconds)	Satisfaction*
1	1	0	22.47	5 (100%)
2	1	0	218.19	4 (100%)
3	1	0	46.38	4 (100%)
4	1	0	120.75	4 (100%)
5	1	0	61.74	5 (100%)
6	1	0	196.29	4 (100%)
7	1	0	81.09	4 (100%)
8	1	0	126.21	4 (100%)
9	1	0	66.6	4 (100%)
10	1	0	178.5	4 (100%)
11	1	0	93.09	4 (100%)
12	1	0	117.36	5 (100%)
13	1	0	99.81	4 (100%)
14	1	0	115.39	4 (100%)
15	1	0	93.55	4 (100%)
16	1	0	30.11	5 (100%)
17	3	0	22.66	5 (100%)
18	3	0	158.5	4.67 (100%)
19	3	0	75.53	4.67 (100%)
20	3	0	110.46	4.33 (100%)
21	3	0	65.66	5 (100%)

Table 5.13 Summary of Data

Overall Metrics

After task session completion, participants rated the program for five overall measures. These measure includes:

- Ease of use

- Frequent of use

- Usefulness

- Learn ability – how easy it would be for most users to learn to use the application

- Information facilitation – how quick participant could find information

All of the participant agreed that the program was easy to use, can find the information very quick, and use the system frequently. The participants will learn to use the system when the system fully implemented in the future. The participants also agree that the system will be useful in the business.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean Rating	Percent Agree
Ease of Use	-	-	-	2	2	4.5	100%
Frequent of Use	-	-	1	2	1	4	75%
Usefulness	-	-	-	1	3	4.75	100%
Learn Ability	-	-	1	3	-	3.75	75%
Information Facilitation	-	-	-	2	2	4.5	100%

Table 5.14 Overall Rating Result

5.3 Implementation

The new system will be implemented on the owner's personal laptop. All applications, systems, databases, and supporting software will be installed to the laptop. Back-up system already implemented by the developer to automatically to back-up the data into the external hard drive when the hard drive plug into the laptop. The system will be used during the working hours because basically the system mainly used for checking the inventory by staff and manager. However, the manager can manage the inventory data and invoices also show the reports of the sales.

While it is implemented, the new system is expected to give more time efficiency and accurate information of the inventory to Moro Seneng. It will also help the owner to manage the report of the sales of the week to keep track of the sales performance. The new database system will support the business to help the growth of the business line.