

**DECISION SUPPORT AND PRODUCTION ORDERING SYSTEM FOR
AYESHA ABED FOUNDATION, MANIKGONJ**

A Thesis

Submitted to the Department of Computer Science and Engineering

of

BRAC University

by

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Of

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DECLARATION

I hereby declare that this thesis is based on the results found by myself. Materials of work found by other researcher are mentioned by reference. This thesis, neither in whole nor in part, has been previously submitted for any degree.

Signature of
Supervisor

Signature of
Author

ACKNOWLEDGMENTS

Special thanks to Dr. Yousuf M. Islam, Director, Research and advisory services who taught me how to think of a decision support system for a Inventory Management System and Md. Mafijul Islam for accepting this task and by overseeing this implementation to completion.

ABSTRACT

The goal of the thesis is to develop an intelligent software tool, which is capable of storing all the information about order receive, delivery and last years product amount information. I planned to focus on analysis and design of the existing system. Center manager and inventory manager provides the data of the total activities. The software is responsible for finding a solution. The difficulty of this research project is in designing an effective method to resolve the entire inventory management system and to come up with a properly compensated system

Objective & Scope:

The objective of this project is to design an MIS Inventory management system and also a monitoring system and test the system using a prototype for the existing System of Ayesha Abed Center, Manikgonj, to make this system more efficient. The prototype will monitor daily, weekly, monthly and yearly product order, delivery and receiving of raw cloth by maintaining a database. This combination of order Monitoring System and the existing cloth receiving procedure will make a valuable contribution to improve the efficiency and the effectiveness of their cloth management system and will also increase information availability for preparation of the report to make the most critical decision for next order for a specific cloth.

To implement this project, I performed the following procedures:

- ☐ Gathering comprehensive knowledge of the existing system. Firstly, the top label management briefly explain how the system works and from the area offices I observed the system implementation. I interviewed the inventory manager of area offices and end suppliers to clarify the system. Take some data & documentation of the current system and study the current system.
- ☐ Finding the problems of the existing system and the solution of the problems.
- ☐ Design a process flow of the total ordering and receiving System for the Ayesha Abed Foundation's proposed system using UML.
- ☐ Develop a prototype for the system using PHP and Microsoft SQL Server.
- ☐ Get manager feedback on the prototype by JAD (Joint Application Development) session.
- ☐ Further improvement of the prototype from user feedback from the JAD session
- ☐ Evaluating the implementation steps for the new proposed system

- Further improvement of the system from user feedback from the JAD session.
- As I break up this process according to steps, so the system is designed as incremental model.

Learning goals:

After successfully complete the work I think I will understand the analysis and design using UML of a real system and what type of problem an analyst and a designer can face to do a real work. I expect I will come to learn the PHP and SQL Server.

Literature review:

Numerous database web sites on the inventory management system is used to gain a better understanding of the concepts and previously developed analysis and design methods. I am already familiar with PHP and SQL Server ; however, I will use some books as a reference and to learn about the new libraries that one can use to simplify coding. The internet will also be a major source of information with most up-to-date development in inventory management system. Some publications on this topic helped me to understand the scheme better.

Procedure/Methodologies:

I used incremental model.

I will analyze and extract the key data from a detailed description of the current system. I will find out the problems of the Existing System. These drawbacks may be both in the system structure and in the terminology. I mainly focus on system structure.

I will provide my suggestions to eliminate the drawbacks. However, I will also consider maintaining the simplicity of the system.

The steps will be carried out by implementing the SDLC (System Development Life Cycle) modified by use of prototyping. A brief idea about the requirements of the ordering system will be gathered. The prototype will be phased through required iterations. Then the outside Information will also be assembled by literature study from books and Internet, observation. The purpose of the prototype will be described to the users and information will be collected about the prototype as user feedback through a JAD session. This feedback will help to improve the prototype and thus the final design of the system.

Resources:

The following resources will be required for our projects.

A. Software Resources

1. Microsoft Office XP 2001.
2. PHP and SQL Server

B. Hardware Resources

1. Intel Pentium 4 PC.

C. Other Recourses

1. Internet connection.
2. A Conference room for JAD session.

Risks/Prerequisites:

There are many centers named Ayesha Abed Foundatuion which are producing different products of Aarong. But the most important raw material of

these centers is cloth. And it is most critical part to make the store update ready for any type of Aarong order. The Ayesha Abed Foundations are located in different locations all over Bangladesh. So it is very difficult to connect in intranet or internet of all the branches of BRAC.

1. There is a potential conflict between the goals of a high-quality appearance and one that is completely customizable. I can only succeed if users find the web site appealing, and main server is on.
2. There are significant technical difficulties in building a web site and web application. This will be a risk because I am not as much as experience relevant tools and technologies. More over I had not enough time to train myself and to review the design and implementation.
3. The schedule for this project is very short. I will manage this by planning a conservatively scoped functional core and series of functional enhancements that can be individually slipped to later releases if needed.
4. Data security issue is big question in my project .for example Does the authority decided who should be allowed access to what?, Operational problem (I will use password scheme how are the passwords themselves kept secret? How often are they changed?) Hardware controls (does our processing unit provided storage protection?) I try to handle the above security problem.
5. Many people who are now working in inventory related data processing of Ayesha Abed Foundation will lose their job in the new system. This will not be ethical under the current situation of our country.

Project Milestones/ Schedule:

1. High level analysis of the existing system.
2. High level design of the system is ready.
3. UML diagrams representing system modules are drawn.
4. The basic scope of the project is determined.
5. Make a prototype.
6. Take feedback from the end user.
7. Testing and documentation of the specifications is complete.
8. Systems not fulfilling a particular specification are redesigned.
9. Graphical User Interface is being improved and re-prototyping the System.
10. A draft of the thesis is submitted to thesis committee.
11. Final Draft Complete

1. Schedule

	Milestone	Date of Completion
1	High level analysis.	June 2
2	High level design.	June 9
3	UML diagrams representing system modules are drawn.	June 17
4	The basic scope of the project is determined.	June 25
5	Make a prototype.	June 28
6	Take feedback from the end user.	July 10
7	Testing and documentation of the specifications is complete	July 12
8	Systems not fulfilling a particular specification are redesigned.	July 15

9	Graphical User Interface is being improved.	July 20
10	Draft of thesis submitted	August 1
11	Final Draft	August 14

Deliverables

As a result of our research, I plan on delivering:

1. The UML diagram, class diagram and Collaboration diagram

The thesis document will describe the research and implementation done to complete my thesis. The appropriate background on the topic of feedback compensation and software development in the area will be presented. I will document the methods I used to analyze the system and their advantages. I will present the UML diagram used for determining the System. I will include documentation on the use of this toolkit. The thesis will contain appropriate visual aids such as graphs, plots, user interface prints, and other examples. All the code will be included in the appendix.

2. Written document.
3. A software toolkit useful for monitoring the systems and input useful data.

The toolkit will be written in PHP, HTML and Microsoft SQL server since it can be easily run on a web browser.

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CHAPTER I

1. INTRODUCTION

Ayesha Abed Foundation is the production plant of Aarong and Aarong is a sister concern of BRAC. Aarong produce different products that mainly produced by Ayesha Abed Foundation situated in different districts in Bangladesh. These centers has local craftsman and women who are busy to produce different items mainly clothes.

All orders are given by Aarong to the concerned Ayesha Abed Foundation and give the center a time frame to deliver the products. The inventory manager of this center always updates its store by raw clothes to fulfill Aarong's order in time. That is why the inventory manager always predict the possible Aarong's order for coming month. The previous years Aarong's order help inventory manager to predict the possible upcoming Aarong's order. According to those previous data manager gives advance order to local craftsman and make the inventory update prepared for Aarong's order.

The inventory management system of all the Ayesha Abed Centers in Bangladesh are manually operated. The manager has to keep track a great deal of data on paper and has to preserve these documents for future activities.

The inventory management system of Ayesha Abed Foundation is with online web based system both for Aarong's order and center order and help manager to keep all kinds of information. It also help manager as a prediction tool to assume the coming months Aarong order within a few seconds.

When Aarong place order to center, the next processes are very time consuming and it is cumbersome to keep track of all the information. Realizing this problem, implementation of a computerized ordering and monitoring system can be of great help. Automating parts of the system may prove helpful if user take "ownership" of the system. So, an automated order monitoring system for Ayesha Abed Foundation has been developed to increase the existing system efficiency. The system has been designed in such a way that any one, even a person who has a very little about computer, can feel relaxed to perform a prompt information service as well as to keep records.

1.1 The Existing System and Its Problems

The existing system of Ayesha Abed Foundation is fully manually operated. All the activities are paper based and many people are needed to maintain the data flow for the whole process.

When Aarong gives order for a specific product to the center then the center has to store such type of raw cloth instantly in its store and after receiving this order, it just place the raw cloth to make the specific product. But before this the main responsibility of this center is to update its store by raw cloth that any time it can meet the cloth demand. So inventory manager of this center always assume what can be the next volume of order by Aarong. For this he/she maintain the previous record to make a decision and place advance order to its local craftsman. But it is sophisticated in that sense that the produced cloth may not be a wastage.

The inventory manager has to keep track all types of information like Aarong order, center order, employee information, suppliers information, order date, delivery date, total amount, last years records, last months records etc. It is very difficult job to maintain all the information by a organized manner.

It is time consuming to retrieve any information. Also there is a possibility of being unable to retrieve information when there is no collection of sorted data.

In addition the information details are kept in papers, which is once more time consuming and not reliable.

It would be very helpful for the employees or manager data are sorted in a organized manner and related reports can retrieved to take any decision.,the management can then easily track which type of cloth is ordered to which suppliers, order date , receive date, and their amount etc. But the existing system doesn't have this competence either.

1.2 The Management Expectation From The Project

The main focus of this project was it would act like a decision support tool and be enable to keep track a\of all related information. They management assumed that the bottleneck with the ordering system was in paper based works and the total process was also not integrated. Restructuring the existing ordering and delivering by implementing an automated monitoring system was their first choice. The management wanted an automated system that would support

their existing center processes. The outputs they expected from the system are:

- 1 A automated ordering process that is synchronous with store.
- 2 A product receiving monitoring system.
- 3 System monitoring for special category of products by a supplier, receive date etc.
- 4 Finally a prediction tools for a specific product for a specific monyth or a year.
- 5 The management looked forward to work on a system that will facilitate the entire monitoring by faster search and report generation from database.

1.3 Problems With Implementing Software Projects

It is documented that many software projects fail [1] and is it is thought that the root cause of these failure could lie in “requirements gathering” and “user ownership” [2]. It can be said that end users play a fundamental role in implementing a software project. While developing an automated system, it is therefore very essential to have user interaction. In some cases the end users who will be benefited by the proposed system are business people and are not as a result familiar with computers or technical terms used in the computer world. So, they feel it difficult to interact with the software project team. Lack of user participation and interaction is a noticeable problem in developing software projects. What To-Be users find difficult during the development are:

- 1 Users do not know how to interact with the software team from the very beginning.
- 2 Users get a view of the future computerized system at a later period.
- 3 Users see very little of the work progressed by the software team.
- 4 It is sometimes difficult to describe real requirements.
- 5 Finally, it is tricky for the users to understand a system specification on paper.

Also there are some problems that the project management or the analysts face during software project implementation. In the analysis phase of SDLC (System Development Life Cycle) [1] one key focus is given to requirements gathering. Interviewing the To-Be users is a good way to gather information about what the users actually want. But if the project management team or the interviewer is not expert enough to select exactly what type of questions to ask, then requirement gathering is not helpful. In the first phase of SDLC an analyst may experience problems like:

- 1 It is difficult at the beginning of requirement collection to select what questions to ask.
- 2 It is not possible to show users a view of the future system at an early stage.
- 3 It is difficult to change the software itself in the final stages of SDLC to refine real

requirements.

- 4 Unless there is any software ready to demonstrate, JAD (Joint Application Design) sessions [1] and other conferences become less informative.

1.4 My Area of Work

There are plenty of other problems that can be faced while implementing a software project but my emphasis in this project is on problems relevant to interaction with the users and changing the software it to satisfy user needs.

1.5 A Proposed Method to Overcome The Identified Problems in Software Project Implementation

After identifying these problems with implementation of software projects, I realized building a prototype might solve some of the problems. Methodologies that use prototyping and incremental model prototyping and have a thorough analysis phase to gather information and to develop ideas for the system concept were exercised.

1.5.1 Prototype

A prototype is a quick program that provides minimal amount of features. It however helps the user to conceptualize what the final system would look like very quickly. So the users can interact with the prototype (quickly put together by the analyst) and thus understand whether the analyst understood, what they want and also helps the analyst to refine real requirements quickly by modifying the prototype with the given feedback.

1.5.2 Prototyping models

The prototyping model is a software development process that begins with a brief requirements collection, followed by prototyping and user evaluation. Attempting to build a prototype before detailed requirement collection helps the analyst to decide what questions to ask. Often the end users may not be able to provide a complete set of application objectives, detailed input, processing, or output requirements in the early stage. After the user evaluation, another prototype is made based on feedback from users, and again the cycle returns to client for user evaluation.

In a throw-away prototyping each of the prototypes is used to minimize the risk associated with the final system by ensuring that important issues are understood before the real system is built. Once the issues are resolved, the project moves into design, acceptance and

implementation. The prototype would represent the accepted functionality design of the real system. Security aspects and distributed aspects are generally absent for the prototype.

1.6 How Building A Prototype Solves The Problems

The development of a complete system is a complex task involving many different groups of people. Systems are complex because they usually have a lot of functionality and often need to cooperate and/or integrate with other systems. Also, the interface of a system is complex. The interface is that part of the system that interacts with the users of the system and therefore has to operate in real time, because users don't like to wait.

It is impossible to start building a system immediately without first investigating the required functionality and identifying the parts of the whole system. Moreover, the different groups of people involved in building the system do not have the same area of expertise. For example there are managers, suppliers, employees and users. Still these people have to be able to communicate with each other about the required functionality of the system to be developed. So, all people must use a common method of abstraction.

In my system, manager and users are not trained computer scientists or professional users and they have no knowledge of advanced design methods used in computer science. Therefore the method of abstraction must be simple yet effective and not require much learning. Prototyping offers such an abstraction.

1.6.1 Easier to create interface

One problem prototypes solve is, the designing of the interface. Nowadays prototypes are mostly used to create user interfaces. It is becoming increasingly important to prototype user interfaces first, because they are becoming more complex. Today almost all user interfaces are graphical, the so called Graphical User Interfaces or GUIs. These interfaces are easier to use than older types of interfaces (e.g. command-line interfaces), but they are harder to create. A prototype doesn't have all the features of real software, so the interface is easier to construct.

1.6.2 Improved ease of use

Products developed using prototyping is easier. Improvement in ease of use is an advantage equally for incremental model and evolutionary prototyping. Users have an opportunity to interact with the prototype, and give direct feedback to designers. For example, in some cases users are not sure that they want certain functions implemented until they actually can try them.

Users may also find certain features or terminology confusing. Also, the need for certain features may not be apparent until the system is actually exercised. Users are more comfortable reacting to a prototype than reading a “boring” abstract written technical specification.

1.6.3 Better match with user needs

Rapid prototyping results in a product, which better matches actual user needs. Prototyping tends to help ensure that the first implementation after the prototype will meet user needs. Sometime Omissions of function are often difficult for the user to recognize in formal specifications. Prototyping helps ensure that the focus of a system is right before the expenditure of resources for development of the entire system. User-provided situation scenarios that contain descriptions of relevant existing or desired work situations can be especially helpful to developers. The first attempt at developing a system will likely fail to meet user needs, and be discarded. It is better that the first effort is a prototype rather than a final deliverable.

1.6.4 Reduction in maintainability

Reduction in maintainability can be gained if prototypes are used in the initial phase. The ease with which the modifications are made using prototype confirms the contention that prototyping can lead to maintainable products. There are also indirect reductions in maintenance costs due to the possibility that user needs will be met the first time, reducing the maintenance associated with changing requirements. If software coding starts at the beginning then at a later stage it's difficult to change the design and coding. There is normally no direct software coding at the stage of prototype use. Normally the software coding starts when the use of prototype is completed. So, prototype can lead to easily maintainable code.

I used Dream Weaver as the prototype tool for user feedback. It is a powerful tool to create user-friendly input environment. It is also very easy to change a segment without changing the whole format. So, it is trouble-free to response using prototype on user feedback.

The real-world case studies suggest that rapid prototyping, when utilized properly, leads to improved software quality. The primary improvements are ease of use, better match with user needs, and often better maintainability.

Prototyping can be used for developing large systems also. These case studies find no particular bias towards either keep-it or incremental model prototyping. After revising real life situations it is recommended that while using a prototype in making software projects developers should try the following

- 1 Carefully define the purpose and scope of the prototype.
- 2 Avoid the use of entry-level programmers for making design decisions.
- 3 Consider performance issues early.
- 4 Limit end-user interaction to a controlled setting.
- 5 Should not under-estimate conversion time.
- 6 Should not keep a prototype that was not initially intended to be kept.

Case study data is not easy to find and is to some extent biased. In case studies negative results are seldom published. Still, Rapid prototyping is being successfully employed in the software industry. With the lessons provided by the case studies, rapid prototyping can be used to solve the problems that are described previously.

CHAPTER II

2. PLANNING PHASE

2.1 System Request

Usually a request for a software system includes four elements:

- 1 Project sponsor
- 2 Business need
- 3 Functionality
- 4 Expected value

The project sponsor is the person who has an interest in seeing the system succeed. This is the person who initiated the proposed project and who will serve as the primary point of contact for the system on the business side. For this project Mr Gias Uddin, Assistant manager and Mrs. Suraya Begum, Manikgonj Ayesha Abed and my supervisor Mr.Mafijul Islam played the role of project sponsor. With their help the system request was prepared and is described below:

System Request for the project

Project Name: Inventory Management System.

Project sponsor: Mr Gias Uddin, Assistant manager and Mrs. Suraya Begum, Manikgonj Ayesha Abed and my supervisor Mr.Mafijul Islam

Business Need:

To help the inventory manager to manage the order place, receiving, their management and as a decision support tool.

Functionality:

Using this automated system inventory manager should be able to complete ordering and receiving procedure. The initial focus should be on tool assistance for better system monitoring. The users should be able to:

- 1 Work on a ordering and receiving system from suppliers.
- 2 Monitor the total amount receive, order to the suppliers.
- 3 Search through suppliers Information, contact person information,specific cloth wise information, ordering and receiving information.

Special issues or constraints:

- 1 There is no internet connection in PCs between the Aarong head office and local Ayesha Abed centers. So, it is not possible to practically implement a connectivity within these centers.

2.2 Technical Feasibility Analysis

Once the needs for the system and its basic functionality have been defined, a more detailed technical feasibility analysis was carried out to better understand the opportunities and limitations associated with the proposed project. This feasibility analysis guided the organization in determining whether to proceed with this project. I mainly focused on these aspects:

- 1 Familiarity with the application.
- 2 Familiarity with technology
- 3 Project size.

The Technical feasibility analysis for this project is stated here:

2.2.1 Technical feasibility (not risky)

Familiarity with the application (Not satisfactory):

- 1 The inventory department has no computerized environment. They are habichauted with the manual process. This department is using hand written form to keep all the required information.

Familiarity with technology (Not at all):

- 2 The users have no experience of working in a network environment.
- 3 There is no internet and LAN connection within the PCs to run the system in a network environment.

Project size (moderate):

- 1 I estimate that the project is moderate in size.
- 2 With some effort the to-be system can be replaced by the current system without much complexity.

CHAPTER III

3. ANALYSIS PHASE

3.1 Requirements Gathering

For requirements gathering it was important to select the “right person”. Ayesha Abed Foundation, Manikgonj has 40 to 45 employees who are working with the current system. But the center manager Mr Himangshu Sannyal has total control of the overall system. So, I selected him as the primary person who will participate during analysis. I chose interviewing as the way in which information should be collected. Then I contacted with Mrs. Surayia Begum, inventory manager of this center for detail information.

As I knew a little about how a real life inventory management system works, it was very difficult for me to decide on what questions to ask so that the requirements could be collected properly. After discussing with my advisor I decided to build the prototype from my own basic knowledge of inventory management system. While building the prototype the problems I faced helped me to understand exactly what questions to ask to the users for requirements gathering.

3.1.1 Designing prototype from the initial concept

The current inventory management system provided me an idea about what they wanted from the future system. Their main concentration was on:

- 1 To predict the required present stock of a specific product.
- 2 To find the last months, years data for a specific criteria
- 3 To prepare report generation.

So, I decided to design fields in the MySQL that can store the inputs for the desired outputs.

Designing the initial database

No matter what information is to be retrieved from the fields of the MySQL, to me Supplier Information, Employee information and product information are key table that should exist in the database. Another tables I designed to keep different information to make all types of queries possible.

<u>Supplier Information</u>
Fields:
<u>supplierid</u>
Name
Address
Phoneno
Centerid
Residence
Mobile

<u>Employee information</u>
Fields:
<u>personid</u>
name
designation
centerid
officialpn
mail
residencepn
mobilepn

<u>Center</u>
Fields:
centerid
centername

address
personid

I had no idea about the fields that should be in a Center Order to suppliers table. So, I decided to design this table after an interview with the inventory manager.

To build a prototype for user demonstration and entry I preferred html because it is easy to change according to user need and data doesn't give a complicated view to a new user and finally.

As two different suppliers and employee may have the same name, I put Supplier ID and employee ID for each of them made it the primary key for the that it cannot be editable and made it auto incremented.

Several interviews were taken for requirements gathering and some user feedback forms were also given to get an idea about what the users actually wanted.

3.1.2 Interviewing the users

The interview is the most commonly used retirements gathering technique. After all, it is natural that usually if we need to know something, we ask someone. The interviews conducted for this project were mostly one-on-one (one interviewer and one interviewee).

Designing questions for interview

Designing the questions for the interview is very important. There are three types of interview questions:

- 1 Closed-ended questions.
- 2 Open-ended questions.
- 3 Probes.

Closed-ended questions are normally those that require specific answer. So, these questions are used when the analyst is looking for specific, precise information.

Open-ended questions are those that leave scope for elaboration on the part of the interviewee. Open-ended questions are designed to gather rich information and give the interviewee more control over the information that is revealed during the interview.

Finally, probing questions follow up on what has just been discussed in order to learn more. They are often used when the interviewer is unclear about an interviewee's answer. The initial questions were prepared based on the problems occurred during the development of the prototype. Several formal and informal interviews and meetings were carried out during the project life time. A sample interview report is given here:

Interview Report

Interview Notes Approved By:

(Mrs. Surayia Begum)

Person Interviewed:

Mrs. Surayia Begum (Inventory Manager, Ayesha Abed Foundation)

Interviewer:

Gazi Toufiq Jamal

Date: 5 th June 2005.

Primary Purpose:

To collect information about the current inventory management system and also to identify problems and solutions for future improvement of the current system.

Question Format:

Q1 Give me a brief idea about the current inventory management system you are using?

Ans: Usually Aarong gives us order any time in the year to make specific product for a given quantity. And after taking this order we have to produce that product within a short period of time. After taking the order we just send the raw cloth to the different section of this center to produce certain designed product. We don't have enough time to make this raw cloth. For this we are supposed to store possible raw cloth at sufficient amount. For this we have to assume blindly and look at the previous years records to assume which type of product was ordered by Aarong against the specific raw product. By taking these data of the previous months or years I have to calculate the possible next order of Aarong. But this is stressful and time consuming to find the

average of a specific product of certain duration of time. For this sometimes we have to simply assume the possible amount of certain raw cloth and make order to our local suppliers. But it may cause shortage or excess of raw cloth in our store and we face many production difficulties. Some times we fail to supply required amount of product to Aarong in time. Moreover it is very tiresome work to maintain the receiving and ordering to different suppliers.

Q2. What are the main problems in this current system?

Ans: Well, as we are completing our present inventory management process manually, sometime we loss information for ordering and receiving to different suppliers, and has to calculate and has sort out the previous record of a certain product to predict the next demand of a specific cloth. It is very time consuming and inefficient system because each day we are busy to order and receive to different suppliers.

Q3. What are possibilities of improving the current system?

Ans: There are some possibilities:

- 1 If there is a system to find average of any specific raw cloth of any certain duration of time.
- 2 The ordering and delivery and receiving can be seen at a glance when needed.
- 3 Suppliers total information, given amount of order, his/her deadline etc can be easily maintained that the whole monitoring system and processing can be faster and effective.

Summary of Interview:

After questioning it is seen that the current system has some limitations. Precise problems can be realized from user point of view. The current system will be more efficient if the problems are solved.

Open Items:

- 1 It is clear that a back-end database will help the users a lot to store information.
- 2 The interview needs to work efficiently.

3.1.3 Feedback from the users about the prototype

The focal idea of using prototype for requirements gathering was to provide a system for the users to interact with so that they can give feedback. More than a few user feedbacks were helpful to improve the prototype. Both verbal and written feedbacks were taken. For some user feedbacks I used user feedback forms. A sample user feedback form is given here:

Implementation of Decision Support and Production Ordering System for
nAyesha Abed Foundation
nManikgonj
(User Feedback Form)

User Name:

Problem encountered:

Fields needed:

- 1.
- 2.
- 3.
- 4.
- 5.

Fields not needed:

- 1.
- 2.
- 3.

Remarks:

Fig : Sample User feedback form

3.1.4 Finalizing the design of the prototype

After repeatedly changing the prototype from according to feedback given, the design was finalized by the inventory manager and the thesis supervisor.

<u>Employee information</u>
Fields:
<u>Personid</u>
Name
Designation
Centerid
Officialpn
Mail
Residencepn
Mobilepn

<u>Store</u>
Field
<u>Serialno</u>
Clothid
Totalamount
Date
Centerid

<u>Receive</u>
Field
Supplierid
Amount
Date
Centerid
Clothid

<u>Product</u>
Field
Clothid
Clothname
Centerid

<u>Log in</u>
Field
<u>Serialno</u>
Userid
Password
Domain

3.1.5 Functional hierarchy

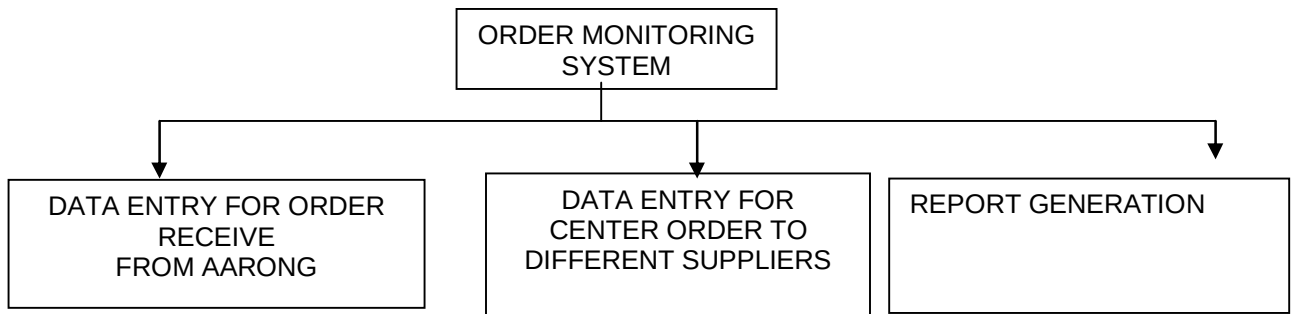
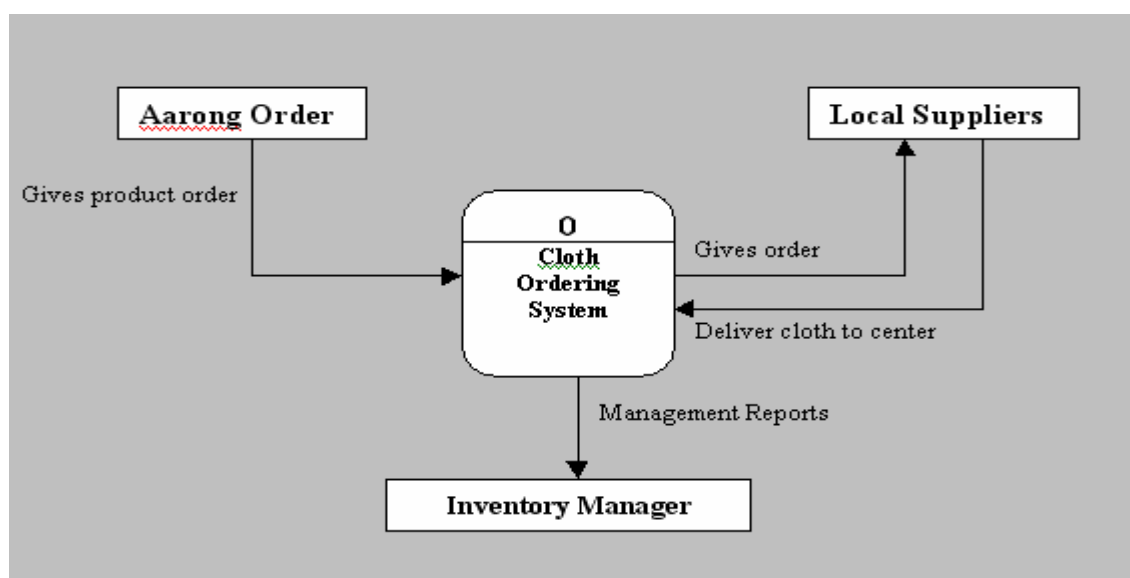


Fig. 3.3 A functional hierarchy diagram Decision Support and Production Ordering System for
 Ayesha Abed Foundation
 Manikgonj

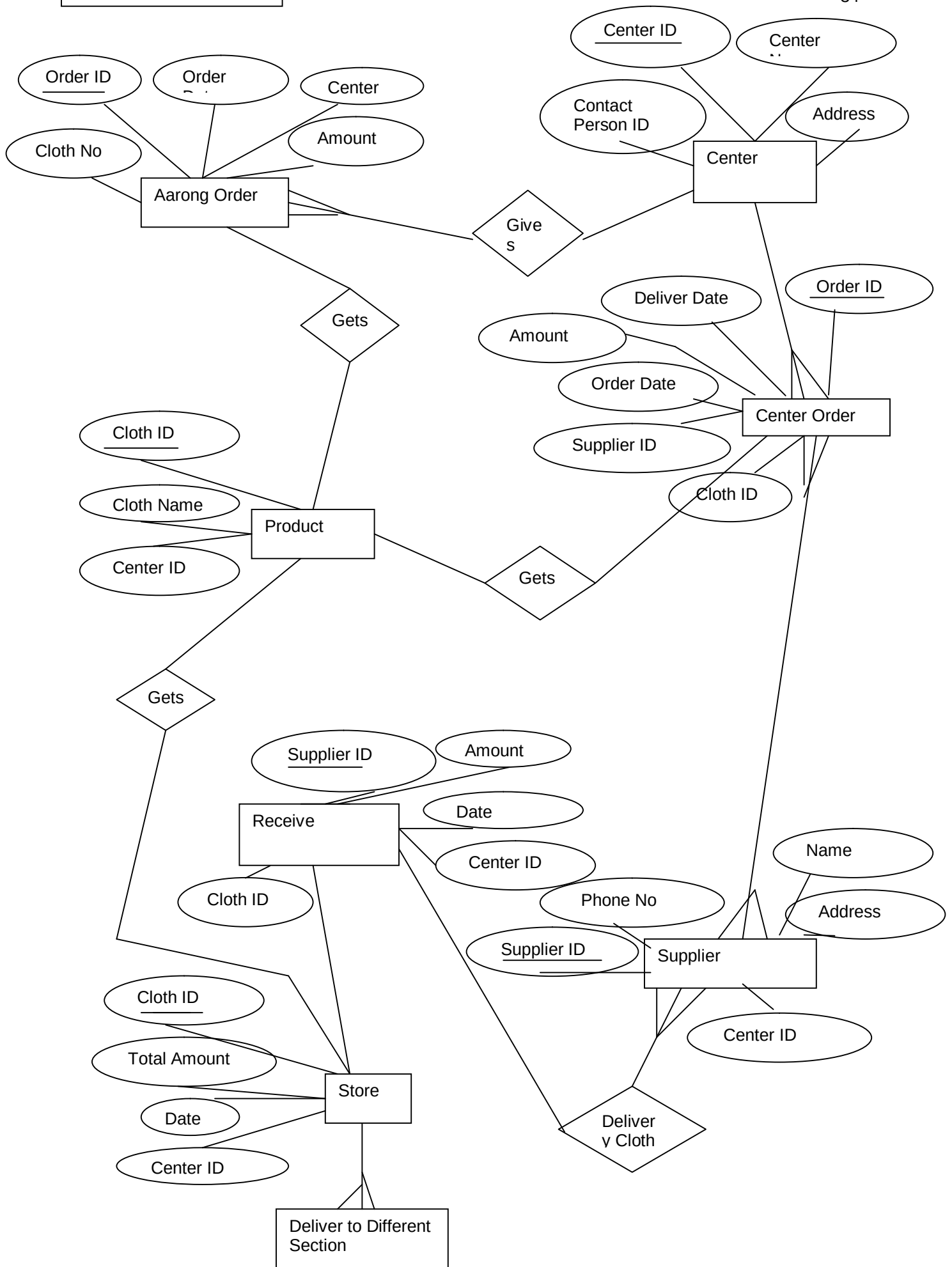
3.1.6 Context diagram

This is the context diagram of Decision Support and Production Ordering System for
 Ayesha Abed Foundation
 Manikgonj

This context diagram contains only one process which is labeled “0”. This single process represents the order monitoring system. Employee information, supplier information, center order, aarong order, store are source/sinks of the system and are represent the all queries.



3.1.7:ER Diagtam



3.2.1 Data flow diagrams

The different processes that constitute the single process shown in the context diagram are shown here in the level-0 DFD of Pathfinder Travel Network's sales monitoring system. Here also CUSTOMER, SALES and ACCOUNTS are source/sinks of the system. In addition we have four files here to store data. They are Customer Info, Passport Info, Requisition Info and Visa Info file.

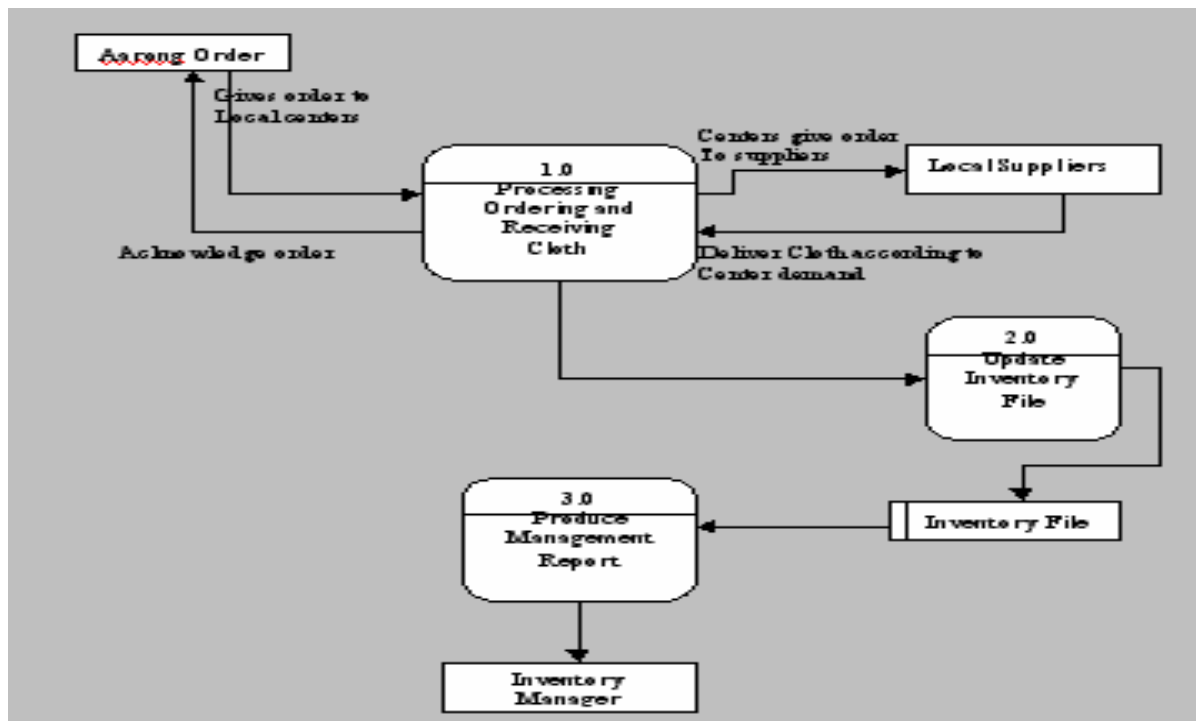
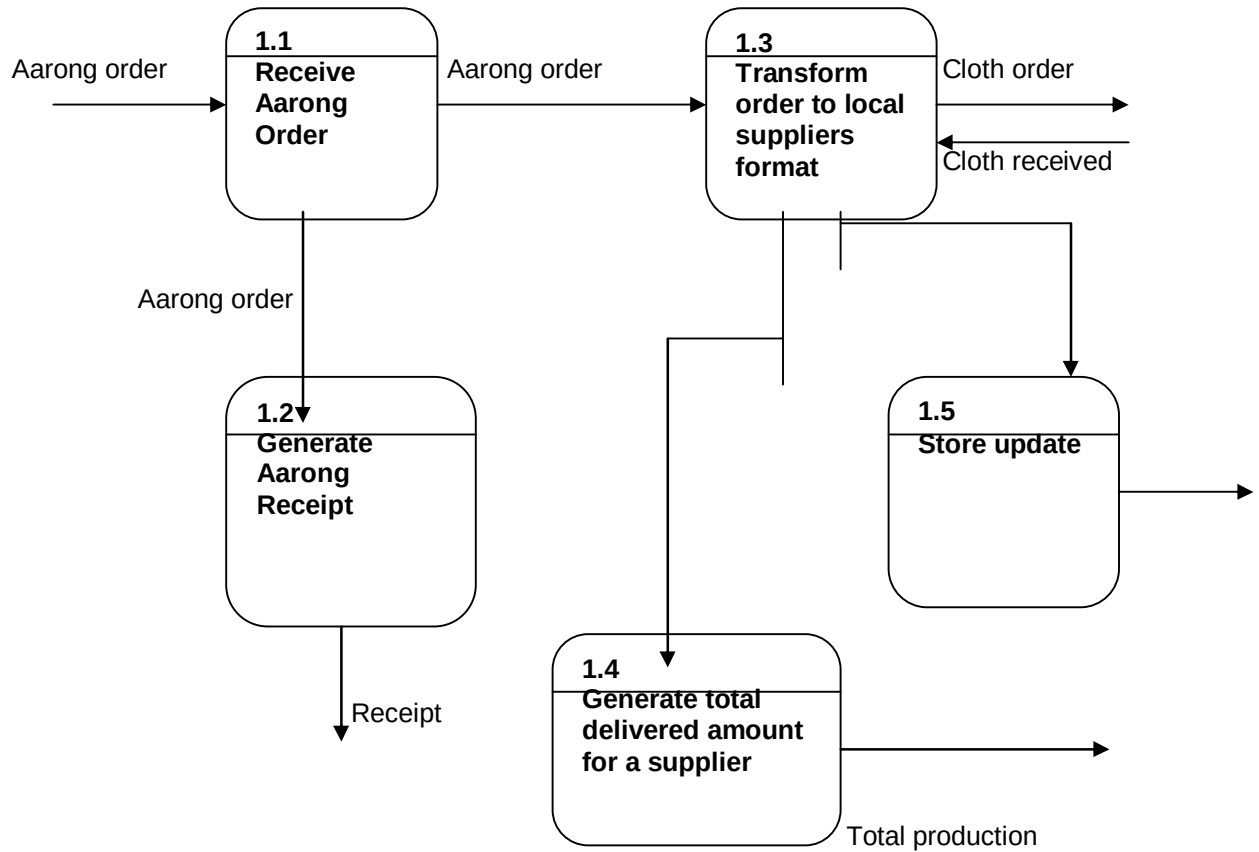


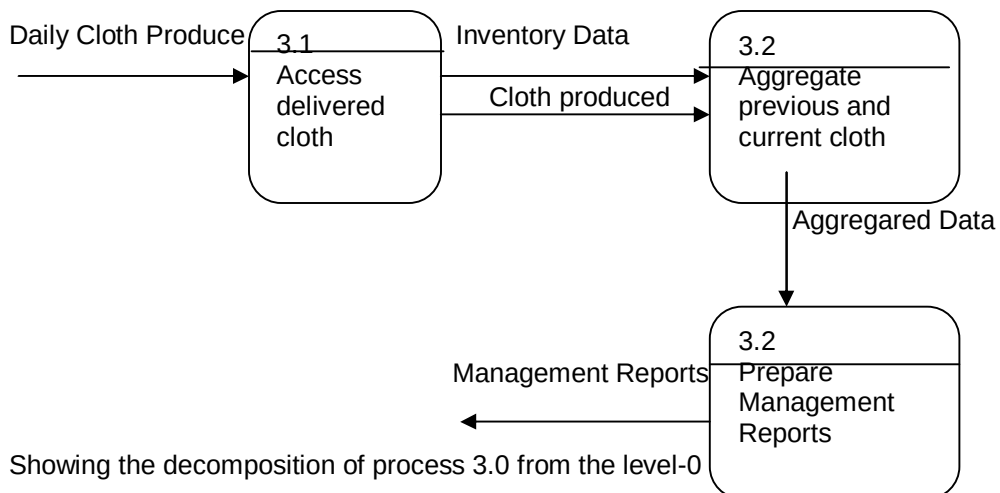
Fig. Level-0 DFD of Pathfinder Travel Network's sales monitoring system

The process 1.0 (Order taking, Order place, Receive) has three sub-processes, which are shown here in the decomposition of process 1.0.

Decomposition of process 1:



Level-1 diagram showing the decomposition of process 1.0 from level-0 diagram for the cloth ordering system for Ayesha Abed Foundation, Manikgonj.



Showing the decomposition of process 3.0 from the level-0

3.2.2 Use-Case Modeling

3.3.1 Use-case description

Here are the use-case descriptions containing all the information needed to build the user-case diagram for Ayesha Abed Foundarion order monitoring system. The use-case diagram is shown in the last part of use-case description.

Use case name: Manage Security	ID: 1	Importance level: Medium
Primary actor: System Admin User	Use case type: Overview, essential	
Stakeholders and interests: System Admin- wants to change his/her password for security. User- wants to change his/her password for security.		
Trigger: A user/system admin changes password. Type: External.		
Normal flow of events ➤ System admin logins to the system. ➤ He/she changes the password by confirming his old password. or ➤ A user logins to the system. ➤ He/she changes the password by confirming his old password.		

Table
Description for Manage Users Use-Case

Use case name: Receive and Transform Aarong order to local suppliers	ID: 2	Importance level: High
Primary actor: Inventory manager	Use case type: Overview, essential	
Stakeholders and interests: User- wants to transform Aarong order into center order. Customer- requests for different amount of cloth.		
Trigger: A supplier confirms his own order . Type: External.		
Normal flow of events: ➤A new supplier ask manager for taking order or order booking. ➤Manager notes down personal details and last records and information of the suppliers. ➤Manager separates suppliers information, given order and delivery details. Or ➤An existing supplier requests for new order or past details. ➤Manager notes down detail information of that suppliers.		

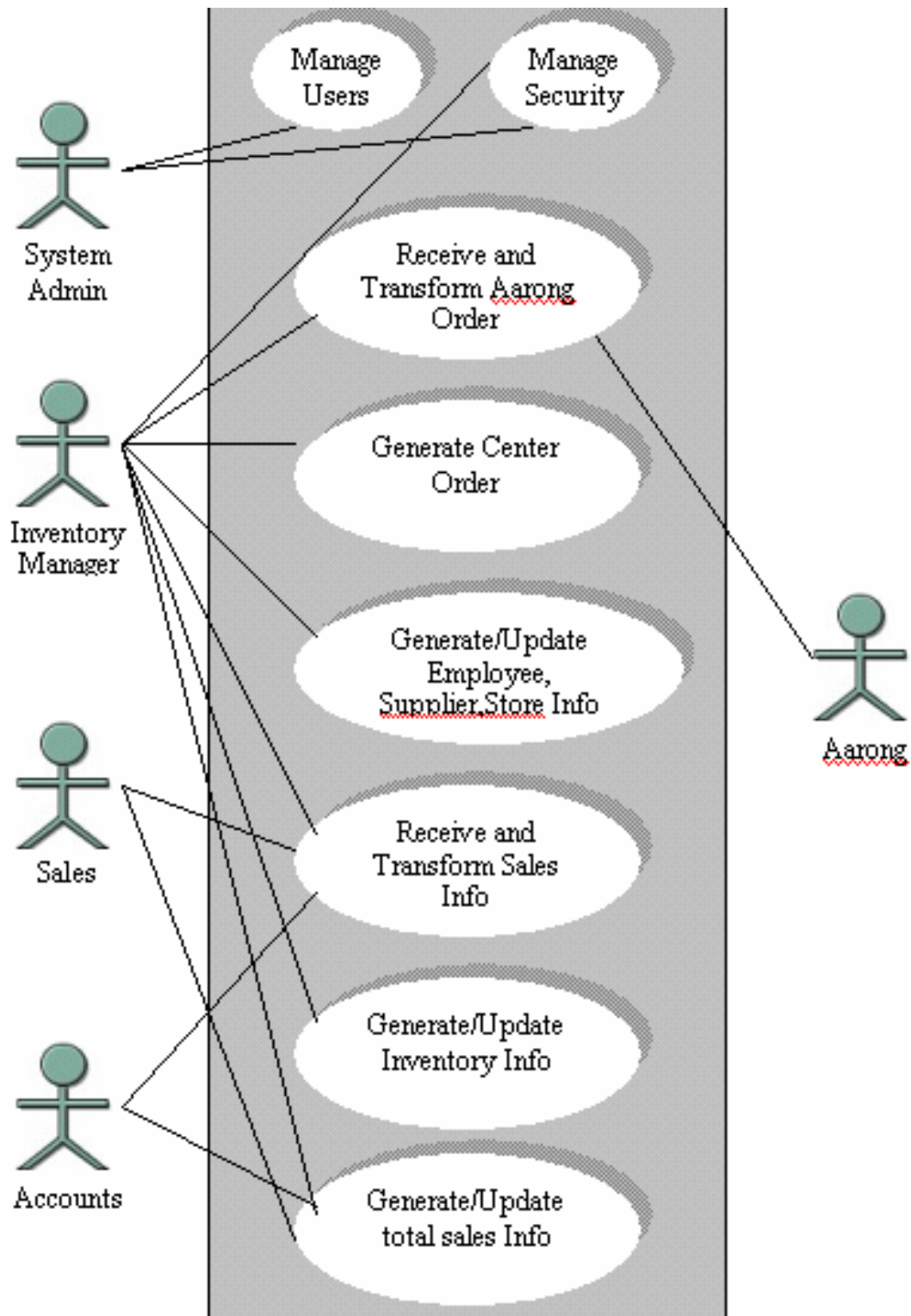
Use case name: Manage Suppliers	ID: 3
Primary actor: System Admin	Use case type: Overview, essential
Stakeholders and interests: System Admin- wants to order or receive from suppliers Suppliers- wants to get total information if necessary.	
Trigger: A new supplier requests for entry or any supplier be deleted. Type: External.	
Normal flow of events: ➤ The new supplier request for entry to the system admin. ➤ System admin logins to the system. ➤ System admin creates a supplier account for the supplier. Or ➤ A request comes to the system admin for a supplier deletion. ➤ System admin logins to the system. ➤ System admin deletes that particular supplier account.	

Use case name: Generate Suppliers, Employees, Order detail Info	ID: 4	Importance level: High
Primary actor: Manager	Use case type: Overview, essential	
Stakeholders and interests: User- wants to store/update order and employee and supplier information.		
Trigger: Manager gathers details information for entry. Type: External.		
Normal flow of events: ➤ Manager Generates a supplier, employee, order detail information table with all personal details of the suppliers by giving necessary entries. ➤If any employee or supplier is no longer valid for any center then his/her information is deleted from the supplier or employee information table.		

Use case name: Generate order Info	ID: 5	Importance level: High
Primary actor: Inventory Manager	Use case type: Overview, essential	
Stakeholders and interests: User- wants to store order details information of a supplier.		
Trigger: Manager separates cloth name, amount details from the order details for entry. Type: External.		
Normal flow of events: ➤ Manager generates a center order information table with all order details for the supplier by giving necessary entries. ➤ If there is any change in supplier's details then the table is updated accordingly by the manager. ➤ If there is an invalid supplier.		

Use case name: Order,Receive and Average Information	ID: 6	Importance level: High
Primary actor: Manager	Use case type: Overview, essential	
Stakeholders and interests: User- Wants to transform Aarong order into cenetr order. Store- Automatically update for the specific cloth.		
Trigger: Manager requests for a average for a specific product. Type: External.		
Normal Flow of Events: ➤ The inventory manager asks for a average for a specific product for a specific duration. ➤ Manager receives the average and sends the order to suppliers. ➤ Manager starts processing the order. If there are enough stock then: No need to give order to local suppliers If there is not enough stock for a specific cloth then the ordering process proceed on. Inventory manager may keep order deliver to local suppliers pending or rejects the request.		

Use case name: Generate employee information	ID: 7	Importance level: High
Primary actor: User	Use case type: Overview, essential	
Stakeholders and interests: User- wants to store employee information.		
Trigger: User notes down detail employee information of that employee customer. Type: External.		



CHAPTER IV

4. DESIGN PHASE

4.1 Designing The Database

My prototype was rearranged to design the database of the final system. There are twelve tables in the database including four major tables to store information. These four tables are:

- 1 Supplier Information
- 2 Employee Information
- 3 Aarong Order
- 4 Center Order

The back-end database is created using MySQL. Queries are maintained from the front-end and it is implemented by PHP as the scripting language. Detail Table descriptions are included here.

4.1.1 Description of tables used

Table Name: Supplier Information	
Description: Stores Information for the suppliers.	
Fields: Primary key (Supplier ID)	
Field Name	Description
<u>Supplierid</u>	ID of the Supplier. It is always unique for different supplier and it is auto incremented.
Name	Name of the supplier.
Address	Address of the supplier.
Phoneno	Official Phone no of the supplier.
Centerid	Center id assign the different centers all over Bangladesh.
Residence	Residence Phone no of the supplier.
Mobile	Mobile Phone no of the supplier.

4.1.1 Description of tables used

Table Name: Employee information	
Description: Stores Information about all the employees of different centers.	
Fields: Primary key (Person ID)	
Field Name	Description
<u>personid</u>	ID of the Employeesr. It is always unique for different employee and it is auto incremented.
name	Name of the employee.
designation	Designation of the employee.
centerid	Center id assign which centers employee he is.
officialpn	Official phone number of the employee.
mail	E-mail address of the employee.
residencepn	Residence phone number of the employee.
mobilepn	Mobile phone number of the employee.

Table Name: Aarong order	
Description: Stores all the Information of Aarong order which is assign to the different centers.	
Fields: Primary key (Orderid)	
Field Name	Description
<u>orderid</u>	Order ID is unique for all Aarong order to different centers all over Bangladesh.
orderdate	In which date order is given to the centers.
clothid	Which cloth is ordered to centers. It is maintained by the cloth identification number.
amount	What amount of products is ordered.
centerid	In which center the ordered is given.

Table Name: Center Order	
Description: Stores Information of all the center order given to different local suppliers.	
Fields: Primary key (<u>Orderid</u>)	
Field Name	Description
<u>orderid</u>	Order ID is unique for all center order given to its different suppliers.
orderdate	In which date the order is given to local suppliers.
supplierid	Supplier id maintain all information for a specific supplier that which order is given to which supplier.
deliverdate	In which date a specific supplier is supposed to deliver the cloth.
amount	What amount is to be delivered.
clothid	Which cloth supplier is supposed to deliver.

Table Name: Center	
Description: Stores Information of the centers.	
Fields: Primary Key (None)	
Field Name	Description
centerid	ID of the center that exists all over Bangladesh.
centername	Name of the center.
address	Address of the center.
personid	Person ID is assigned to find the concerned centers contact person.

Table Name: Delivery	
Description: Stores Information of which product will be delivered from which center at which amount.	
Fields: Primary key (Package_Type)	
Field Name	Description
clothid	The ID for the specific cloth.
amoun	The assigned amount for a specific supplier.
centerid	Assigned center id for deliver the product.

Table Name: Log In	
Description: Stores Information for the authorized person that which persons are assigned as Administrator, Inventory manager, center manager, Accountant as for system demand.	
Fields: Primary key (<u>serialno</u>)	
Field Name	Description
<u>serialno</u>	ID of the Customer that already exists in the Requisition_Info Table.
userid	Name of that Customer.
Password	Submission date of the papers for Visa.
Domain	

Table Name: Product	
Description: This table is the product information table.	
Fields: Primary key (None)	
Field Name	Description
Clothid	Assigned unique number for a specific cloth.
Clothname	Name of the cloth
Centerid	Unique ID for a specific center.

Table Name: Receive	
Description:	
Fields: Primary key (None)	
Field Name	Description
supplierid	Unique supplier identification to recognize the supplier.
amount	Which amount Inventory manager is supposed to receive.
date	Which date manager will receive the product.
centerid	Assigned the center id against the center name.
clothid	Assigned the cloth id against the cloth name.

Table Name: Store	
Description:	
Fields: Primary key (None)	
Field Name	Description
clothid	Assign the unique cloth number against for a specific cloth.
totalamount	It assign the total amount for a specific cloth delivered by a specific supplier.
date	In which date the cloth amount is stored.
centerid	In which center cloth is received.

4.2 Designing The User Interface

The user interface of the final system is designed in standard Windows approach. The main characteristics of this system are:

- 1 The final system has text fields for data entry.
- 2 It uses command buttons to complete most of the tasks.
- 3 A user-friendly Main Menu/Home page categorizes all the tasks.
- 4 It uses separate forms to insert information and any query of data.
- 5 It has a login option as a security feature.
- 6 The back-end database is not visible in the final system.
- 7 A user has no access to change the back-end database.

Screens of the interface are developed by Hyper Text Markup Language (html). The principles that were kept in mind while designing the screens are:

- 1 Layout

The text fields are placed in chronological order and have a natural spontaneous flow to minimize the users' movement from one area to the next.

- 2 Content awareness

All forms have titles and search areas are marked with headings and frames. Each data field has its own label to identify that field.

- 3 User experience

The forms are user friendly. So, both experienced and non experienced users will feel comfortable to use them.

- 5 Consistency

All the forms have consistency. Looking at one form of a specific type (e.g. forms for Employee information) will give the user a idea about how the other forms will work.

- 6 Minimal user effort

Finally the interface is designed in a way that minimizes the amount of effort needed to accomplish tasks. The main menu is categorized and for adding information.

4.2.2 Descriptions of forms



Fig. 4.1 Main Menu

The main menu of the interface has nine menu options. From the Login option a user can login to the system as an administrator or as a accountant or as a manager. The Supplier information, Employee information, Delivery reports, Receive reports, Average reports, production details, contact person details forms are available in the home page. Only Manager or administrator can add new supplier or employee. To search any data for Supplier or employee or related any production data user can access these options from home page. Only an administrator can delete an existing user although.

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Address <http://localhost/Aysheya%20abed/aarongorder.php> Go Links



**INVENTORY MANAGEMENT SYSTEM
FOR
AYESHA ABED FOUNDATION**

Order Date	Year 2005 Month January Day 1
Cloth Name	Khadi
Amount	
Center Name	Aayeshaabed Manikgonj
Submit Reset	

Done Local intranet

Fig: Aarong order form

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Address <http://localhost/Aysheya%20abed/centerorder.php> Go Links

 **INVENTORY MANAGEMENT SYSTEM
FOR
AYESHA ABED FOUNDATION** 

Order Date	Year 2005 Month January Day 1
Center Name	Select Region
Supplier Name	Select supplier
Deliver date	Year 2005 Month January Day 1
Amount	
Cloth Name	Khadi
Submit Reset	

Done Local intranet

Fig. 4.2 Center order form

To access all the options of the Main Menu a user has to login using this form. User can login as an Administrator, an Accountant as a user or as a guest. Different login options can be provided to user with different access environment.

An administrator can access all the options.

A user also has access to all the options apart from the permission to insert new supplier or employee information.

To login user has to type his/her user name and password. Then if the password and user name is correct then clicking the Sign in button will confirm the login process. A wrong user name or password will display a warning message about wrong user name or password.

Login

**INVENTORY MANAGEMENT SYSTEM
FOR
AYESHA ABED FOUNDATION**

Please sign in
Enter your ID and Password

User Name	
Password	
Domain	Select Domain ▼
Signin	

Fig. Log in form

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**INVENTORY MANAGEMENT SYSTEM
FOR
AYESHA ABED FOUNDATION**

DELIVERY REPORTS OF ALL SUPPLIERS AND PRODUCTS

From **To**

DATE	Year 2005 Month January Day 1	Year 2005 Month January Day 1
	Submit	

Done Local intranet

Fig: Delivery reports for all suppliers and products

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Address http://localhost/Aysheya%20abed/datewisereceivequery.php Go Links



DATE WISE RECEIVE QUERY FOR A SPECIFIC CENTER

From				To			
Date	Year	Month	Day	Year	Month		
	2005	January	1	2005	January		
Select CenterName to find the Suppliers Name:	Aayeshaabed Manikgonj						
Submit							

Done Start Apache Local intranet

Fig. Fig: Date wise receive query for a specific center

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Address http://localhost/Aysheya%20abed/Datewisedelivery.php Go Links

DELIVERY REPORT OF A SPECIFIC SUPPLIER

Center Name	Select Region
Supplier Name	Select supplier
Submit	

[HOME](#)

Done Local intranet

Fig: Delivery report for a specific supplier

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Address http://localhost/Aysheya%20abed/Datewisedelivery.php Go Links

DELIVERY REPORTS OF A SPECIFIC PRODUCT

From			To			
Date	Year 2005	Month January	Day 1	Year 2005	Month January	Day 1
Product Name	khadi					
						Submit

Done Local intranet 11:51 PM

Fig. 4.5 Delivery report for a specific product

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Address http://localhost/Aysheya%20abed/supplier.php Go Links

**INVENTORY MANAGEMENT SYSTEM
FOR
AYESHA ABED FOUNDATION**

Name			
Address			
Phone NO	 Official	 Residence	 Mobile
Center Name	Aayeshaabed Manikgonj		
Submit Reset			

[HOME](#)

Done Local intranet

Fig: Center order

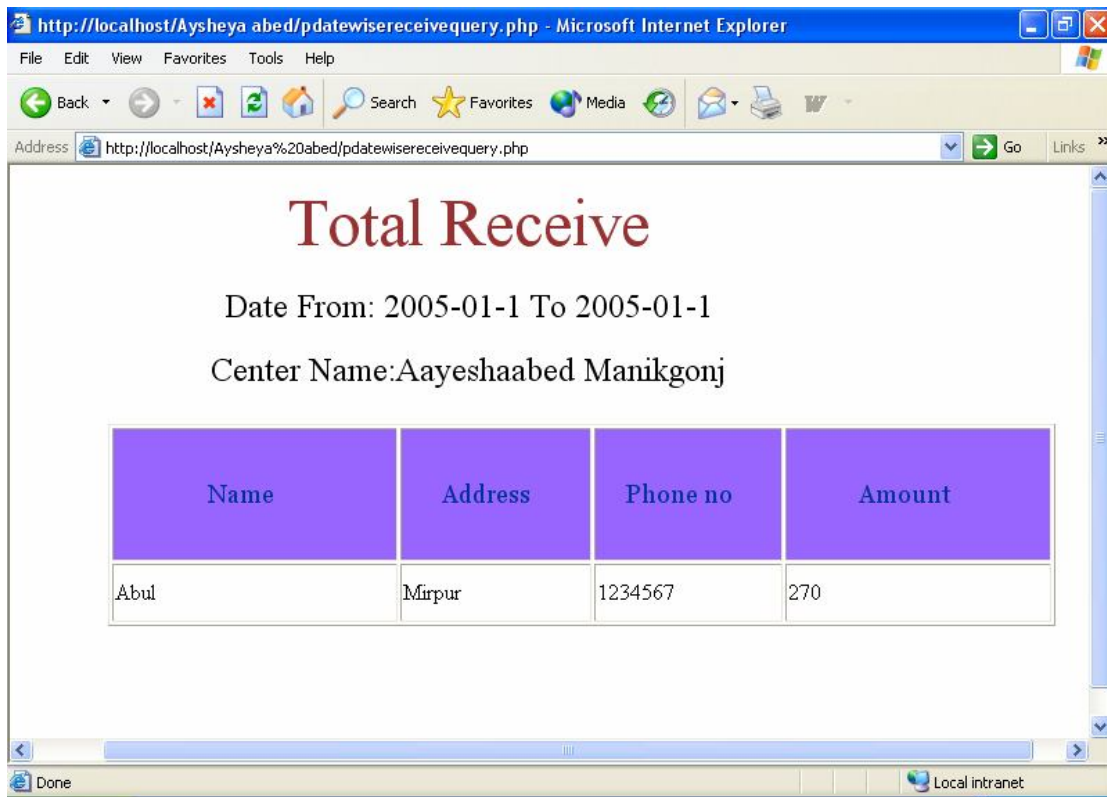


Fig. 4.6 Total receive for a specific supplier

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Address http://localhost/Aysheya%20abed/average.php Go Links



SELECT PRODUCT Khadi

SELECT MONTH January

SELECT YEAR 2005 to 2005

Submit

Done Local intranet

Fig: Average report for a specific product for a specific month.

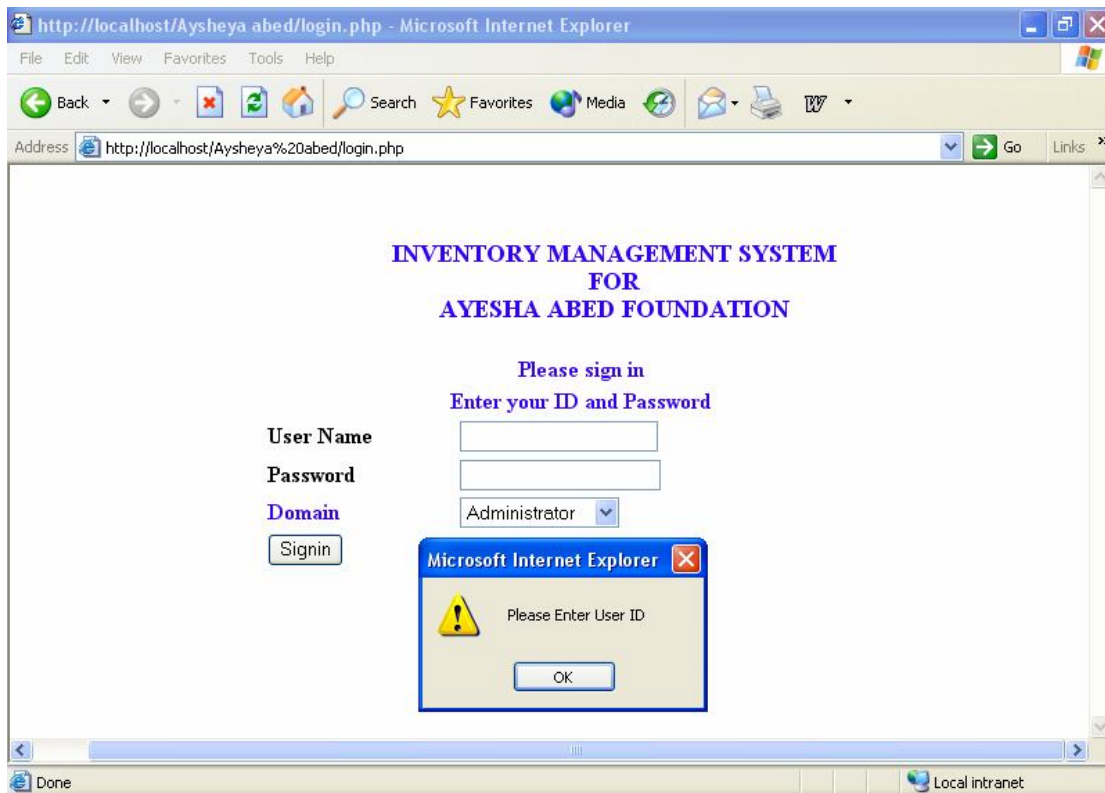
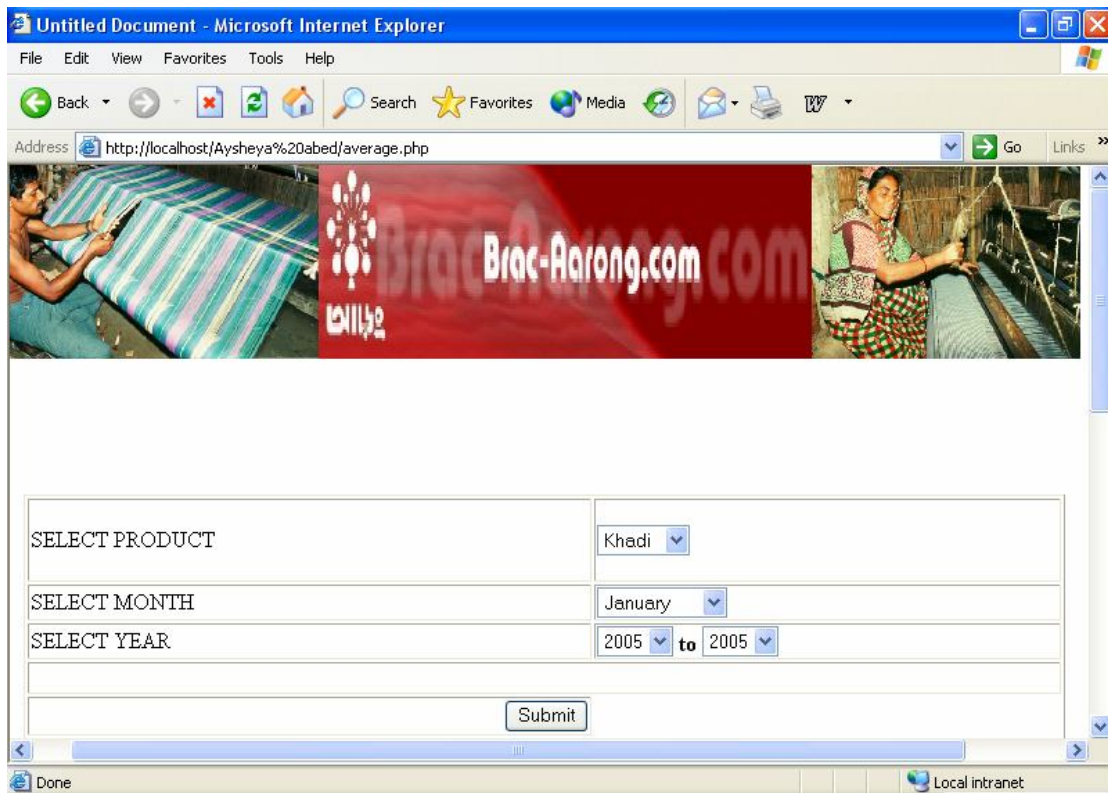


Fig: Authentication in Log In form

4.3 Designing Reports

This system can produce reports on the screen, Reports are perhaps the most visible part of any system because a primary reason for using an information system is to access the information that it produces.

There are many types of reports. A report can be detailed, a summary, turnaround documents or graphs. In my system order monitoring system all reports that are generated is basically detailed. PHP is used for producing different type of query and create reports. Reports can be generated from any search results of the Ordering Information, Supplier Information, Employee Information, Receiving Information form. Here is a sample report that shows all of my queries.



http://localhost/Aysheya%20abed/pDatewisedelivery.php - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Media

Address http://localhost/Aysheya%20abed/pDatewisedelivery.php Go Links

DATE WISE DELIVERY FOR ALL PRODUCTS

Name	Address	Phone no	Amount	Cloth Name
MOJAFFOR	KALIAKOIR	900323	100	Khadi
MOJAFFOR	KALIAKOIR	900323	100	Khadi
bahadur	jatrabari	123	85	Khadi
Ranjit	Pirgacha	7710478	56	Khadi
BACK				HOME

Done Local intranet

CHAPTER V

5. IMPLEMENTATION PHASE

5.1 Coding And Testing

The database design and interface design specification of the to-be system were turned into workable computer code. Both the GUI (Graphical User Interface) and the coding were completed using PHP. The testing requirements were collected during the analysis phase. User testing of the completed system was done by simulated data. Later the system testing was carried out using real data.

LIST OF REFERENCES

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2. Rogers. Pressman, Software Engineering: a practitioner's approach, New York, NY, 10020: The McGraw-Hill companies, inc. Delhi 110 092, India, Pearson Education (Singapore) Pt .Ltd.
3. <http://www.cs.uiowa.edu/writingTips.html>
4. <http://www.idinews.com/index.html>

APPENENDICES

Joint Application Design (JAD): A structured process in which users, managers, and analysts work together for several days in series of intensive meeting to specify or review system requirements.

Incremental commitment: A strategy in systems analysis and design in which the project is reviewed after each phase and continuation of the project is rejustified in each of these reviews.

UML: Unified Modeling Language

Incremental System Delivery

Planning increments

Incremental delivery is based on the concept of delivering a specified 'part' of the system, often in a specified time-scale, ideally to the users of the system. Increments are often therefore scoped by user-meaningful items, such as allowing particular use cases and meeting operational constraints. Less frequently, an increment will be defined to meet some internal need such as delivery of a particular subsystem for integration testing. There are a number of 'objects' that can be used to define the scope of an increment, such as:

- A Use Case - defining a unit of end user functionality to be delivered;
- A Domain - defining a specific 'application area' that should be delivered;
- An system constraint - defining a specific degree of performance (or reliability etc.) to be achieved;
- A Subsystem (in the System Architecture) - defining a specific unit of hardware to be delivered;

Typically the order and scope of increments is defined to:

- Reduce risk;
- Accommodate 'pre-ordained' system development constraints, such as hardware or external software delivery schedules;