Development of a Management Information System: a Case Study

by

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CANDIDATES'S DECLARATION

It is hereby declared that this project report or any part of it has not been submitted elsewhere for the award or any degree or diploma.

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Md. Anisur Rahman

Dedicated

to

My Parents

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List of Abbreviations

IMEI	International Mobile Equipment Identification
PSN	Product Serial Number
VID	Verification Identification
IT	Information Technology
TCO	Total Cost of Ownership
MSSQL	Microsoft Structured Query Language
VB	Visual Basic
GUI	Graphical User Interface
SDLC	System Development Life Cycle
IS	Information System
JAD	Joint Application Design
GSS	Group Support System
BPR	Business Process Reengineering
OOP	Object Oriented Programming
DFD	Data Flow Diagram
ER	Entity Relationship
CSR	Customer Service Representative
SE	Service Engineer
DBMS	Database Management System
MRI	Material Receipt and Inspection
SPR	Store Purchase Requisition
MIS	Management Information System

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ABSTRACT

The use of different types of cell phone has drastically increased over the years. Consequently, the trouble in these phones has become more complicated than ever. The cell phone manufacturer has become in a large scale in different countries with their customer care center (CCS) to repair the troubles that peoples are facing daily. In different CCS, the information of care is carried out using combined or stand-alone spreadsheet and processing software that have reduced the level of complexity in dealing with the service system. However, the traditional tools do not provide the interlinked information in precise and usable way. Therefore, there is a need for developing of complete service and inventory management software that will overcome the limitations of using nonintegrated software and paper works. A software has been developed to address the issue in this report. It keeps records of cell phone and their time-to-time service information. In addition, the software provides inventory information, and enables a complete requisition system. Data related to International Mobile Equipment Identification (IMEI), Product Serial Number (PSN), Verification Identification (VID) and product code also could be maintained in this software. As a result tracking of cell phone in CCS will become easier. Thus scope of deficient in the service of cell phone reduces significantly that ensure the customer to get better and faster service.

Introduction

1.1. Introduction

Computers are the invention of the nineteenth century. The fastest and accurate processing of information using computers made wide spread of the information technology in almost all the sectors of business and industries. This information technology (IT) based automation of the organization helps to lower the operational costs, improve the service, reduce errors and inconsistencies and uses staff more effectively [1]. The large and sensitive organizations like banks, militarily etc use vendor specific software to develop their IT solution but medium and small enterprise cannot take the advantages of the vendor provided software due to its high total cost of ownership (TCO) [2]. They are still working with the traditional paper based system to manage the service section. They often decline to buy high cost software from abroad. It is necessary to develop software that is low cost and can easily be developed. This project presents a solution for this problem. In this project, a cell phone company having multiple service and support centers has been considered as a case study [3]. The proposed low cost solution for the said company is also usable with some customization for any other similar organizations.

1.2. Motivation

Now-a-days cell phone is part of our daily life. Sustain cell phone servicing is very important for a cell phone company to run, spread their business. Hundreds of care center have been established in Bangladesh in the last decade. To provide the regional service for the customers from the cellular phone company is very much important. Frequent ranges of customers come to the service centre for repair their cellular phone. At present service and support care center with different region is providing this service alone and cooperate with other service center. The automation of the data regarding in this service like service require, parts require and warranty claim is essential in a server based database system. It will help the administration of cellular phone company to know the business, inventory, support and logistic of their business.

This automation solution will help to lower operational costs, improve IT service, reduce errors and inconsistencies, and use staff more effectively. Automation of repetitive, manual tasks also ensures compliance and accelerates process standardization, while freeing IT resources for strategic projects that deliver greater value to the business. Because automation automates complex processes across the service lifecycle, it can also helps to optimize utilization of physical and virtual assets, thus gaining agility and reducing redundant capital outlays and energy costs.

1.3. Objectives with Specific Aims and Possible Outcomes

This project has following objectives:

- To develop a management information system (MIS)
- To design a flexible front end system where transactional data can be easily posted
- To implement the system in a 2-tier client server environment
- To generate various reports for the management for understanding the business and decisions making

1.4. Possibility/ Scopes

Some scopes of this software are given below:

1. Any particular care center which can use the software to keep records of service and to manage inventory
2. An Employee can have access within a network
3. An Employee will be able to know about the job information
4. An employee will be able to
    - Enter and view job and inventory information
    - Distribute job to others
    - Enter service information
    - Submit requisition for parts
    - Issue the requested parts
    - View job status
    - Enter delivery information

5. An administrator will be able to log in into the system using given password
6. Administrator will be able to
    - Change the password
    - Add, view, edit and delete the users

7. The system will make sure the specific job is ready for delivery or not

Software Development Life Cycle (SDLC)

2.1. Outline of Methodology

The project is maintained through the stages of SDLC, which is the traditional methodology for developing, maintaining and replacing information system. The phases in SDLC, which is maintained, are:

1. Planning
2. Analysis
3. Design
4. Implementation
5. Maintenance

2.1.1. SDLC Planning Phase

Planning phase in SDLC is the phase where identify, analyze, prioritize and arrange which information system (IS) needs. Development of a business case, i.e. justification for IS in terms of tangible and intangible benefits, costs, technical and organizational feasibility of the proposed system that determines whether a required system makes economic, technical, operational, legal, contractual and political organizational feasibility.

Project is a planned undertaking of a series of related activities to reach an objective that has a beginning and an end. Objective of a project -

- Solve a business problem
- Take advantage of business opportunities
- Other non rational reasons: spend existing available resources, training and enhancing skills of employees

Some activities in planning phase are:

1. Describing project scopes, alternatives and feasibilities
2. Dividing project into manageable task and logical order
3. Developing a preliminary schedule

4. Developing a communication plan
5. Determining a project standards and procedures
6. Identifying and accessing risks

For an organization based on manual system, it is very difficult to maintain the large numbers of cell phone for service that are used by different branch or site offices every day. Some of these organizations already use desktop-based software and others use web-based software with limited functionalities. Therefore, a low cost system will be financially feasible. The system will reduce maintenance cost. The system will save employee's time and give proper information when he/she wants.

2.1.2. SDLC Analysis Phase

Analysis phase in SDLC is the phase with evolves study and structures system requirements. The output of this phase is a system requirement and best alternatives to design the system. The process of determining system requirements is

- Impertinence: Question everything (find out the every scenario)
- Impartiality: Find the best solution to a business problem or opportunity (suitable from both end and find the best option)
- Relax constraints: Prepare for the exceptions (avoid using traditions)
- Attention to details: Every fact must fit with every other facts (try to increase the coverage for all stakeholders)
- Reframing: Take a different look (try think in a different way and avoid following patterns)

Methods to determine system requirements

- Traditional Methods:
    1. Interviews
    2. Survey via questionnaires
    3. Direct observation of working people
    4. Study business documents (forms, reports)
- Modern Methods:
    1. Joint Application Design (JAD)
    2. Group Support System (GSS)

3. Case Tools
4. Prototyping

- Radical Methods:
  1. Business process reengineering (BPR)

In data analysis stage, data of a large cellular service center is analyzed, which are being used for project in order to have clear idea about project.

2.1.3. SDLC Design Phase

Design phase in SDLC is the phase where requirements are converted in solution to system. In this phase, functional features are described independently, which is called logical design. Logical specification is transformed to technology-specific details, a detailed model that captures the overall structure of data in an organization.

In the design stage, design is developed using the selected position of data entry and report generation options and others. An integrated user-friendly graphic user interface (GUI) can be fully event driven and such that the project staffs with little computer knowledge can operate the system. Database related to this application also is planned. The database design would be flexible and upward scalable. To meet these criteria following tools are used.

Visual Basic

Source: Microsoft Corporation

Purpose: To Design the user interface and coding for user trigger

Definition of the interface: Microsoft Visual Basic is the software, which provides a flexible and reliable interface experience with enhanced privacy features for all users

MS SQL Server

Source: Microsoft Corporation

Purpose: Required as database server

Definition of the interfaces: MS SQL Server is the world’s most popular database software. With superior speed, reliability, and ease of use, MS SQL Server has become

the preferred choice of corporate IT Managers because it eliminates the major problems associated with downtime, maintenance, administration and support

Crystal Report

Source: Seagate Corporation

Purpose: Required as report design and report viewer

Definition of the interfaces: Crystal Report is most compatible report designer for Visual Basic Interface and MS SQL Server database

2.1.4. SDLC Implementation Phase

Implementation phase in SDLC is the phase where design is covered with code, test, install and support information system. Physical design specification must be turned into working code, code must be tested for error detection and correction, the system must be installed and user must be prepared for new system.

In the coding stage, all the applications are implemented using object oriented programming (OOP) language. Core application is network application for remote availability.

In the test and modification stage, the software is extensively tested under different scenarios and modification is performed if necessary. In the performance analysis stage, quality attribute of the system such as scalability, reliability and resource usage is evaluated to determine how fast the developed software performs under various workloads.

2.1.5. SDLC Maintenance Phase

Maintenance phase in SDLC is the phase where system is systematically repaired and improves the information system. After the system is in operation, various changes are made in order to add new functionalities, to port the software to new platform, or to adapt the software to new technologies during maintenance phase of system.

Software Design

3.1. Introduction

The chapter design describes the flowchart of the activities of Nokia customer care centre (CCS), data flow diagram (DFD), entity relationship (ER) diagram, the desired features of the software that has been developed, including, database design, software design, screen layouts and other documents etc.

3.2. Flow Chart of Activities of Nokia Customer Care Center

Figure 3.1. shows the flowchart of the activities of the Nokia's CCS located in Mirpur, Dhaka. The company has multiple service and support centers. This CCS deals with troubleshoot, repair or swap of the malfunctioning cell phone of people those are made by Nokia. The owner of the malfunctioning cell phone comes to care center and faces nos. of customer service representative (CSR) sited in front desk of care center. CSR usually notes the troubles of cell phone addressed by customer and check whether the repair covered under warranty or not. Receiving the malfunctioning cell phone from the customer CSR pass this to admin officer of distribution who is responsible to distribute the cell phone to service engineer (SE). Whether the cell phone is in the period of warranty then this is passed to SE of a group who is responsible for repair the cell phones that are in period of warranty, otherwise the cell phone is passed to SE of another group who is responsible for repair the cell phones that are in period out of warranty. On basis of noting problems of the cell phone SE diagnosis and troubleshoot the problems and requisite to store for required parts for repairing the cell phone. Getting parts from store for specific cell phone, SE repair cell phone by setting the parts. If repair is not possible for cell phone, which is in period of warranty, then care center claim to Nokia to swap the cell phone to customer. Whether repair is done or not possible to do or swappable, the cell phone is returned to admin officer of distribution through whom it passes to delivery desk for delivery to customer.

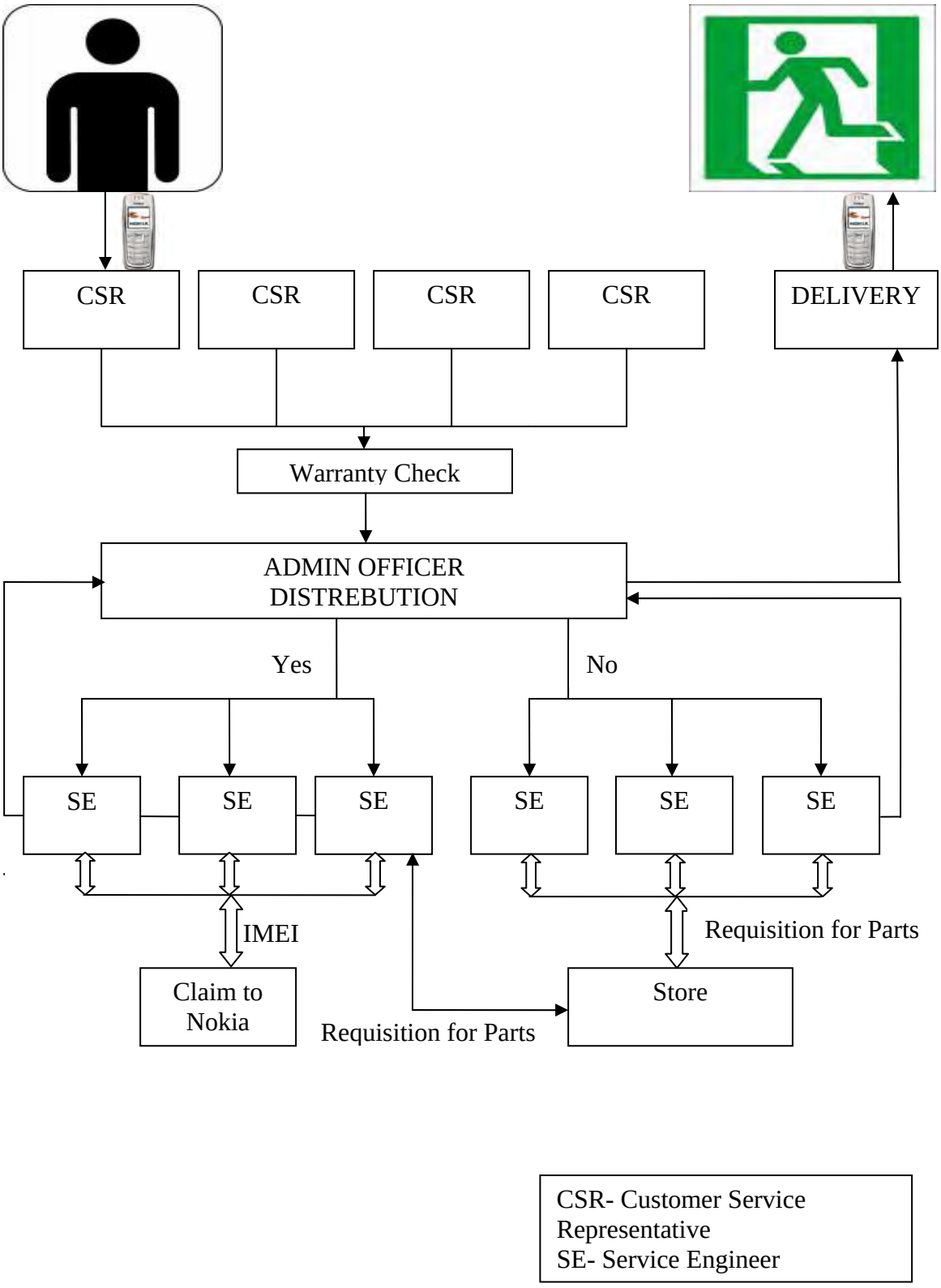

Figure 3.1. Flow Chart of Activities of Nokia Customer Care Center

3.3. Data Flow Diagram

Figure 3.2. shows the data flow diagram of the Nokia's CCS. The owner of the malfunctioning cell phone comes to care center to orders for resolving the problems of cell phone. This order is processed in customer order file (1.0) in database. On basis of noting problems of the cell phone, items are requested to store for repairing the cell phone. On requisition, items are issued on specific order. Going through repairing the customer cell phone, services are done and parts are used which update the services file (2.0) and inventory file (3.0) in database. On basis of formatted services data and formatted inventory data service-accomplished report and inventory report are generated. On basis of daily services accomplished and daily inventory depletion management report (4.0) are generated in database. From which management reports are generated for care center manager. Whether repair is done or not possible to do or swappable the cell phone is returned to customer through updating customer order file (1.0) in database.

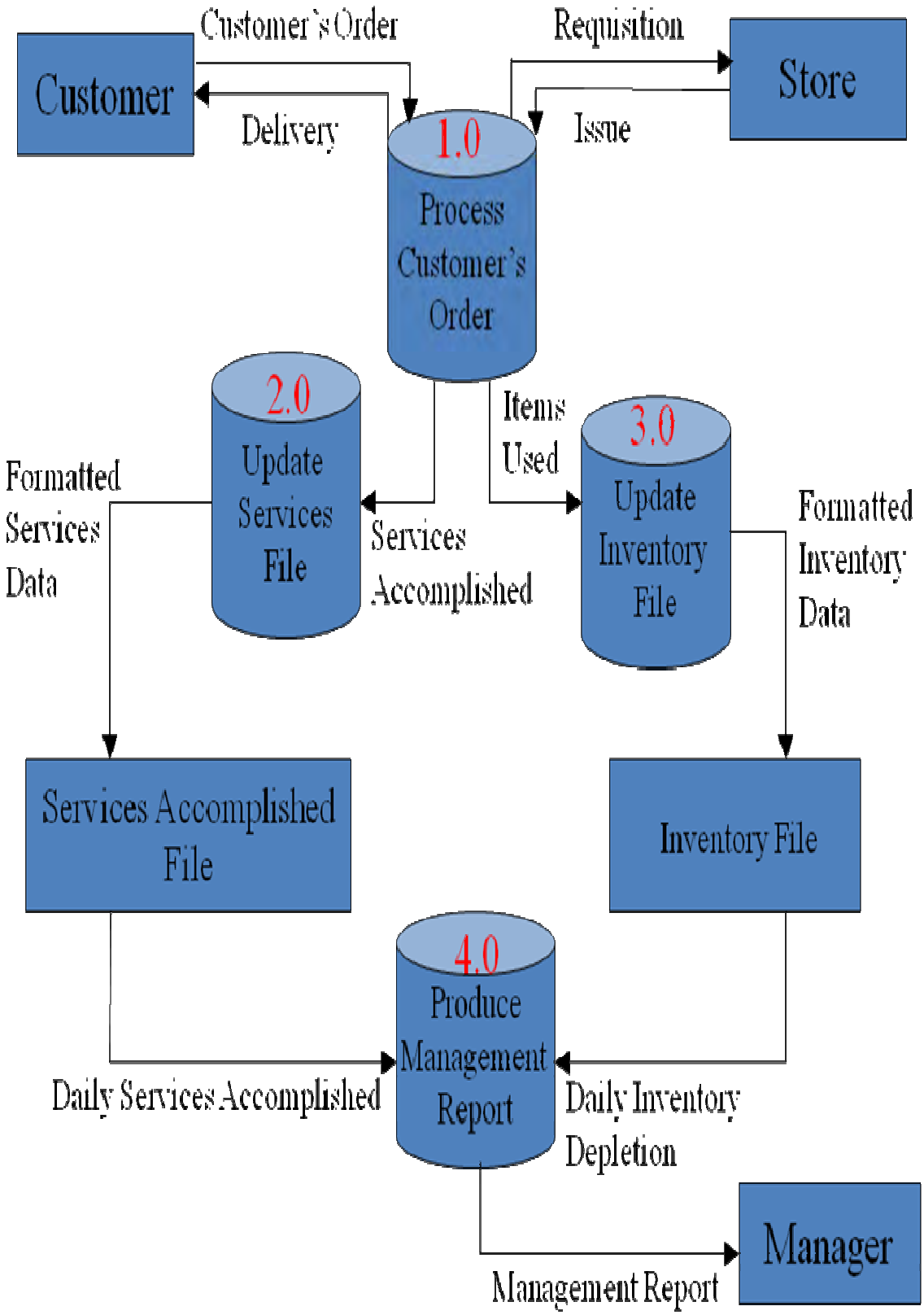

Figure 3.2. Data Flow Diagram

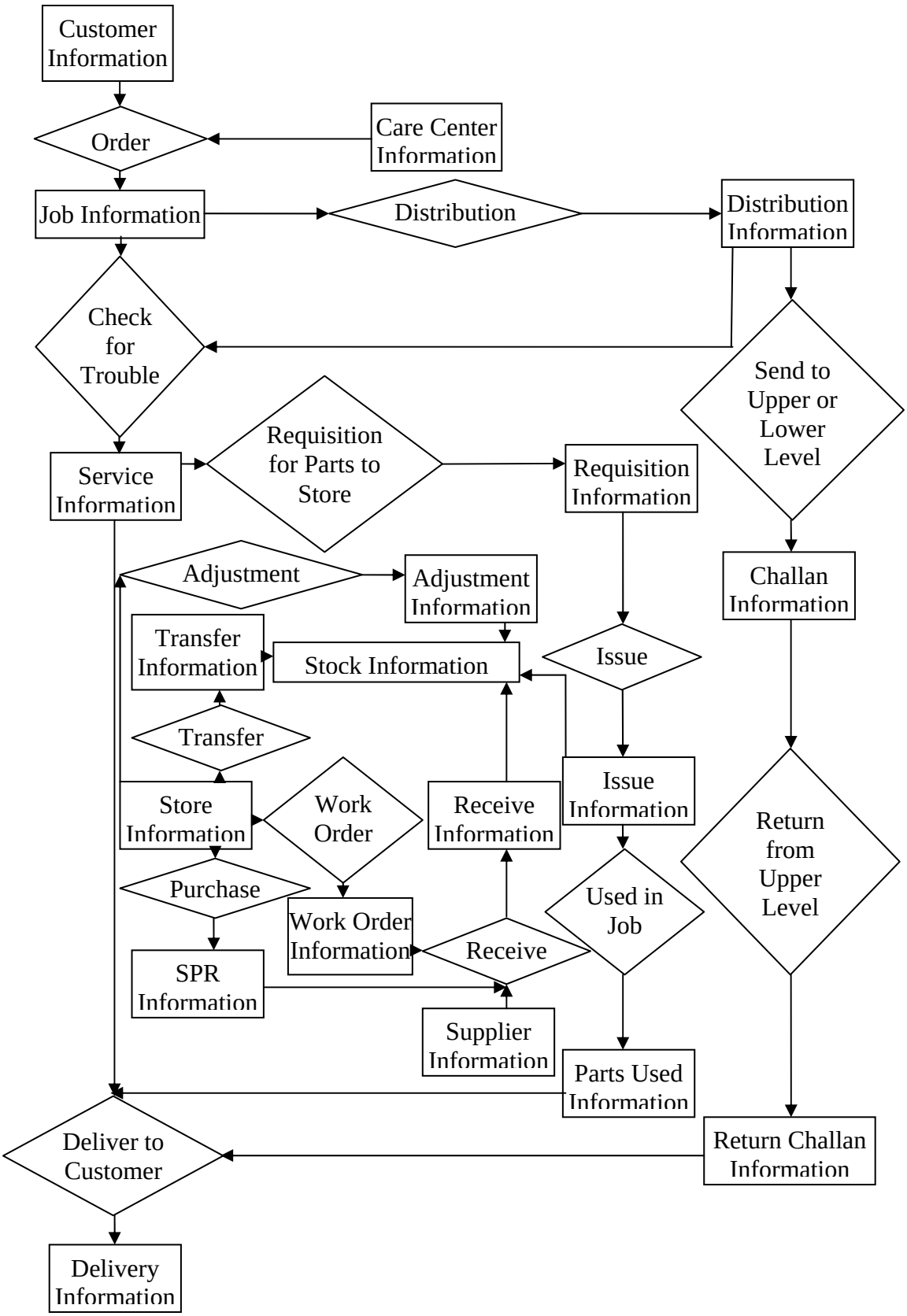

Figure 3.3. Entity Relationship Diagram

3.4. Database Design

A database is a collection of information, organized in such a way that a computer program can quickly select desired piece of data. The computer program used to manage and query a database has known as a database management system (DBMS). Databases are designed to offer an organized mechanism for storing, managing and retrieving information. This includes detailed specification of data elements, data types, indexing options and other parameters residing in the DBMS data dictionary.

3.4.1. Data Overview of Various Informative Screen

Data dictionary describes the table format, which is used in database design. The following transaction tables are used in database design.

Table 3.1. Job Information

Field Name	Identity	Data Type	Data Length	Requirement	Key
Name_Center	Yes	Character	100	Yes	FK
No_Job	Yes	Character	20	Yes	PK
Name_Make	No	Character	100	Yes	
Name_Model	No	Character	100	Yes	
No_IMEI	No	Character	15	Yes	
Date_Receive	No	Date	10	Yes	
Date_Delivery	No	Date	10	Yes	
Name_Customer	No	Character	100	Yes	
No_Contact	No	Character	100	No	
Address_Contact	No	Character	100	Yes	
Code_Product	No	Character	20	Yes	
Warranty_Product	No	Boolean	3	Yes	
Date_Purchase	No	Date	10	No	
Cost_Job	No	Numeric	8	Yes	
Cost_Notok	No	Numeric	8	Yes	
Remarks_Job	No	Character	100	No	
Reference_Dead	No	Boolean	3	Yes	
Details_Fault	No	Character	100	No	
Details_Physical	No	Character	100	No	
Name_Employee	No	Character	100	Yes	

Table 3.2. Accessories of Job Information

Field Name	Identity	Data Type	Data Length	Requirement	Key
Name_Center	Yes	Character	100	Yes	FK
No_Job	Yes	Character	20	Yes	FK
Name_Accessories	Yes	Character	100	No	FK

Table 3.3. Condition of Job Information

Field Name	Identity	Data Type	Data Length	Requirement	Key
Name_Center	Yes	Character	100	Yes	FK
No_Job	Yes	Character	20	Yes	FK
Name_Condition	Yes	Character	100	No	FK

Table 3.4. Fault of Job Information

Field Name	Identity	Data Type	Data Length	Requirement	Key
Name_Center	Yes	Character	100	Yes	FK
No_Job	Yes	Character	20	Yes	FK
Code_Fault	Yes	Character	10	Yes	FK

Table 3.5. Distribution of Job Information

Field Name	Identity	Data Type	Data Length	Requirement	Key
Name_Center	Yes	Character	100	Yes	FK
No_Job	Yes	Character	20	Yes	FK
Date_Distribution	Yes	Date	10	Yes	PK
Name_CenterD	Yes	Character	100	Yes	FK
Name_Employee	Yes	Character	100	Yes	
Date_Return	No	Date	10	No	

Table 3.6. Work of Job Information

Field Name	Identity	Data Type	Data Length	Requirement	Key
Name_Center	Yes	Character	100	Yes	FK
No_Job	Yes	Character	20	Yes	FK
Name_PSN	No	Character	15	Yes	
Name_VID	No	Character	15	Yes	
Name_HW	No	Character	15	Yes	
Name_SWO	No	Character	15	Yes	
Name_SWN	No	Character	15	No	
Remarks_Job	No	Character	100	No	
Date_Job	No	Date	10	Yes	
Status_Job	No	Boolean	3	Yes	
Date_L3	No	Date	10	No	

Table 3.7. Service of Job Information

Field Name	Identity	Data Type	Data Length	Requirement	Key
Name_Center	Yes	Character	100	Yes	FK
No_Job	Yes	Character	20	Yes	FK
Name_Service	Yes	Character	100	Yes	FK
Price_Local	No	Numeric	8	Yes	

Table 3.8. Requisition for Parts of Job Information

Field Name	Identity	Data Type	Data Length	Requirement	Key
Name_Center	Yes	Character	100	Yes	FK
No_Job	Yes	Character	20	Yes	FK
Date_Requisition	Yes	Date	10	Yes	
Code_Product	Yes	Character	20	Yes	FK
Quantity_Product	No	Numeric	8	Yes	

Table 3.9. Issue for Parts of Job Information

Field Name	Identity	Data Type	Data Length	Requirement	Key
Code_Store	Yes	Character	20	Yes	FK
Name_Center	Yes	Character	100	Yes	FK
No_Job	Yes	Character	20	Yes	FK
Date_Isuue	Yes	Date	10	Yes	
Code_Product	Yes	Character	20	Yes	FK
Quantity_Issued	No	Numeric	8	Yes	
Rate_Product	No	Numeric	8	Yes	

Table 3.10. Used Parts of Job Information

Field Name	Identity	Data Type	Data Length	Requirement	Key
Name_Center	Yes	Character	100	Yes	FK
No_Job	Yes	Character	20	Yes	FK
Code_Product	Yes	Character	20	Yes	FK
Quantity_Product	No	Numeric	8	Yes	

Table 3.11. Delivery of Job Information

Field Name	Identity	Data Type	Data Length	Requirement	Key
Name_Center	Yes	Character	100	Yes	FK
No_Job	Yes	Character	20	Yes	FK
Date_Delivery	No	Date	10	Yes	
Remarks_Delivery	No	Character	100	No	
Name_Delivery	No	Character	100	Yes	
Type_Payment	No	Character	10	Yes	
No_Cheque	No	Character	100	No	
Date_Cheque	No	Date	10	No	
Percent_Discount	No	Numeric	8	Yes	
Amount_Delivery	No	Numeric	8	Yes	
No_MR	No	Character	20	Yes	
Amount_Service	No	Numeric	8	Yes	
Amount_Parts	No	Numeric	8	Yes	

Table 3.12. Challan Information

Field Name	Identity	Data Type	Data Length	Requirement	Key
No_Challan	Yes	Character	20	Yes	PK
Date_Challan	No	Character	10	Yes	
Name_CenterC	No	Character	100	Yes	

Table 3.13. Job of Challan Information

Field Name	Identity	Data Type	Data Length	Requirement	Key
No_Challan	Yes	Character	20	Yes	FK
Name_Center	Yes	Character	100	Yes	FK
No_Job	Yes	Character	20	Yes	FK

Table 3.14. Return Challan Information

Field Name	Identity	Data Type	Data Length	Requirement	Key
No_Challan	Yes	Character	20	Yes	PK
Date_Challan	No	Character	10	Yes	
Name_CenterC	No	Character	100	Yes	

Table 3.15. Job of Return Challan Information

Field Name	Identity	Data Type	Data Length	Requirement	Key
No_Challan	Yes	Character	20	Yes	FK
Name_Center	Yes	Character	100	Yes	FK
No_Job	Yes	Character	20	Yes	FK
Model_New	No	Character	100	No	
IMEI_New	No	Character	15	No	
Product_New	No	Character	15	No	

Table 3.16. Open Stock Information

Field Name	Identity	Data Type	Data Length	Requirement	Key
Code_Store	Yes	Character	20	Yes	FK
Code_Product	Yes	Character	20	Yes	FK
Balance_Product	No	Numeric	8	Yes	
Value_Product	No	Numeric	8	Yes	

Table 3.17. Work Order Information

Field Name	Identity	Data Type	Data Length	Requirement	Key
No_WorkOrder	Yes	Character	20	Yes	PK
Date_WorkOrder	No	Date	10	Yes	
Code_Supplier	No	Character	20	Yes	
Total_WorkOrder	No	Numeric	8	Yes	

Table 3.18. Item of Work Order Information

Field Name	Identity	Data Type	Data Length	Requirement	Key
No_WorkOrder	Yes	Character	20	Yes	FK
Code_Product	Yes	Character	20	Yes	FK
Qty_Required	No	Numeric	8	Yes	
Rate_Product	No	Numeric	8	Yes	
Amt_Product	No	Numeric	8	Yes	
Remarks_Product	No	Character	100	No	

Table 3.19. SPR Information

Field Name	Identity	Data Type	Data Length	Requirement	Key
No_SPR	Yes	Character	20	Yes	PK
Date_SPR	No	Date	10	Yes	
Total_SPR	No	Numeric	8	Yes	

Table 3.20. Item of SPR Information

Field Name	Identity	Data Type	Data Length	Requirement	Key
No_SPR	Yes	Character	20	Yes	FK
Code_Product	Yes	Character	20	Yes	FK
Qty_Required	No	Numeric	8	Yes	
Rate_Product	No	Numeric	8	Yes	
Amt_Product	No	Numeric	8	Yes	
Remarks_Product	No	Character	100	No	
Rate_Previous	No	Numeric	8	Yes	
Stock_Product	No	Numeric	8	Yes	

Table 3.21. Receive Information

Field Name	Identity	Data Type	Data Length	Requirement	Key
No_MRI	Yes	Character	20	Yes	PK
Code_Store	Yes	Character	20	Yes	FK
Date_MRI	No	Date	10	Yes	
Code_Supplier	No	Character	20	Yes	
Remarks_MRI	No	Character	100	No	

Table 3.22. Items of Receive Information

Field Name	Identity	Data Type	Data Length	Requirement	Key
No_MRI	Yes	Character	20	Yes	FK
Code_Store	Yes	Character	20	Yes	FK
Code_Product	Yes	Character	20	Yes	FK
Rate_Product	No	Numeric	8	Yes	
Qty_Received	No	Numeric	8	Yes	
Amt_Product	No	Numeric	8	Yes	
Remarks_Product	No	Character	100	No	
Qty_Issued	No	Numeric	8	Yes	
Qty_Returned	No	Numeric	8	Yes	
Qty_Adjusted	No	Numeric	8	Yes	
Qty_TransferedFrom	No	Numeric	8	Yes	
Qty_TransferedTo	No	Numeric	8	Yes	

Table 3.23. Return Information

Field Name	Identity	Data Type	Data Length	Requirement	Key
No_Return	Yes	Character	20	Yes	PK
Date_Return	No	Date	10	Yes	
Code_Supplier	No	Character	20	Yes	
Code_Store	No	Character	20	Yes	
Total_Return	No	Numeric	8	Yes	

Table 3.24. Items of Return Information

Field Name	Identity	Data Type	Data Length	Requirement	Key
No_Return	Yes	Character	20	Yes	FK
Code_Product	Yes	Character	20	Yes	FK
Qty_Return	No	Numeric	8	Yes	
Rate_Product	No	Numeric	8	Yes	
Amt_Product	No	Numeric	8	Yes	
Remarks_Product	No	Numeric	8	Yes	

Table 3.25. Transfer Information

Field Name	Identity	Data Type	Data Length	Requirement	Key
No_Transfer	Yes	Character	20	Yes	PK
Date_Transfer	No	Date	10	Yes	
Code_StoreFrom	No	Character	20	Yes	
Code_StoreTo	No	Character	20	Yes	
Total_Transfer	No	Numeric	8	Yes	

Table 3.26. Items of Transfer Information

Field Name	Identity	Data Type	Data Length	Requirement	Key
No_Transfer	Yes	Character	20	Yes	FK
Code_Product	Yes	Character	20	Yes	FK
Qty_Transfer	No	Numeric	8	Yes	
Rate_Product	No	Numeric	8	Yes	
Amt_Product	No	Numeric	8	Yes	
Remarks_Product	No	Numeric	8	Yes	

Table 3.27. Adjustment Information

Field Name	Identity	Data Type	Data Length	Requirement	Key
No_Adjustment	Yes	Character	20	Yes	PK
Date_Adjustment	No	Date	10	Yes	
Code_Store	No	Character	20	Yes	
Remarks_Adjustment	No	Character	100	No	
Total_Adjustment	No	Numeric	8	Yes	

Table 3.28. Items of Adjustment Information

Field Name	Identity	Data Type	Data Length	Requirement	Key
No_Adjustment	Yes	Character	20	Yes	FK
Code_Product	Yes	Character	20	Yes	FK
Qty_Adjusted	No	Numeric	8	Yes	
Rate_Product	No	Numeric	8	Yes	
Amt_Product	No	Numeric	8	Yes	
Remarks_Product	No	Numeric	8	Yes	

Table 3.29. Stock Information

Field Name	Identity	Data Type	Data Length	Requirement	Key
Code_Store	Yes	Character	20	Yes	FK
Code_Product	Yes	Character	20	Yes	FK
Option_Invoice	Yes	Character	20	Yes	PK
Date_Invoice	Yes	Date	10	Yes	PK
No_Invoice	Yes	Character	20	Yes	FK
OpenBal_Product	No	Numeric	8	Yes	
Rate_Balance	No	Numeric	8	Yes	
Amount_OpenBal	No	Numeric	8	Yes	
Quantity_Receive	No	Numeric	8	Yes	
Rate_Receive	No	Numeric	8	Yes	
Amount_Receive	No	Numeric	8	Yes	
Quantity_Issue	No	Numeric	8	Yes	
Rate_Issue	No	Numeric	8	Yes	
Amount_Issue	No	Numeric	8	Yes	
Quantity_Return	No	Numeric	8	Yes	
Rate_Return	No	Numeric	8	Yes	
Amount_Return	No	Numeric	8	Yes	
Quantity_TransferFrom	No	Numeric	8	Yes	
Rate_TransferFrom	No	Numeric	8	Yes	
Amount_TransferFrom	No	Numeric	8	Yes	
Quantity_TransferTo	No	Numeric	8	Yes	
Rate_TransferTo	No	Numeric	8	Yes	
Amount_TransferTo	No	Numeric	8	Yes	
Quantity_Adjustment	No	Numeric	8	Yes	
Rate_Adjustment	No	Numeric	8	Yes	
Amount_Adjustment	No	Numeric	8	Yes	

System Features

4.1. System Features

The developed service and inventory management system (SIMS) have different essential features. Screen shot of some of the main features are explained below.

4.1.1. Security Information

Figure 4.1. shows the security information screen which is defined by system administrator. Multilevel security has been worked out in this software. Every user is defined for permission to entry, edit and view data. The system administrator has enormous chance to define the security for every user.

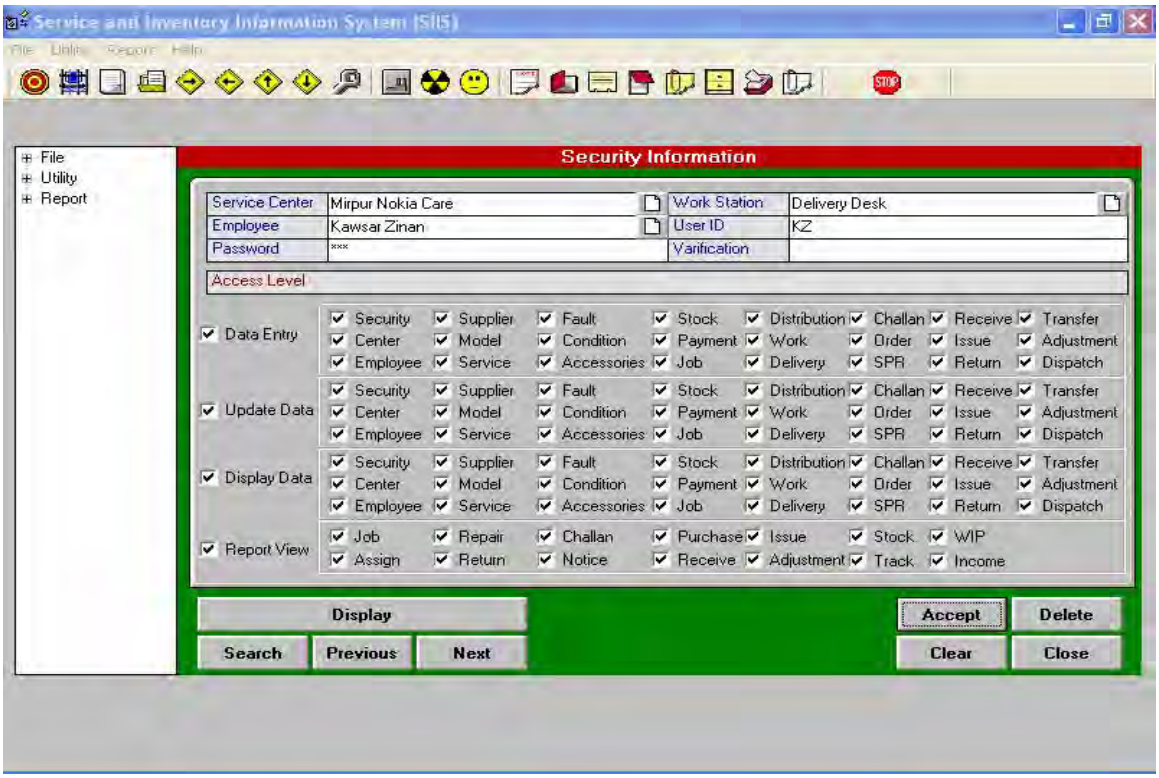

Figure 4.1. Security Information Screen

4.1.2. Job Information

Figure 4.2., 4.3., 4.4. show the job information screen which is filled by Customer Service Representative (CSR). The details of a job (i.e. a cellular phone of customer) are entered by CSR sited in front side of service center. The details information of fault, condition and accessories are also need to cover in this session for record keeping and printing automated job sheet.

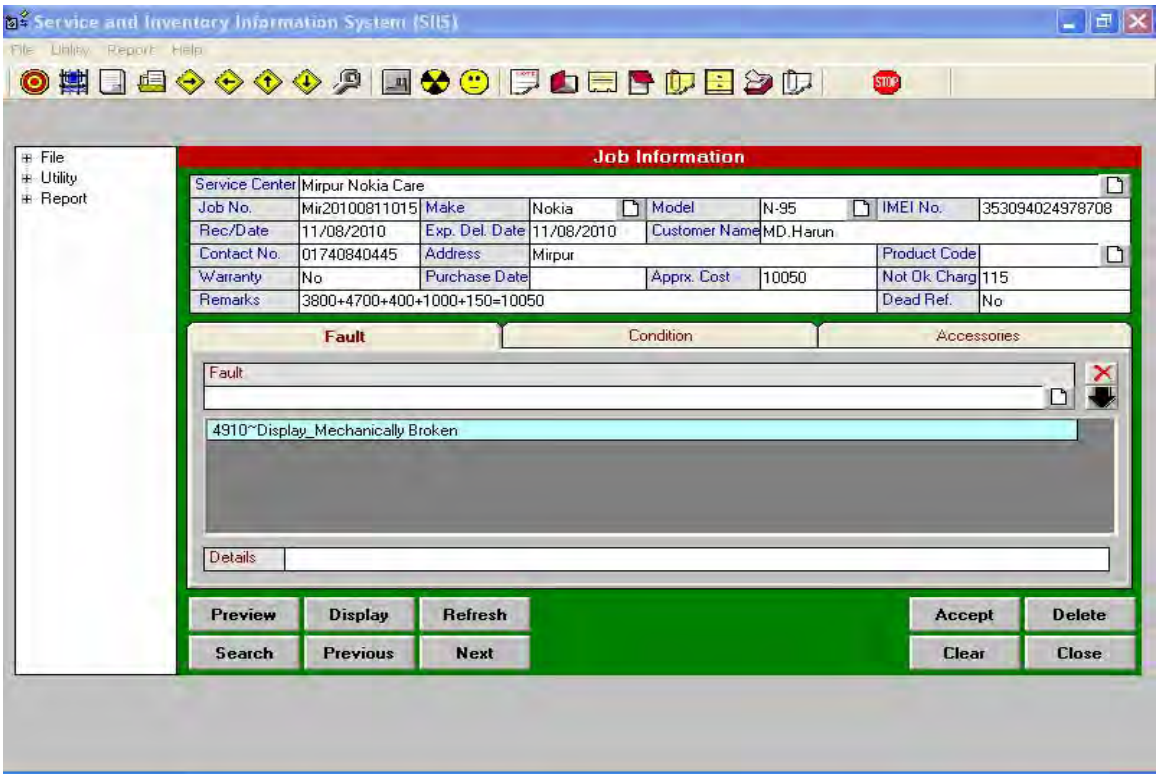

Figure 4.2. Job Information Screen

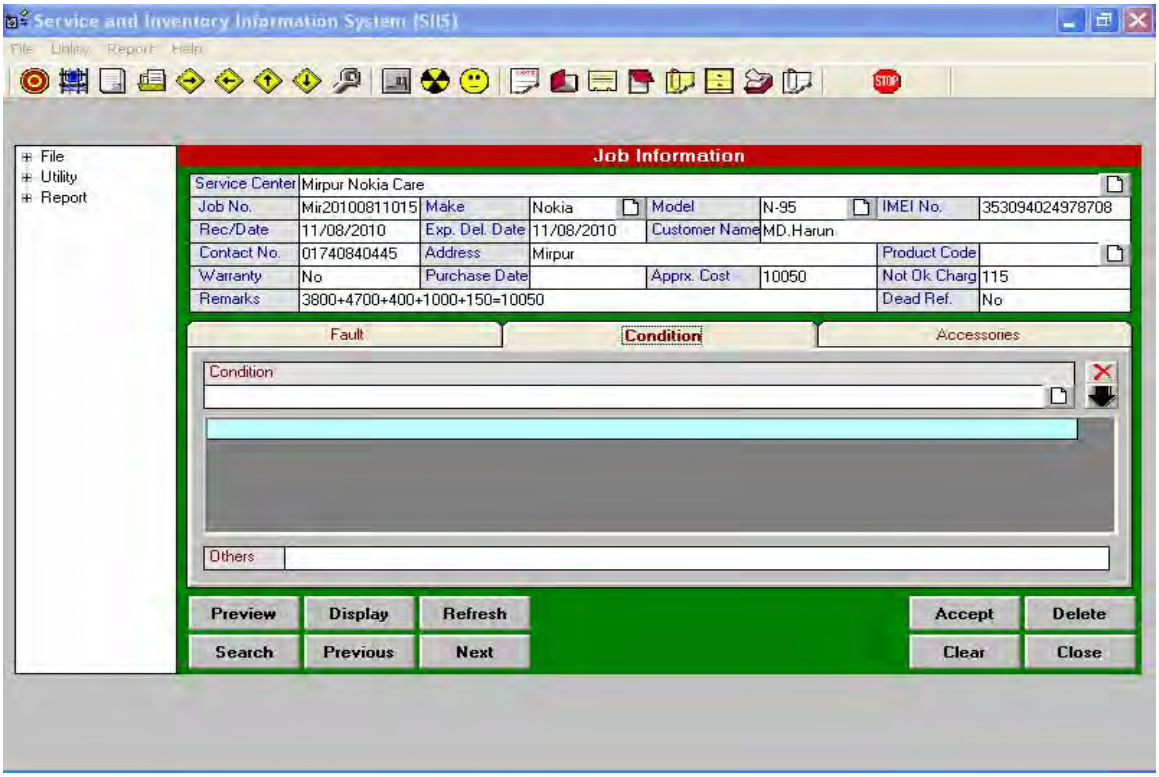

Figure 4.3. Job Information Screen

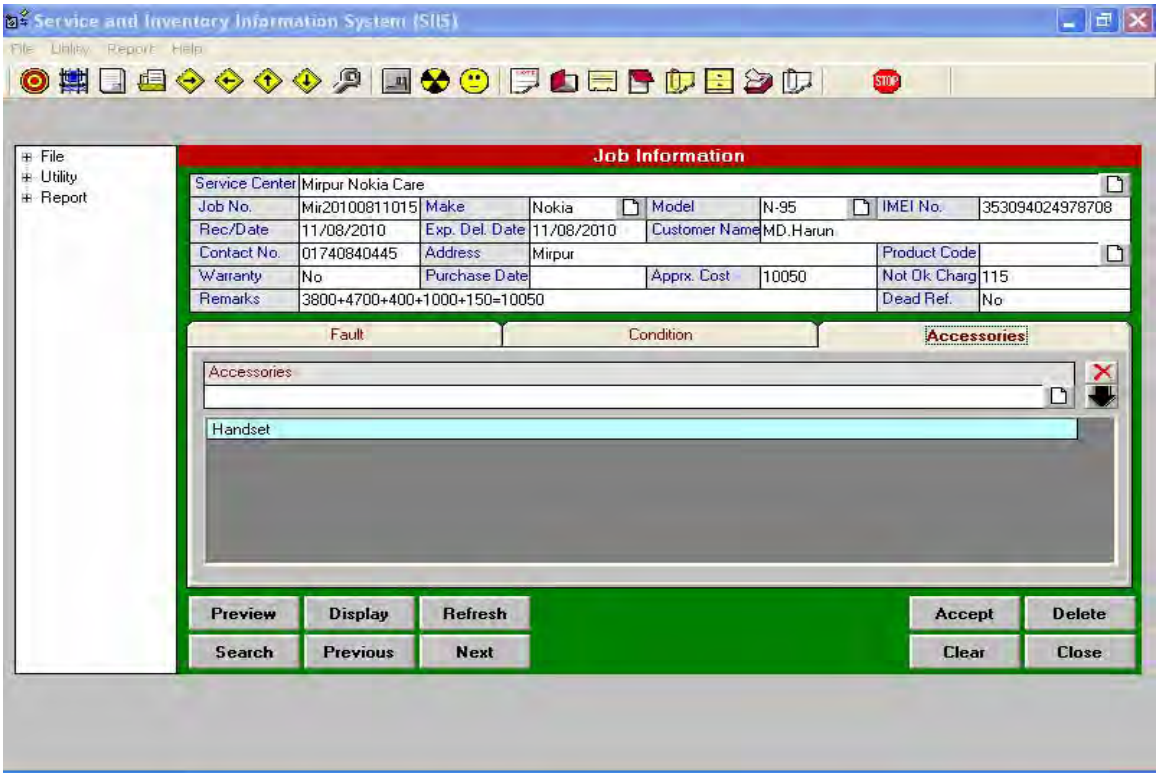

Figure 4.4. Job Information Screen

4.1.3. Job Distribution Information

Figure 4.5. shows the job distribution information screen which is filled by admin officer responsible for distributing the jobs. Admin officer distributes the jobs to different engineers. At the time of distribution, the records are keeping in software for tracking of the mobile set in future and track for the engineer who is responsible for the Job.

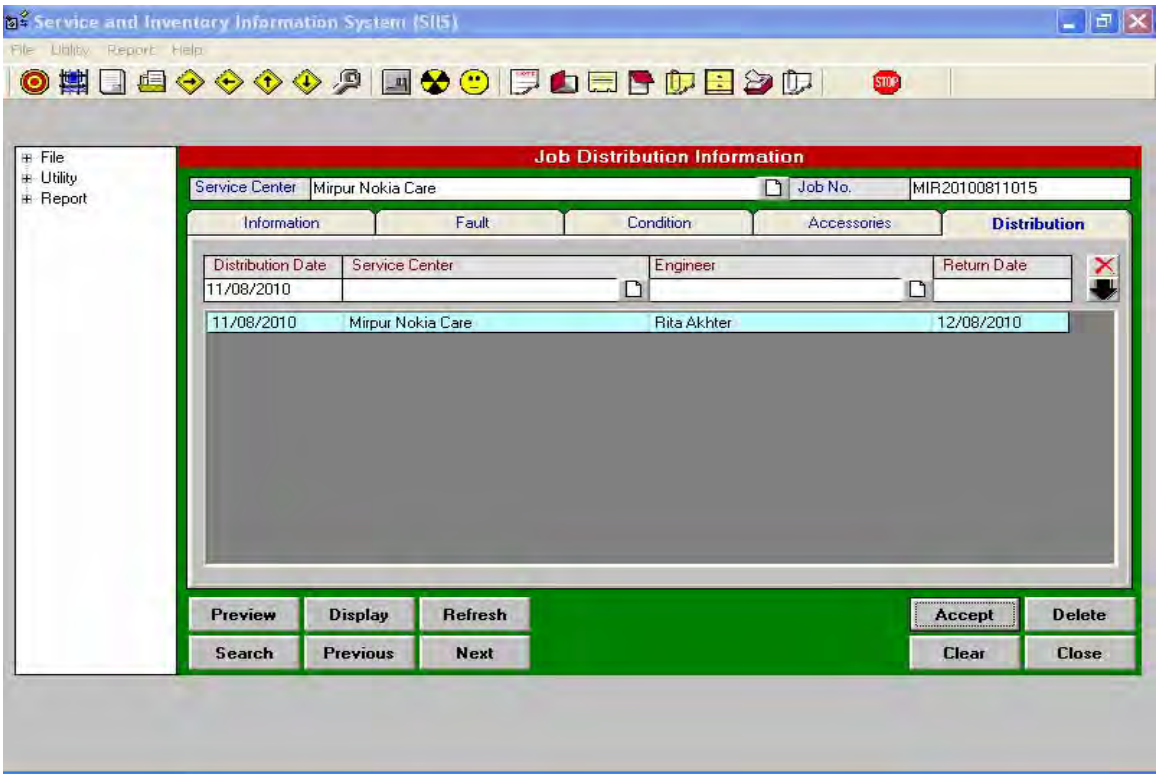

Figure 4.5. Job Distribution Information Screen

4.1.4. Work Information

Figure 4.6., 4.7., 4.8. show the work information screen which is filled by service engineer responsible for carrying out the job. The engineer to whom the job is distributed carried out the distributed job. The facts and finding of mobile set are kept as record in this software. The engineer can also give requisition for parts; he/ she required to recover the trouble. He/ She kept the record of service done by him/her and parts used in job for automated billing of job and printing automated requisition slip. After the job is completed returned to the admin officer who distributed the job. Admin officer in distribution information keeps the return date.

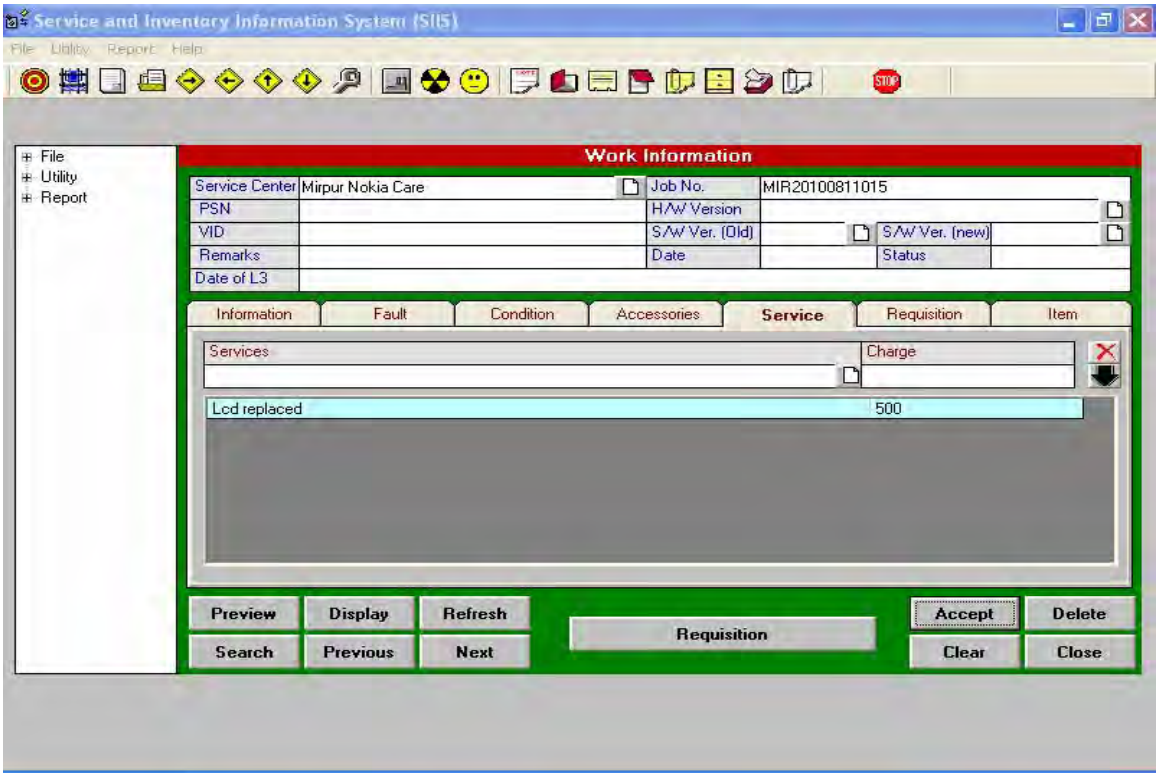

Figure 4.6. Work Information Screen

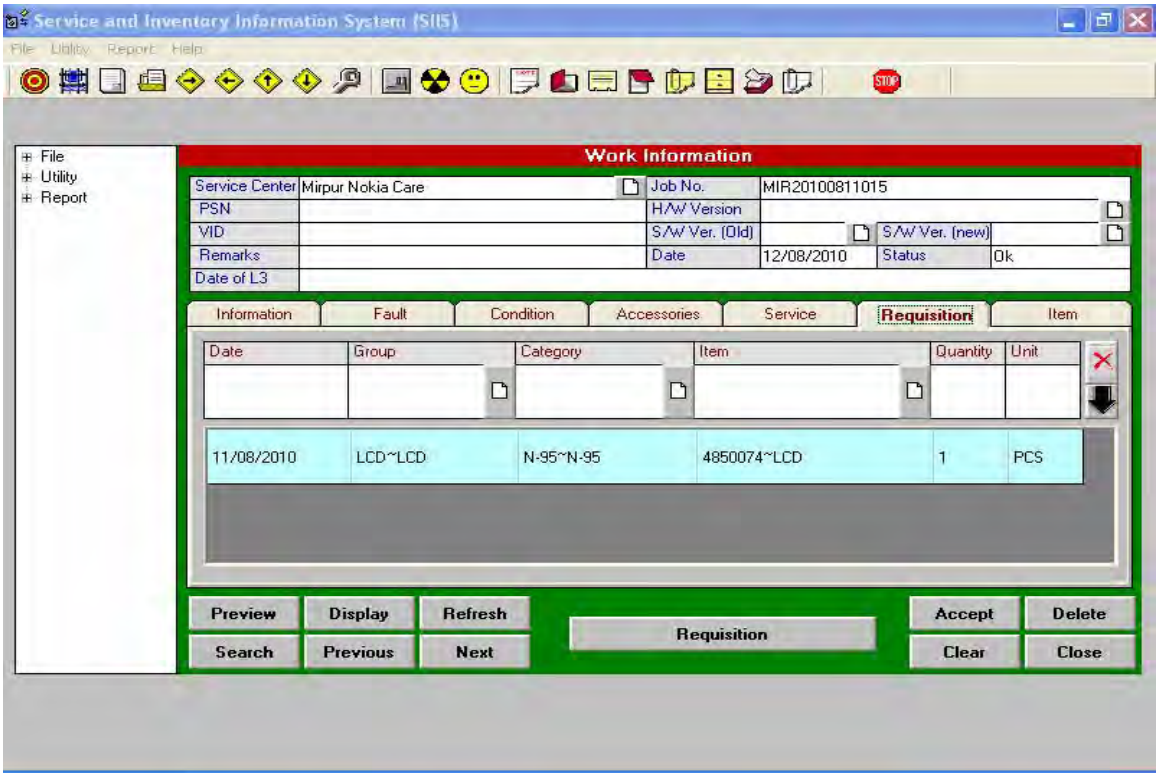

Figure 4.7. Work Information Screen

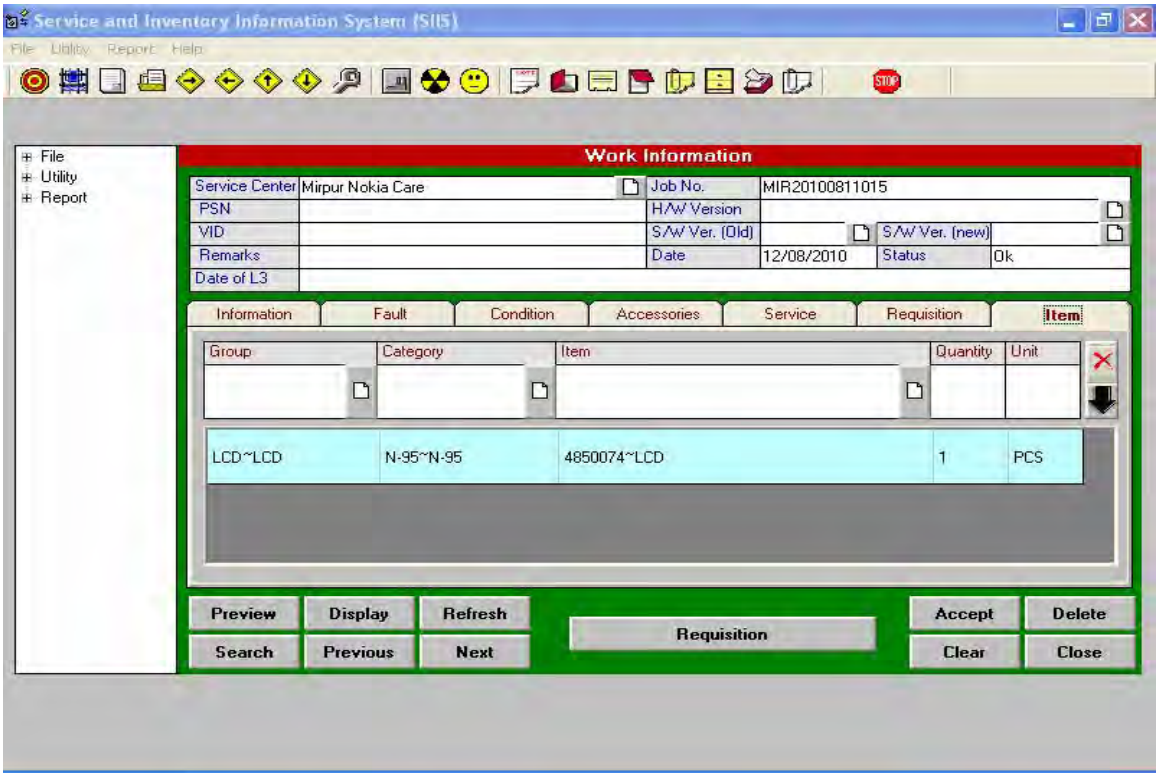

Figure 4.8. Work Information Screen

4.1.5. Item Issue Information

Figure 4.9. shows the Item Issue information screen which is filled by store officer responsible for issuing the parts to engineer on account of job. To know the parts requirement store officer can view the requested parts from engineer for a specific job. The store officer can keep record the parts issued for the job with the value of the parts. Therefore, it is helpful to automated billing for the job and printing automated issue slip.

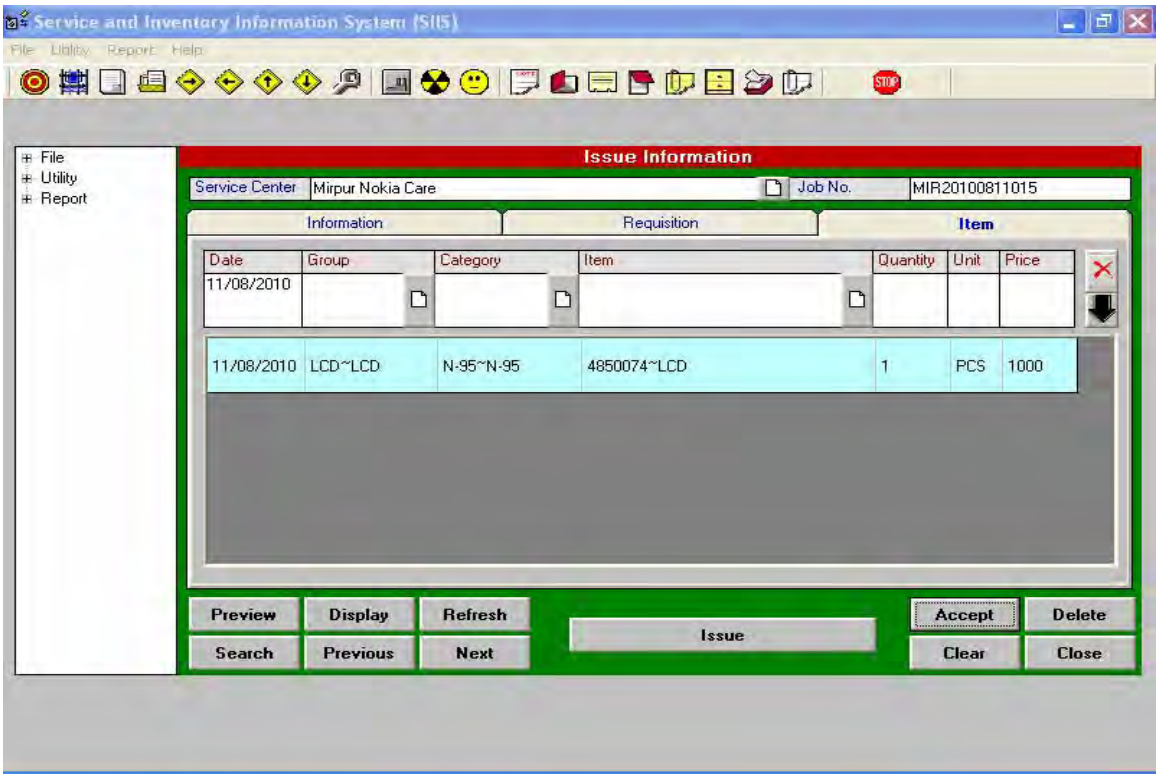

Figure 4.9. Item Issue Information Screen

4.1.6. Delivery Information

Figure 4.10. shows the job delivery information screen which is filled by people responsible for delivering the job. From the delivery desk, the officer can track the phone sets that needs to be deliver. He/ She can view the job status with details job information, service carried out and parts included in this job. He/ She can keep the record related to delivering the job. The automated bill and money receipt are generated in this phase by using the software.

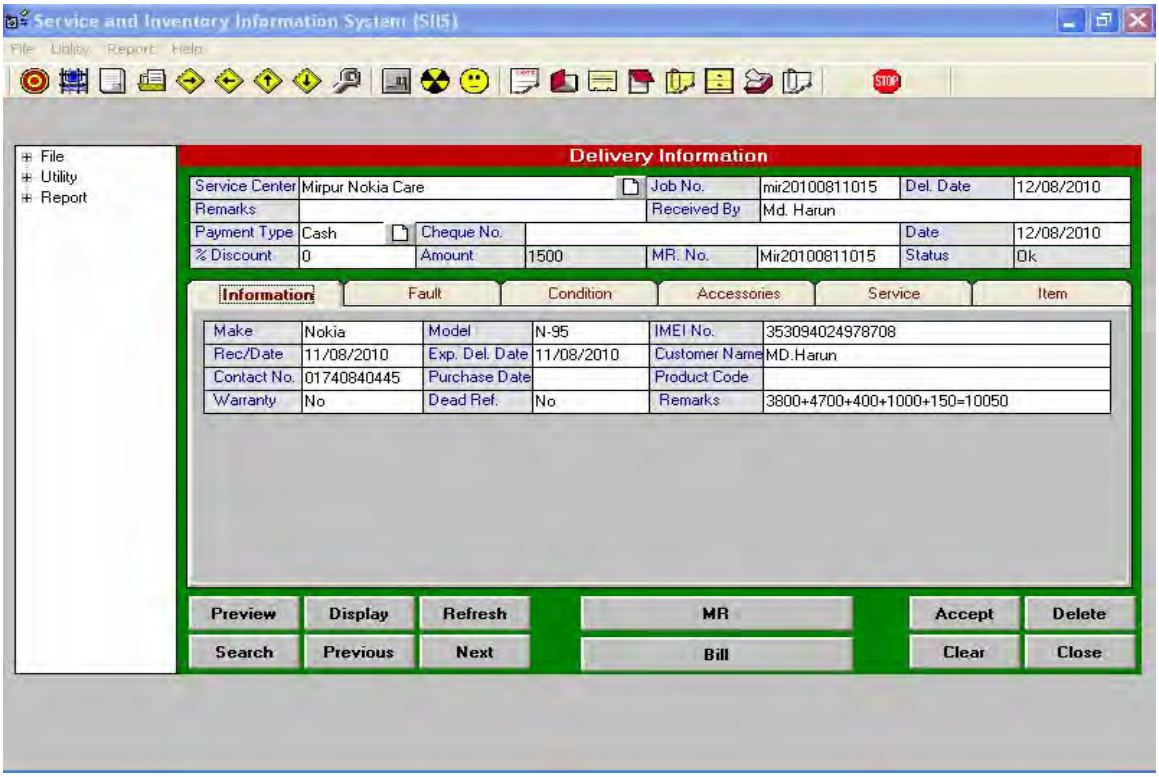

Figure 4.10. Job Delivery Information Screen

4.1.7. Job Challan Information

Figure 4.11. shows the job challn information screen which is filled by warranty officer responsible for delivering the job not recovered by the engineer to upper level service center. The job that is not possible to recover by this service center is passed to upper level center for recovery. Those jobs are sent through a challan. The information of the job sent in a challan is kept record in this software for future and printing automated challan.

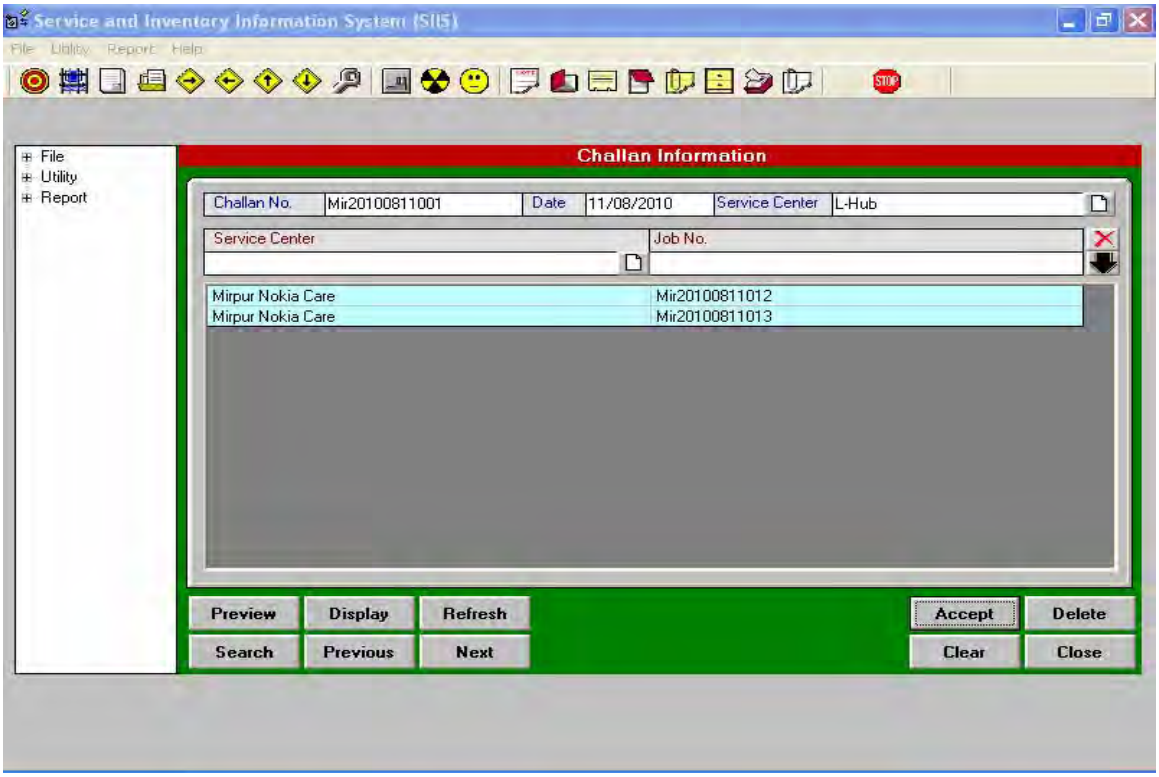

Figure 4.11. Job Challan Information Screen

4.1.8. Job Return Challan Information

Figure 4.12. shows the job return challan information screen which is filled by warranty officer responsible for receiving the job serviced or swapped by upper level service center. The jobs those were sent to upper level of service center returned after recovery or swap of the phone set. This information is kept in the software for track the phone whether it has returned or not from upper level service center.

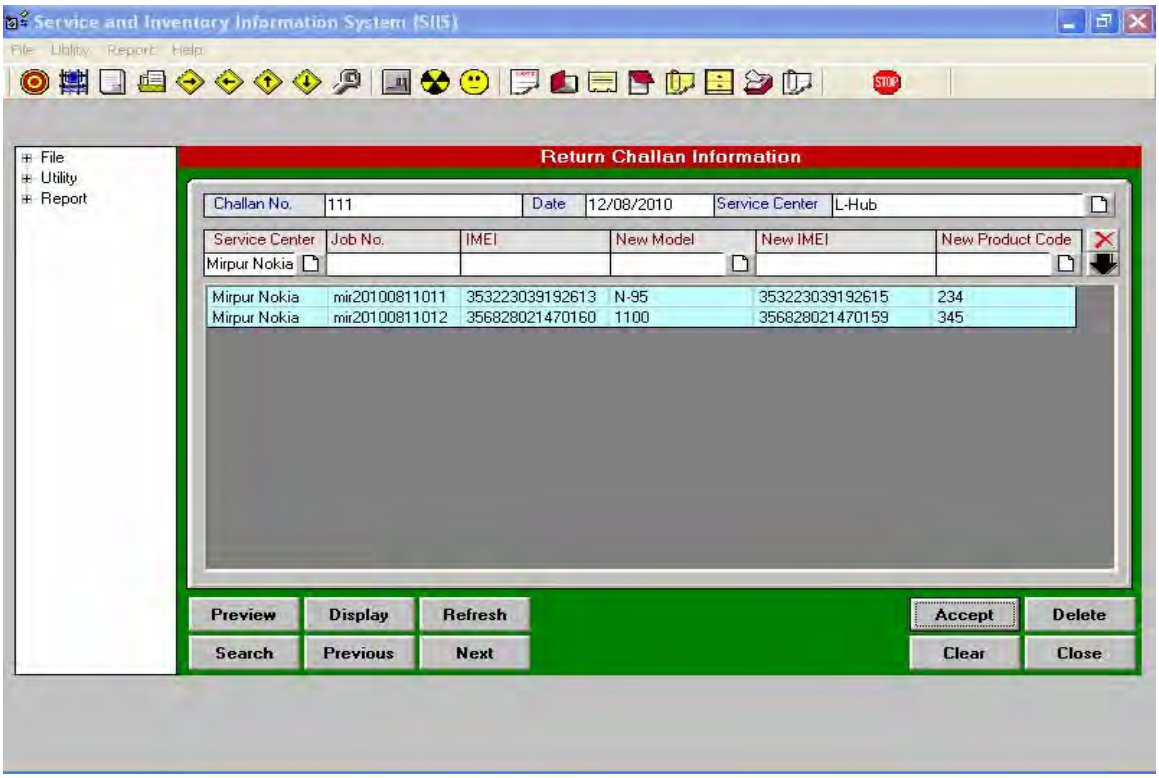

Figure 4.12. Job Return Challan Information Screen

4.1.9. Item Open Stock Information

Figure 4.13, 4.14., 4.15. show the item open stock information screen which is filled by store officer. At the beginning of implementation of software, the stock in store is needed to keep as record in software. The quantity and valuation of each individual item needs to be recorded for stock update with stock valuation.

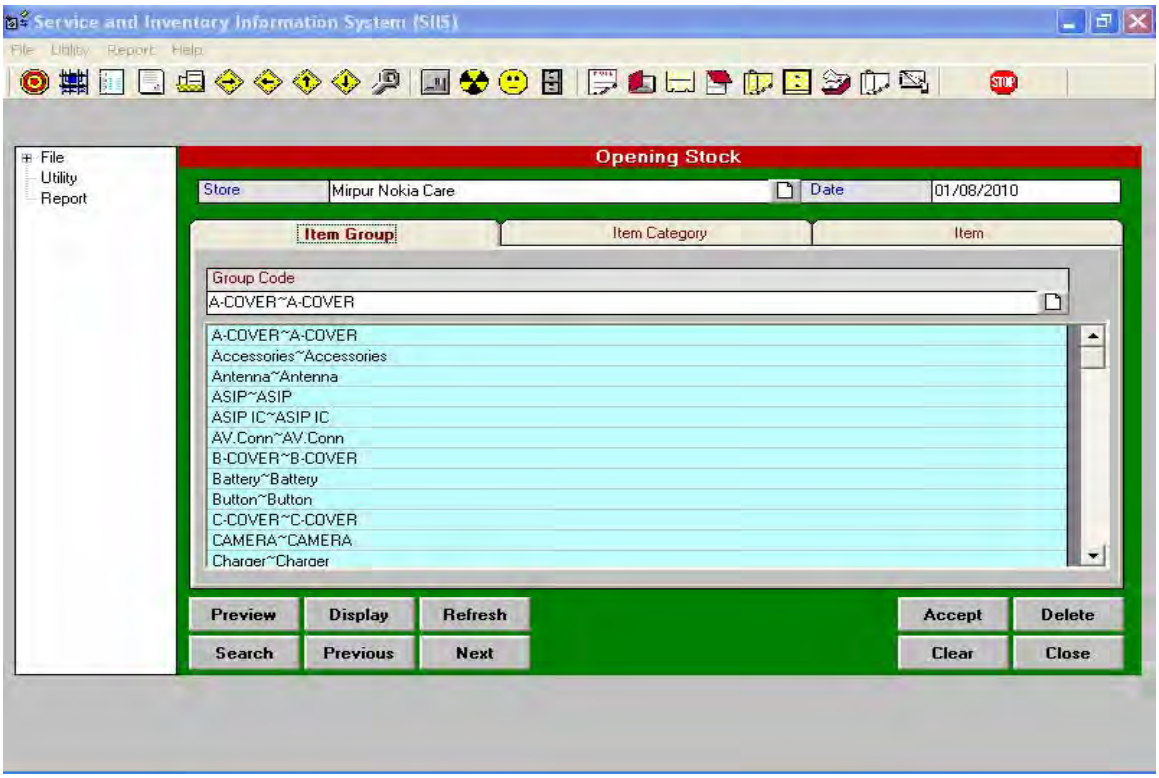

Figure 4.13. Item Opening Stock Information Screen

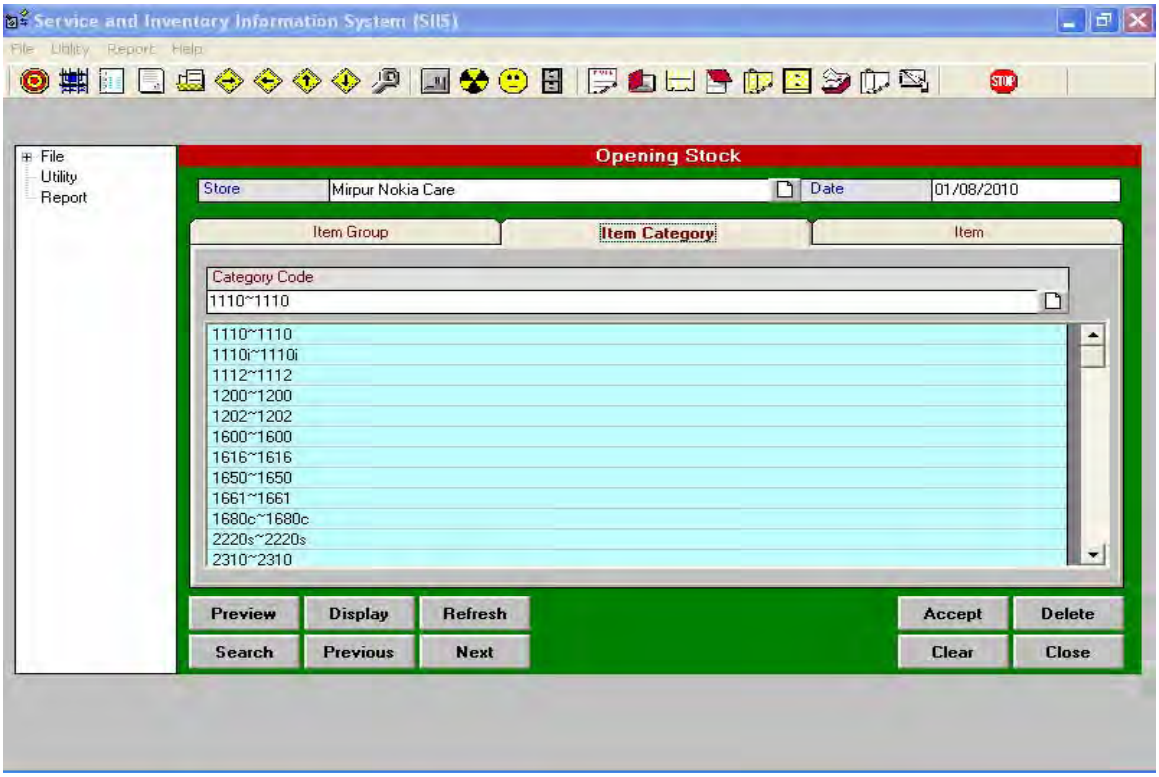

Figure 4.14. Item Opening Stock Information Screen

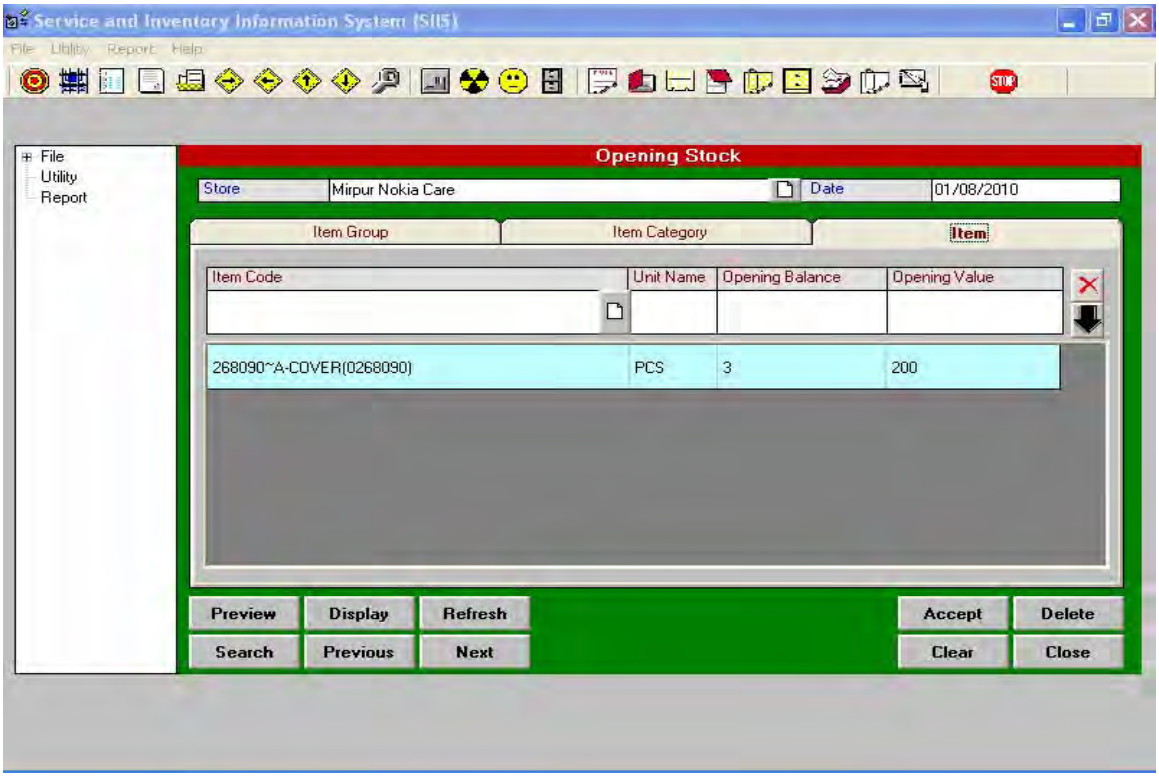

Figure 4.15. Item Opening Stock Information Screen

4.1.10. Item Work Order Information

Figure 4.16. shows the item work order information screen which is filled by store officer responsible for ordering the item to vendor. The items are entered the store through vendor according to work order. The vendor is ordered by care center for supply the ordered items. The details related to work order are kept as record for future and printing automated work order.

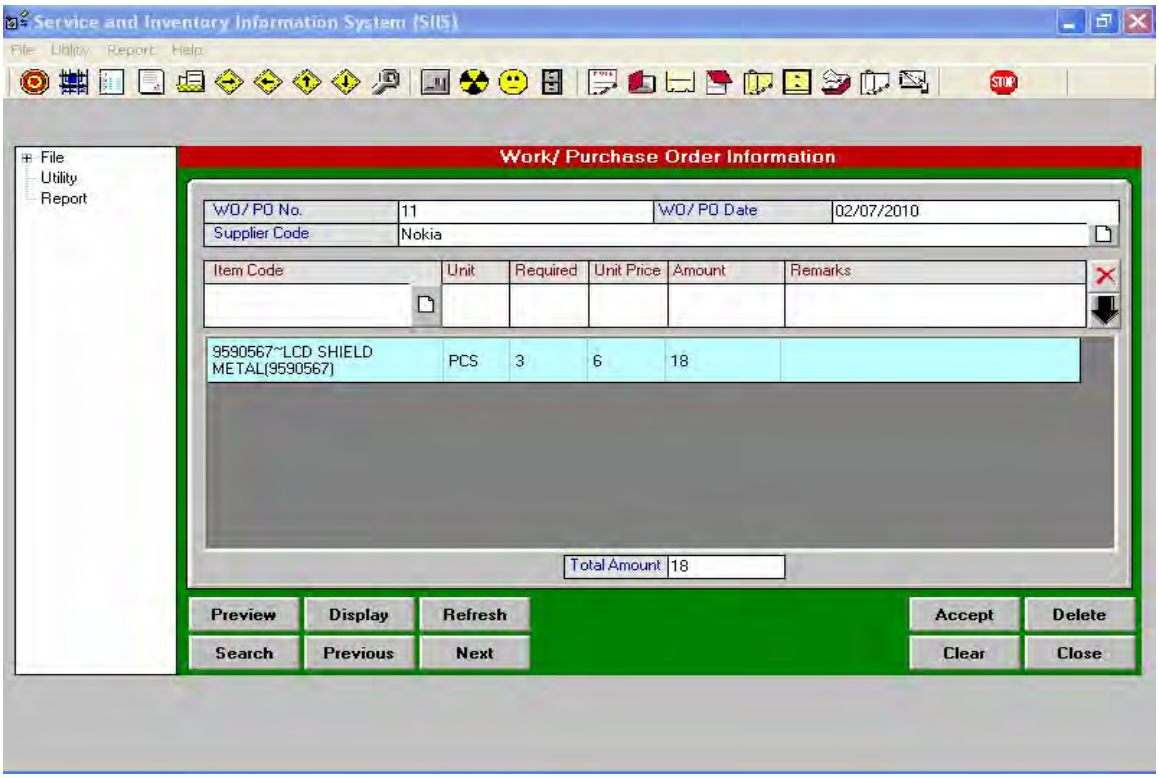

Figure 4.16. Item Work Order Information Screen

4.1.11. Item SPR Information

Figure 4.17. shows the item Store Purchase Requisition (SPR) information screen which is filled by store officer responsible for ordering the purchase of item from local market. The item are entered the store through purchase from local market according to SPR. The details related to SPR are kept as record for future and printing automated SPR.

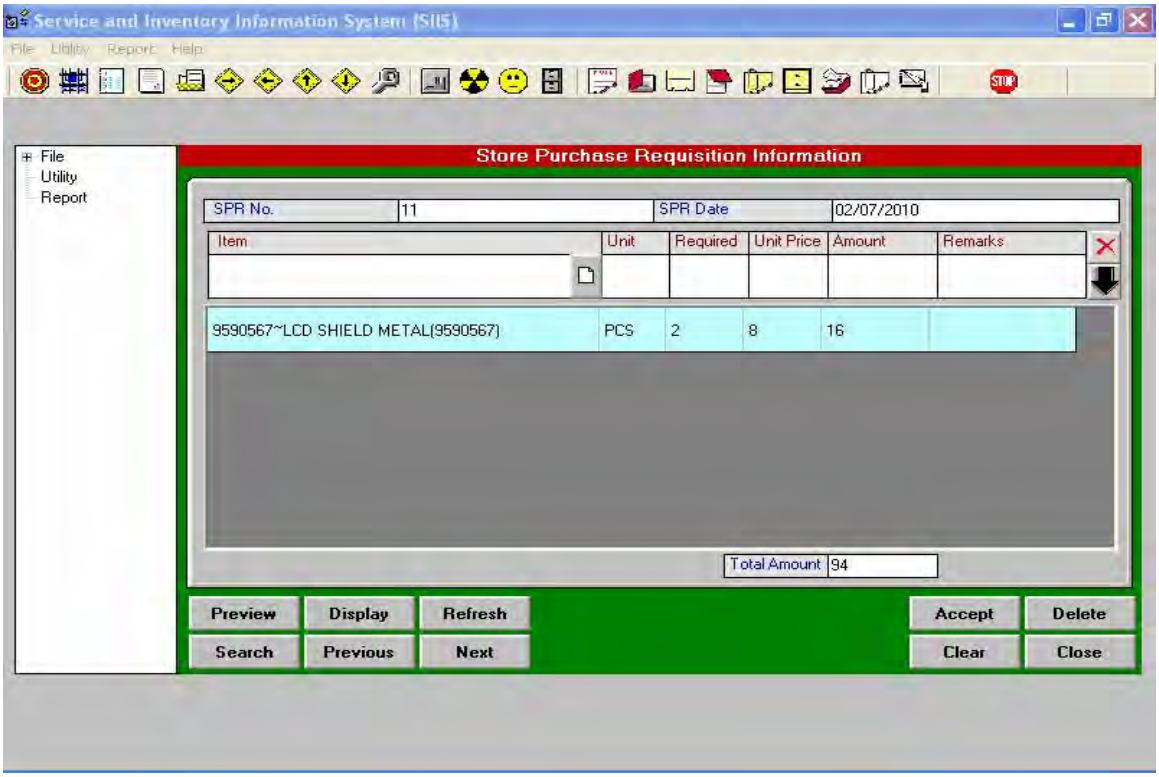

Figure 4.17. Item SPR Information Screen

4.1.12. Item Receive Information

Figure 4.18., 4.19. show the item receive information screen which is filled by store officer responsible for receiving, inspecting and accepting the item from vendor or from local purchase. The items are entered the store through vendor according to work order or from local market through the SPR. The details related to receive are kept as record in this software for update the stock and for future issue to job and printing automated Materials Receipt and Inspection (MRI).

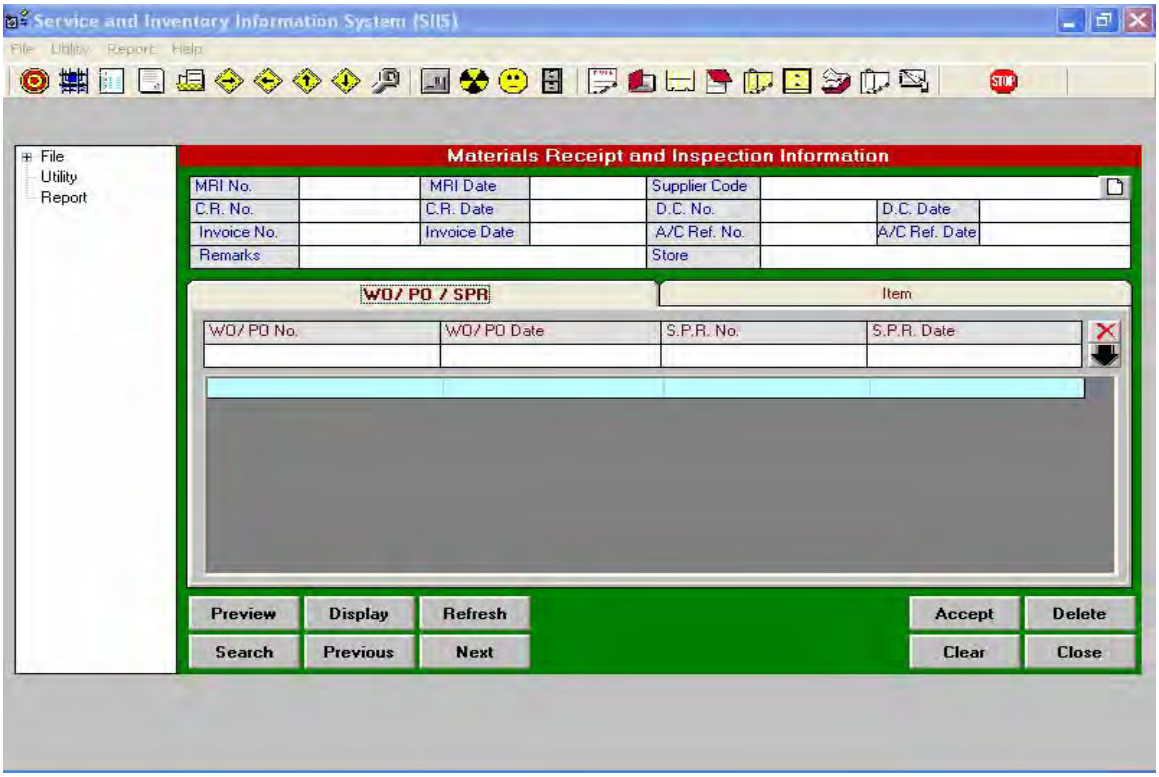

Figure 4.18. Item Receive Information Screen

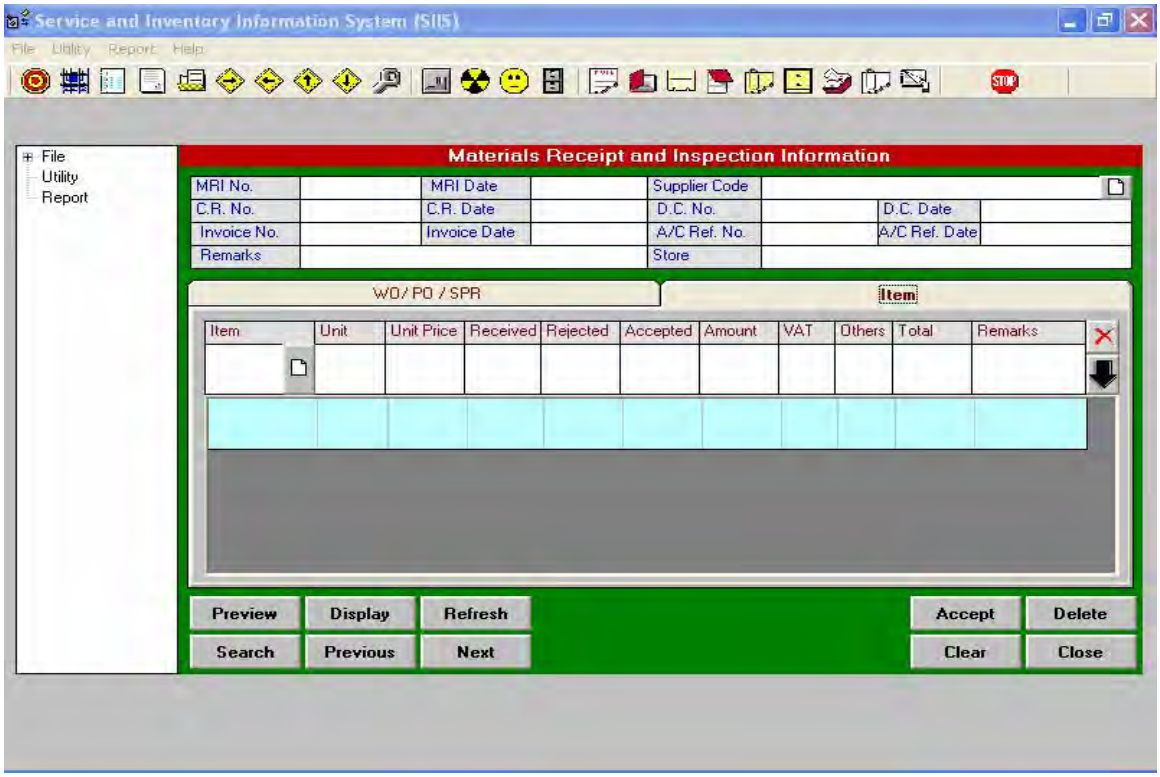

Figure 4.19. Item Receive Information Screen

4.1.13. Item Return Information

Figure 4.20. shows the item return information screen which is filled by store officer responsible for returning the item which is found faulty to vendor. If any item found faulty then it is returned to vendor physically. The return item needs to be recorded in this software for updating stock and printing automated gate pass.

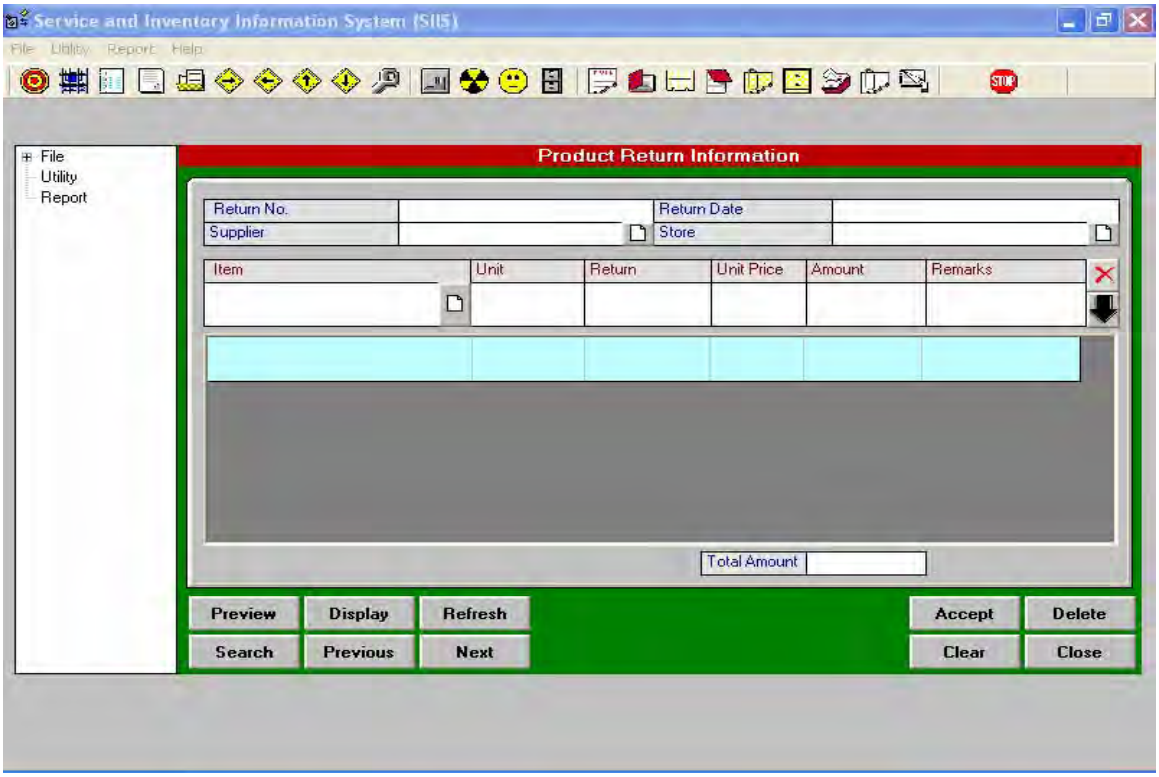

Figure 4.20. Item Return Information Screen

4.1.14. Item Transfer Information

Figure 4.21. shows the item transfer information screen which is filled by store officer responsible for transferring the item from one store to another store. Item can be transferred from one store of one service center to another store of other service center physically. This record is kept in the software for stock update and printing automated transfer form.

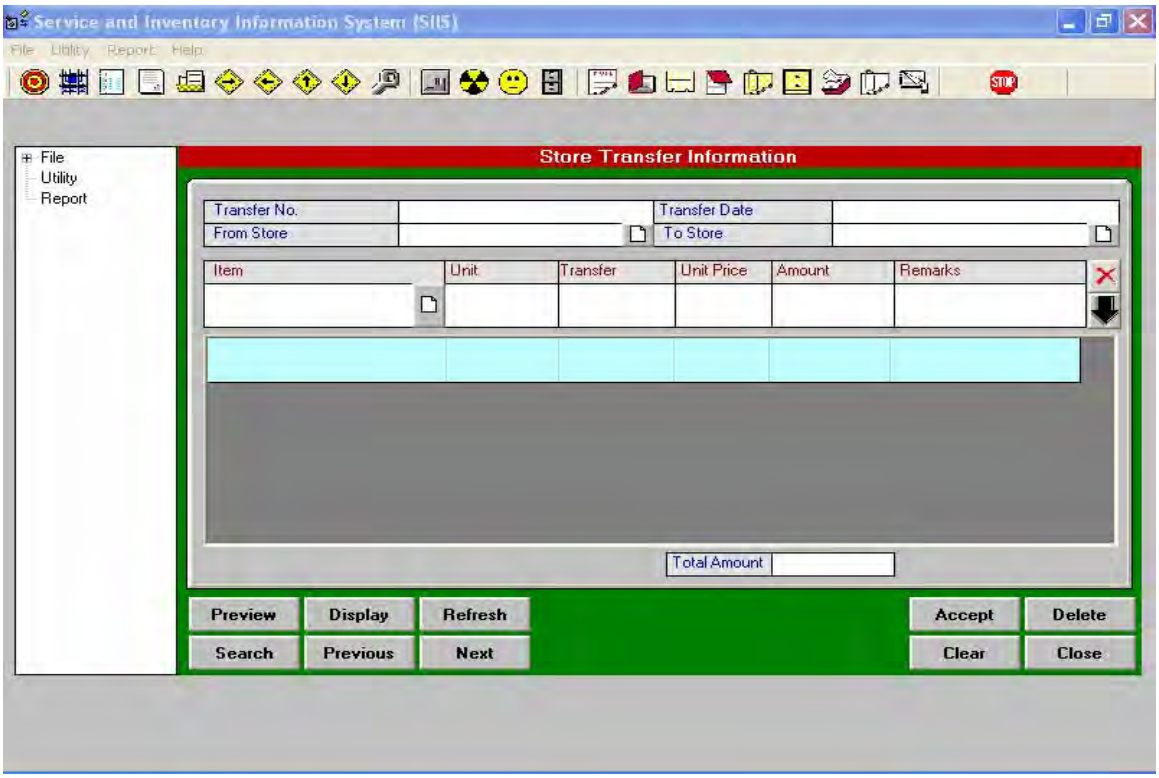

Figure 4.21. Item Transfer Information Screen

4.1.15. Item Adjustment Information

Figure 4.22. shows the item adjustment information screen which is filled by store officer responsible for adjusting the item if any dispute found between physical stock and theoretical stock. At any moment of audit, the physical and theoretical balance of stock may be varied. This varied quantity is needed to adjust in software for actual stock update. This stock can be positive or negative.

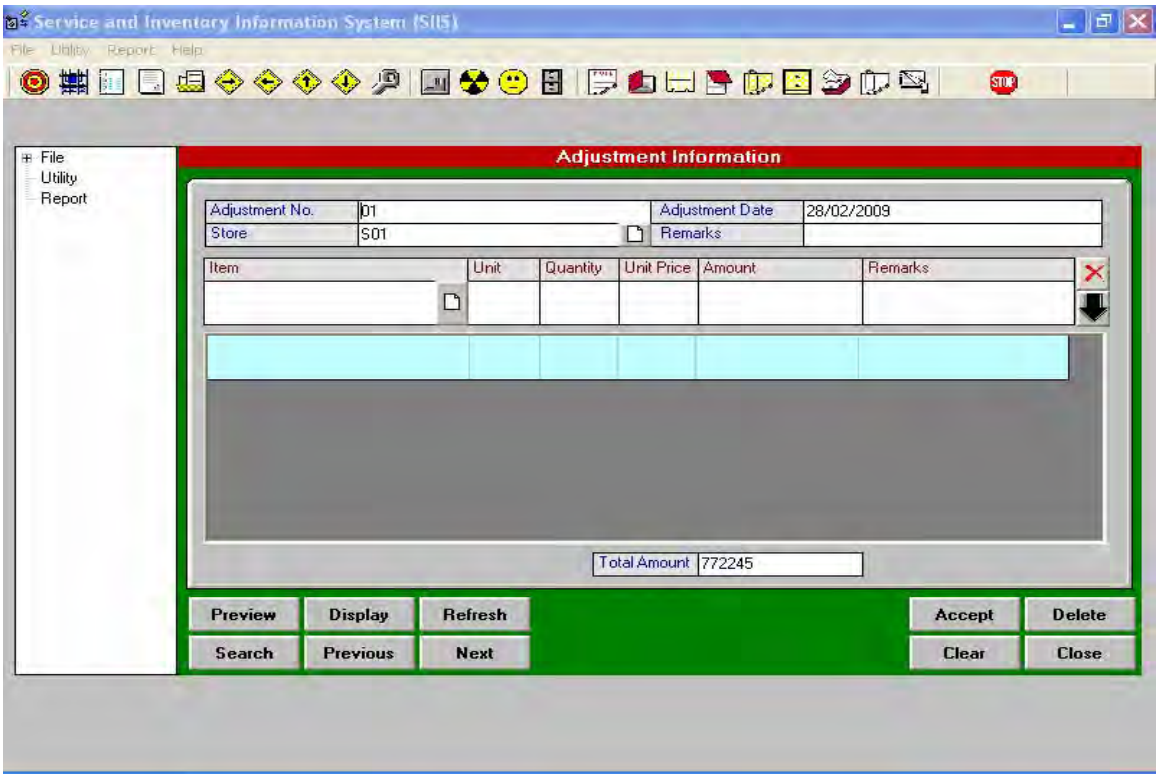

Figure 4.22. Item Adjustment Information Screen

4.2. Field Test of the Software

The developed software is installed in the Nokia's CCS of Grameen Telecom located at Mirpur. Employees from low level to high level are using this software to carry out their daily job that they did manually before.

Conclusion

5.1. Conclusion

Low cost IT solution is very helpful for the medium and small business enterprise. Low cost software for Nokia Care Center of Grameen Telecom has been developed and presented in this report. The developed software is user friendly. Users from different level can easily use the software for record keeping of their daily service and inventory information. It gives various business reports. Nokia Care Center of Grameen Telecom is using the software. It is working properly/ effectively without any major trouble. Now the company can save a lot of time and deliver better service to customer very faster and efficiently.

5.2. Future Works

The developed software has lot of scopes for enhancement. In future, the management information system (MIS) report can be generated for business decision rule. A huge scope to generate of financial report is found in the software from which Nokia's CCS would be helpful to make the decision for business scope and spread up the business in various locations of Bangladesh. It is also possible to identify the model of cellular phone that is facing more trouble and make the cellular phone company to make attention for recovery the problem on specific model. Many graphical reports for data analysis may be embedded in this software from existing data for enhancing the software in future.

References

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