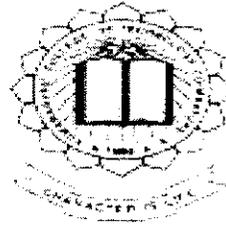


P-2743



**IMPLEMENTATION OF SALES FORCE AUTOMATION
USING MOBILITY SOLUTION
AT NAGARJUNA FERTILIZERS AND CHEMICALS LTD**

By

**Subha.P
Reg. No. 71206621054**

Of

KUMARAGURU COLLEGE OF TECHNOLOGY, COIMBATORE

A PROJECT REPORT

Submitted to the

FACULTY OF MASTER OF COMPUTER APPLICATIONS

*In partial fulfillment of the requirements
For the award of the degree*

Of

MASTER OF COMPUTER APPLICATIONS

**Anna University
Chennai - 600025**

July, 2009



BONAFIDE CERTIFICATE

Certified that this project report titled “SALES FORCE AUTOMATION USING MOBILITY SOLUTION” at NAGARJUNA FERTILIZERS AND CHEMICALS LTD is the bonafide work of Ms.P. Subha who carried out the research under my supervision. Certified further, that to the best of my knowledge the work reported here in does not form part of any other project report or dissertation on the basis of which a degree or award was conferred on a earlier occasion on this or any other candidate.

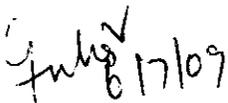


Faculty Guide

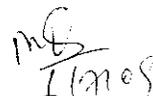


Head of the Department

Submitted for the viva-voce examination held on ..06/07/09.....



Internal Examiner



External Examiner

Registered Office :
Nagarjuna Hills,
Hyderabad - 500 082. INDIA
Phones : 23357200, 23357204
23357589, 23356859
Grams : "NAAGFERTS"
Fax : (91-40)23354788



June 01, 2009

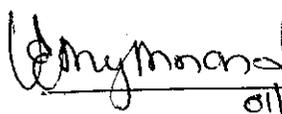
CERTIFICATE

This is to certify that **Ms. P. Subha**, Roll No: 71206621054, M.C.A final year student of Kumaraguru College of Technology, Coimbatore, affiliated to Anna University has completed an internship with our organization "**Nagarjuna Fertilizers and Chemicals Limited**". The period of internship was from 10th Dec 2008 to 30th May 2009. During this period, the intern has worked on a project entitled as "**Sales Force Automation using Mobility Solution**" as part of her course curriculum.

She has done her project using .NET & ORACLE during the period Dec-2008 to May 2009, under the guidance and supervision of our officials **Mr. P. Prasanna Hanuman**, Team Leader (IT Mobility Solutions) & **Ms. K. Sudha Madhavi**, Project Coordinator(IT Mobility Solutions) .

We hereby certify that **Ms P Subha** has completed the assigned project work well within the time frame and up to our satisfaction. During the project period, She had displayed a greater level of programming skills, high degree of commitment & sincerity, and her conduct during the project is commendable.

For **NAGARJUNA FERTILIZERS AND
CHEMICALS LIMITED**


01/06/2009

NAIR P V PRASAD
Senior MANAGER (IT SOLUTIONS)

ABSTRACT

Nagarjuna Fertilizers and Chemicals Ltd is implementing the Sales Force Automation using Mobility Solution. In order to ensure that the sales order processing activities are captured 'ONLINE' as and when it happens at ground level {rural markets}, NFCL's IT team has initiated Sales Force Automation Project using GSM network as the data transmission media. It uses .Net integrator to update the Central Data Base – SAP. The project has been named as 'nCircle'.

In order to reduce the delays and complexities the sales officers, warehouse agents, railheads agents are given pocket pc or PDA in which they can login with their own respective user id and passwords. The main functions of sales officer, warehouse agents will be available in the PDA screens from which they can select the options.

Sales officer can raise the order by selecting the required options, then by clicking send button the information will go as an SMS (Short messaging service) to the SIM located in the server at Hyderabad. Using capture, listener, parser etc the information is picked from the SIM registry and pushed to oracle database. After certain validations employed it is pushed to SAP. Here all the work is automated instead of manually writing in the paper.

It implements a wireless technology which would enable the remote field teams to interact with SAP and connect warehouses virtually at very low transactions costs and reduce the delays and latency in the business process and thereby improve operational efficiency.

Objective:

To implement a wireless technology which would enable the remote field teams to interact with SAP and connect warehouses virtually at a very low transactional costs and reduces the delays and latency in the business process and thereby improve operational efficiency.

ACKNOWLEDGEMENT

It is beyond the comprehension of mere elegance of word to acknowledge someone who has been the guiding spirit behind the dissertation. I am very much grateful to the principal Vice Principal Prof R Annamalai and Dean Dr. S. Thangasamy for his excellent support.

With profound reference and high regards I record my indebtedness Gratitude to Dr Mr. M. Gururajan, Head of the Department, Mrs Geetha, Project Coordinator and my Guide Mrs Jalaja Jayalakshmi, Department of Computer Application, Kumaraguru College of Technology for their guidance throughout my project work.

My heartfelt gratitude to Mr. Nair P V Prasad, Manager of Nagarjuna Fertilizers and Chemicals Limited, for his valuable guidance and patience, without which this project would not have been completed. I am thankful to Mr. P. Prasanna Hanuman, Team leader of Nagarjuna, for his excellent guidance, timely suggestions and constant support in all my endeavors.

I take this opportunity to thank all the Associates in Nagarjuna Fertilizers and Chemicals Limited, Hyderabad for their help and cooperation, which has led to the successful completion of this project work. And I would like to thank my parents, friends, and all those who helped me in this project and whose names are leftover.

Table of Contents	
1. Introduction ...	1
1.1 System Overview.....	1
1.2 Organization Profile	2
2. System Study and Analysis	5
2.1 Existing System Architecture	5
2.2 Proposed System Architecture.....	8
3. Development Environment	10
3.1 Hardware Environment.....	10
3.2 Software Environment	10
3.3 Programming Environment	11
4. System Design and Development	14
4.1 Data Model	14
4.2 Process Model.....	18
5. Implementation	25
6. Software Testing	35
6.1 System Verification	35
6.2 System Validation.....	35
6.3 Testing	35
6.3.1 Unit Testing.....	36
7. Performance and Limitations	41
7.1 Merits of the System.....	41
7.2 Limitations of the System.....	41
8. Conclusion	42
8. References	43

CHAPTER 1

INTRODUCTION

1.1 SYSTEM OVERVIEW

NFCL is the first fertilizer company in India, having implemented SAP-ERP system during the year 1999-2000. Presently, Central Database on ERP-SAP ECC 6.0 Apart from Corporate Office at Hyderabad and plants at Kakinada, the IT connectivity through VPN, VSNL, and Leased Line etc exists to the 20 Regional Offices spread over various states in India.

The last mile connectivity was missing because their end customers were farmers or agribusiness dealers. The product is targeted to rural market. The farmers were illiterate and ignorant. what they want is the product on time. When ever a requirement of product is there the sales officers will collect the orders from the corresponding dealers in a pre printed SNDO (sale note cum delivery order).He will collect the orders and courier or fax to the regional office.

In the regional offices the manual entry of these SNDO into SAP takes place. Orders once entered in SAP are informed to sales officer. The sales officer will call the corresponding warehouse persons to dispatch the required quantity to the dealer. The warehouse person will then dispatch the material with an invoice copy along with the truck and keeping one invoice copy for reference. Altogether to complete an order it takes a minimum of 4 to 6 days delay. Apart from that lot of confusions and errors occurred because of manual interference.

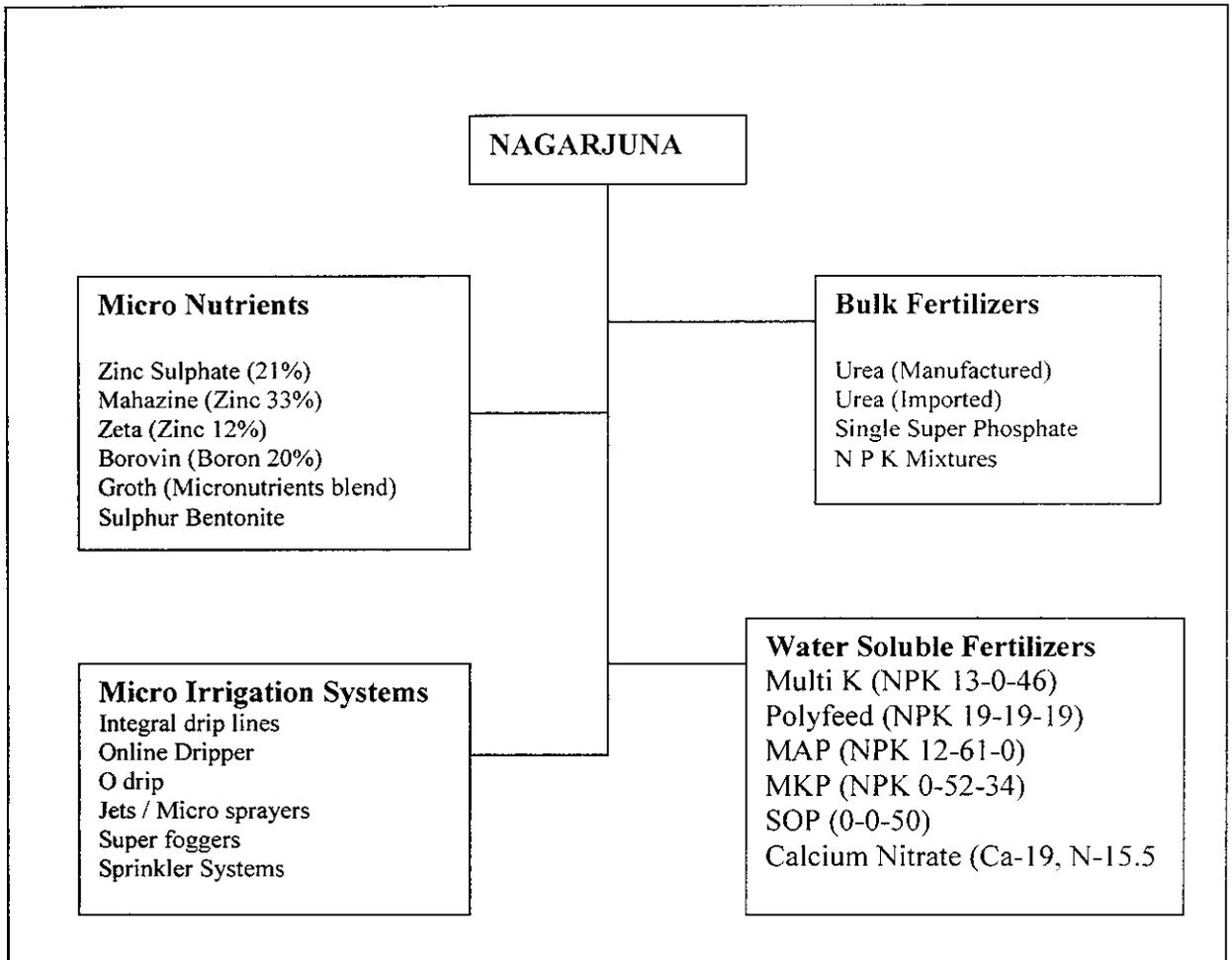
As a company producing 1.2 million tones of urea, a delay of 4-6 days was very big. They are the largest urea manufacturers in India and the responsibility of delivering the product on the specified date was important. Since the last mile connectivity was missing there was lot of confusions, complexity and delays in the processes.

1.2 ORGANIZATIONAL PROFILE

Nagarjuna Fertilizers and Chemicals Ltd. (N F C L) is south India's largest Urea Manufacturing company having its registered office at Hyderabad and Urea manufacturing plants at Kakinada (East Godavari district of Andhra Pradesh).NFCL is the flagship company of the nagarjuna group. Late Shri K V K Raju was the founder of nagarjuna group which had made a mark in steel/pipe manufacturing, finance and agri-business. In the late nineties the group has diversified into the energy sector with refining and power generation projects (at several of implementation).

NFCL produces about 1.40 million tons urea per annum at its state of the art production facility at the port town of Kakinada on the East coast of India. The company markets close to 2.40 million tons of urea (including 1.2 million tons of urea imported through Vizag, Kakinada & Cuddler Ports). In addition, the company markets a wide range of plant nutrition (SSP, NPK mixtures, micro nutrients and water soluble fertilizers) and micro irrigation products (Integral drip lines, online drippers, foggers, sprinkler systems etc) NFCL clocked a turnover of Rs2000 cores in Financial Year 2008-08 and is all set to exceed this figure in Financial Year 2009-10.

NFCL is the first fertilizer company in India, having implemented SAP-ERP system during the year 1999-2000. Presently, Central Database on ERP-SAP ECC 6.0 Apart from Corporate Office at Hyderabad and plants at Kakinada, the IT connectivity through VPN, VSNL, and Leased Line etc exists to the 20 Regional Offices spread over various states in India. The Business process involves complex Logistics in dealer requirement fulfillment and is mainly happens in rural markets.



SALES AND DISTRIBUTION NETWORK

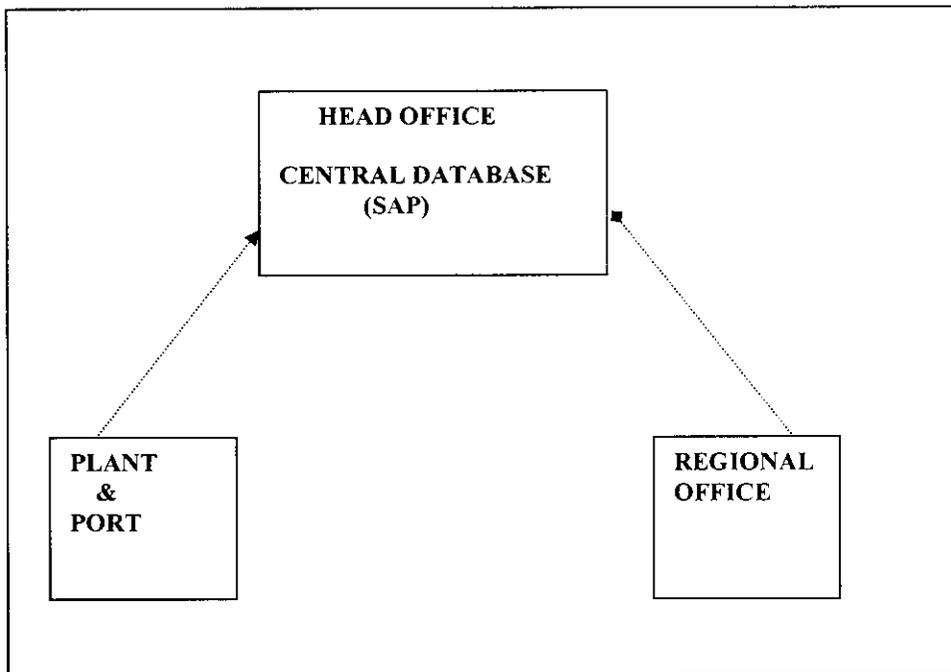
NFCL has a marketing strength of around 80 marketing officers spread over various states in India with over 130 warehouse locations. NFCL is one of the first companies in fertilizer domain to implement SAP.

NFCL has connectivity till the area office level through a network of leased and VAST lines. Although the last mile connectivity till the marketing officer level was missing. Typical business process of processing a sales order did have a delay as the marketing officer needed to communicate with the regional offices through phone/fax/courier and the order would be

Sales Force Automation Using Mobility Solution

captured at the regional office level from where an approval for the order used to happen at Head office in Hyderabad on various parameters like availability of stock, credit of distributor etc.

The marketing officer would then send the delivery order to the concerned warehouse for execution. The warehouse would make a delivery challan and dispatch the material. These documents would then be sent to area office where these will be entered in SAP and invoice will be generated at the end of month.



CHAPTER 2

SYSTEM STUDY AND ANALYSIS

2.1 EXISTING SYSTEM ARCHITECTURE

NFCL is the first fertilizer company in India, having implemented SAP- ERP System during the year 1999-2000. Presently, Central Database on ERP-SAP ECC 5:0. Apart from Corporate Office at Hyderabad and Plants at Kakinada, The IT Connectivity through VPN, VSNL, and Leased Line etc exists to the 20 Regional Offices spread over states in India.

In existing system whenever an order is placed by a dealer sales officer will note in a pre printed manual SNDO. One copy is kept with them; the other copy is forwarded to regional offices. In the regional offices the orders are verified, validated and then it was entered manually into SAP from various regional offices

The Business Process involved complex Logistics. Manual Documentation happens at grass root level for sales & distribution related activities and are feed into SAP at Regional Office level.

2.1.1 BUSINESS PROCESS AT SALES OFFICE

- Sales Order Processing involves the following steps:
- Sales Officer Collects the Order from the dealer in a pre-printed – Manual Document named as Sale Note Cum Delivery Order (SNDO) and advises warehouse to execution of SNDO.
- Sales officer sends one copy of the SNDO's to Regional Office for data entry into SAP.

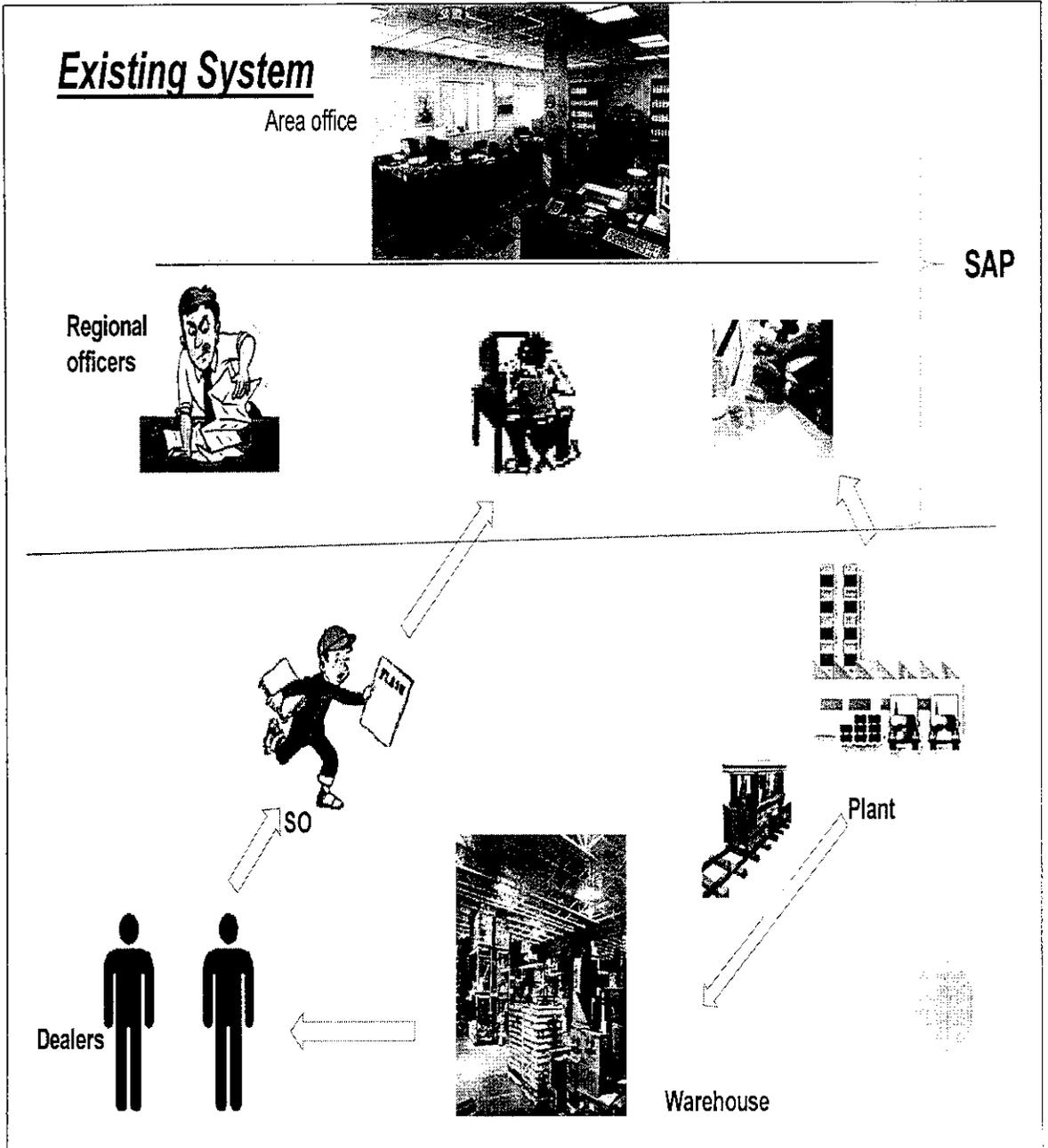
2.1.2 BUSINESS PROCESS AT WARE HOUSES

- Based on the SNDO (order), Warehouse agent executes the order and material is shipped on a delivery challan.
- Warehouse Agent will send one copy of the Delivery challans to Regional offices for entry into SAP.
- Once the Delivery Details are captured in SAP, Invoice generation happens at Regional Office.
- Data validation takes with a gap of 1 to 3 days time.
- All of these processes were completely offline from the central SAP system.

2.1.3 DISADVANTAGES OF EXISTING SYSTEM

- Sales Offers / Warehouse Agents, Dealers etc on the field were NOT Online with SAP in remote areas.
- No real stock status at points is available.
- Credit Check for the distributors NOT Online
- In the post-VAT scenario, tax invoice moving with the shipment was impossible without connectivity.
- The Business Process involved complex Logistics.
- Manual Documentation happens at grass root level for sales & distribution related activities and are feed into SAP at Regional Office level.
- Effectively, the data in SAP is NOT On Line due to manual documentation and the data Validation is 3 to 4 days old.

EXISTING SYSTEM - DIAGRAM



2.2 PROPOSED SYSTEM ARCHITECTURE

In order to ensure that the sales order processing activities are captured “ONLINE” as and when it happens at ground level {rural markets}, NFCL’s IT team has initiated Sales Force Automation Project using GSM Net work as the data transmission media and using .Net integrator to update the Central Data Base –SAP. The project has been named as ‘nCircle’.

This is purely NFCL IT Department initiative and has stated the Pilot Project in the year 2008-09. SFA includes an end to end solution in sales order processing & also enhances the Invoice {Bill} along with the receipt of stocks thereby helps the customer to claim the VAT Input tax.

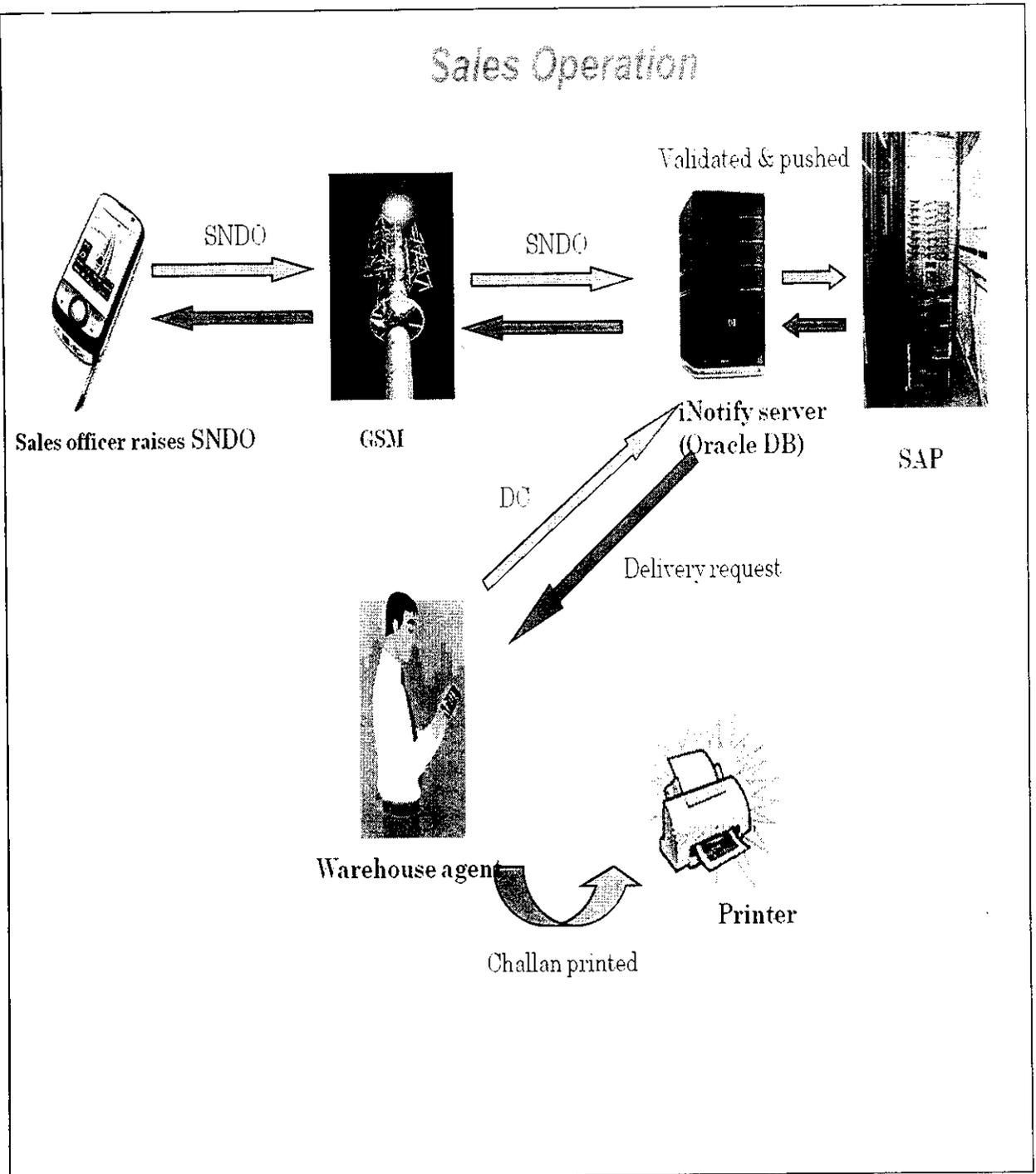
The proposed system is designed to eliminate the drawbacks of the existing system. In order to reduce the delays and complexities the sales officers, warehouse agents, railheads agents are given pocket pc or PDA in which they can login with their own respective user id and passwords. The main functions of sales officer, warehouse agents will be available in the PDA screens from which they can select the options.

Sales officer can raise the order by selecting the required options, then by clicking send button the information will go as an SMS (Short messaging service) to the SIM located in the server at Hyderabad. Using capture, listener, parser etc the information is picked from the SIM registry and pushed to oracle database. After certain validations employed it is pushed to SAP. Here all the work is automated instead of manually writing in the paper.

The SFA system tracks all activities / stages that has been made with a given customer, order etc. The SFA gives the sales team the ability to access and manage critical sales information using the PDA device which the users to operate the system.

The other important aspect of this SFA projects is the Central Database {SAP} will be the controlling point for all master related data and control checks like credit management, receivables management etc.

PROPOSED SYSTEM - DIAGRAM



CHAPTER 3

DEVELOPMENT ENVIRONMENT

3.1 HARDWARE ENVIRONMENT

SERVER END

- IBM Dual Processor Server on Architecture
- A SIM to receive incoming messages.
- LAN to connect systems.
- Magnetic discs for regular back ups.
- Native GSM Connectivity through multiple channels such as GSM Modem, SMSC/SMPP relays

CLIENT END

- Windows Mobile 2003 powered PDAs (Personal Digital Assistant) with GSM.
- A SIM to sent and receive messages.
- PDA charger for power supply.
- Epson Dot matrix printer with Bluetooth converter for the warehouses.

3.2 SOFTWARE ENVIRONMENT

SERVER END

- Windows 2003 Enterprise Server with IIS
- Oracle 9i Enterprise edition
- C#.NET
- Capture, Listener, Parser, SAP connector to insert data into tables.
- SAP

CLIENT END

- Microsoft Windows Mobile 2003 should be enabled in PDAs.
- Microsoft open NETCF and SQL CAB files.
- Customized sales force automation CAB file.
- A sms_recv to receive the incoming message.



3.3 PROGRAMMING ENVIRONMENT

3.3.1 C#.Net

Visual C# is a simple, type-safe, object-oriented, general-purpose programming language. It provides code-focused developers with powerful tools and language support to build rich, connected Web and client applications on the .NET Framework.

3.3.1.1 C#.net overview

- Visual C# 2005 is the modern, innovative programming language and tool for building .NET-connected software for Microsoft Windows, the Web, and a wide range of devices.
- With syntax that resembles C++, a flexible integrated development environment (IDE), and the capability to build solutions across a variety of platforms and devices, Visual C# 2005 significantly eases the development of .NET-connected software.

3.3.1.2 Features of C#.net

- Visual C# 2005 builds on a strong C++ heritage.
- Immediately familiar to C++ and Java developers, C# is a modern and intuitive object-oriented programming language that offers significant improvements, including a unified type system, "unsafe" code for maximum developer control, and powerful new language constructs easily understood by most developers.

- An advanced inheritance model enables developers to reuse their code from within any programming language that supports .NET.
- .NET Framework class library to gain powerful built-in functionality, including a rich set of collection classes, networking support, multithreading support, string and regular expression classes, and broad support for XML, XML schemas, XML namespaces, XSLT, XPath, and SOAP.
- Using Visual C# 2005, developers can construct powerful Web services that encapsulate business processes and make them available to applications running on any platform.
- Visual C# 2005 also enables developers to build the next generation of Windows-based applications. With visual inheritance, developers can greatly simplify the creation of Windows-based applications by centralizing in parent forms the common logic and user interface for their entire solution.
- With native support for the .NET Compact Framework, mobile Web devices, and embedded applications available as part of Visual Studio 2005 Professional Edition, C# developers can now target a wide variety of mobile devices, including Pocket PCs, mobile phones, and devices powered by the Windows CE operating system. Programmers can become immediately productive by using the same programming model and tools for creating powerful device-based software as they use for building robust Windows- and Web-based solutions.

3.3.2 Sql Server 2005

Microsoft SQL Server 2005 provides a new Management Studio, integration with Visual Studio 2005, and the Microsoft .NET common language runtime - all of which help you build, debug, and operate applications faster and more efficiently. SQL Server 2005 Management Studio Express, for easily managing your database. Best of all, as your needs grow; your applications will seamlessly work with the rest of the SQL Server product family.

3.3.2.1 Overview of Sql Server 2005

Extending the strengths of SQL Server 2000, SQL Server 2005 provides an integrated database management and analysis solution that can help developers to do the following

- Build, deploy, and manage enterprise applications that are more secure, scalable, and reliable.
- Maximize IT productivity by reducing the complexity of developing and supporting database applications.
- Share data across multiple platforms, applications, and devices to make it easier to connect internal and external systems.
- Control costs without sacrificing performance, availability, scalability, or security.

3.3.2.2 Features of Sql Server 2005

SQL SERVER 2005 provides statements for a variety of tasks, including

- Querying data
- Inserting, updating, and deleting rows in a table
- Creating, replacing, altering, and dropping objects
- Controlling access to the database and its objects
- Guaranteeing database consistency and integrity
- Supports PL/SQL

CHAPTER 4

SYSTEM DESIGN AND DEVELOPMENT

4.1 DATA MODEL

Table Name: SNDO_HEADER

Name	Type	Size	Key
Sndo_No	Nvarchar(10)	20	Primary Key
Dlr_Code	Nvarchar(10)	20	
Req_Date	Nvarchar(10)	20	
Inco_Term	Nvarchar(10)	6	
Wh_Code	Nvarchar(3)	10	
Tpin	Nvarchar(5)	8	
Plant_Code	Nvarchar(4)	8	
Flag_Status	Nvarchar(1)	2	
Date_Cancel	Nvarchar(10)	20	
Cancel_By	Nvarchar(50)	100	
Reason	Nvarchar(100)	200	
So_Code	Nvarchar(3)	6	
Sndo_Date	Nvarchar(10)	20	

Table Name: SNDO_DETAIL

Name	Type	Size	Key
Line_Item	Bigint	8	
Sndo_No	Nvarchar(10)	20	Foreign Key
Cons_Code	Nvarchar(10)	20	
Prod_Code	Nvarchar(18)	36	
Quantity	real	4	

Table Name: DEALER_MASTER

Name	Type	Size	Key
State_Code	Nvarchar(3)	6	
Area_Code	Nvarchar(4)	8	
Dist_Code	Nvarchar(6)	12	
So_Code	Nvarchar(3)	6	
Dlr_Code	Nvarchar(10)	20	Primary Key
Dlr_Name	Nvarchar(40)	80	
Location_Code	Nvarchar(10)	20	
Tin	Nvarchar(35)	70	
Dlr_Type	Nvarchar(2)	4	
City	Nvarchar(20)	40	

Table Name: CONSIGNEE_MASTER

Name	Type	Size	Key
Consignee_Code	Nvarchar(10)	20	Primary Key
Consignee_Desc	Nvarchar(100)	200	
Cons_Loc_Code	Nvarchar(10)	20	
Address	Nvarchar(120)	240	
City	Nvarchar(20)	40	

Table Name: DEALER_CONSIGNEE

Name	Type	Size	Key
Consignee_Code	Nvarchar(10)	20	
Dlr_Code	Nvarchar(10)	20	Foreign Key

Table Name: DEVICE_SETTING

Name	Type	Size	Key
Device_Serial	Nvarchar(35)	70	
Licence_Key	Nvarchar(30)	60	
Password	Nvarchar(4)	8	
Modem_No	Nvarchar(15)	30	

Sales Force Automation Using Mobility Solution

T_pin	Nvarchar(4)	8	
So_Code	Nvarchar(4)	8	
Lock	Nvarchar(1)	2	
Area_Code	Nvarchar(3)	6	

Table Name: LOCATION_MASTER

Name	Type	Size	Key
Location_Code	Nvarchar(10)	20	Primary Key
Location_Desc	Nvarchar(50)	100	
Area_Code	Nvarchar(3)	6	

Table Name: INBOX

Name	Type	Size	Key
Inbox_id	Bigint	8	Primary Key
Recv_Date	Nvarchar(10)	20	
Cell_No	Nvarchar(12)	24	
Message	Nvarchar(160)	320	
Processed_State	Nvarchar(1)	2	

Table Name: PAYTERM_MASTER

Name	Type	Size	Key
Payterm_Code	Nvarchar(4)	8	Primary Key
Payterm_Desc	Nvarchar(30)	60	
So_Area	Nvarchar(5)	10	
Start_Date	Datetime	8	
End_Date	Datetime	8	

Table Name: PRODUCT_MASTER

Name	Type	Size	Key
Product_Code	Nvarchar(9)	18	Primary Key
Product_Desc	Nvarchar(20)	40	
Sap_Flag	Nvarchar(1)	2	

Sales Force Automation Using Mobility Solution

Int_Flag	Nvarchar(1)	2	
Material_Code	Nvarchar(18)	36	

Table Name: SENTBOX

Name	Type	Size	Key
Sent_Box_id	Bigint	8	Primary Key
Sent_Date	Nvarchar(10)	20	
Sent_Message	Nvarchar(160)	320	
Sent_State	Nvarchar(1)	2	
Retry	Nvarchar(1)	2	

Table Name: SO_MASTER

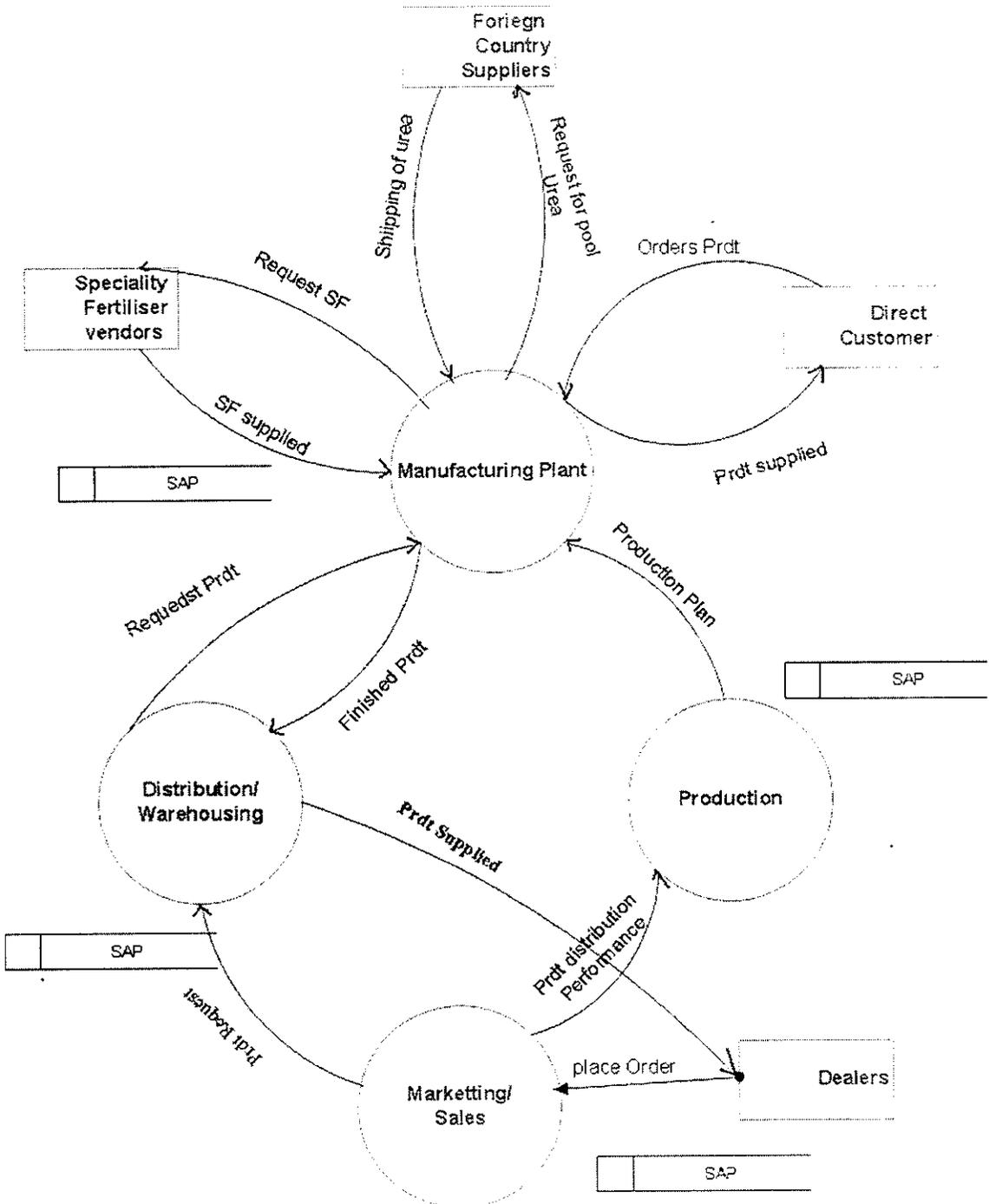
Name	Type	Size	Key
So_Code	Nvarchar(3)	6	Primary Key
Flag	Nvarchar(1)	2	

Table Name: WAREHOUSE_MASTER

Name	Type	Size	Key
Wh_Code	Nvarchar(10)	20	Primary Key
Wh_Desc	Nvarchar(50)	100	
Wh_Location	Nvarchar(10)	20	
Plant_Code	Nvarchar(5)	10	
Area_Code	Nvarchar(3)	6	

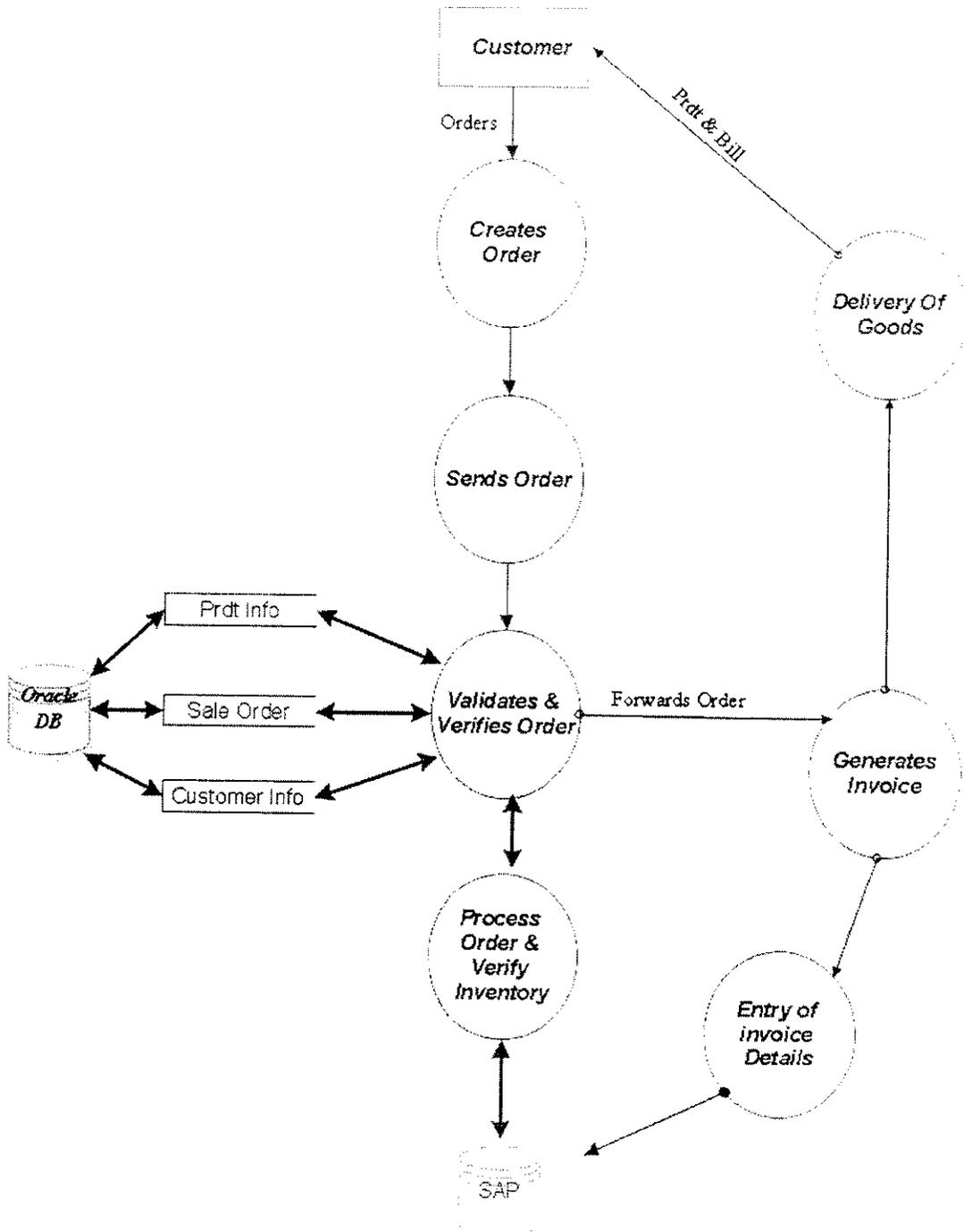
4.2 PROCESS MODEL

4.2.1 SYSTEM FLOW DIAGRAM

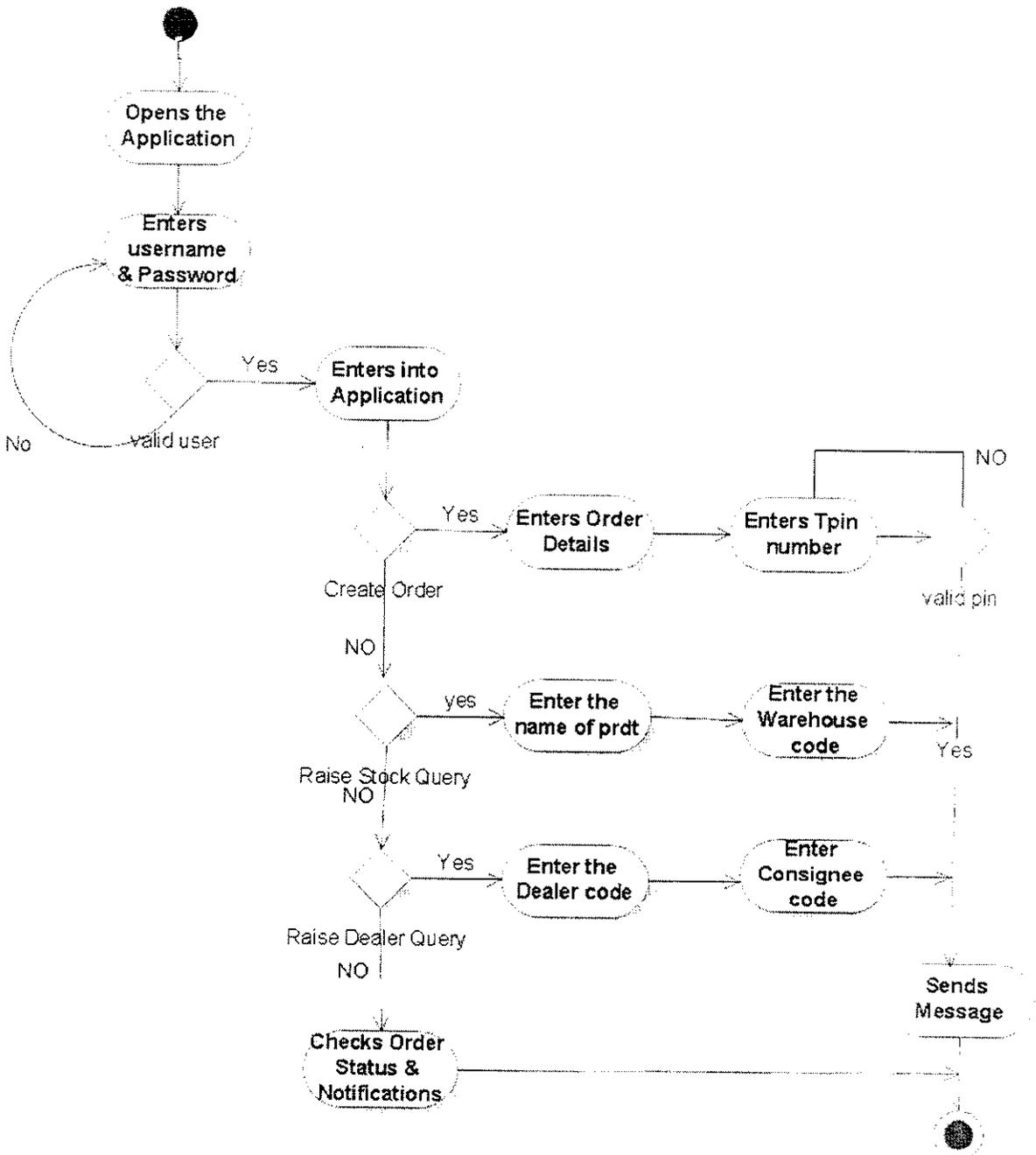


4.2.2 DATA FLOW DIAGRAM

DFD -Order Processing

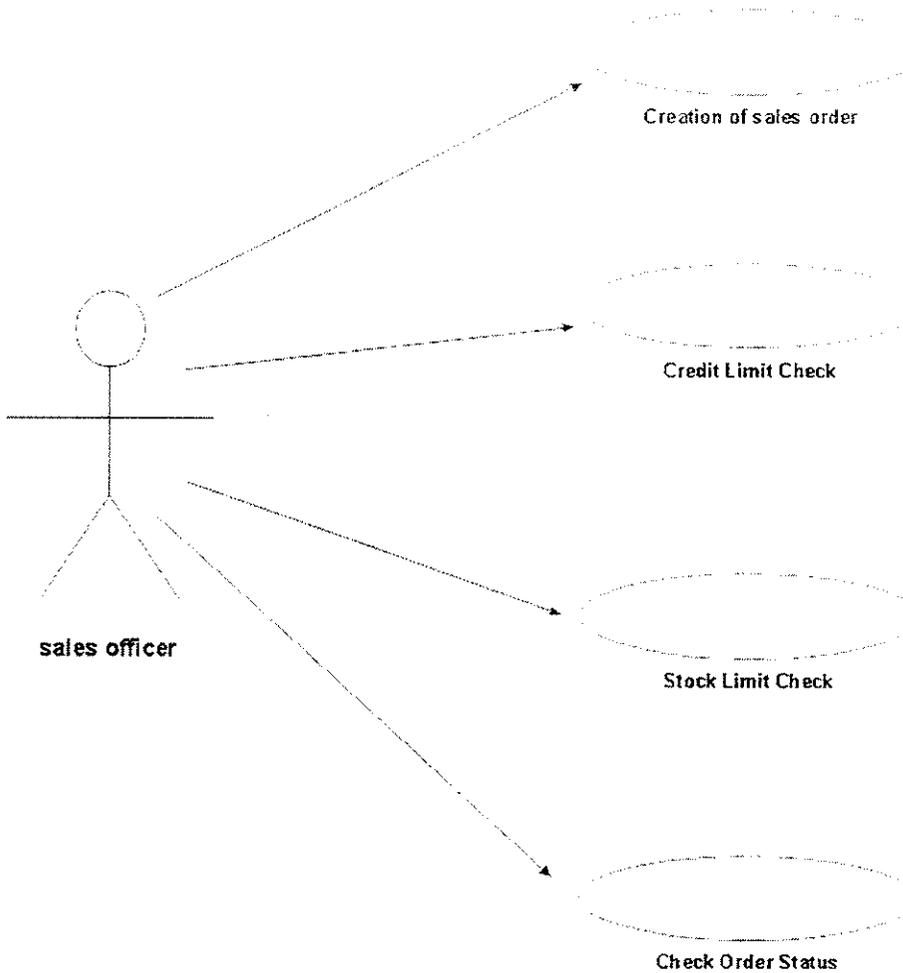


4.2.3 ACTIVITY DIAGRAM

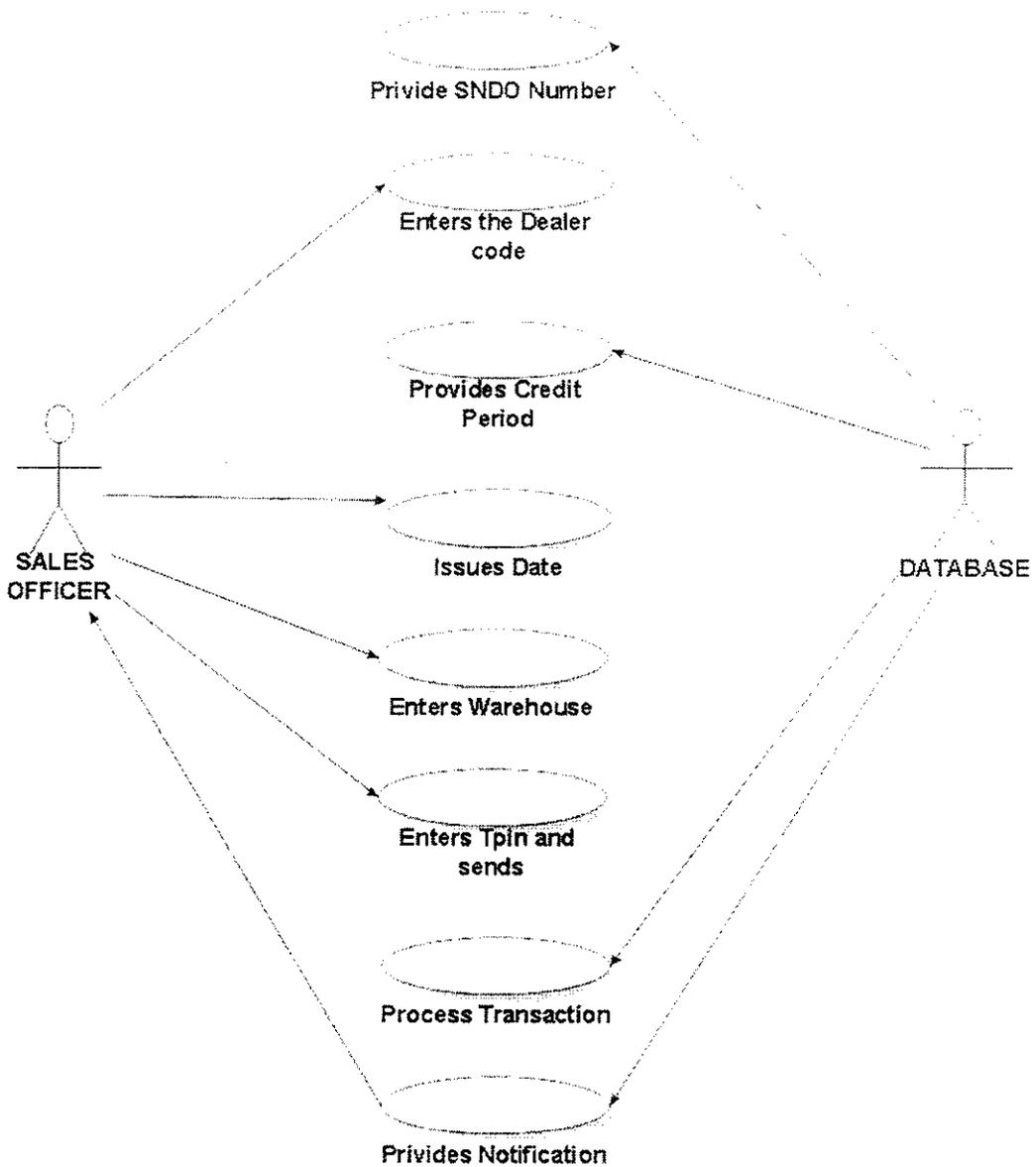


4.2.4 USECASE DIAGRAM

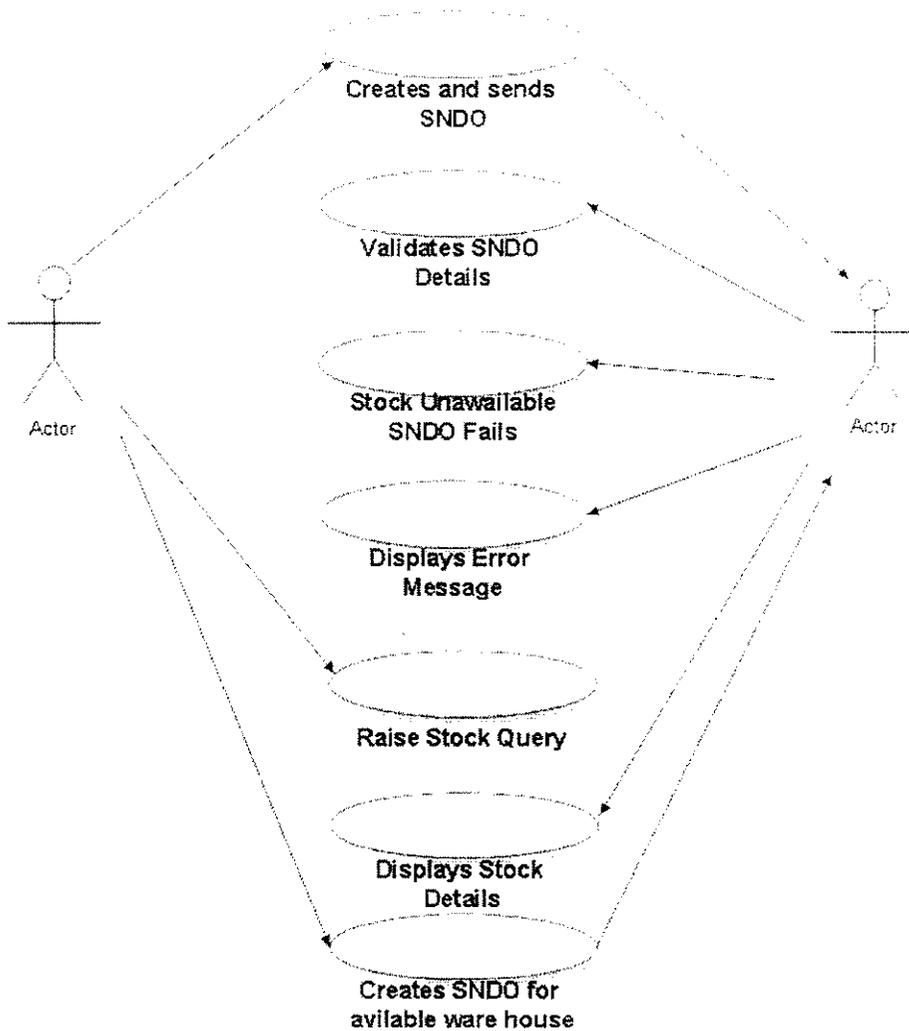
Usecase of Sales officers Functions



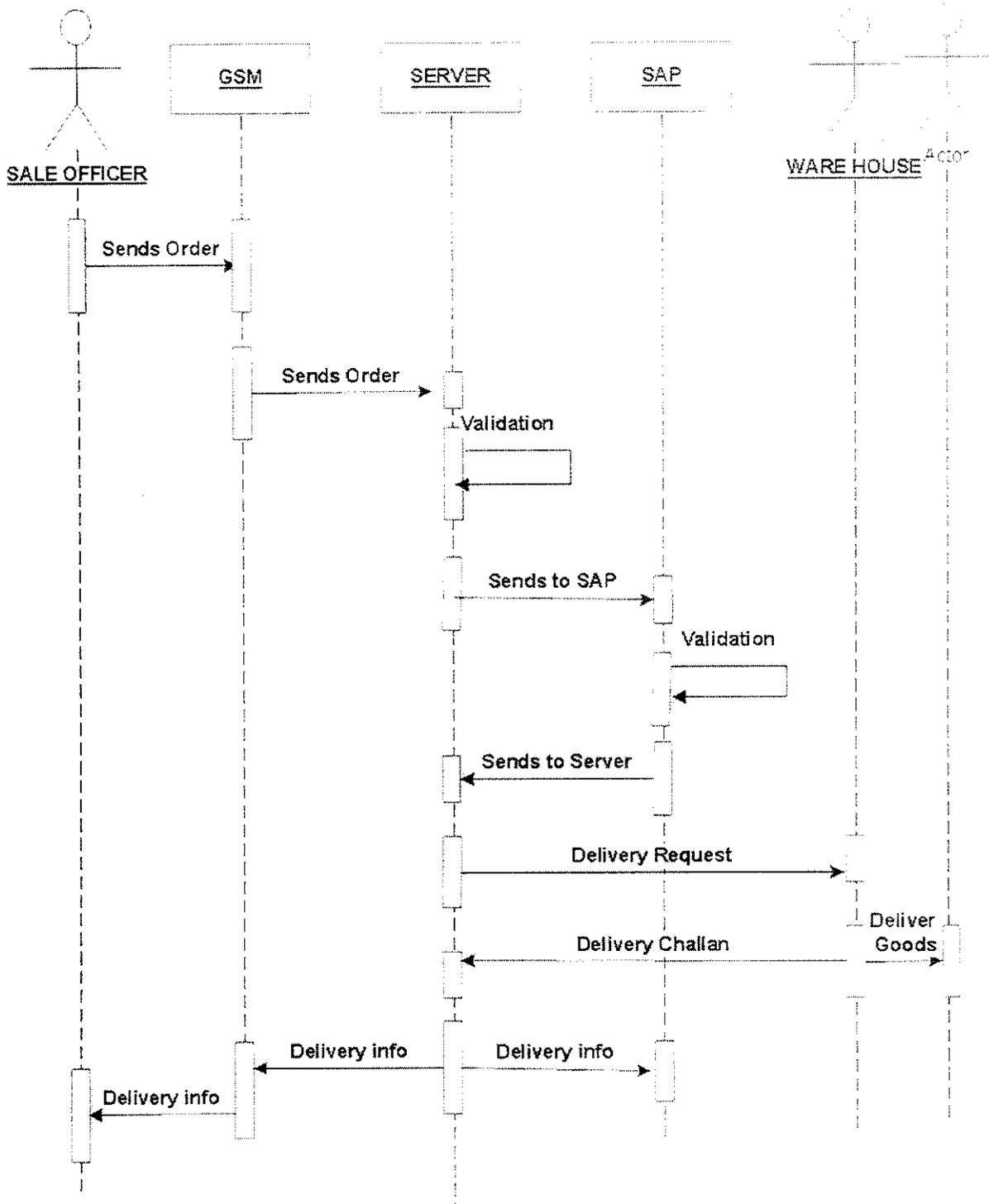
Usecase for Creation of An SNDO



Usecase for Stock Unavailable



4.2.5 SEQUENCE DIAGRAM



CHAPTER 5

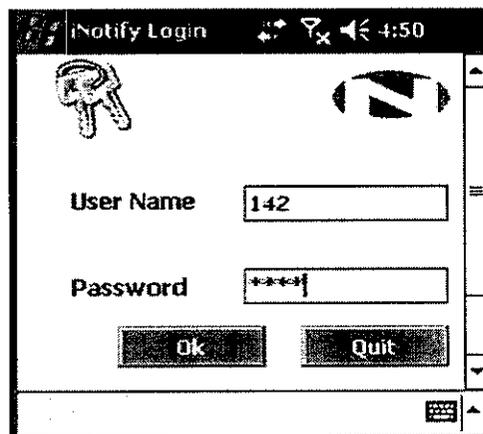
IMPLEMENTATION

Starting the application



- Once you power-on the device, you will see “Today” screen. Select programs from the main menu.
- As shown in the figure it will show all the applications loaded in the Pocket PC.
- Click the icon named “! nCircle” to start your application.

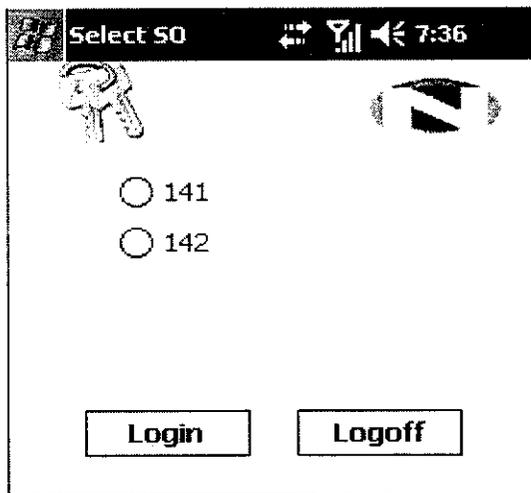
Login :



Sales Force Automation Using Mobility Solution

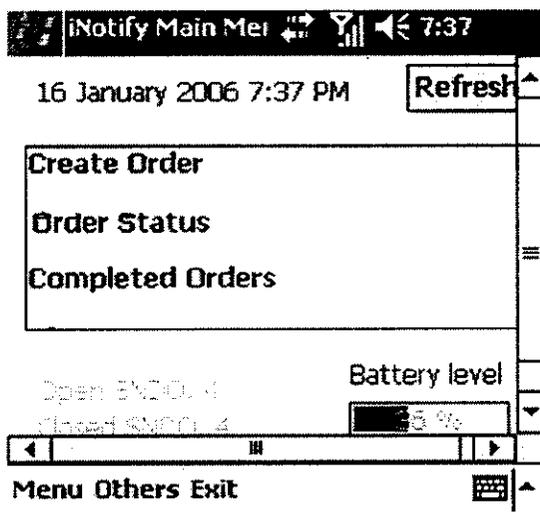
- A dialogue will appear to enter your user name and password.
- Note: For wrong user name & password the OK button will not be activated.
- You can click on the keyboard icon in the taskbar to activate or deactivate the on screen keyboard
- OK Button will open Main menu screen.

Choose Sales officer :



You can choose the SO Code login if you are assigned to multiple territories

Main Menu :



The Main Menu has following buttons:

- Create Order: To create a new SNDO.
- Order Status: To view the status of SNDO.
- Completed Orders: To view the fulfilled Orders by warehouses.
- Others: sub menu for other queries etc.
- Current Battery Level Indicator
- Exit : to exit from the application

Create a new SNDO :

When clicked on CREATE ORDER button, the New SNDO screen will be displayed as shown.

It consist of the following buttons

- Cancel: To cancel the process and return to main menu.
- Next: To go to next screen.
- By Loc: To select the consignee by location.
- By Cd: To select the consignee by code.

Creating a SNDO with Single Consignee

New Sndo 12:26

0000022165-"MURALI FERTILIZERS,"

By Loc By Cd

Quantity

Product MFD UREA

Cr.Period 20

Reqd. Date 17-01-2006

Cancel Next

Procedure to create SNDO:

- Select the dealer name by clicking on the down arrow below to dealer name label
- Select the consignee by clicking on the down arrow below consignee label.
- Enter the quantity.
- Select the product from the list.
- Select the credit period.
- Select the required date.

New Sndo 12:38

Select Delivery Terms

Ex Fol

Ext Fdt

Enter Transaction Pin ****

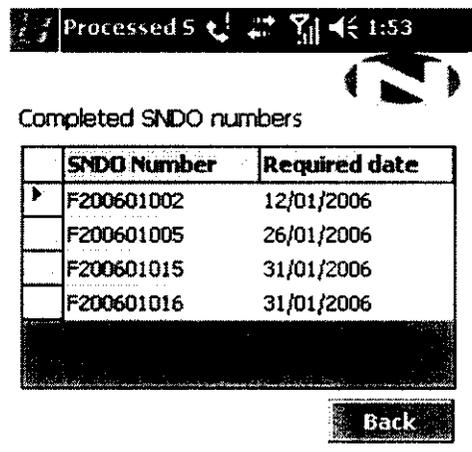
Back Save

- Select the warehouse & delivery terms.
- Enter the valid TPIN & click on save button, following screen will appear.



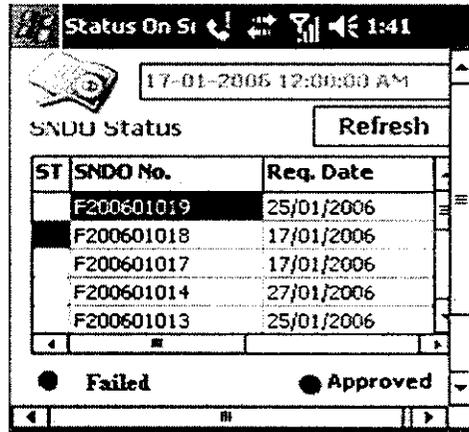
- After entering correct TPIN, click Save to save the SNDO.
- A screen will appear as shown & SNDO will be saved and data will be sent across to the server.
- Please note that this may take a little time depending upon network coverage

Completed Orders



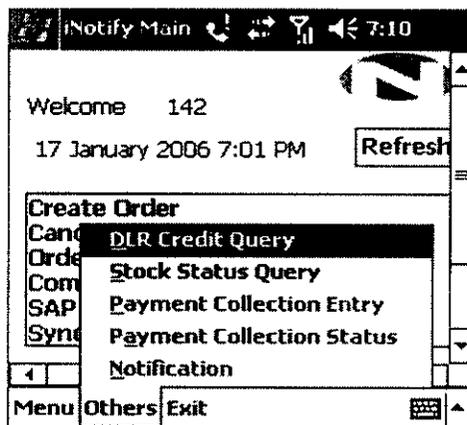
- These are the SNDO's against which all the DC's are raised at the concerned warehouse; those will appear in the following screen.

Order Status

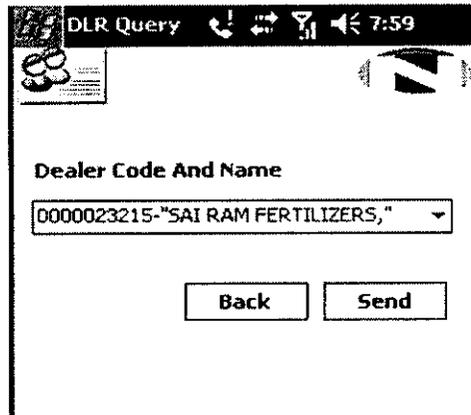


- When clicked on SNDU Status button shown screen will appear.
- It consists of following buttons.
- Back: To go back to main menu.
- Following icons indicate the status of SNDO.
- Approved: Means SNDO is approved.
- Failure: Means failed to send the SNDO because of server.

Dealer Credit Query



- 1. Click others in the task bar.
- 2. Menus will popup, from the menu, Click on option Stock Status Query.

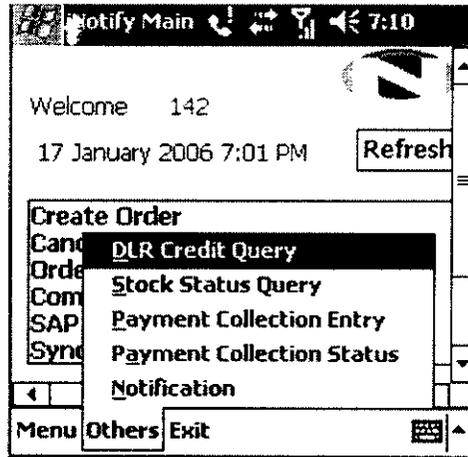


- Form the list, select the appropriate warehouse and the product and click Send to send a query to nCircle server.
- By clicking Back, it will take you back to previous menu.

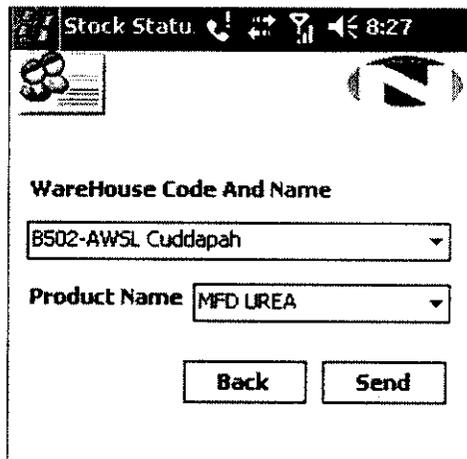


- Once the data is sent to server, you will see the relevant message.
- Click OK to close the screen

Stock Status Query



- Click others in the task bar.
- Menus will popup, from the menu, Click on option Stock Status Query.



- Form the list, select the appropriate warehouse and the product and click Send to send a query to nCircle server.
- By clicking Back, it will take you back to previous menu.



- Once the data is sent to server, you will see the relevant message.
- Click OK to close the screen.

Notifications

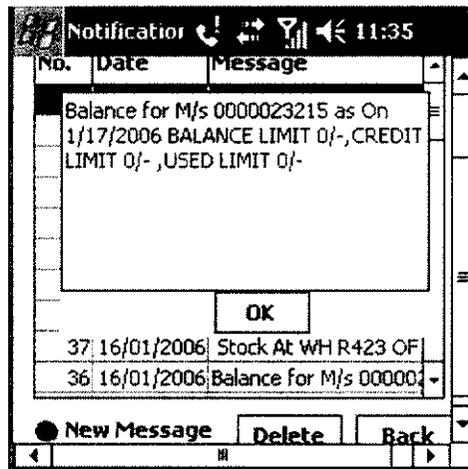
Notificator 11:33

No.	Date	Message
45	17/01/2006	Balance for M/s 000000
44	17/01/2006	Stock At WH B502 OF
43	17/01/2006	Balance for M/s 000000
42	17/01/2006	Balance for M/s 000000
41	17/01/2006	Balance for M/s 000000
40	16/01/2006	Stock At WH B510 OF
39	16/01/2006	Balance for M/s 000000
38	16/01/2006	Stock At WH B510 OF
37	16/01/2006	Stock At WH R423 OF
36	16/01/2006	Balance for M/s 000000

New Message Delete Back

- For each of the queries Send a response which will be available in Notification
- Blue indicates new notification
- Clicking on a particular row would open details of the same.

Sales Force Automation Using Mobility Solution



- Details of the message.
- Option is available to delete these messages once you have read them.

CHAPTER 6

SOFTWARE TESTING

System Implementation is the part of the software engineering life cycle, where, the design artifacts are converted to a working application. Coding is done in this stage using an apt framework and programming language, which would solve the specific problem the best way. Once the design is coded into a working application, it has to be verified, validated and tested in detail. The tested product if successful is deployed in the user environment.

6.1 SYSTEM VERIFICATION

System Verification answers the question “Am I building the product right?” It includes the review of interim work steps and interim deliverables during a project to ensure they are acceptable. Verification also determines if the system is consistent, adheres to standards, uses reliable techniques and prudent practices, and performs the selected functions in the correct manner. In data access, it verifies whether the right data is being accessed, in terms of the right place and in the right way.

6.2 SYSTEM VALIDATION

Validation answers the question “Am I building the right product?” This checks whether the developer is moving towards the right product, whether the development is moving towards the actual intended product that was agreed upon in the beginning. Validation also determines if the system complies with the requirements and performs functions for which it is intended and meets the organization’s goals and user needs. It is traditional and is performed at the end of the project. In data access, it checks whether we are accessing the right data, in terms of data required to satisfy the requirement.

6.3 TESTING

Software testing is the process used to assess the quality of computer software. It is an empirical technical investigation conducted to provide stakeholders with information about the quality of the product or service under test, with respect to the context in which it is intended to

operate. This includes, but is not limited to, the process of executing a program or application with the intent of finding software bugs. Software testing methods are traditionally divided into **black box testing and white box testing.**

Black box testing treats the software as a black-box without any understanding of internal behavior. It aims to test the functionality according to the requirements. Thus, the tester inputs data and only sees the output from the test object. **White box testing**, however, is when the tester has access to the internal data structures, code, and algorithms. White box testing methods include creating tests to satisfy some code coverage criteria.

Testing can be done on the following levels:

- Unit Testing
- Integration Testing
- System Testing

6.3.1 UNIT TESTING

Unit testing tests the minimal software component, or module. Each unit (basic component) of the software is tested to verify that the detailed design for the unit has been correctly implemented.

Test case reports:

Login:

S.No	Test Case	Input Data	Expected Result	Actual Result	Pass/Fail
1	Enter into application	User id and password	Users can login to application	. Users can login to application	Pass
2		Wrong user id or password	Displays incorrect user id and password message	Displays incorrect user id and password message	Pass

Area code:

S.No	Test Case	Input Data	Expected Result	Actual Result	Pass/Fail
1	Select area code	Area code is selected	Must enter into main menu	Enters into main menu	Pass
2		Area code not selected	Must display message	prompts to select area code	Pass

Main Menu:

S.No	Test Case	Input Data	Expected Result	Actual Result	Pass/Fail
1	Selection of various Main menu options	Select Create Order	Must display Create Order form for order creation	Create Order form displayed	Pass
2		Select Order Status	Must display the status of all the orders created	Displays the status of created orders	Pass
3		Select Completed Orders	Must display all the completed orders	Displays all the completed orders	Pass
4		Select Dealer Query	Must display Dealer Query form	Displays Dealer Query form	Pass
5		Select Stock query	Must display stock status query form	Displays stock status query form	Pass

Sales Force Automation Using Mobility Solution

Create order:

S.No	Test Case	Input Data	Expected Result	Actual Result	Pass/Fail
1	A sale order creation	Dealer selection relevant to the need	Corresponding consignees are displayed.	Consignees are displayed.	Pass
2		Enter date as current date	Required day should always be 10 days ahead.	Message displayed to change days 10 days ahead.	Pass
3		Quantity not entered	Must prompt user to enter the quantity	Prompts user to enter the quantity	Pass
4		credit period not selected	Must prompt user to select the credit period	prompts user to enter the quantity	Pass
5		Select next button	Must displays SNDO create form.	Displays SNDO create form.	Pass
6		Select cancel option	Must return to main menu.	Returns to main menu.	Pass

SNDO Creation:

S.No	Test Case	Input Data	Expected Result	Actual Result	Pass/Fail
1	SNDO order creation	warehouse location not	Must display message to	Displays message to	Pass

Sales Force Automation Using Mobility Solution

		selected	select warehouse	select warehouse	
2		Input valid TPin.	Must create order and sent to server.	Sndo order is created and sent to server.	Pass
3		Input wrong TPin	Must display Invalid Tpin message.	Invalid Tpin message is displayed	Pass

Completed orders:

S.No	Test Case	Input Data	Expected Result	Actual Result	Pass/Fail
1	View Completed orders		Must display all the orders which are successfully created and sent to server	Displays all the orders which are successfully created and sent to server	Pass
2		Select back button	Must return to main menu	Returns to main menu	Pass

Order status:

S.No	Test Case	Input Data	Expected Result	Actual Result	Pass/Fail
1	View status of each order being created		Must display the status of each order created	Displays the status of each order created	Pass

Dealer query:

S.No	Test Case	Input Data	Expected Result	Actual Result	Pass/Fail
1	Create dealer query	Dealer selection relevant to the need	Corresponding consignees are displayed.	Consignees are displayed.	Pass
2		Select sent	Must sent Dealer query successfully to server	Dealer query is successfully sent to server	Pass
3		Select cancel	Must Return to main menu	Returns to main menu	Pass

Stock status query:

S.No	Test Case	Input Data	Expected Result	Actual Result	Pass/Fail
1	Create stock query	Stock warehouse relevant to the need	Corresponding stocks in the warehouse must be displayed.	Corresponding stocks in the warehouse must be displayed.	Pass
2		Select sent	Must sent stock query successfully to server	Stock query is successfully sent to server	Pass
3		Select cancel	Must Return to main menu	Returns to main menu	Pass

CHAPTER 7

PERFORMANCE AND LIMITATIONS

7.1 MERITS OF THE SYSTEM

- Creation of sales Order to enter number in his PDA sends to server.
- Credit Limit Check , Stock Level Check
- Raise Sales Order , Collection etc online
- Check details of shipments against sales orders, receipt status, etc.
- Gets the status of each warehouse / rail head including transit stocks
- Progress of the entire life cycle of a sales operation will be available with the user.
- Remaining stock will be assigned to private godown through his PDA (personal digital assistant).

7.2 LIMITATIONS OF THE SYSTEM

- Life span of PDA is low – 2 to 4 years so the cost employed in buying PDAs is very high.
- When there is no tower or gsm facility then creation of order and other associated activities becomes impossible.
- Each activity with the server involves message cost.
- SAP messages will usually take more than five messages and hence the cost involved is also high.
- When ever a new dealer is added it should be imported to all the sales offices, warehouse agents PDA. This task is accomplished via message triggering.

CHAPTER 8

CONCLUSION

The project entitled “**SALES FORCE AUTOMATION ON MOBILITY SOLUTIONS**” will run with a good performance and reliable to the applications. The resulting system is close to user requirements. The project will save users time by using the P.D.A. so that users can perform various operations on their P.D.A. The project has been appreciated by all the users in the organization. It is easy to use, since it uses GUI provided in the user dialog. User friendly screens are provided.

The goals well set in mind I have ventured into the development of this system and as there my best to meet the requirements of the **Nagarjuna fertilizers and chemicals Ltd.** As there is always a room for improvement, this project can reach to its perfection and potential with few more extensions and enhancements, as on going process.

CHAPTER 9

REFERENCES

BOOKS:

- Senn, Mc Graw **Analysis of Information System and design** Publications 1996.
- Bill Grountgeiger **Professional C#. NET** WROX Publications
- Elias M.AWARD **System Analysis And Design** Glagotia Publications 1995
- Roger S.Pressman **Software Engineering** Mc Graw-Hill Publications 1996

WEB SITES:-

www.nagarjunafertilizers.com

www.expertsexchange.com

www.codeproject.com

www.c-sharpcorner.com

www.codeguru.com

www.google.com