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# PRODUCT CERTIFICATE AUTHENTICATION IN SUPPLY CHAIN MANAGEMENT

By

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Of

**KUMARAGURU COLLEGE OF TECHNOLOGY**
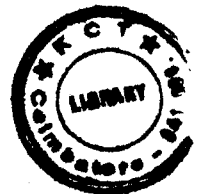**COIMBATORE**

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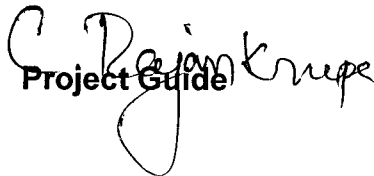
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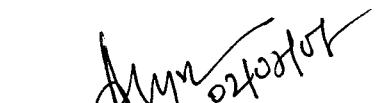
## BONAFIDE CERTIFICATE

This is to certify that the project report titled **Product Certificate Authentication in Supply Chain Management** is the bonafide work of **Mr. J. Rajesh Babu Reg.No.(71204621028)** who carried out the project 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 an earlier occasion on this or any other candidate.


**Project Guide**                                        **Head of the Department**


Submitted for the University Examination held on ___ C 2 - C 7 - 2.0C 7 _____


**Internal Examiner**                                      **External Examiner**

Date: 13/06/2007

# TO WHOSOEVER IT MAY CONCERN

This is to certify that **Mr. J. RAJESH BABU (Reg.No 71204621028)** final year student of Master of Computer Application from Kumaraguru College of Technology, Coimbatore, has successfully completed project titled **"PRODUCT CERTIFICATE AUTHENTICATION IN SUPPLY CHAIN MANAGEMENT** "during the period from January 2007 to June 2007.

During this period, his work and conduct was found satisfactory. We wish him success in all his future endeavors.

K. Ananthakrishnan

Manager

# ABSTRACT

Supply Chain Management is developed as GUI based user friendly application with VB.Net as Front end and SQL Server as database server. This is developed for integration of Company to have proper and efficient supply procedure of goods to various dealers and distributor.

The application would help the distributor and dealer to identify their supply chain in an effective manner. The main objective of the system is to track the supply chain of the product from the warehouse of the manufacturer to the distributor and or dealer.

To provide the management a transparent flow of products being delivered to the end user through various channel of distribution. The application also achieve the task of product search i.e., which product is supplied to the consumer through which intermediary.

The another important objective of this application is to provide every product a unique key so that the duplicates can be identified when the products are returned from the end user for further enhancement or rectifying the defects.

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# CHAPTER 1

## INTRODUCTION

## 1.1   SYSTEM OVERVIEW

The supply chain mechanism for the Electronic goods manufacturing organization can be handled efficiently by the company in appropriate distribution model. The SCM model provides information regarding the manufacturer's components location and its availability across the distribution channel. Handle supply procedure of materials and components to various manufacturing units.

The product uniqueness is identified for all the components in the system. Component requirements are calculated efficiently for any particular job. Fabrication system maintains the status about job scheduling, production and disposition. Data update and duplicate identification are stored to have an overall interaction with system.

Product Quality is checked to maintain supply chain system free of error prone products being delivered to clients. Supply Chain Management encompasses the planning and management of all activities involved in sourcing and procurement, conversion, and all Logistics Management activities. Importantly, it also includes coordination and collaboration with channel partners, which can be suppliers, intermediaries, third-party service providers, and customers. In essence, Supply Chain Management integrates supply and demand management within and across companies

In this project, the product details deals with the information regarding the product specification, rate and nature of the availability and the supplier who issue this product.

The Ware housing part involve in the description of the capacity of storage, item that can be stored and the location in which it is situated. The contact person and the uniqueness of the unit is also maintained as additional information to enhance the easy accessing of the data by the middle men involved in the supply chain.

The distributor part governs about the personal and business information about the distributor lie across the chain. It also holds the information about the merits and demerits of the respective distributor in handling the goods

The dealer receives the goods from the distributor who is the main person in providing the information regarding the consumer behavior to the higher level people.

The dispatch scheduling part of the project involve in the schedule of the goods being dispatched from the warehousing to the concern distributor or the dealer. It also gives the information regarding the goods which are currently in transportation.

The issuing authority closely works in association with the authentication process. This module issue the certificate to the product that the system handles is unique in nature. To check the product identity by the firm for the customer is done through this module. This part of the coding takes the certificate from the consumer and check with the authentication process regarding duplicity is available in the system or not.

## 1.2 COMPANY PROFILE

**Maestros,** The IT industry worldwide often ignores the fact that only about 20% of available features are used by customers effectively. The gap between features and their utilization is widening everyday. Most IT service providers wait for customers to demand IT solutions and services. Maestros has revolutionized this cycle! We learn technologies quickly, convert technical features to business benefit and offer the benefit to the potential customers. This proactive approach is what makes Maestros unique. We help you exploit technology fully and effectively with 100% customer satisfaction.

Maestros have a highly skilled team of developers and architects who have extensive experience in designing, developing and implementing technology solutions. The versatility of our personnel covers the entire range of Microsoft products, including server platform, development tools, web products and front office.

Maestros are currently in the process of implementing ISO 9001 compliant processes and systems. For application development related quality assurance, change management and testing Rational Unified Process and Tools are used. Rational products are the world leader in software quality management. We also use Microsoft Solutions Framework and Rapid Economic Justification methodologies to ensure that the services provided translate into business benefits.

Adding tangible value by institutionalizing technology exploitation by evolving a replicable methodology using a scaleable structure. Our core skill is to imbibe technology and add tangible value to your business using it effectively. Growth would be achieved making this process repeatable for a large number of customers, technologies and geographies.

# CHAPTER 2

# SYSTEM STUDY AND ANALYSIS

## 2.1 PROBLEM STATEMENT

Physical distribution and logistics were envisioned to have broad responsibilities for managing activities associated with product flow from the points of raw material acquisition to the end consumer. Although the scope of the field was extensive, actual management practice was generally limited to coordination of activities within the logistics function or among those activities associated with product flow. Boundary-spanning management was embraced but little practiced.

The total cost concept served as the basis for managing certain activities collectively. Activities such as transportation and inventory control were collectively managed because they were in cost conflict. All those activities associated with product flow and displaying this cost tradeoff characteristic were considered a part of the new field of physical distribution or logistics.

Physical distribution and logistics were embraced by both marketing and production areas, but they gave little attention to issues of product flow. As a result, physical distribution and logistics began to develop as an independent function within business. This action was spurred by the recognition that logistics costs were high and that there was an unrealized opportunity to reduce them.

Among the areas of purchasing, production, and physical distribution, there was little coordination, even though they had a direct effect on product flow management. This coordination was to become a major theme in later years.

The Company maintains their data's in different tables which did not have proper relation between them. The existing system did not have good integration between the modules in the total business process. Some of the process in Supply Chain management system is preformed manually. The transaction time to accomplish a task is huge, which was difficult for the data processor to handle the system effectively and quickly.

## 2.2 EXISTING SYSTEM

Physical distribution with its outbound orientation was first to emerge, since it represents about two thirds of logistics costs and it was considered a component of the marketing mix (product, place or physical distribution, promotion, and price) of essential elements.

When comparing the early vision of physical distribution and logistics with the current one for supply chain management, there is little difference.

Although physical distribution is usually associated with outbound product movements from a firm, this definition indicates a broader concept that includes both inbound and outbound movements. The previous literature described business logistics in terms of both physical supply and physical distribution, but they also recognized that logistics takes place throughout the supply channel, from producer to end consumer.

Although these early definitions suggest a broad scope for physical distribution and logistics, the focus was on coordinating among the activities within the function, with little emphasis on coordinating among the other functions within the firm or among external channel members. This limited application of a much broader scope probably had to do with technological limitations of information systems at the time and the difficultly of managing across areas of responsibility.

### 2.2.1 Drawbacks of the Existing System

The drawbacks of the existing systems can be summarized as below:

- Product duplicity was possible.

- No tracking of product across the supply chain

- Transaction time was high

- Security authentication is not provided.

- Dealer to distributor references were not handled properly

## 2.3    PROPOSED SYSTEM

The proposed system is developed to track the supply chain procedure of the product distribution channel from the warehouse to the dealer. The proposed is supposed to help the management to visualize the transparency of products being delivered. The proposed system has the provision for product search.

The product uniqueness should be maintained across the supply chain. Transaction time for retrieving the data from the server should be very less. Security authentication should be provided user login. The proposed system solves the drawback and works satisfactorily. The proposed system is good management information system.

### 2.3.1 Advantages of the Proposed System

The expected benefits of the Proposed System are as follows:

- Data manipulations are done faster and precisely.

- Product uniqueness is maintained.

- Separate tables are used to store separate information

- Company details are recorded in separate table

- Tracking of the product across the chain is feasible

## 2.4 FEASIBILITY ANALYSIS

A feasibility study is conducted to select the best system that meets performance requirements.

### 2.4.1 Technical Feasibility

Technical analysis centers on the existing computer system (hardware, software etc.) and to what extent it can support the proposed addition. This involves financial considerations to accommodate technical enhancement .If the budget is a serious constraint, then the project is judged not feasible

### 2.4.2 Operational Feasibility

An estimate should be made of how strong a reaction the user staff is likely to have toward the development of a computerized system .It is common knowledge the computer installations have something to do with turnover, transfers and changes in employee job status. Therefore it is understandable that the introduction of a

candidate system requires special effort to educate, sell and train the staff on new ways of conducting business

### 2.4.3 Economic Feasibility

Economic analysis is the most frequently used method for evaluating the effectiveness of the candidate system. More commonly known as cost/benefit analysis, the procedure is to determine the benefits and savings that benefits outweigh costs and then the decision is made to design and implement the system. Otherwise, further justification or alterations in the proposed system will have to be made if it is to have to approve.

# CHAPTER 3

# DEVELOPMENT ENVIRONMENT

## 3.1 HARDWARE REQUIREMENTS

The hardware support required for deploying the application:

### Server Configuration:

| | | |
|---|---|---|
| Processor Speed Minimum | : | Pentium 4 |
| RAM | : | 512 MB |
| Hard disk | : | 40GB |

### Client Configuration:

| | | |
|---|---|---|
| Processor Speed Minimum | : | Pentium 4 |
| RAM | : | 256 MB |
| Hard disk | : | 40GB |

## 3.2 SOFTWARE REQUIREMENTS

The software support required for deployment is as follows:

| | | |
|---|---|---|
| Server Operating System | : | Windows 2000 Server |
| Client Operating System | : | Windows XP |
| Frame work | : | .NET framework |
| Database | : | SQL Server |
| Language | : | VB.Net |

## 3.3 PROGRAMMING ENVIRONMENT

### 3.3.1 VB.NET

## WORKING WITH FORMS AND CONTROLS

Forms allow us to work visually with controls and other items from the toolbox. In VB .NET forms are based on the System.Windows.Forms namespace and the form class is System.Windows.Forms.Form..

A control is an object that can be drawn on to the Form to enable or enhance user interaction with the application.

## WORKING WITH MENUS

In this project, we used this control for four main menus namely Master details, Transactions, Certificate Authentication and Reports.

Master menu has sub menus through which we can access the forms of Supplier, product, warehouse etc, as sub menus in which we can enter their details for storing in database.

Likewise, all other menus are tied up with their corresponding forms through sub menus.

## OOP WITH VB.NET

In Inheritance, if any child class overrides base class, base class should be specified as "Overridable" and child class is specified as "Overrides". The "MustOverride" keyword indicates that any child of this class must provide its own version of this property or method, and the "MustInherit" keyword means that this class cannot be used on its own.

**ADO.NET**

ADO.NET provides two kinds of Objects. One of which is OLEDB and the other is the SQL server. In our project, SQL server is our database. ADO.Net provides us with the set of objects that bypass the OLEDB provider and directly access the SQL server tabular data stream. This direct access to SQL server's data stream increases the applications performance.

To access the ADO.NET classes we have to import some namespaces that hold the objects, which are required to carry out our database level operations.

In our project, for any kind of manipulation with our database the SQL server use the set of objects in this class

- **SQLConnection** - Represents the connection to the SQL Server Database for DataSet object
- **SQLCommand** - Used to execute the T-SQL commands such as stored procedures, functions etc
- **SqlCommandBuilder** - Automatically generates the commands in SQL Adapter

**CRYSTAL REPORT**

In this project, "Crystal Report" plays a major role in delivering the data reports very clearly to manage the supply chain right from the manufacturer to the end user. We can also use these reports in web to refer or to publish in the web server, which will be very easier to track the supply chain.

To track the supply chain accurately, we can generate reports by grouping one or more tables based on the common fields which play as chain identifier ( in our project, it is the codes given to supplier, dealer , distributor etc..).

### 3.3.2 MS-SQL SERVER 2000

Microsoft SQL Server 2000 is a full-featured relational database management system (RDBMS) that offers a variety of administrative tools to ease the burdens of database development, maintenance and administration. In this article, we'll cover six of the more frequently used tools: Enterprise Manager, Query Analyzer, SQL Profiler, Service Manager, Data Transformation Services and Books Online.

**Enterprise Manager** is the main administrative console for SQL Server installations. It provides you with a graphical "birds-eye" view of all of the SQL Server installations on your network. You can perform high-level administrative functions that affect one or more servers, schedule common maintenance tasks or create and modify the structure of individual database.

**Query Analyzer** offers a quick and dirty method for performing queries against any of your SQL Server databases. It's a great way to quickly pull information out of a database in response to a user request, test queries before implementing them in other applications, create or modify stored procedures and execute administrative tasks.

**SQL Profiler** provides a window into the inner workings of your database. You can monitor many different event types and observe database performance in real time. SQL Profiler allows you to capture and replay system "traces" that log various activities

**Service Manager** is used to control the MSSQLServer (the main SQL Server process), MSDTC (Microsoft Distributed Transaction Coordinator) and SQLServerAgent processes. An icon for this service normally resides in the system tray of machines running SQL Server. You can use Service Manager to start or stop any one of the service.

# CHAPTER 4

# SYSTEM DESIGN AND DEVELOPMENT

## 4.1    ORGANIZATION OF PROJECT WORK

Project work is first started with the intension of overcoming the disadvantages of the existing system. The drawback is that, there is no tracking of supply chain, prevailing of product duplicity and moreover, transaction time is too high.

To overcome this, we introduce a project based on the concept of Keyed Certification for every product which plays a vital role in managing the supply chain right from the scratch, up to the delivery of the product to the end user.

The various modules that are designed are as follows:

- Product details
- Warehousing
- Distributor
- Dealer
- Dispatch scheduling
- Issuing authority

## 4.2.    PORTRAYAL OF THE MODULES

### MODULE 1: PRODUCT DETAILS

The product details deals with the information regarding the product specification, rate and nature of the availability and the supplier who issue this

product. Every product is given with a code which will used to track the chain with the next level persons (Dealer, Distributor) who involved in the chain.

The data are tightly integrated by means of storing in the table using integrity constraints. The product code is the very important information in this by which we are going to start the supply chain tracking.

## MODULE 2: WAREHOUSING

The Ware housing part involve in the description of the capacity of storage item that can be stored and the location in which it is situated. Here, warehouse code is used to track the chain in dealer and distributor level.

The contact person and the uniqueness of the unit is also maintained as additional information to enhance the easy accessing of the data by the middle men involved in the supply chain.

## MODULE 3: DISTRIBUTOR

The distributor part governs about the personal and business information about the distributor lie across the chain. It also holds the information about the merits and demerits of the respective distributor in handling the goods.

The distributor code is tracked along with the warehouse code to track the flow from which warehouse, the product is delivered to which distributor. By maintaining this information, the product going to dealer will be in contact with the distributor for getting transaction details in future.

## MODULE 4: DEALER

The dealer receives the goods from the distributor who is the main person in providing the information regarding the consumer behavior to the higher level people. Every dealer has a dealer code in association with particular distributor which helps in supply chain tracking.

This sort of details would help the manufacturer in identifying the likes and dislikes about the product. Thereby the firm could modify the product quality

and appearance. It will help in delivering the defect free, original product and avoids prevailing of duplicate product.

## MODULE 5: DISPATCH SCHEDULING

The dispatch scheduling part of the project involve in the schedule of the goods being dispatched from the warehousing to the concern distributor or the dealer. It also gives the information regarding the goods which are currently in transportation.

This module maintains the transaction details like product sold date, to which dealer or distributor the product is delivered from which warehouse. If any problem is found or detected in the product, we can track where the problem is introduced by seeing the dispatch scheduling information.

## MODULE 6: ISSUING AUTHORITY

The issuing authority closely works in association with the authentication process. This module issue the certificate to the product that the system handles is unique in nature. The key value issued with every certificate is used to find the original and duplicate product. If any duplicate product is mingled with the originals, we can find out the original product by inspecting the certificate key.

To check the product identity by the firm for the customer is done through this module. This part of the coding takes the certificate from the consumer and check with the authentication process regarding duplicacy is available in the system or not.

## 4.3. INPUT PARADIGM

Input design is the process of converting user-oriented inputs to a computer-based format. The quality of the system input determines the quality of system output. Input design determines the format and validation criteria for data entering to the system.

The input forms of the Product Certificate Authentication in Supply Chain Management are listed as below:

### 4.3.1 MASTER FORMS:

❖ **Supplier Master Form**

This form is used to get the details of suppliers like Supplier name, Supplier code, Address, contact number. Supplier code is generated automatically when a new supplier is entered into the database.

❖ **Product Master Form**

Information like Product name, product code, description of the product, number of products (Units), along with supplier name who supplies the product are inputs to this form. Here, product code is generated in accordance with Supplier code.

❖ **Warehouse Master Form**

Here, supplier name is selected from the database and the warehouse code is generated automatically for every supplier. The other information like Warehouse name, contact person, phone number and address is given as user input.

❖ **Dealer Master Form**

Here, User enters dealer name, contact person, contact number and Address. Dealer code is generated for every new user. Existing dealer codes are stored in the database are used as reference to avoid duplicate codes.

❖ **Stock Master Form**

In this form, warehouse code and dealer code are selected from the database. Opening balance and reorder level are entered manually. This detail used to track the dealer to whom the product is delivered from the warehouse.

❖ **Distributor Master Form**

This form deals with getting user inputs like Distributor name, contact person, phone number, Address. Distributor code is automatically generated.

## 4.3.2 TRANSACTION FORMS:

❖ **Stock Details Form**

This form used to store the stock details. It gets the warehouse code and product code from the database. Users will enter the Stock availability details (On hand), number products to order (On order), Total stock, and stock status whether ordering is Normal, high or Low.

❖ **Distributor Sales Details Form**

This form is used to track the sales details of distributor from warehouse. Information like warehouse code, distributor code and product code are taken from the database. Then, amount of the product is calculated by getting the product rate and quantity from the user.

❖ **Dealer sales Details Form**

In this form, dealer sales information is entered. Dealer code, product code and warehouse code are selected from the database. Sales number and date of selling the product are entered manually by the user. Amount of the product is calculated using the product rate and quantity.

❖ **Product Return Form**

In this form, dealer enters the product return details like serial number, return date, product code and quantity. Dealer Id and sales no are generated automatically.

## 4.3.3 CERTIFICATING FORMS:

❖ **Certificate Issue Form**

Every dealer gets their own certificate key for every product by entering the fields like Dealer code, Issue date, Sales number and product code. After entering all the details, Certificate Key is generated. All details are stored in the database by clicking the save button.

❖ **Certificate Verification Form**

In this form, certificate key is verified whether it is valid key or invalid key. Return number, product code and Certificate key are entered. When clicking the "verify key" button, a message will be displayed showing the key is valid or not.

## 4.4. OUTPUT PARADIGM

In supply chain management, tracking information can be maintained clearly by generating them as reports. Database details are grouped as per the requirement of the information and they are generated as reports which can be taken print out to maintain them as hard copies.

Different reports are generated for different criteria. By generating reports, Administrator can track the chain from the supplier to end user. If Distributor wants to track, he/she can generate report by grouping warehouse and distributor tables. Likewise, every person can generate their information according to the criteria or requirement they need. The reports present in the system are:

➤ Product Report

  Product report clearly gives the product id, product name, supplier name who supplies the product, description of every product and unit of product available

➤ Stock Report

  Stock report gives the stock level maintained and on hand level of product and on order level of product.

➤ Distributor Sales Report

  In this report it provides the distributor name, id and which product sold and information of that product and dealer information who buy that product.

➤ Dealer Sales Report

  Dealer sales report gives the information about the dealer, product and for you whom the product sold.

➤ Warehouse Report.

  In warehouse report it gives the warehouse id, contact person and supplier name.

> Certificate Issue Report

Certificate issue report gives the product id and certificate key of that product.

> Supplier Report

Supplier report gives the supplier information like name, id, phone number and address.

Reports help to maintain the accuracy of data, easy way of getting the information

## 4.5. DATABASE PARADIGM

Database design deals with the table structure and organization. The purpose of the database is to enable easy Access of information for the user. The general theme behind databases is to handle the information as an integrated one.

The database is to enable easy access of information for the user. A database system is basically o computerized record keeping system, it is a computerized system whose overall purpose is to maintain information and make information available on demand.

Database Management System is used to manipulate inter related data and set of programs that allow several uses to access and manipulate the data. The tables are normalized so that they can provide better response time, have data integrity, avoid redundancy and be secure.

## 4.6   TABLE STRUCTURE

| Table No.  4.6.1 | Table Name:  Supplier Master | |
|---|---|---|
| **Field Name** | **Type** | **Description** |
| SCode | Varchar | Primary Key<br>Supplier Code |
| SupplierName | Varchar(20) | Component Name |
| Phno | Integer | Phone Number of the Supplier |
| Address | Varchar(20) | Address of the Supplier |

| Table No.  4.6.2 | Table Name:  Product Master | |
|---|---|---|
| **Field Name** | **Type** | **Description** |
| SCode | Varchar(50) | Supplier Code |
| PCode | Varchar(50) | Primary Key<br>Product Code |
| PName | Varchar(50) | Product name |
| Description | Varchar(50) | Description of the product |

| Table No.  4.6.3 | Table Name:  Warehouse Master | |
|---|---|---|
| **Field Name** | **Type** | **Description** |
| SCode | Varchar(10) | Supplier Code |
| WhCode | Varchar(20) | Primary Key<br>Warehouse Code |
| WhName | Varchar(20) | Warehouse name |
| ContactPerson | Varchar(20) | Name of the contact person |
| Ph | Integer | Phone Number of the contact person |
| Address | Varchar(50) | Address of the contact person |

| Table No.  4.6.4 | Table Name:  StockMaster | |
|---|---|---|
| **Field Name** | **Type** | **Description** |
| WhCode | Varchar(10) | Foreign Key Warehouse Code |
| PCode | Varchar(10) | Product Code |
| OpenBalance | Integer | Opening balance |
| Reorder | Integer | Reorder details of the product |

| Table No.  4.6.5 | Table Name:  Distributor Master | |
|---|---|---|
| **Field Name** | **Type** | **Description** |
| DistCode | Varchar(10) | Distributor Code |
| DistName | Varchar(10) | Distributor Name |
| ContactPerson | Varchar(10) | Name of the contact person |
| Ph | Integer | Phone Number of the contact person |
| Address | Varchar(10) | Address of the contact person |

| Table No.  4.6.6 | Table Name:  Dealer Master | |
|---|---|---|
| **Field Name** | **Type** | **Description** |
| DCode | Varchar(10) | Dealer Code |
| DName | Varchar(10) | Dealer Name |
| ContactPerson | Varchar(10) | Foreign Key Component Code |
| Ph | Integer | Phone Number of the contact person |
| Address | Varchar(10) | Address of the contact person |

| Table No. 4.6.7 | Table Name: Stock Details | |
|---|---|---|
| **Field Name** | **Type** | **Description** |
| WhCode | Varchar(10) | Primary Key Warehouse Code |
| PCode | Varchar(10) | Product Code |
| Balance | Integer | Balance details of the stocks |
| Order | Integer | Ordering details of the stocks |
| Total | Integer | Total amount of the order. |
| Stock | Varchar(10) | Stock available |

| Table No. 4.6.8 | Table Name: Distributor Sales Details | |
|---|---|---|
| **Field Name** | **Type** | **Description** |
| DistCode | Varchar(10) | Foreign Key Distributor Code |
| SDt | Date/Time | Sold Date |
| PCode | Varchar(10) | Product Code |
| Prate | Integer | Product Rate |
| Qty | Integer | Quantity of the product |
| Amount | Integer | Amount of the product |
| WhCode | Varchar(10) | Foreign Key Warehouse Code |

| Table No. 4.6.9 | Table Name: Dealer Sales Details | |
|---|---|---|
| **Field Name** | **Type** | **Description** |
| Sno | Integer | Foreign Key Distributor Code |
| DCode | Varchar(10) | Foreign Key Dealer Code |
| SDt | Date/Time | Sold Date |
| PCode | Integer | Product Code |
| Prate | Integer | Rate of the product |
| Qty | Integer | Quantity of the product |
| Amount | Integer | Amount of the product |
| DistCode | Varchar(10) | Foreign Key Distributor Code |

| Table No. 4.6.10 | Table Name: Certificate issue | |
|---|---|---|
| **Field Name** | **Type** | **Description** |
| Dcode | Varchar(10) | Foreign Key Dealer Code |
| IssDt | Date/Time | Issue Date |
| SalesNo | Integer | Sales Number |
| Pcode | Varchar(10) | Primary Key Product Code |
| Ckey | Varchar(10) | Certificate Key |

## 4.7  DATA FLOW DIAGRAMS

Data flow diagrams are graphical representation depicting information regarding the flow of control and the transformation of data from input to output. The DFD may be used to represent the system or software at any level of abstraction. In fact, DFD can be partitioned into levels

### 4.7.1 Level 0



### 4.7.2 Level 1    OVERALL PROJECT BLUEPRINT

## 4.7.3 LEVEL 2 – PRODUCT INFORMATION

Product data provider

Requests

Details

Availability and position

Product purchase information

Feature and discounts queries

**PRODCUT INFORMATION PROCESSING**

Prod spec

Product information

Prod qty

Stock

## 4.7.4 LEVEL 2 – WAREHOUSING MAINTENANCE

Warehousing distribution

Order requests

Dispatch

Prod Availability request

Distributor requirement analysis

Status and location

**WAREHOUSING MAINTENANCE**

Prod availability

Warehouse master

Position

Stock

## 4.7.5 LEVEL 2 – DISTRIBUTOR & DEALER



## 4.7.6 LEVEL 2 – DISPATCH SCHEDULING

## 4.7.7 LEVEL 2 – ISSUING AUTHORITY

# CHAPTER 5

# IMPLEMENTATION

Implementation of Product Certification Authentication in Supply Chain Management involves many faces, In this project many users are available they are supplier, distributor, dealer and end users so separate login have created for every users, if dealer enter with his own id and password corresponding dealers information only displayed for security purpose.

Administrator can view all the information in this project if any problem occurs administrator will clear those problems. We have master tables for all the users and every single user has individual identification code and that code will be developed atomically, personal information of every single user are stored in master tables.

Then transaction phase is started in this we have Dealer sales transaction, Distributor Sales Transaction, Stock Maintenance and Product Return transaction, in dealer transaction it gives the information about the product soled and to whom it soled, in distributor sales details it gives the information about distributor and dealer who purchase the product and quantity, rate of product soled, next product return form in that sales number, date of return, product id and unit of product returned are specified clearly.

Next phase is Certificate generation phase this phase is very important because using this phase only we are going to identify the duplicate product from original product. Certificate generation is done in all places like manufacturing, distributor, dealer and etc. Using this key we can also track the product transaction.

Finally report generation phase in this crystal report is used and to view the crystal report the report viewer is used, it will generate individual report for all transaction, using the report also we can track the flow of transaction. For example Warehouse -> Distributor -> Dealer this flow can be obtained.

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.

## 5.1 SYSTEM VERIFICATION

Product certificate authentication in supply chain management has undergone the verification in placing the right controls, binding controls with appropriate database fields. Verifications are done in following tools.

Combo boxes are used in transaction forms to list the codes of appropriate users (Dealer, Distributor etc...). They are verified whether the information they are listing are bounded to the right table form the database. The forms using this control are as follows:

- ✓ Distributor Sales details
- ✓ Dealer Sales details
- ✓ Products return details etc...

## 5.2 SYSTEM VALIDATION

In this project, validation is done in the different views. First, we are validating whether all the inputs given are correct and meaningful. For example, when we are entering the name of the person, it should contain only characters. If any numeric entered, the control shouldn't accept and should show error.

Second, we are validating the controls whether they are binding with the database in a meaningful manner. For example, if a dealer enters his/her details in dealer master, the data should be stored correctly in the "dealer master" table in the database when "save button" is clicked. Likewise, the edit and delete buttons also validated for their perfect operation.

Third, generating codes are validated. The codes generated should be correct and unique for each and every form (supplier, product, dealer, distributor etc...). For example, if product code is generated, it should contain the corresponding supplier number along with product number and the entire code should contain the supplier and product number.

Finally, the certificate key generation is validated. The key generated for every product is validated for their uniqueness and correctness.

## 5.3 TESTING

The classical strategy for testing computer software begins with "testing in the small" and works outward toward "testing in the large". So, we begin with unit testing, then progress towards integration testing, and culminate with validation and system testing.

### 5.3.1 Unit Testing

Unit testing focuses verification effort on the smallest unit of software design-software component or module. In our project, totally we have 13 forms. Each and every form is nothing but a class in Vb. Net. Since, class is a smallest unit we are testing all classes like base class, child class, friend class etc...

All forms like supplier master, product master, dealer master, distributor master, warehouse master, stock master, dealer sales details, distributor sales details, product sales return are tested individually for their source code correctness and perfection.

### 5.3.2 Integration Testing

Integration testing tests the process of integrating the various modules to form the completed system. When we are intending to integrate all the modules together to get a complete project, we will face some integration errors i.e. problem in intercommunicating with other modules.

To find and recover those integration errors and to get an error free project, the project is undergoing the integration testing. First, we integrated Product details with warehouse code. Then, they are integrated with dealer and distributor towards Dispatch scheduling. Finally to get the overall perfection, we are integrating all the

sub integrated modules with the Issuing authority module which forms the project as a complete system.

### 5.3.3 System Testing

System Testing is actually a series of different tests whose primary purpose is to fully exercise the computer based system. Although each test has a different purpose, all work to verify that system has been properly integrated and perform allocated functions.

The supply chain software is tested in variety of ways to know whether there is a chance of failure of software and what the way to recover it is. Also, it is tested for its security and protection mechanisms built into the system are proper and powerful to protect the system from improper penetration.

Finally, the software is tested for its run-time performance within the context of an integrated system.

# CHAPTER 6

## CONCLUSION AND FUTURE ENHANCEMENT

### 6.1    CONCLUSION

We have developed a Supply chain management project, which runs with mentioned features (Certification method), which inherently helps the public to buy the original goods from the authorized person (Supplier, Dealer, Distributor etc...).

The project is very simple, interactive and clearly understandable. The code written in this project is very clearer. The system is tested with various sample data within an LAN environment and it can be implemented worldwide if properly enhanced.

This project has been developed so flexible that the change can be made easily. Some of the error handler modules are also used. Thus all this features makes the project successful.

### 6.2  FUTURE ENHANCEMENT

At present, this project concentrates on reducing the transaction speed and increasing the easy way of tracking the supply chain. Security feature implemented is applicable when the project is used in LAN environment.

But, this project can be further enhanced by implementing it in Internet, maintaining a centralized database server world wide. We can also enhance by developing separate security supporting software to help in world wide secure transaction and tracking.

## APPENDICES – Screen Shots

## Login Form

**Main Menu**



*Prodouct Cerficate Authentication In Supply Chain Management*

*Administrator*

*Supplier*

*Warehouse*

*Distributor*

*Dealer*

# Master Forms

**Product Master**

**Warehouse Master**

# Transaction Form

**Dealer Sales Details Form**

**Distributor Sales Details Form**

**Product Return Details Form**

# Certificate Issue Form

## Certificate Issue

| | |
|---|---|
| DealerId | Dlr1001 |
| Issue Date | 25/2/2007 |
| SalesNo | 1 |
| ProductId | S3P11002 |
| Certificate Key | 1100110011 |

Add    Save    Edit    Delete

Find    Exit

**Certificate Verification Form**

# Report Form

**Distributor Report Form**

MainReport

### Distributor Report
05/27/2007

| DistCode | PDt | PCode | PRate | Qty | Amount | WhCode |
|----------|-----------|--------|-----------|-----|-----------|--------|
| D1001 | 03/04/2007 | S1P1001 | 10,000.00 | 5 | 50,000.00 | S1W1001 |
| D1002 | 03/04/2007 | S4P1001 | 10,000.00 | 3 | 30,000.00 | S1W1002 |
| D1003 | 05/08/2006 | S4P1002 | 1,200.00 | 20 | 24,000.00 | S1W1003 |
| D1004 | 02/08/2006 | S2P1002 | 3,000.00 | 10 | 30,000.00 | S2W1004 |
| D1005 | 07/05/2006 | S1P1003 | 4,000.00 | 5 | 20,000.00 | S2W1005 |

start    WindowsApplication1    Reports      5:39 PM

# Dealer Report Form

MainReport

## Dealer Reports
05/27/2007

| SNo | DCode | PDt | PCode | PRate | Qty | Amount | DistCode |
|-----|--------|-----------|---------|----------|-----|-----------|----------|
| 1 | Dlr1001 | 03/29/2004 | S1P1001 | 11000.00 | 4 | 44000.00 | D1001 |
| 2 | Dlr1002 | 02/13/2006 | S2P1001 | 2000.00 | 100 | 200000.00 | D1002 |
| 3 | Dlr1003 | 03/09/2006 | S1P1003 | 3000.00 | 5 | 15000.00 | D1004 |
| 4 | Dlr1004 | 06/09/2006 | S2P1001 | 2000.00 | 10 | 20000.00 | D1005 |
| 5 | Dlr1005 | 05/09/2006 | S1P1004 | 6000.00 | 5 | 30000.00 | D1006 |

start    WindowsApplication1 ...    SCM MAIn - Microsoft...    Reports    6:16 PM

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# Certificate Issue Report

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