visibility
intelligence
value

Item Level Warehouse Management

Trent Limited

Software Requirement Specification (SRS)

The document details the summary of solution architecture and approach for the development of Segment Management System for Tata Projects Limited. The document is based on the inputs, system study, discussions and meeting held between BCI & Tata Projects Ltd. Teams.

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Submission Date: 12- 09-2022

Version: 1.0

Revision History

REVISION NO.	DATE	PREPARED BY	REVIEWED BY	COMMENT
1.0	08-08-2022	Omkar Gaonkar	Ashutosh Kroria	SRS Document for Segment Management System

Abbreviations:

Name	**Abbreviation**
Bar Code India	BCI
Warehouse Management Server	WMS
Advance Shipping Note	ASN
License Plate Label	LPL

Table of Contents

1 SPECIFICATION ORGANIZATION

The objective of this document to provide the application to create a Segment Management System Application which will facilitate the automation of manual processes using AIDC Technology required in handling and managing Segments in its yard to fixtures and movement to implementation sites.

Section 1: Introduction

This section provides hardware requirements and documentation conventions.

Section 2: User Interface

This section depicts screen design and logic flow, and is categorized into two groups:

- Application Master Module
- Common Routine

Section 3: System Architecture

This section provides information of system architecture.

2 INTRODUCTION

2.1 INTENDED AUDIENCE AND READING SUGGESTIONS

The scope of the software would require the development of the front end application, client device application and communication server to transfer data from application to server. The document lays down the specifications of the middleware application, its architecture and infrastructure requirements.

The entire solution consists of followings:

1. Web Application

2. Communication Server Application

3. Mobile Device Application

2.2 PROJECT SCOPE

The scope of the application is to develop and implement the UHF passive RFID based solution with interface to WMS. The aim of the solution is to automate the process of handling and managing flow of apparel and other products within the Trent supply chain using passive RFID Technology.

The entire solution consists of followings:

- Web Application
- Mobile Device Application
- Communication Server Application

3 SOFTWARE/HARDWARE REQUIREMENTS

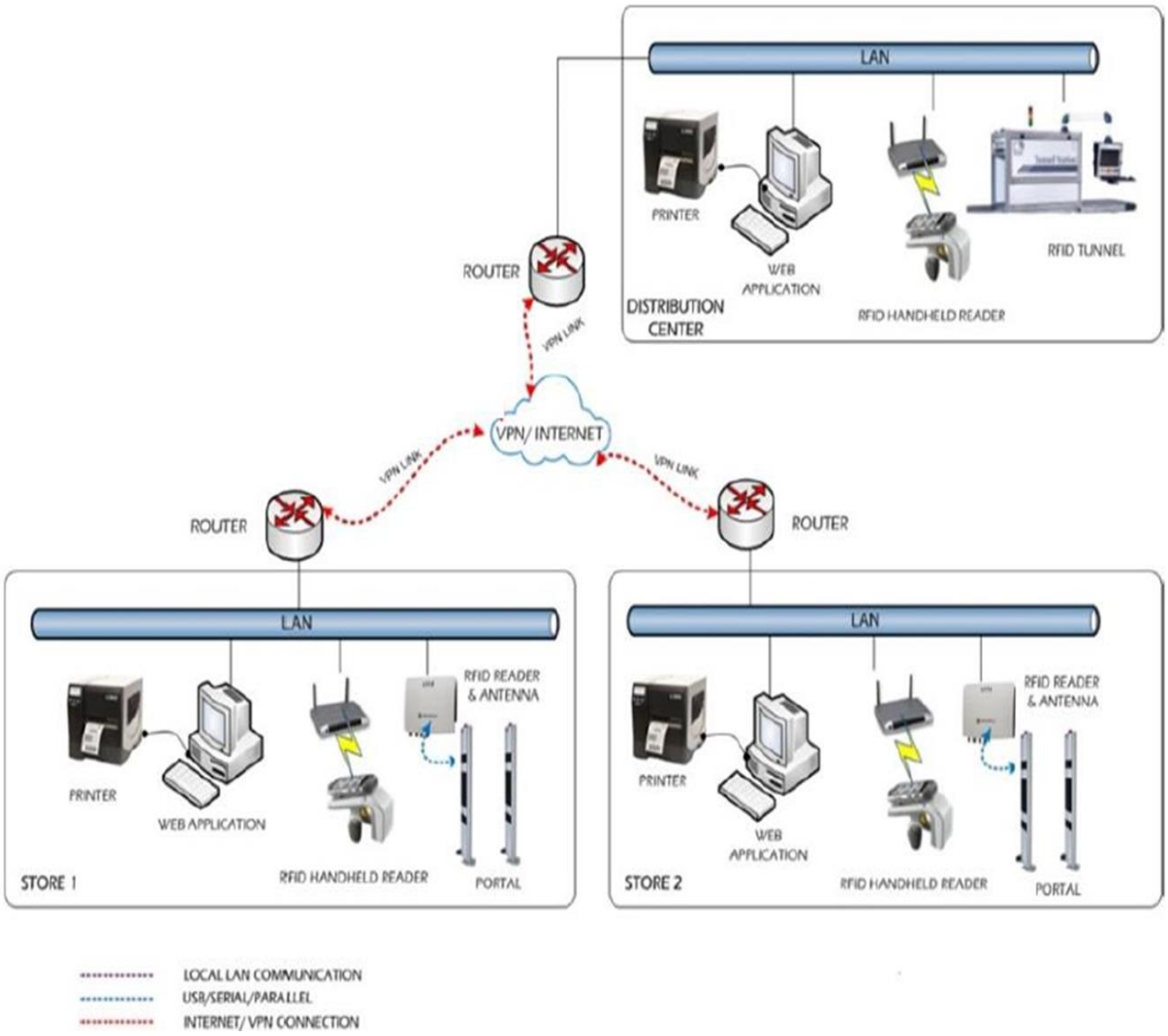
Below are the hardware and the software requirements of the application:

3.1 COMPUTERS

Desktop would require following specifications:-

- I5/i7 Processor with Windows 10 operating System
- 8 GB RAM
- 100GB HDD
- Dot net Framework 4.5

4 SOLUTION ARCHITECTURE



5 User Interface Specification Conventions

This section specifies the user interface portion of the application.

Section Organization

The User Interface Specification presents screen displays or "**Dialogs**".

Documentation Conventions

This section incorporates illustrations of the application user interface. Each screen display "Dialog" consists of the screen display image, a process name, a paragraph documenting the processing required for the dialog, a paragraph listing the navigation options, and a table listing for each variable field on the dialog, its database source or destination, format, and any instructions required to process the field.

The following section contains a sample dialog with each area identified.

6 System Log

System shall maintain internal logs for application.

6.1 Error Logs

These logs will contain any errors encountered during runtime for faster resolution of any problem post deployment.

6.2 Audit Logs

These logs will monitor the activities of user who accessed the application, made changes to File/ Document and the time stamp of these activities.

7 ARCHITECTURAL DESIGN

Overall System consists of:

- Web Application
- Device Application
- Communication Server

7.1 WEB APPLICATION

A Web Application will be developed for performing transactions like Master Creations such as RFID Reader Master, Article Master, Warehouse Master and Store Master Activities.

7.2 DEVICE APPLICATION

This application will include transactions including will directly communicate with user input and process the request to communication server.

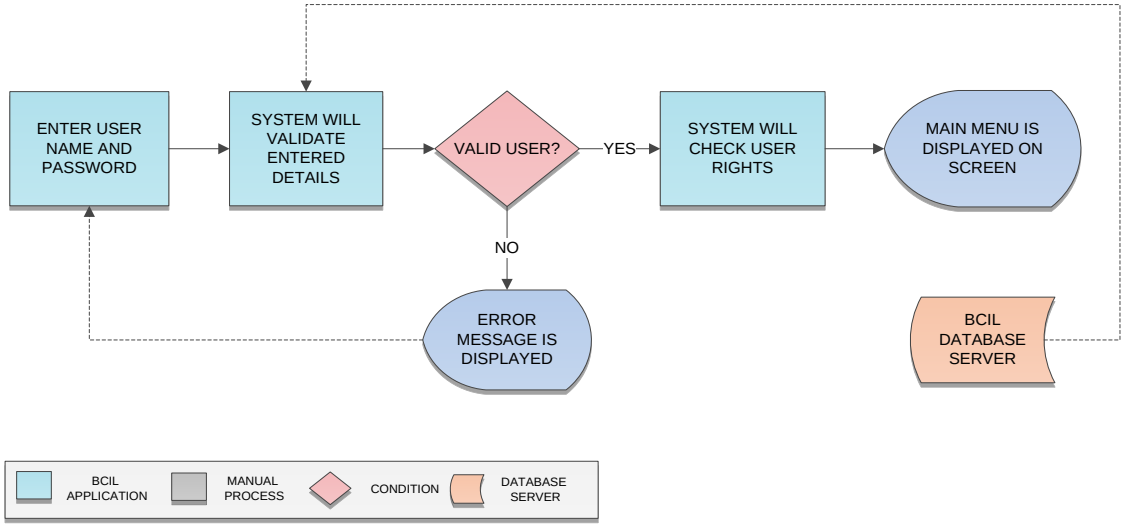
7.3 COMMUNICATION SERVER

This application will handle the device request in real time. Most of business logic on scanning will run on this module.

8 APPLICATION MODULES

8.1 APPLICATION LOGIN- WEB & DEVICE APPLICATION

This login module will provide access to the application modules. Here the admin/user needs to enter the login detail to enter in the application and to perform the desired actions.



Process: User needs to enter the User Name/ID and Password in display fields and press the Login button. Application will validate the user credential.

User will be able to view only those screens/ modules of which he has been given access rights to.

Validation

- User Name/ ID will be unique for all users.
- User Name/ ID and Password length will be set.

After successful login application menu screen will appear; this screen will have the Master and Transaction options etc.

8.2 User Management

The module will let application administrator to manage the Users, and the rights assigned to the same; the rights will define authorized application access of users.

The User Management & Master data will be created using **Web Application.**

8.2.1 User Master

This module will let user to create application users who will access the application. The master will store the users' details in system.

Data Fields	1. User ID 2. User Name 3. Description 4. Password 5. Email 6. Address 7. Contact 8. Active/ Inactive
Process Steps	1. Enter required details i.e. User ID, User Name, Description, Password in system 2. Email, Address, Contact are optional data fields 3. Check the Active checkbox to make the user active 4. Click on Save button to save details in database 5. Newly added user will appear in data grid
Functions	1. Add, Edit/Update, Delete as per requirement. 2. User ID and Password is used to access the application.
Role	Admin will create/ add user details via window application

8.2.2 User Rights/ Permission

This module will let admin to assign module / screen access rights to the application users. Once assigned, authorized users can access the application. Once permissions are assigned, user will be able to view only those screens/ modules of which he has been given access rights to by Admin.

Data Fields	1. User ID/ Name 2. Module /Screen Names
Process Steps	1. Admin will select User Name/ID. 2. Screen/ module names will appear in data grid along with checkbox. 3. Admin will check the checkbox against module/ screen to which selected User should be assigned access permissions. 4. Save and Update the details in database
Functions	Add, Edit/Update as per requirement
Role	Admin / Authorized User will assign access rights to the selected User

8.3 MASTERS

8.3.1 RFID READER MASTER

The module will be used to read the RFID tags that are slicked on merchandise.

Data Fields	1. Location 2. IP Address 3. Antenna Power
Process Steps	1. Enter the Location. 2. Enter the IP address of the RFID tag. 3. The antenna power frequency will be displayed on screen. 4. Save the details in database.
Functions	View details of the RFID tag details.

8.3.2 ARTICLE MASTER

The module will be used to view the article details downloaded from WMS server.

Data Fields	1. Article Code 2. EAN Number 3. Description
Process Steps	1. Enter the article code number. 2. Enter the EAN number in the box. 3. Enter the description of the article. 4. Save the details in the database.
Functions	View details of the article number for items.

8.3.3 WAREHOUSE MASTER

This module will be used to save Location details in database and provide identification to them by unique RFID tag.

Data Fields	1. Goods Received Note (GRN) 2. Cycle Count 3. Item Search 4. Enter Location Type i.e., OK/ Reject/ Damage and Return
Process Steps	1. Enter Goods received details from the database. 2. Enter the Cycle count of the item. 3. Select the Item search details. 4. Select Location Type i.e. Accepted or Rejected. 5. Save the details in database.
Functions	Add, edit/update and Delete Storage Location details as per requirement.

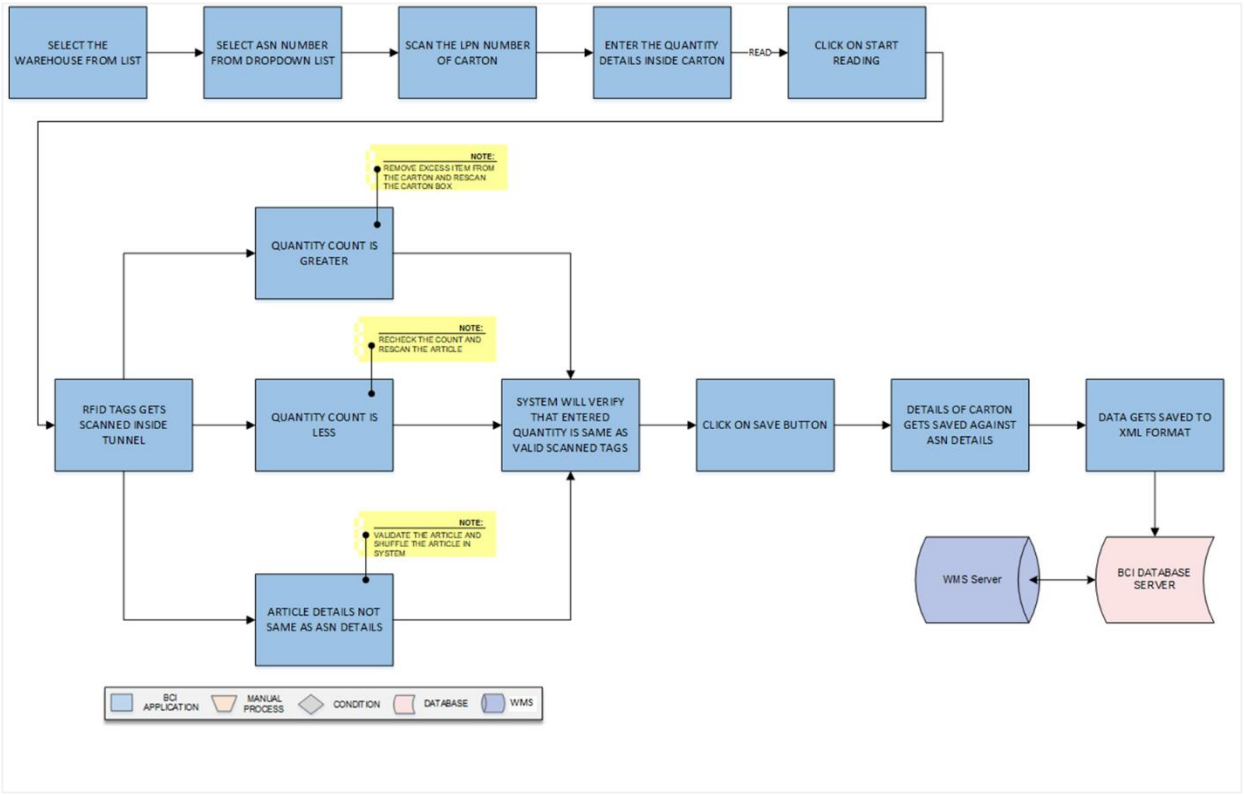
8.3.4 STORE MASTER

The module will be used to will be used to save the Store details in database.

Data Fields	1. Store ID 2. Store Description 3. Is Active i.e. Zone is Active or Not 4. POS details
Process Steps	1. User will enter Store ID and store Description. 2. Select the Store is Active or In-active. 3. Enter the POS details. 4. Save the details in database.
Functions	Add, Edit/Update, Delete as per requirement.

8.4 WAREHOUSE

8.4.1 RECEIVING MATERIAL



Activities

Module Description	This module will be used to receive the item is through a tunnel that consist of RFID reader and antenna to check the Tags connected to the merchandiser. The carton consist of item has tag with quantity details on it and passed through the tunnel. ***This activity will be done using Web Application.***

Pre-Conditions	1. Authorized access to the application. 2. For unique identification of carton the License Plate Number to be pasted on it. 3. Quantity details and ASN number to be downloaded from WMS system. 4. RFID reader and antenna are working properly.

Process Steps	1. Select the ASN Number from the list. **ASN number consist of LPN Number, Article, and Quantity.* 2. Scan the LPN number of the Carton. 3. Enter the Quantity details of item in the carton.

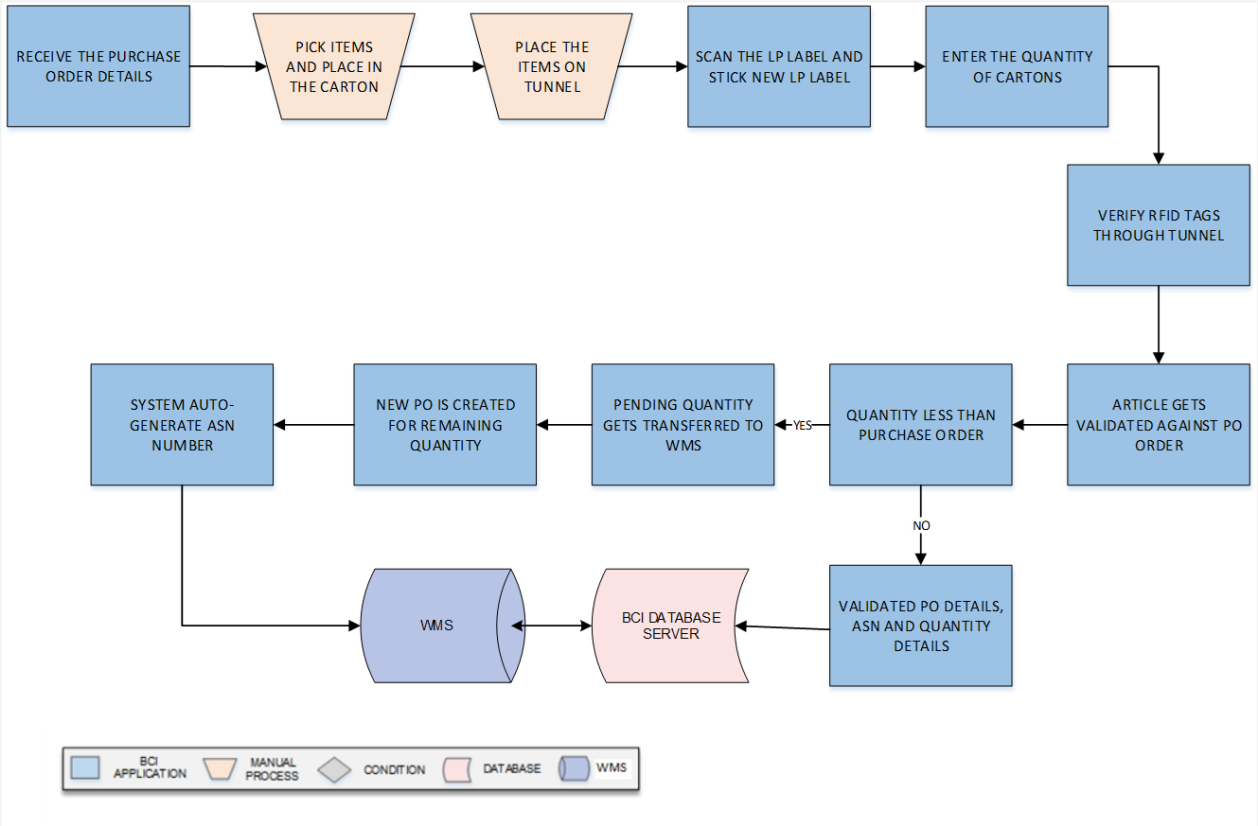
	4. Click on 'Start Reading' to start the reading of material inside tunnel. 5. RFID tags gets scanned inside the carton through tunnel. **RFID reader antenna is connected to the tunnel to read the tags.* 6. The reading count quantity gets displayed on the screen. **Read count quantity gets validated with entered quantity.* 7. If quantity count is greater than entered quantity. ** Remove excess item from the carton and rescan the carton box.* 8. If quantity count is less than entered quantity. **Recheck the count and rescan the article.* 9. If article is not as per the ASN details downloaded from WMS. **Validate the article and shuffle the details of the article in system.* 10. Click on the Save button, once quantity is validated with ASN quantity. 11. Details of the Carton gets saved against the ASN details. 12. Data gets saved to XML format and transferred to WMS system. 13. Information is saved in a database and kept in a WMS.

Post-Conditions	1. Received item details will get saved in the database. 2. Extra item found in the Carton to be informed to vendor. 3. XML format to be checked and validated on WMS Server

Validations	1. An alert should be displayed in case invalid ASN Number is selected. 2. An alert should be displayed in case RFID tag not scanned properly. 3. An alert should be displayed in case invalid quantity not matched with ASN details. 4. An alert message is displayed in case of any error / invalid activity.

Remarks	Add any remark (If needed).

8.4.2 DISPATCH TO STORE



Activities

Module Description	This module shows the process to pack and dispatch the article from the Warehouse to the Stores mentioned against the Purchase Order.

Pre-Conditions	1. Material should have MOLD ID tags. 2. Mold to be iron cased with tag attached to it.

Process Steps	1. The user will receive the purchase order. 2. The user will select and pack the requested items into cartons. 3. Place the Cartons on the tunnel. 4. Scan the LP label before applying a fresh one. 5. Enter the quantity of the cartons. 6. Verify the details of Cartons through tunnel. 7. Through a tunnel, the article is checked against the Purchase Order. 8. The WMS Database Server stores details.

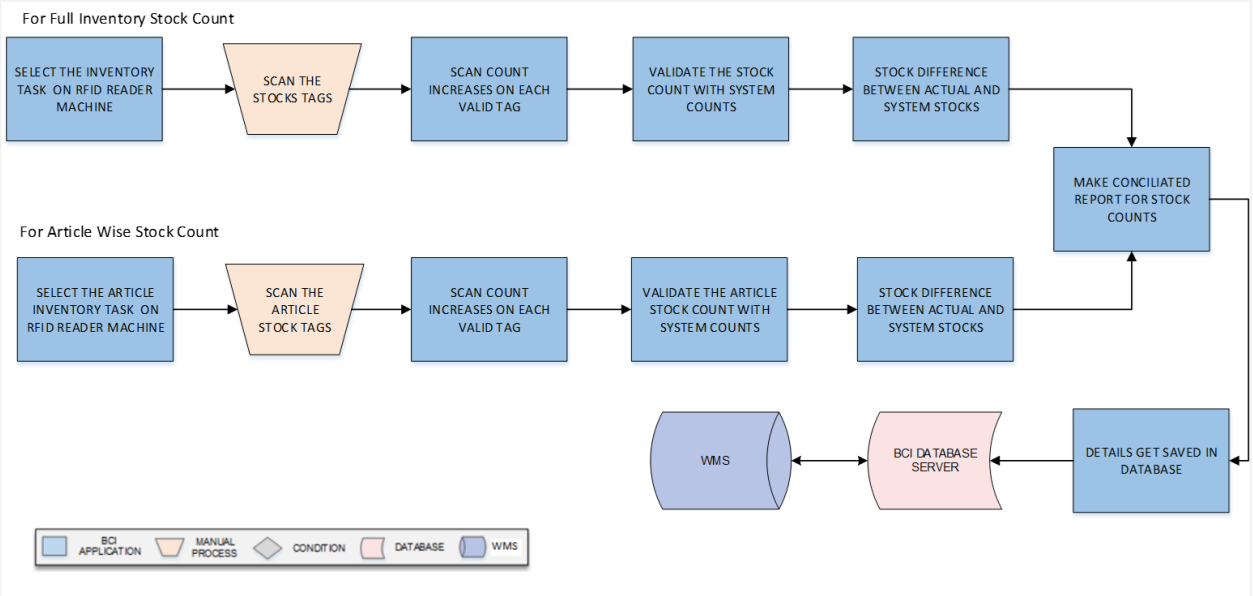
	9. If the quantity obtained falls short of the purchase order. 10. Information about the pending quantity is sent to WMS. 11. The remaining quantity is used to generate the new PO. 12. The system auto generate the ASN number for it. 13. Information is saved in a database and kept in a WMS.

Post-Conditions	1. Dispatch item details will get saved in the database. 2. Purchase Order details to be verified from Server.

Validations	1. An alert should be displayed, if quantity is more than Purchase Order. 2. An alert should be displayed in case of Pending quantity. 3. Details of Pending quantity will be sent to WMS server for new ASN creation. 4. An alert message is displayed in case of any error / invalid activity.

Remarks	Add any remark (If needed).

8.4.3 INVENTORY



Activities

Module Description	This module will be used to count the Inventory stored in the warehouse. The inventory can be segregated and counted based on whole count or on article wise count.

Pre-Conditions	1. Inventory material stock count to be downloaded on system. 2. RFID hand machine to be properly scanning the tags of stocks.

Process Steps	1. Select the Inventory task. 2. Select the task ID on RFID reader machine. 3. Physically scan the warehouse's stock with an RFID device. 4. Each stock count results in an increase in the scan count. 5. Check the stock details in the system against the stock count. 6. If there is a difference between the system count and the real count. 7. Conciliated report would be made for it. 8. The warehouse's whole stock can be checked, and the inventory can be verified. 9. Users can also check stocks by article if they choose. 10. Information is saved in a database and kept in a WMS.

Post-Conditions	1. Inventory stocks to be verified by the person physically. 2. Auto-data updating on server in real time.

Validations	1. An alert should be displayed in incase article tags are not scanned. 2. An alert message is displayed in case of any error / invalid activity.

Remarks	Add any remark (If needed).

9 SRS Scope Change Process

9.1 Before Sign Off

Any changes in SRS need to be informed in writing by Tata Projects Ltd. It will be incorporated / confirmed only after doing detailed feasibility study by BCI.

- If any change is out of scope then this would be done as a CR post feasibility and priority will be decided based on mutual agreement.
- Once the change is developed , any further change in the same would be considered as a CR

9.2 After Sign Off

Any changes in proposed solution after approval of this document by Tata Projects Ltd. are subjected to confirmation from BCI, taking feasibility constraints into account. These changes will be incorporated (if any) into the solution only after delivering proposed solution & may be charged as extra.

- Any change in the proposed solution due to customer system design or process will be considered as CR
- Any process which is not mentioned in this document will not be considered as “mutual understanding or default presence or standard practice”.

The changes in proposed solution before & after acceptance will be mutually agreed and duly signed and accepted by Tata Projects Ltd. & BCI.

9.3 SRS Acceptance

Agreed and Accepted by Tata Projects Ltd. and Bar Code India

For Tata Projects Limited	**For Bar Code India (BCI)**
Name:	**Name:**
Designation:	**Designation:**
Department:	**Department:**