

1.1 Processes

This section provide the details of WMS requirement from Operation perspective.

1.1.1 Download of Inbound Interface

Overview

ASN or TO can be used for Prior into WMS of Shipment coming to Warehouse. This will enable Warehouse to plan their resources.

Objective

To provide Warehouse with the ability to get visibility on shipment coming to warehouse.

PO (Purchase Order)

Warehouse can use PO directly to receive inventory. System will support EDI Standard of PO download. System will also provide a UI interface to create or copy or upload existing PO. System will also provide directly usage form PO from eFreightsuite.

ASN (Advanced Shipment Notification) or Return Order (RO)

Warehouse can use PO directly to receive inventory. System will support EDI Standard of ASN (Shipment) download. System will also provide a UI interface to create or copy existing ASN and SO. Systems can also provide feature to convert all or part of PO to ASN. ASN may exist linked to PO or without a PO.

System will also provide support for single/ Multiple ASN/ Invoice/ PO. System will also provide directly usage form ASN from eFreightsuite.

TO (Transfer Order)

To provide Warehouse with the ability to transfer inventory from one warehouse to another warehouse. System will hear convert Outbound inventory to Receiving shipment for warehouse. TO Order can be created from UI.

1.1.2 Pre Receiving - Appointment Scheduling

Overview

User can create and schedule the appointments for all shipments (ASN/PO or TO/RO) arriving at the warehouse and accordingly assign the resources.

Using appointment scheduling a user can better allocate the time and resources like Equipments, manpower, Locations, Bays etc required to move product in the yard and to load and unload shipments at the docks. This enables management to more effectively measure yard and dock task durations.

Objective

Using appointment scheduling Warehouse operations can better allocate the time and resources required to move product in the yard and to load and unload shipments at the docks.

Inbound

WMS will provide a calendar view to create Appointment for inbound Shipment for a warehouse.

WMS will also provide appointment for Dock Door for unloading.

WMS will track if shipment arrive at expected time , this would be user to track the KPI for vendor, supplier, transporter.

Appointment Scheduling

Vehicle is loaded:

- Guard to inspect the vehicle and transport documents. This is a manual process.
- Guard checks in the system if appointment exists or not.
- If appointment exists guard will assign the vehicle to receiving dock.
- If Appointment does not exist guard will assign the truck to yard/parking lot. This is a manual process.
- Guard will inform inbound supervisor to create the shipment (ASN) and appointment.
- Inbound Supervisor creates shipment and assigns a receiving dock
- Inbound Supervisor informs guard. This is a manual step.
- Guard assigns vehicle to the receiving dock.
- Post unloading vehicle will be checked out.

Warehouse Manager - Shipment (Appointment) Scheduling 2

- Appointment can be created for warehouse only
- Define dock doors and availability
- Create & manage appointments for inbound/outbound shipments
- Track status from guard check-in to check-out

The diagram illustrates the appointment scheduling process. It starts with 'trailer contents' (represented by a truck icon), which is scanned by a handheld device. An arrow labeled 'Manually entered time to unload' points from the scanner to a calendar titled 'Appointment Scheduling'. The calendar has a grid with a highlighted cell labeled 'carrier/truck dock'. A small number '29' is visible in the bottom right corner of the calendar.

1.1.3 Pre-Receiving Yard Management

Overview

Yard Management deals with the overseeing and administration of a company's yard and dock doors. It also ensures that all of a business' shipping and receiving requirements are fully planned for and met.

This functionality will be used for Inbound as well as Outbound and the warehouse personnel decides what vehicle need to be moved to dock, their location in the yard, their destination location, and which yard users are available to do the job.

Objective

To provide Warehouse with the ability get visibility into inventory sitting in vehicles and are better able to manage, schedule, and record the arrival, placement, location, and status of trailers, trucks, containers, and their content.

Inbound

WMS will provide capability to configure Yard linked to warehouse; Every Yard Location will be uniquely defined in system.

When vehicle or Truck or Trailer arrived and if there is no dock door empty, system will assign a Yard location and suggest to move vehicle or Truck or Trailer to that Yard Location. User can also manually assigned Yard location for vehicle or Truck or Trailer or open cargo.

When Dock door is free, system will ask Truck or Trailer to move to Dock door, this will tracked by WMS Task or it could be manual task.

WMS will assign Dock Door based on Put Away Type on Shipment (Freezer required Item or Ambient Item) and nearest storage location based on the customer location in the warehouse.

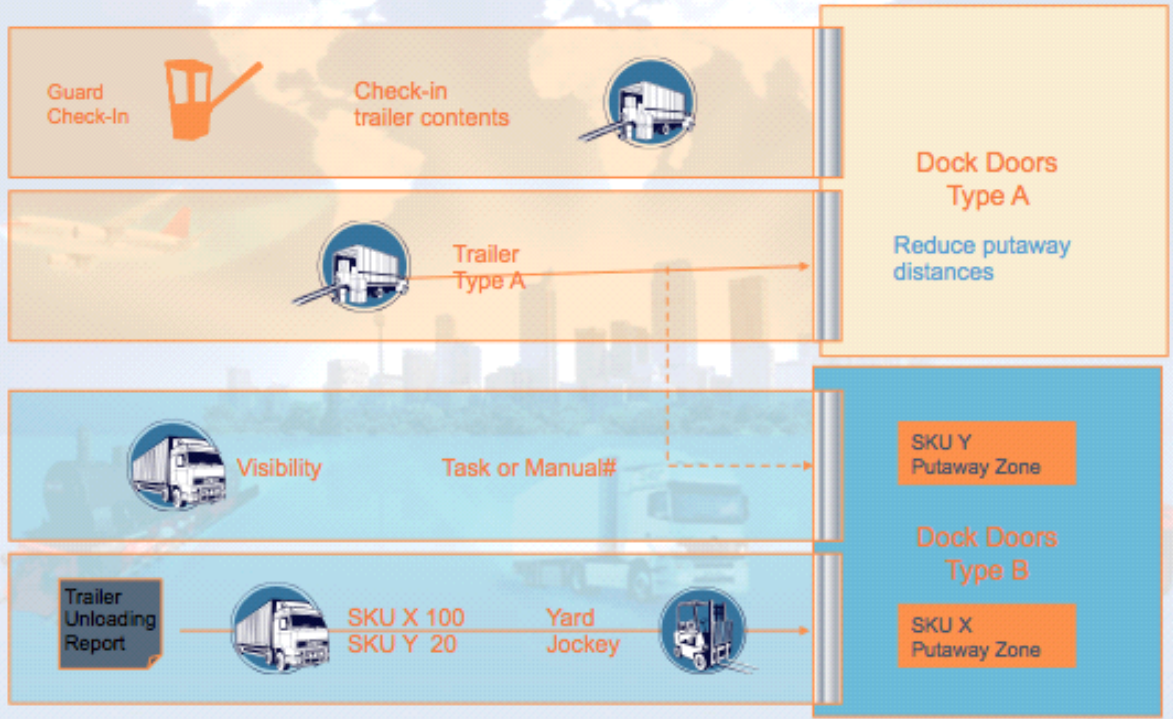
Yard Management

- Guard to inspect the vehicle and transport documents. This is a manual process.
- Vehicle arrived at gate, guard to check if appointment exists then refer appointment scheduling process flow.
- If appointment does not exist or vehicle has arrived before time of appointment.
- Guard assigns a yard or parking lot in the yard and checks in the vehicle.
- Guard will direct the vehicle to the parking/yard lot.
- Guard assigns vehicle to the dock once the dock appointment is scheduled for that vehicle.

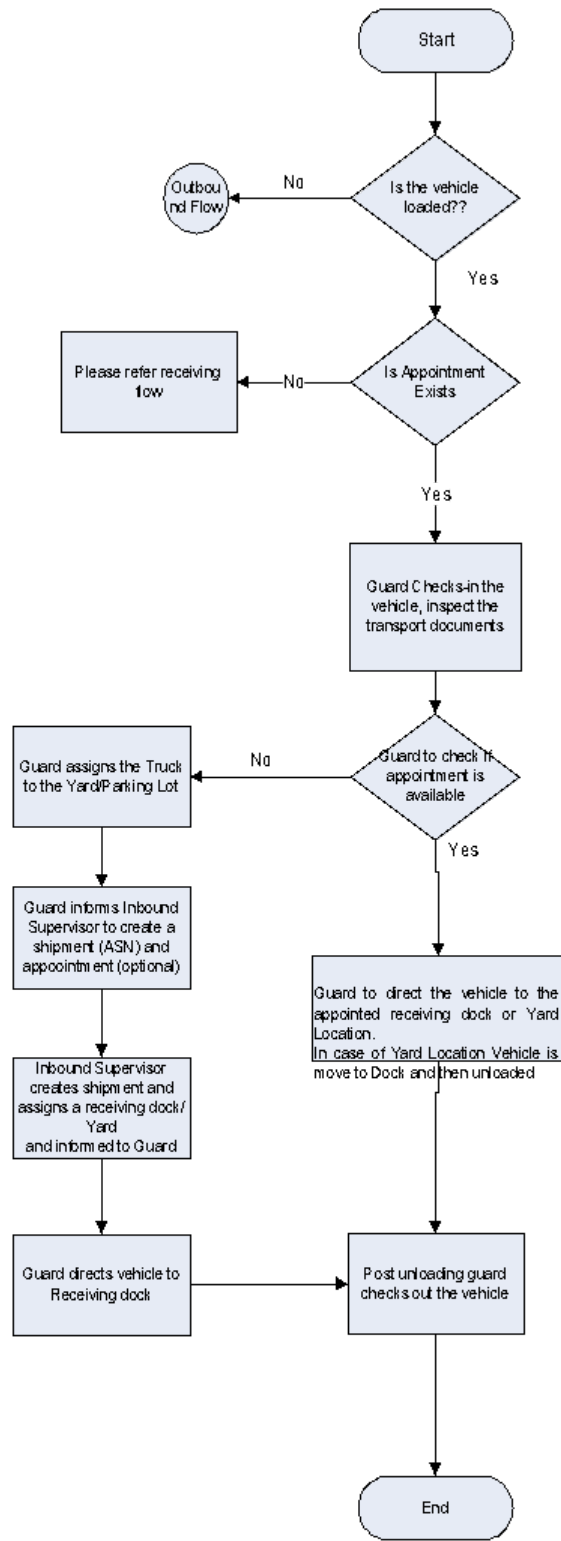
The User has the ability to see the list of available yards/ docks in the system and hence can decide on which one to select out of the available ones. The occupied yards/docks do not appear in the list at all thus making it easier for the User to make his choice.

Warehouse Management - Yard and Dock Door Management

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Yard Management Process



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1.1.4 Receiving

Overview

Receiving covers the process of managing and controlling the inbound materials from the time of receipt or return of inventory to storage in various zones. From a WMS perspective it includes Receiving (Physical), QC, VAS.

Upon Receipt of a Purchase Order, a Stock Transfer Order, or a Return Order inventory will be moved on a LPN and will follow a path through the Warehouse facility according to the Status set by each group. Upon updating of the Status:

- WMS will create a Move Task to the appropriate Zone.
- Task will be completed by Users at the Console (UI) or with a Mobile Device(PDA).
- Put Away Tasks will be created when Status is updated.

Objective

To provide Warehouse with the ability to track inventory from the moment it is received until it is picked and shipped. Users will be able to view inventory as it passes through the receipt process based on the LPN. Users/Supervisors will be able to search throughout the database by; SKU, Receipt, PO, Status, Location.

Receiving Preference

- WMS can receive returns.
- Advance Ship Notice (ASN) may or may not be sent by the vendor against a PO/TO (STO)/Rors. ASN can be either Case/Pallet or SKU Type.
- Header details (i.e. carrier, ship date, estimated arrival date) may be edited.
- All lines will be received to a LPN.
 - WMS will be printing labels that display a bar code and visual license plate number in case of blind receipts.
- Based on Attribute set at SKU or ASN, system will direct user to enter Inventory Tracking Details such as Batch No, Lot No, Serial No. , Expiry Date, Manufacturing Date, COO.
- System will also validate shelf life days, expiry date before receiving.
- At the time of receiving some vendors might want a certain percentage of their goods to be examined through the QC process. WMS makes it possible to define vendor specific QC preferences at the time of creating the User.
- It is also possible to define the percentage for over receipt for different items.

Receiving Process

The vehicle will be unloaded and a physical quality check will be done by the user as per the SOP.

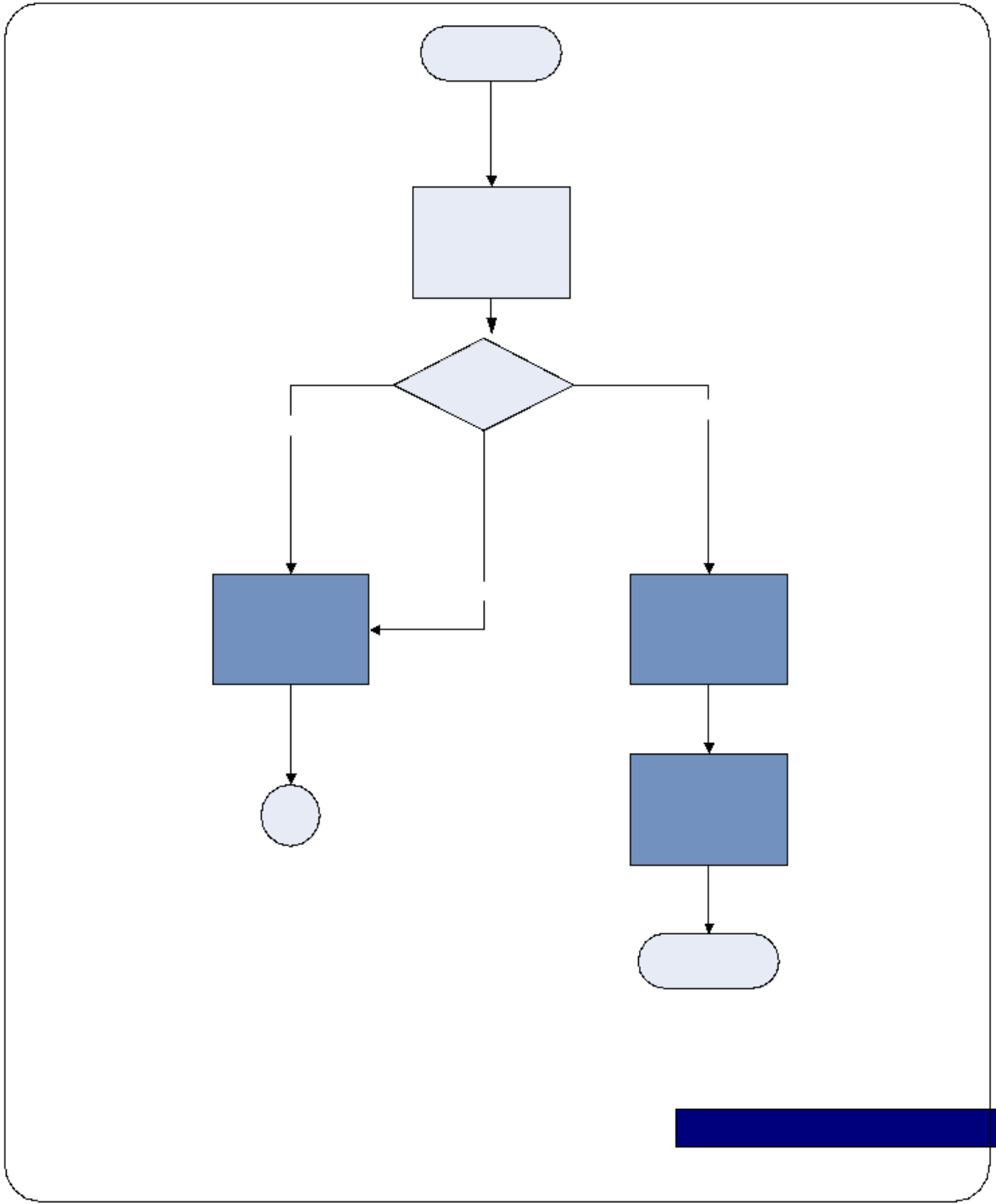
System will support receiving by UI or Mobile.

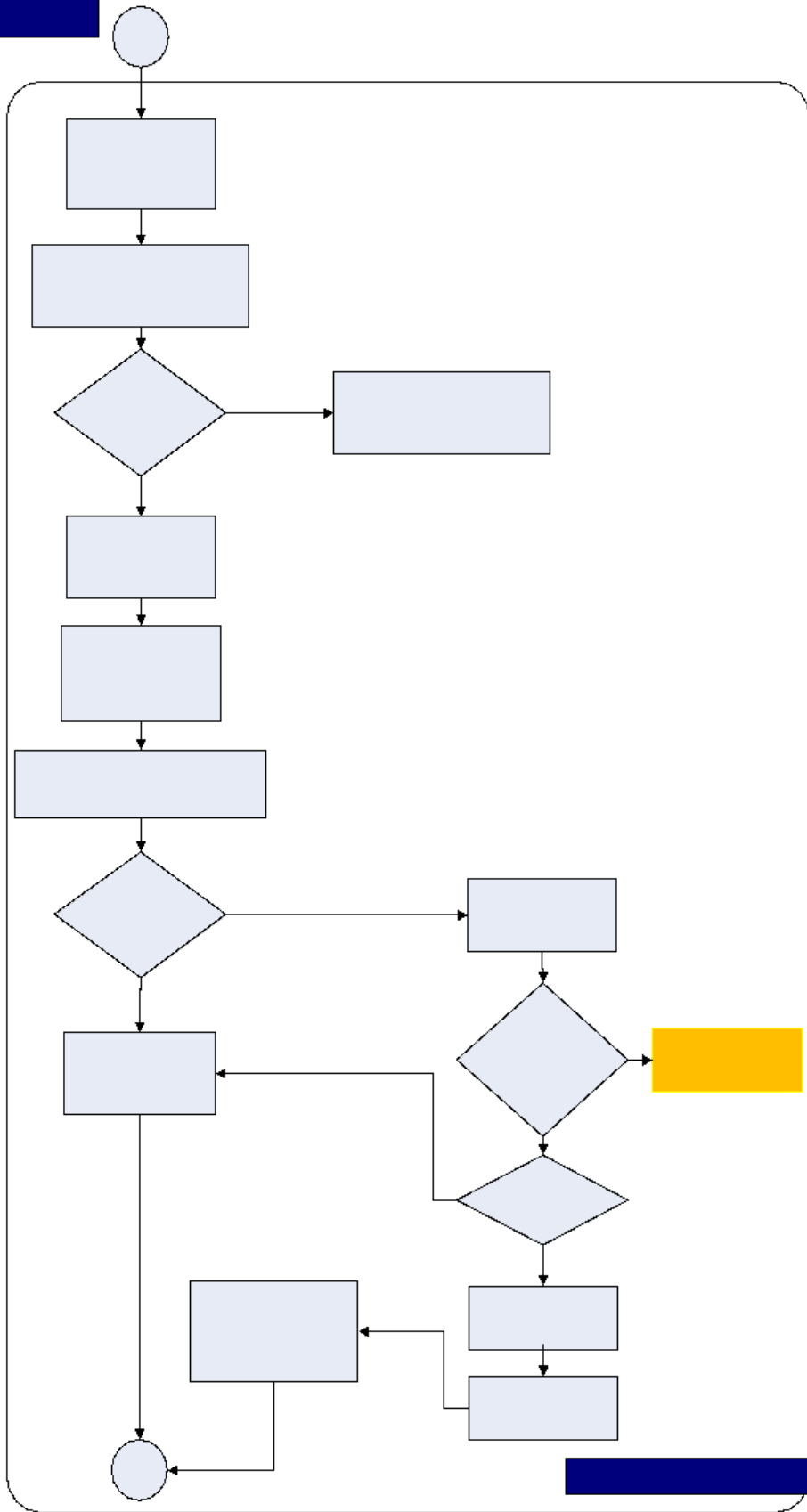
System will also provide 1 click receiving for complete shipment or receiving where user need to enter every step like ASN or PO No, LPN, SKU, Qty, UOM, Inventory Tracking Attributes.

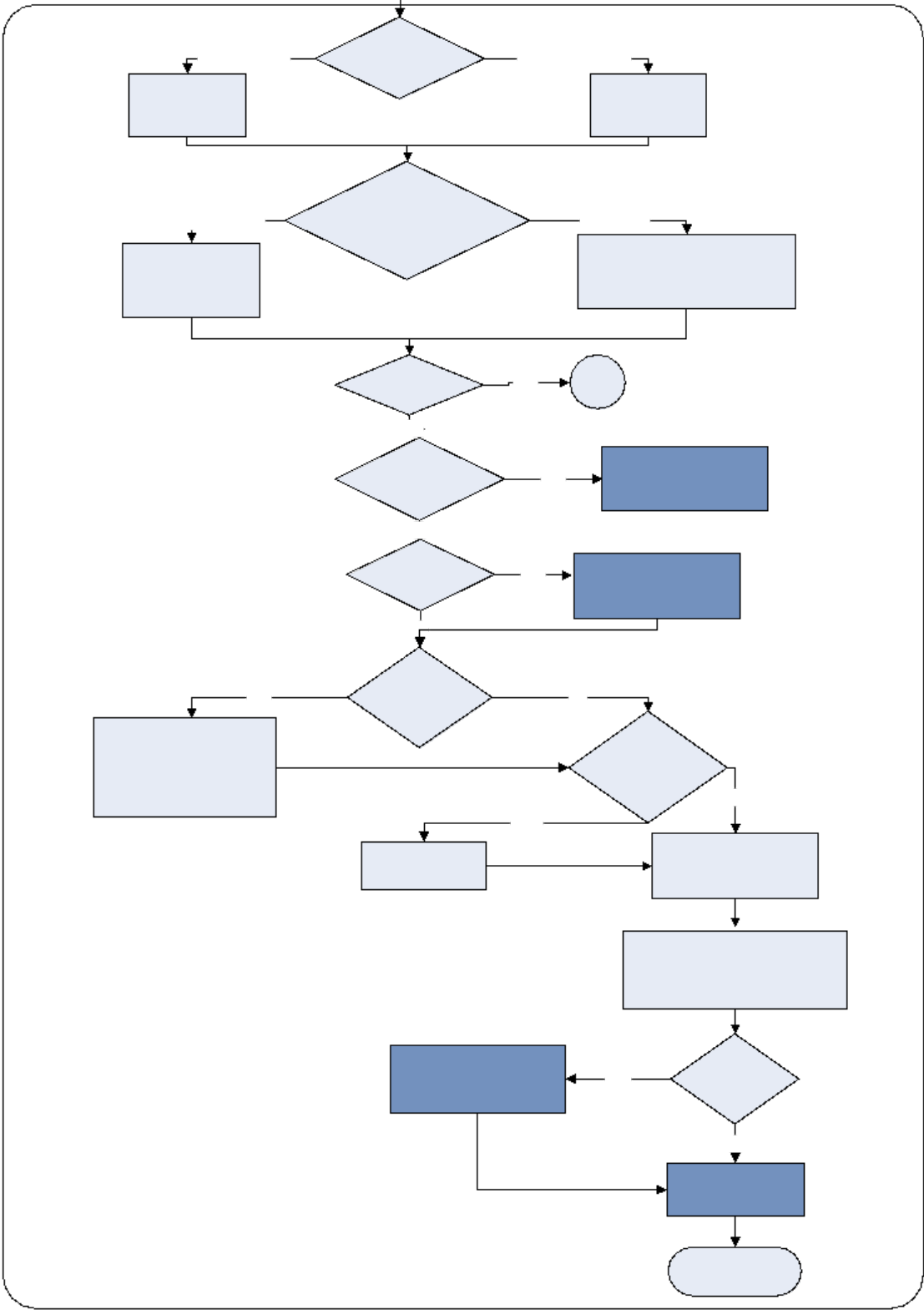
Dock/Staging:

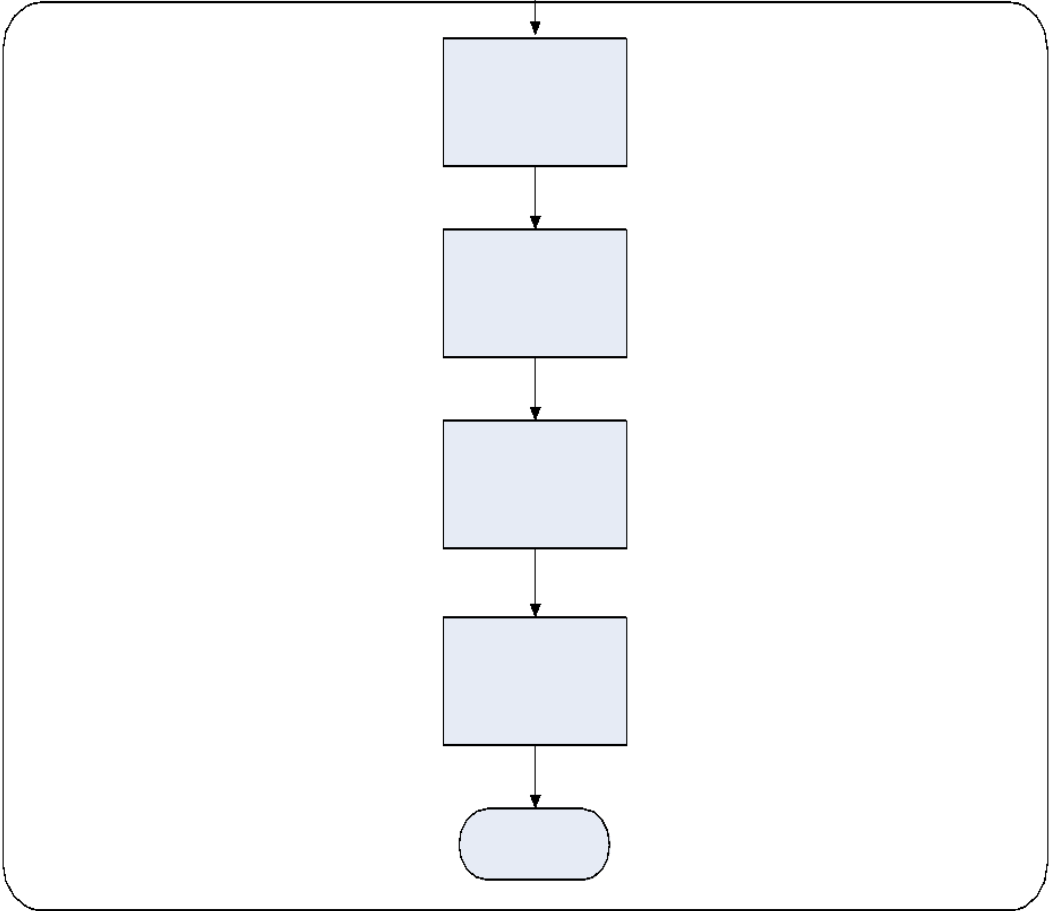
- The WMS will generate a report having list of all the Demands, where Activity Type = Cross Dock , ASN No., PO No., Quantity, Ship To . The report will have only those activities which were recorded in the system at the time of generating the report. The supervisor can also generate this report before receiving.
- This functionality will also exist if receiving is done by mobile/PDA.
- Every ASN line is received into one/many LPN's.
 - No two SKU's should be mixed into the same LPN. (This is configurable to allow or not allow)
- A received LPN can be sorted in the following situations(only applicable in Case Type Shipments):
 - Mixed SKU LPN.

- An activity demand exists in the system e.g. QC for partial LPN.
- If the ASN Type = "Blind Receipts" then the pre-printed labels will be pasted on the LPN's and the SKU's will be received on them.
- The WMS will ask user to enter Lot Attributes , based on SKU/Item Setup (example batch no, Lot No. , Serial NO, Manufacturing date, expiry date, COO) if Item Master is setup to capture lot attribute as mandatory or optional.
- The WMS will validate the applicable shelf life % or value if the setup is done on Item Master.
- The WMS will record Discrepancy during receiving
 - Over Receipt – The system will allow the user to do over receipt till the tolerance % pre-defined through the configurator.
 - Short Receipt – In case of short receipt, the user can mention one or more discrepancy codes for this reason.
- After products are received, WMS creates a Move Task for the LPN from Receiving Dock to QC/VAS/Outbound Staging Location (Cross-Docking)/Storage Locations
 - Task will be created when receipt is closed by the Receiving User (mobile device function or Workstation UI).
 - Move Tasks can be edited, held or cancelled by Users who have the proper authority.
- Move Tasks will be completed by Users via Mobile Device or Workstation UI.
- After the receipt is completed, system will generate the Good Received Note (GRN), however this will only increment the inventory in WMS, no feed will be sent to Customer's system i.e. Customer System inventory will not be incremented at this step. (This is again configurable if customer ask to provide the inventory feed, system will be able to do at this step)
- If the ASN Type = "Blind Receipts" and the Item on Shipment (ASN) is new i.e. Item Master record does not exist, then system will block the receiving of the Item. (This is again optional step to block receiving or allow, if allowed, a default location will be show for Put Away)
- Warehouse will do the cubic scan and send the cubic WMS to ERP/Item Master and ask them to bridge the new Item record.
- If Pallet come with mixed Item then sorting can be done as part of Receiving.
- Multiple user can work on Receiving on same ASN/PO.
- WMS will also support one step receive and Put Away in which case post receiving on same transaction Put Away will be called (move Task) from user perspective it would be single truncation.
- WMS will support Multiple receipt for one ASN/PO.









Warehouse Management - Inbound Shipments

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- Any expected receipt information can be used to create shipment
 - ASN from vendor via EDI
 - Purchase Order from vendor
 - Manufacturing Order from factory
- ASN May be key entered into Warehouse Management
- SKU-level or LPN Level
- Multi-levels (PO and Shipment level)
- Improves receiving efficiency
- Enables
 - Auto-reconciliation of expected vs. received
 - Appointment Scheduling
 - Cross docking



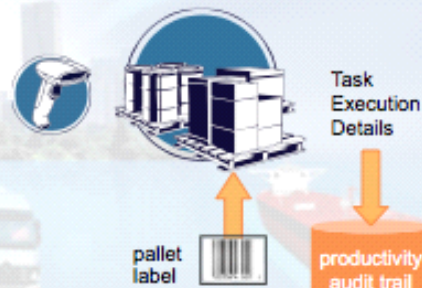
Warehouse Management -Receiving: Identification of Goods

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Receiving Capabilities

- Receive via RF against inbound shipment
- Receive via RF
- Apply bar coded license plate (LPN)
 - Pre-printed ('blind')
 - Print on demand – Post receipt
 - Vendor supplied LPN
 - Apply on case, pallet, or both
- Receive multiple units of measure
- Capture basic information
 - PO, shipment, trailer
 - SKU and quantity
- Real-time updates
 - Warehouse Management inventory
 - Reconcile against expected amounts
 - GRN

Capture activity information
(including timestamp &
user ID) for tracking



Warehouse Management -RF Receiving Example (TO BE)



Validate
expected
receipt
quantity

```
Plt nbr: 000009284
Item nbr : 740018
CHEESE CHEDDAR WHITE
BLOCK 0001/40 LB
/4104010 686710
Ti/Hi: 9 / 6
Nbr of cases : 54
Warn!Excds Sh&PO ASN
```



Warehouse Management -RF Receiving Example (TO BE)

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Enter
correct
expiration
date
format

Receive Cs's
 CHEESE CHEDDAR WHITE
 BLOCK 0001/40 LB
 /4104010 686710
 Nbr of cases : 54
 Manufac dt mm/dd/yy
 Date : 030101 -

Receive Cs's
 Shipment number
 00000000
 PO# 3012000
 Order ref: E00K32
 Pallet number
 0000000000

- Multiple date types and date formats
- Rotation date alerts
- Lot tracking
- Catch Weight Entry
- Returnable Container Tracking

WMS will also support Receive Sort capability, where in during receiving based on SKU ID Scan , WMS will allow sorting where in by receipt it would create multiple Pallet.

1.1.5 QA – Quality Analysis

Overview

QA process is optional on receiving flow, based on customer SOP a certain portion of Inbound shipment is QA to see it matches quality.

Objective

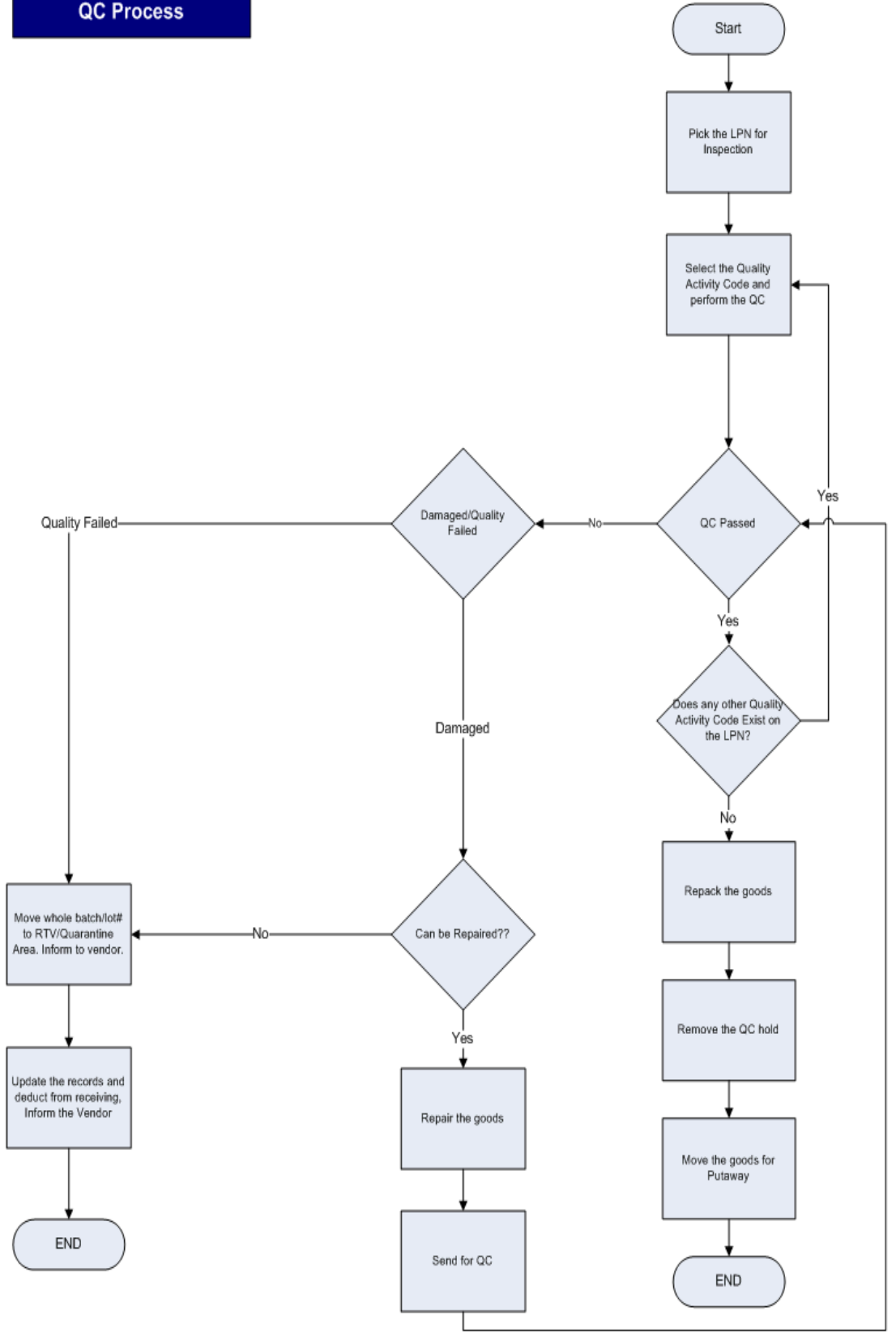
To provide Warehouse a capability to track QA process and manage inventory transition.

Process

- User will scan the LPN for inspection, select the quality activity code and perform QC.
- User will update the Status –
 - QC passed** –
 - User will check if any other activity code exists.
 - If no, user will repack the goods and remove the QC hold in the system.
 - WMS will create Move Tasks upon completion of QC for Put Away to Storage Locations.
 - QC failed** -
 - User will check if goods can be repaired.
 - If yes, repair the goods and again perform QC.
 - If goods cannot be repaired update the hold status as quality failed. And create move task to Put Away complete batch #/ lot# to RTV /Quarantine area.

- Move Tasks will be completed by Agent via Mobile Device or Workstation UI.

QC Process



1.1.6 Put Away

Overview

Put Away process is post receiving or with receiving where WMS based on Put Away rule setup and current inventory and location picture, identify and execute task to move inventory to final location from where it can be allocated to order.

Objective

To provide Warehouse a TASK to move inventory from receiving dock to final location from where it can be allocated to order

Process

Receiving and Put Away can be 1st step process or 2nd step process based on configuration.

Logic for Put Away:

- When an LPN arrives for Put Away, for Put Away type of Item 1st priority Zone is checked for availability. If a location is available, the item is Put Away there. If not, the next zone, so and so for.
- Different Type of Put Away supporters
 - Type of Item – Shelf, Floor, Rack, Freezer, Chiller and priority in zone – This is also referred to Put Away Type
 - Based on weight and volume of Item, Pack, Case and Pallet
 - Radial around active
- System will ask user to complete Task in Put Away Location Sequence.

Put Away post QA/ VAS:

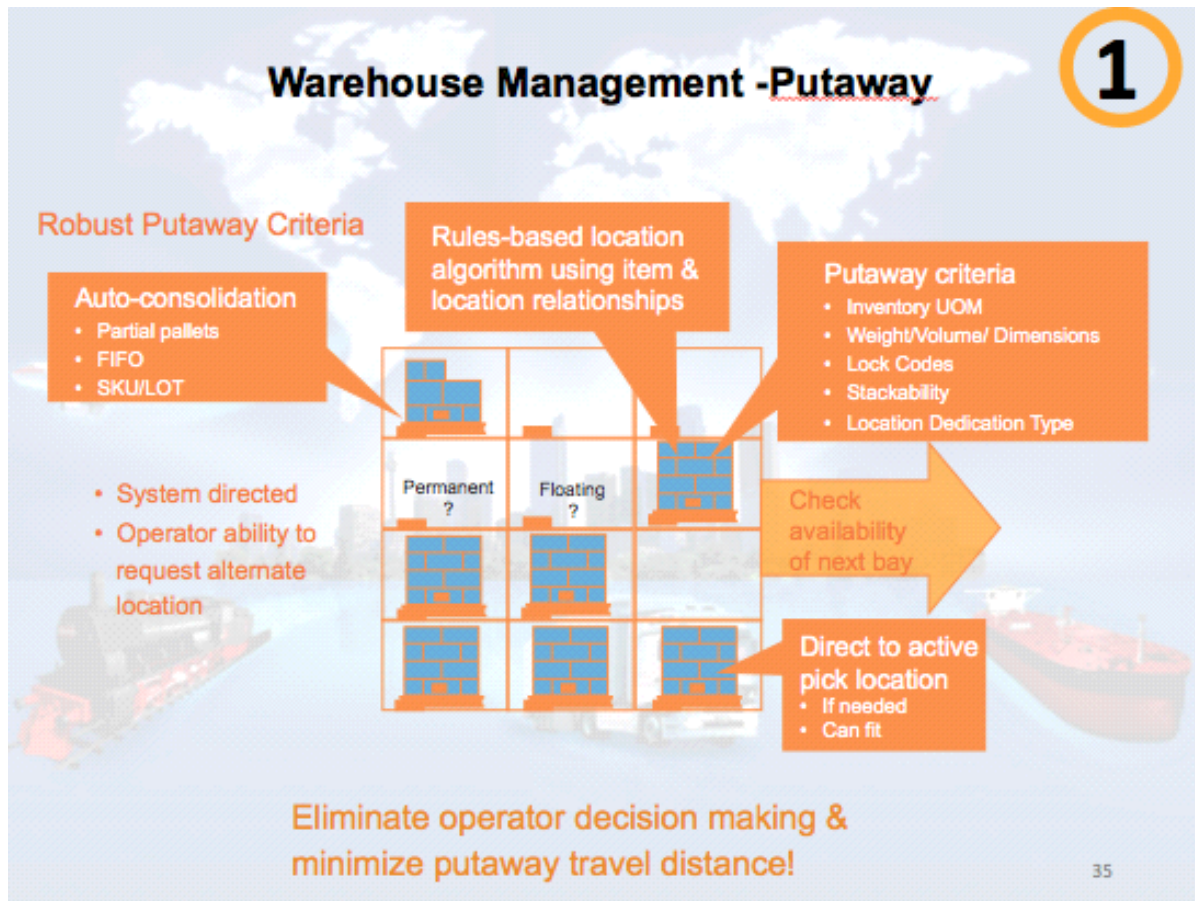
In case of stock that is sent for QC and VAS, once the activity (QA/VAS) is completed and goods are sent for Put Away, the target location for the item is determined based on the Put Away logic as described above.

Put Away Execution

Put Away tasks are generated by the system as the receiving confirms on the basis of Put Away algorithm defined. Put Away configuration will check if there is an activity demand existing for any pallet/case/item for cross-docking, VAS, Quality and the tasks will be generated accordingly directing the user to respective location. Put Away can be executed in two ways:

- Mobile Device Base:
 - Warehouse user opens the Put Away screen on the mobile device.
 - User will scan the LPN on his mobile device and it will display the suggested Put Away location
 - User will take the LPN to the system suggested location, places the LPN and scans the location
 - System is updated real time about the location inventory
 - The Put Away cycle continues till all the received inventory is Put Away
 - Inventory gets updated, bin quantity is updated and the inventory becomes available
 - In case user cannot Put Away at system suggested location then user can ask for alternate location or at last can put to location of user choice.
- UI Based:
 - Put Away moves tasks are generated in the system and the user prints the Put Away list which has list of all the LPN's along with the system suggested Put Away locations
 - User manually does the Put Away based on the Put Away list and updates the list for Put Away execution at the suggested location or alternate location
 - User confirms Put Away completion in the system and marks if Put Away has been done at any alternate locations
 - Warehouse supervisor checks and enters any variations in the system

- Inventory gets updated, bin quantity is updated and the inventory becomes available



Warehouse Management - Putaway Algorithm

1

Define Customer Specific Putaway Algorithm

Reserve (upper levels)



Active (lower level)



Configure sophisticated storage rules based on Item or Item Group:

1. Refill active location if required considering rotations issues
2. Search for optimal consolidation considering
 - Co-mingling of Item, Lot & Rotation Dates
 - Stackability
3. Search for optimal empty reserve location, starting from active location considering
 - Tl/Hl, Pallet Height
 - Clearance
 - Volumetrics
 - Pallet/Location Fit
 - Avoid aisles with traffic
 - Balance inventory across aisles

Warehouse Management - Inventory Consolidation

2

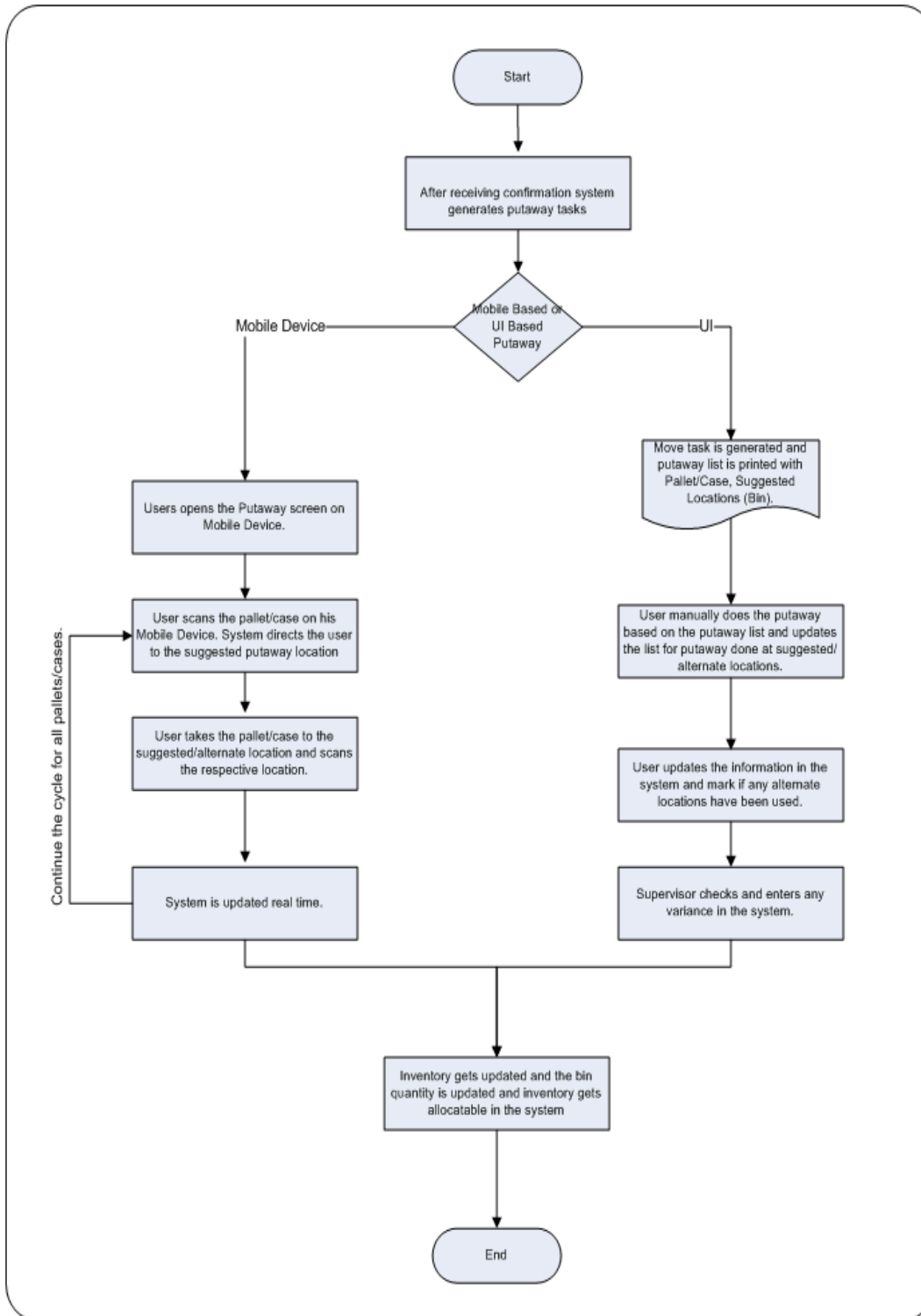
Automated consolidation of partials during putaway

- Identify opportunities to consolidate inventory before utilizing empty locations
- Consolidation of partial pallets
- Consideration for

- Lot
- Expiration date
- Pallet quantity
- Location capacity



Putaway Process



Overview

Post Receiving (Pre or Post Put Away complete)Receipt Verification is done where WMS will generate a GRN – Good Receipt Note which will act as a record of what all inventory warehouse has received.

Objective

To provide Warehouse a capability to track what all inventory it received in Inbound Shipment

Process

- At the end of shift the GRN will be produced for the ASN's having the following status:
 - ASN Status = "Receipt Confirmed" and Inventory Status = "On Hand" which means that all the LPN's for that ASN have been Put Away
- The GRN will then sent to the Vendor as a confirmation of the goods received
- GRN can be generated from RF or UI and can be auto printed or manually printed.
- WMS can be configured to auto generate ASN when all inventory is moved to On Hand Status which means all product is Put Away.

1.1.8 Cross Docking

Overview

Operation may require inbound shipments at the warehouse to be considered as available inventory and hence do Cross Docking for back orders or urgent orders.

Objective

To provide Warehouse a capability to allocate inventory received without Put Away to back order or urgent order.

Process

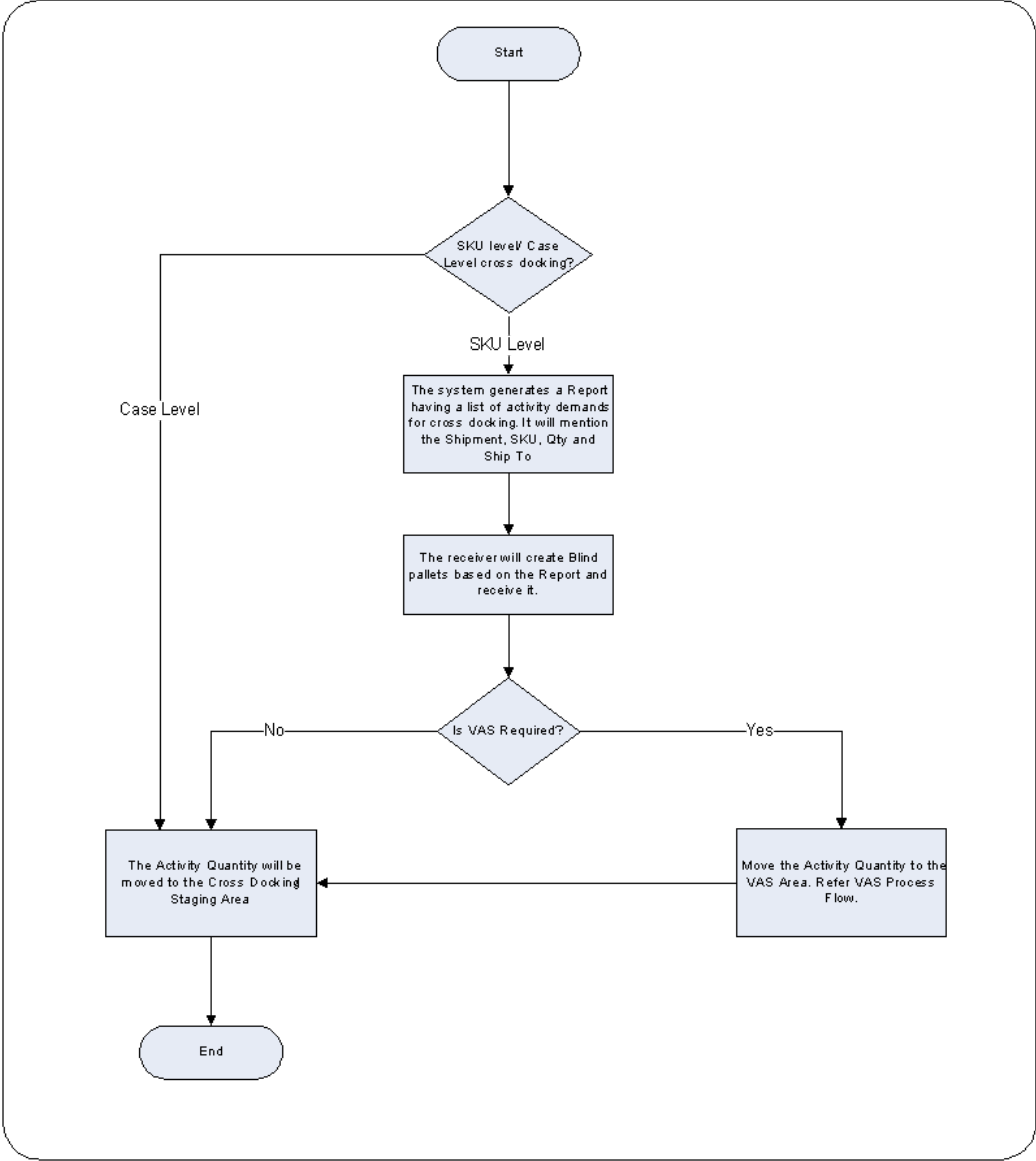
For Urgent sales order (Pick Ticket, distro, Sales order) a Flag is sent in Order File along with ASN (Optional)

1. A Receiving Activity report will be generated for receiving supervisor so that he knows in advance if any activity demand for cross docking exists.
2. Case Level Cross Docking:
 - a. Activity Quantity will be moved to the Cross Docking/Outbound Staging Area.
3. SKU Level Cross Docking:
 - a. The items will be received on Blind LPN's.
 - b. Next, the LPN's will be scanned.
 - c. Activity demand for VAS:
 - i. If it exists, then the activity quantity will be moved to the VAS area. After VAS activity is performed the activity quantity is moved to the outbound staging area.
 - ii. If it does not exist, then the activity quantity will be moved directly to the outbound staging area.
 - d. After that the shipment is sent out and confirmed.

For Back orders:

For a back order, an activity demand is generated for the quantity that the order is short of. Once new inventory is received, it should be sent to cross dock area which is then moved to outbound staging area.

Cross-Docking Process



Cross Docking Process