



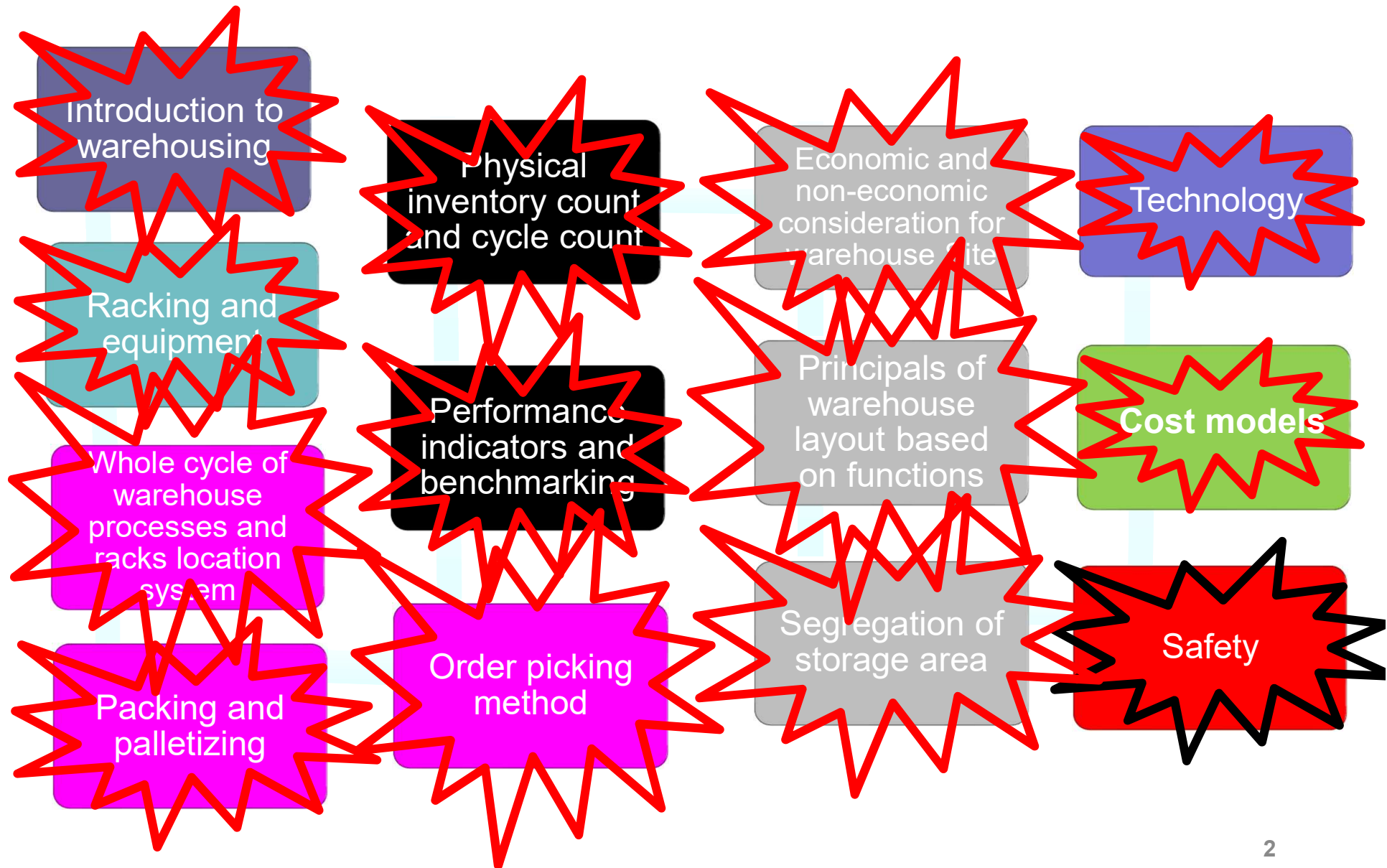
Lesson 13

WMS

SCHOOL OF
ENGINEERING

E215 –
Warehousing
and Storage

E215 Warehousing and Storage Topic Flow

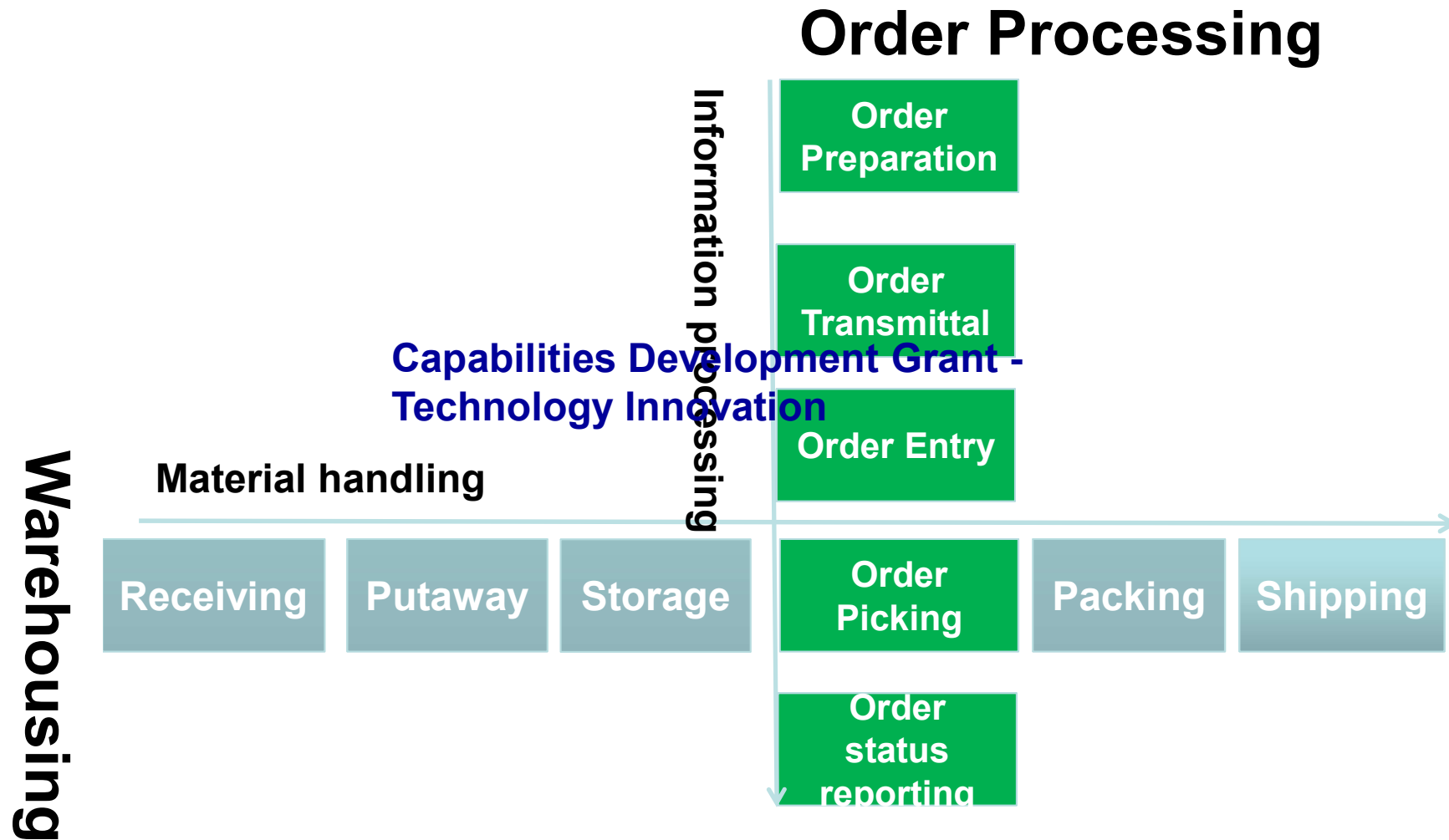


Learning Objectives



- Explain the need for a WMS
- Apply the WMS:
 - Completing an Inbound and Outbound process in WMS
- Elaborate on how the WMS works:
 - Understanding the different features of a WMS

General Processes in a Warehouse



Use of IT in a Warehouse



- Receiving
 - Compare ASN with the Delivery Order, Purchase Order (if any), or incoming goods data
 - Update information on the received cargo
- Putaway
 - Assigned unique and specific location to every SKU within the warehouse.
- Storage
 - Provide accurate information of every SKU in terms of quantity, information, status
- Picking
 - Prepare picking information such as location, SKU no, unit of measure and quantity required
 - Pre-arrange the pick list to minimize travelling time
- Shipping
 - maximise the volume and weight utilization of the packaging.

Traditional IT methods



- Manual input and output that is non-automated and very repetitive
- Too little flexibility in organizing data and too much flexibility which restricts compliance
- Prone to input errors without validation
- Lack of workflow and business logic
- No real-time overview
- Limited integration with other systems

Need for a WMS



Warehouse Management System (WMS)

- An intelligent application that encompasses all the warehouse processes and transaction, and controls the movement and storage of materials in a warehouse
- Tracks multiple inventory SKU and its flow
- Monitor shipment schedule and inventory control
- Direct and optimize stock putaway and order picking based on real-time information of location utilization
- Generates reports and computes cost
- Align different resources available together with labour, so as to meet demand of customers
- Allows for multi-site visibility across geography from a single terminal via Internet

Other advantages of a WMS



- Run processes in a paperless mode
- Reduce number of wrong picks and deliveries
- Improve traceability from start-to-finish
- Manage order information by ASN and EDI
- Provide warehouse workers with efficient tools
- Focus on building best-of-breed warehouse management and distribution systems together with partners and customers
- Use available warehouse space more efficiently
- Improve cycle counting
- Reduce dependency on warehouse personnel
- Improve productivity and thus reduce inventory holding cost

Do all warehouses need WMS?



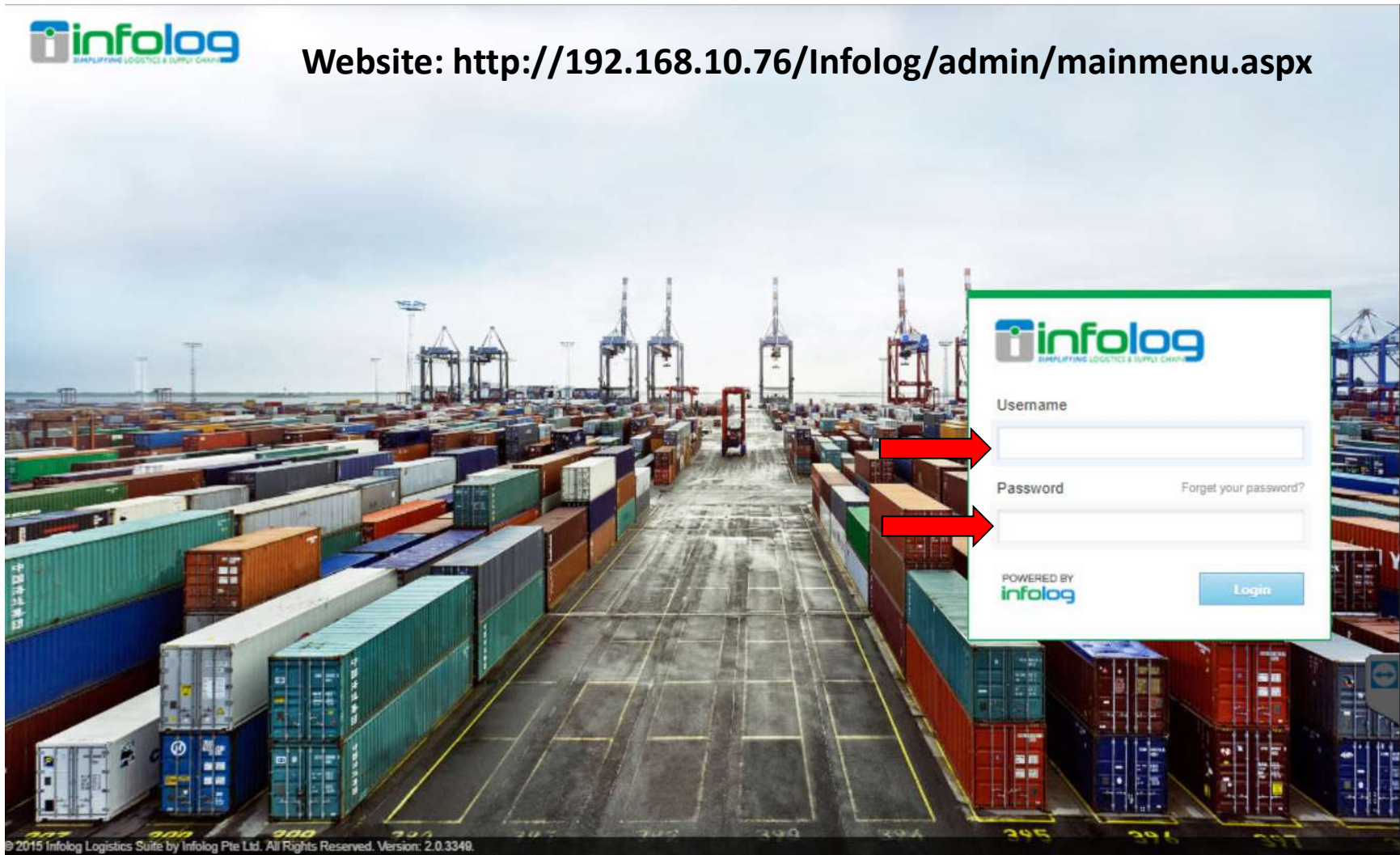
- Do You Really Need WMS?
 - Cost – software, training, implementation, hardware (bar code scanner, RF terminal) for Automated Data Collection (ADC)
 - Maintenance and system administration
- Benefits must outweigh the cost!

Factors to be Considered



- R.O.I
- Competitive Advantage
- Long Term Profitability
- Industry Pressure
- Customer Compliance

Login to Infolog



The image shows a login interface for Infolog, overlaid on a background of a container yard. The interface includes the Infolog logo, a username input field, a password input field, a "Forgot your password?" link, and a "Login" button. Red arrows point to the username and password input fields.

infolog
SIMPLIFYING LOGISTICS & SUPPLY CHAINS

Website: <http://192.168.10.76/Infolog/admin/mainmenu.aspx>

Username

Password [Forgot your password?](#)

POWERED BY **infolog**

Login

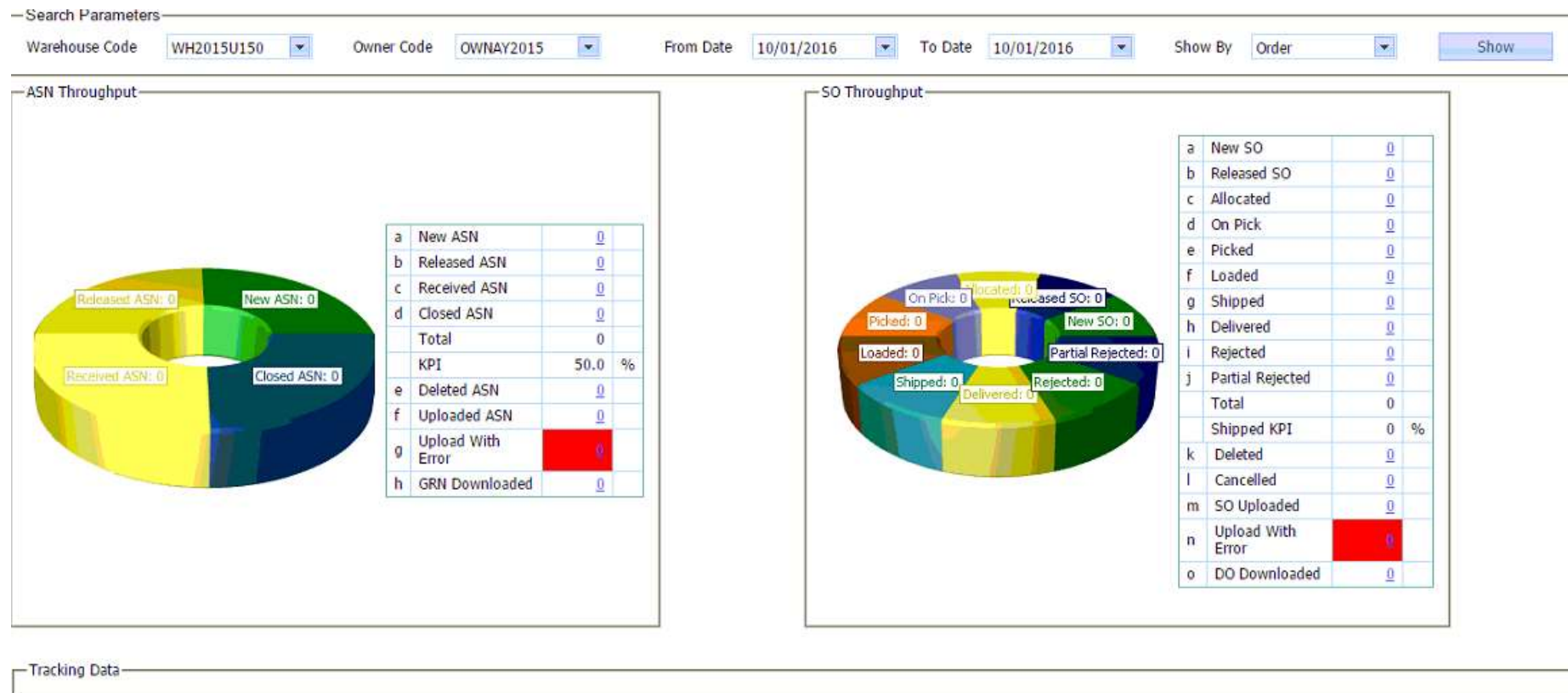
© 2015 Infolog Logistics Suite by Infolog Pte Ltd. All Rights Reserved. Version: 2.0.3349.

WMS - Dashboard



Shows an overview of the tasks, including the number of ASNs to be received and number of SOs to be shipped.

It gives the warehouse manager an update on the status of the inbound and outbound processes and KPI.



ASN Entry



ASN Entry - create an Advanced Shipment Notification Entry of expected goods to be received

Fill in details of incoming products based on the PO

Warehouse Code: WH2015U149
Owner Code: OWNAY2015
ASN No: 157
So No:
Trans Code: PO
Vessel:
PO No: IBPO130806
Ref No:
Supplier Code:
Supplier Name:
Container No:
Container Size:
ASN Date: 15/01/2016
ETA DATE: 15/01/2016
ETD Date: 15/01/2016
Inventory Status: G
Remark1:
Remark2:
Seal No:
Save Delete New
Asn Line Supporting Document

#	Line #	Description(1)	Product Code	Qty Ordered	UOM Code	So Price	Expiry Date	Allow Expired	Remarks
Update Cancel									
Edit New Delete	1	PS Printer	PS Printer	35	CTN				
Edit New Delete	2	NPG-Cartridge	NPG-Cartridge	80	CTN				

ASN Entry – Supporting documents



Warehouse Code: WH2015U150
Owner Code: OWNAY2015
ASN No: 153
So No:
Trans Code: PO
Vessel:

PO No: IBPO130806
Ref No:
Supplier Code:
Supplier Name:
Container No:
Container Size:

ASN Date: 10/01/2016
ETA DATE: 10/01/2016
ETD Date: 10/01/2016
Inventory Status: G
Remark1:
Remark2:
Seal No:

Save Delete New

Asn Line Supporting Document

File Name:

Description:

Upload Clear

Allows the system to upload the PO for future reference

#	File Name	Description	File Type	Created By	Created Date	#
No data to display						

Receiving ASN -> Goods Received Note



Owner Code: OWNAY2015
Warehouse Code: WH2015U149
Supplier Code:
GRN No: NEW GRN NO

ASN No: 157
PO No: IBPO130806
Supplier Name:

GRN Date: 15/01/2016
ATA Date: 15/01/2016 15:42:52 PM
Receiving Dock: RCV DOCK

Receive All Multiple Lines Receiving

GRN Line Supporting Document

	Line No	Product Code	Product Name	Storage Type	UOM		Qty Ordered		Qty Received	
					Whole	Loose	WHOLE	LOOSE	WHOLE	LOOSE
	1	PS Printer	PS Printer	Dry	CTN	CTN	35	0	0	
	2	NPG-Cartridge	NPG-Cartridge	Dry	CTN	PCS	80	0	0	

Full | Partially | Empty

System generates a GRN upon receiving the items in the ASN to update status and location

Goods are placed at receiving dock before putaway to location

FEFO Product – enter expiry date



Navigation buttons: Back, Forward, Home, Search

Form fields:

- ASN No: 157
- PO No: IBPO130806
- Supplier Name:
- Last GRN NO: [155]
- GRN Date: 15/01/2016
- ATA Date: 15/01/2016 15:42:52 PM
- Receiving Dock: RCV DOCK

Storage Type	UOM		Qty Ordered		Qty Received		Qty To Received		Remarks
	Whole	Loose	WHOLE	LOOSE	WHOLE	LOOSE	WHOLE	LOOSE	
Dry	CTN	CTN	35	0	35	0	0	0	
Dry	CTN	PCS	80	0	0	0	80	0	message num -[104] Please enter Expiry Date!

For Filament, as it is a FEFO Product, its expiry date has to be entered into the system, otherwise the goods cannot be received

Update Expiry date and Putaway



If choosing your own location, tick on Direct Putaway. When unticked, the system will choose its own location

GRN Receiving

GRN No: 155 PO No: IBPO130806 ASN No: 157
GRN Date: 15/01/2016 Product Code: NPG-Cartridge Qty Ordered: 400
Line No: 2 Description: NPG-Cartridge Qty Received: 0
Asn Remark: Asn Line Remark: Qty To Received: 400
Pallet No: ☐ New Pallet No ☐ Old Pallet No 6

☒ Direct Putaway

<input checked="" type="checkbox"/>	#	Row ID	Location Code	Pallet ID	Expiry Date	Qty	Uom Received	Inv Status
<input checked="" type="checkbox"/>	Delete	1			29/02/2016	8	CTN	G
<input checked="" type="checkbox"/>	Delete	2			29/02/2016	8	CTN	G
<input checked="" type="checkbox"/>	Delete	3			29/02/2016	8	CTN	G
<input checked="" type="checkbox"/>	Delete	4			29/02/2016	8	CTN	G
<input checked="" type="checkbox"/>	Delete	5			29/02/2016	8	CTN	G
<input checked="" type="checkbox"/>	Delete	6			29/02/2016	8	CTN	G
<input checked="" type="checkbox"/>	Delete	7			29/02/2016	8	CTN	G
<input checked="" type="checkbox"/>	Delete	8			29/02/2016	8	CTN	G

Update Expiry date before receiving

Putaway Task Generation



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Putaway List by Location

OWNAY2015 (Ownay 2015)

WH2015U147 (WH2015U147)

System will generate a Putaway Task, for the staff to move the pallet to the designated locations

Print Date : 15/01/2016 5:25:29PM

Printed by : AY2015U147

Page No : 1 of 1

Task ID	From Pallet No	Source Location	Destination Location	Pallet Qty	Check Digit
154057	10	RCV DOCK	01-01-02	40	_____
154058	11	RCV DOCK	01-01-02	40	_____
154059	12	RCV DOCK	01-01-02	40	_____
154060	13	RCV DOCK	01-01-03	40	_____
154061	14	RCV DOCK	01-01-03	40	_____
154062	15	RCV DOCK	01-01-03	40	_____
154063	16	RCV DOCK	01-02-03	20	_____
154064	17	RCV DOCK	02-01-03	15	_____
154065	6	RCV DOCK	02-01-02	40	_____
154066	7	RCV DOCK	02-01-02	40	_____
154067	8	RCV DOCK	02-01-02	40	_____
154068	9	RCV DOCK	02-01-02	40	_____

Sales Order Entry



Create a new SO Entry, and enter Sales Order details, including quantity and customer code

Warehouse Code: WH2015U147
Owner Code: OWNAY2015
Order No: 2
Order Ref: OBSO160606
Trans Code: SO
Allocation Type:
To Loc Code: SHIP DOCK
Allocate Qty: ☐ On Hold ☐
Pack Before Shipment: ☐

Cust Code: CUSAY2015
Customer Name: CUSAY2015
Address No: CUSAY2015
Address 1: Singapore
Address 2:
Address 3:
Zip Code:
Delivery Type:
Customer PO:
Courier Code:
Order Date: 15/01/2016
Delivery Date: 15/01/2016
Req Delivery Date: 15/01/2016
Delivery Zone:
Delivery Route:
Delivery City:
Delivery Country Code:
Pref Delivery Time Slot:
Remark 1:
Remark 2:

Save Delete New

So Entry Supporting Document

#	Org Line	Line #	Description(1)	Product Code	Qty Ordered	Uom Code	Open Qty	Qty Avail	Expiry Date	Exclude Expiry Date
Update Cancel										
Edit New Delete		1	PS Printer	PS Printer	2	CTN	2	60	15/01/2016	
Edit New Delete		2	NPG-Cartridge	NPG-Cartridge	4	CTN	20	830	15/01/2016	

System shows available quantity when product code is entered

Pick List



Release SO, Allocate goods and Generate Pick Task, in order to generate the Pick List

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Tel: 65 6276 4288 Fax: 65 6276 6933
Co Regn No: 100004/2015 GST Regn No: 100005/2015

Print Date : 15/01/2016 5:43:31PM
Printed by : AY2015U147
Page No : 1 of 1

Order No : 2
Order Ref : OBSO160606

Pick List By Order Report

OWNAY2015 (Ownay 2015)
WH2015U147 (WH2015U147)

SO# : 2



Pick List#: 664207



Customer Code : CUSAY2015 - CUSAY2015
Singapore

Destination Location : SHIP DOCK

Locations, SKU and quantity are generated

Other info such as order number and customer code are also indicated

Line #	Source Location	Product Code	Description(1)	Qty Ord	Loose Qty To Pick	Whole Qty To Pick	Check Digit
Picking Zone : PZ							
2	01-01-02	<input type="checkbox"/> NPG-Cartridge	NPG-Cartridge	20	<input type="checkbox"/>	20 PCS = 4 CTN	
1	01-02-01	<input type="checkbox"/> PS Printer	PS Printer	2	<input type="checkbox"/>	2 CTN = 2 CTN	

Shipment Confirmation



After goods have been picked and ready for shipment, this screen allows information such as the vehicle and route to be entered, and this ties in with a Transport Management System (TMS)

Shipment Confirm Load Tracking

Warehouse Code: WH2015U147 Order Ref: Single ☒ Multiple ☐

Owner Code: All Order No:

From Delivery Date: To Delivery Date: Delivery Route:

From Order Date: To Order Date: Floor No:

From Delivery Zone: To Delivery Zone: Picking Zone:

Driver ID: Vehicle Plate No: Courier Code:

Batch No: Delivery Country Code: Search

Total rows selected: 1. ☒ Select all rows [Clear selection]

<input checked="" type="checkbox"/>	Owner Code	Order No	Order Ref	Delivery Date	Order Date	Delivery Zone	Pref Delivery Time Slot	Total Product	Remark 1
<input checked="" type="checkbox"/>	Partial	OWNAY2015	2	OBSO160606	15/01/2016	15/01/2016		0	

Product Code	Description(1)	Whole UOM	Whole Qty	Qty Ordered	Qty Outstanding		Qty Pick		Qty P
					Loose	Whole	Loose	Whole	
PS Printer	PS Printer	CTN	1	2	0	0	0	0	2
NPG-Cartridge	NPG-Cartridge	CTN	5	4	0	0	0	0	4

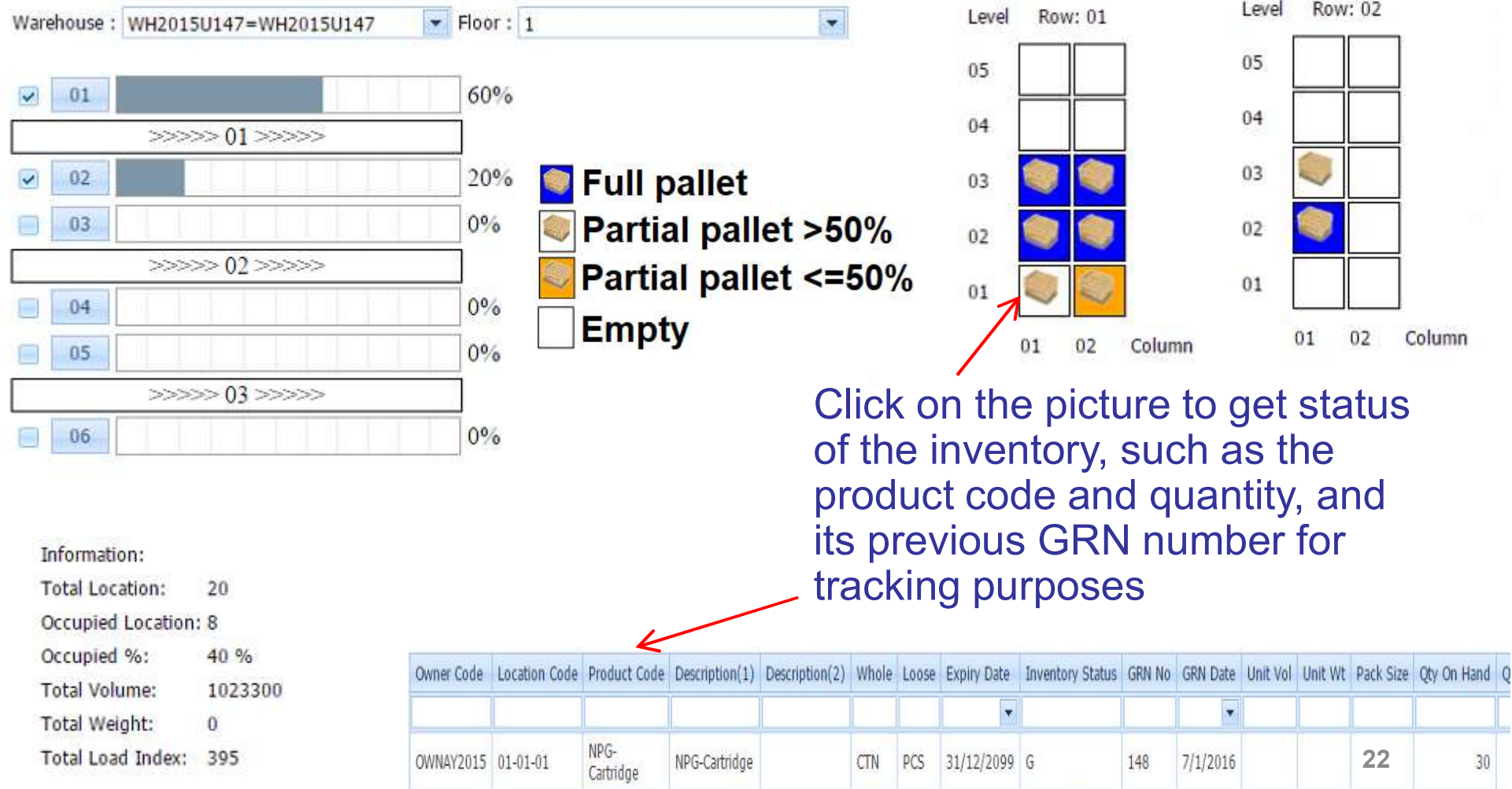
Create Load Confirm Shipment Update Delivery Date

Confirm Shipment to update that these goods have left the warehouse, and no longer part of inventory

Warehouse Layout



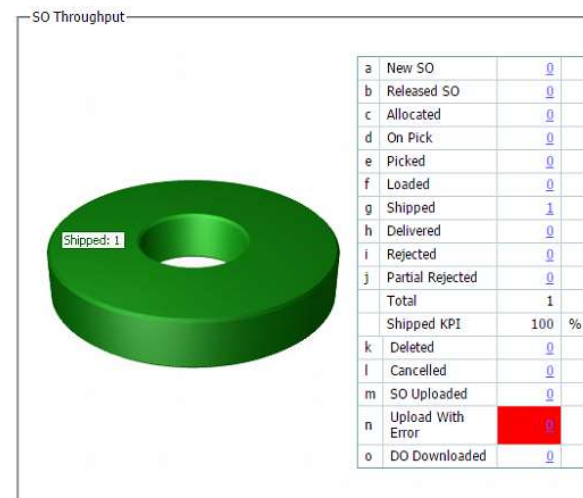
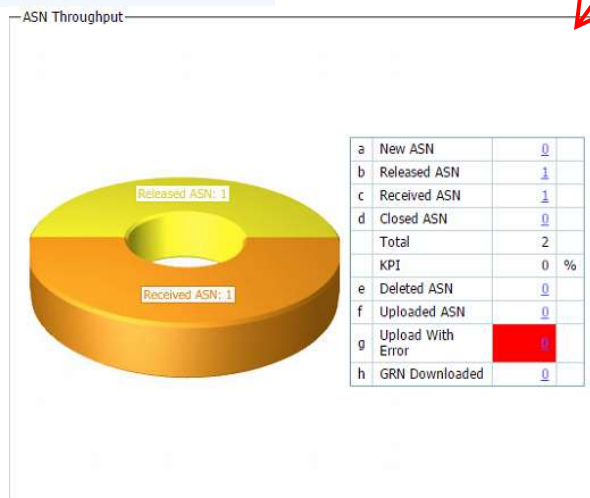
The Warehouse Layout gives an illustration of the overview of inventory status in the warehouse, including the locations that are occupied and the occupancy rate



Warehouse Enquiry

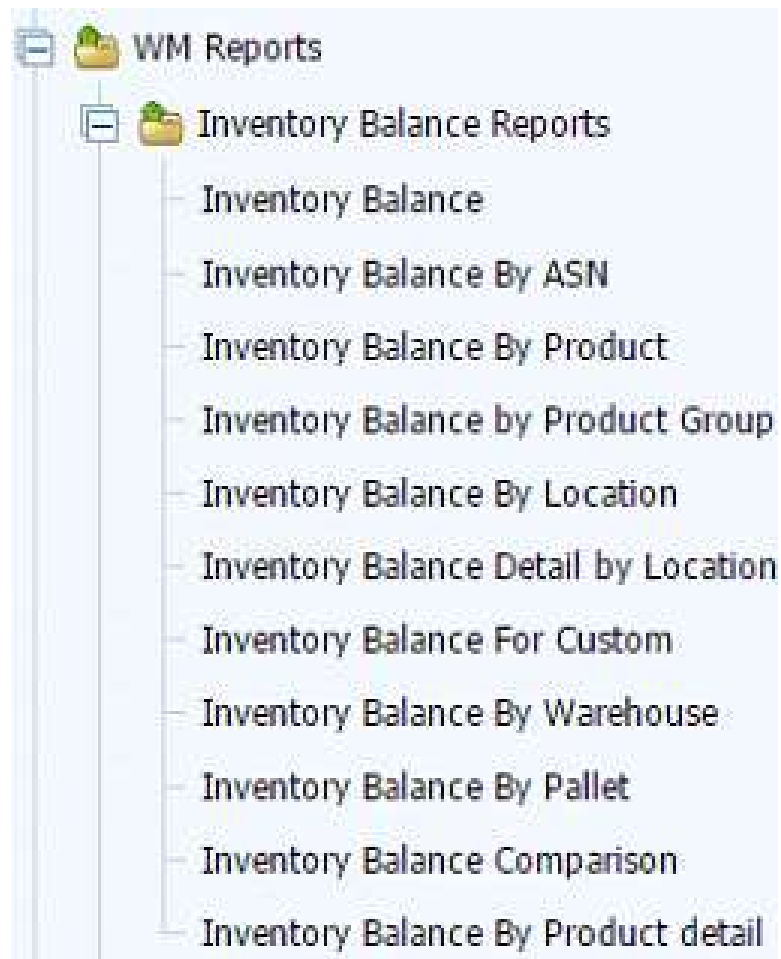


The Warehouse Enquiry module gives information about the inventory and its movement, such as the throughput and other statistics



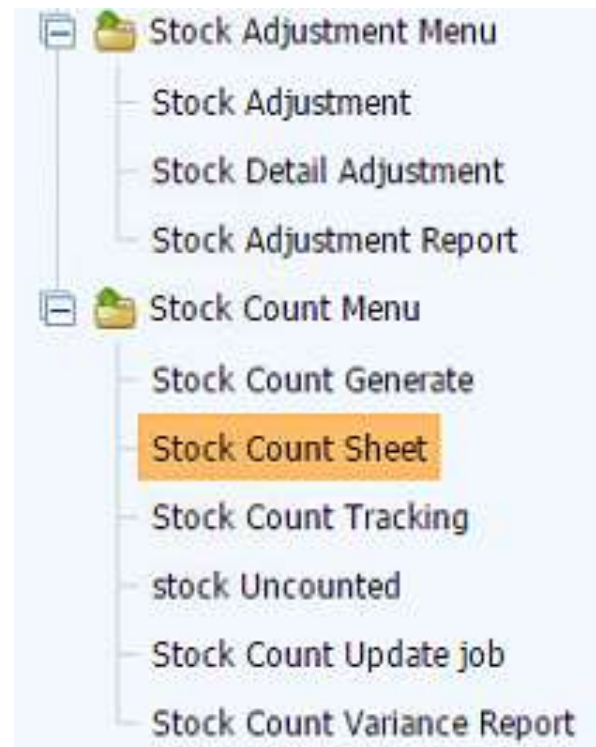
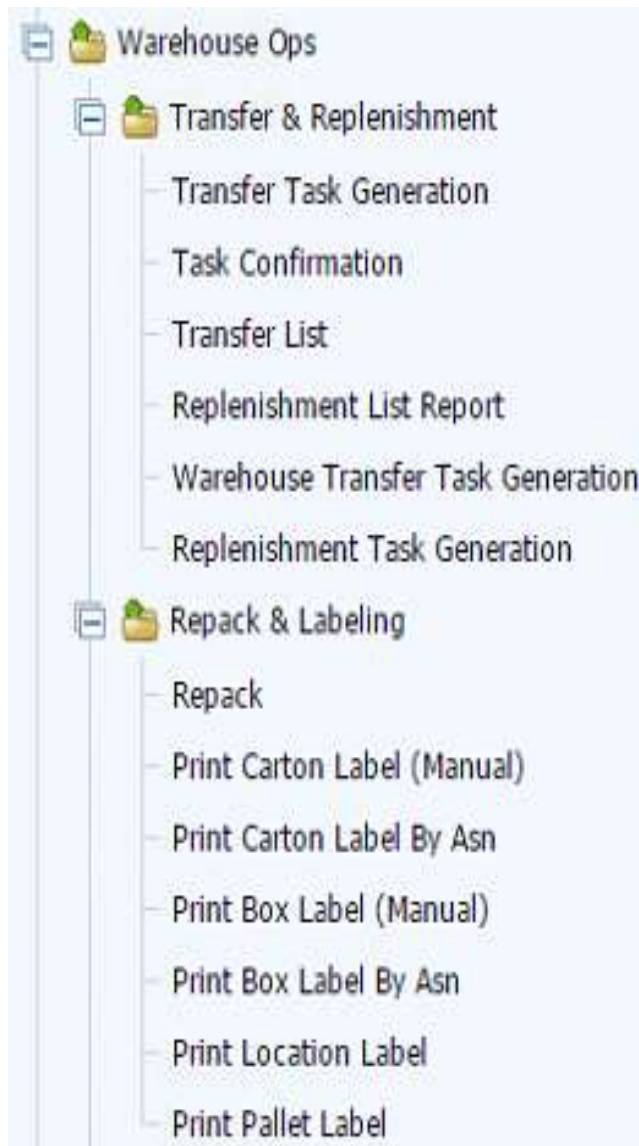
Tracking Data									
#	Owner Code	Order No	Order Ref	Order Date	Delivery Date	Trans Code	Total Lines	Total DO	Cust Code
1	OWNAY2015	2	OBSO160606	15/01/2016 00:00:00	15/01/2016 00:00:00	SO	2	1	CUSAY2015

Warehouse Reports



Various Reports to update, such as on goods inventory balance, stock aging and movement

Other Warehouse Operations



Other operations carried out in the warehouse include transfer and replenishment of goods, repacking and relabeling, stock adjustment and stock counting

Stock Count sheet



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Stock Count Sheet Report
OWNAY2015 (Ownay 2015)
WH2015U147 (WH2015U147)

Print Date : 6:25:27PM
Printed by : AY2015U147
Page No : 1 of 2

Job ID : 166 Picking Zone : PZ
Storage Type : Dry - Dry Row No : 01

Location Code	Pallet No	Prod Code	Description	Count	Whole UOM	Count	Loose UOM	Lot No	Item Remarks	Expiry Date	Inv Status
01-01-01	1	NPG-Cartridge	NPG-Cartridge	—	CTN	—	PCS				G
01-01-02	10	NPG-Cartridge	NPG-Cartridge	—	CTN	—	PCS				G
01-01-02	11	NPG-Cartridge	NPG-Cartridge	—	CTN	—	PCS				G
01-01-02	12	NPG-Cartridge	NPG-Cartridge	—	CTN	—	PCS				G
01-01-02	2	NPG-Cartridge	NPG-Cartridge	—	CTN	—	PCS				G
01-01-03	13	NPG-Cartridge	NPG-Cartridge	—	CTN	—	PCS				G
01-01-03	14	NPG-Cartridge	NPG-Cartridge	—	CTN	—	PCS				G
01-01-03	15	NPG-Cartridge	NPG-Cartridge	—	CTN	—	PCS				G
01-01-03	3	NPG-Cartridge	NPG-Cartridge	—	CTN	—	PCS				G
01-02-01	4	PS Printer	PS Printer	—	CTN	—	CTN				G
01-02-02	5	PS Printer	PS Printer	—	CTN	—	CTN				G
01-02-03	16	PS Printer	PS Printer	—	CTN	—	CTN				G

Counter : _____ Recorder : _____ Checked : _____ Data Entry : _____
Date & Time : _____ Date & Time : _____ Date & Time : _____ Date & Time : _____

Learning Objectives



- Explain the need for a WMS
- Apply the WMS:
 - Completing an Inbound and Outbound process in WMS
- Elaborate on how the WMS works:
 - Understanding the different features of a WMS