

# **MAXIMO ASSET MANAGEMENT**

*Dissertation submitted in partial fulfillment of the  
requirement for the*

*Degree Of*

**BACHELOR OF TECHNOLOGY**

**IN**

**ELECTRONICS AND COMMUNICATION  
ENGINEERING**

BY

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UNDER THE GUIDANCE OF

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Department of Electronics and Communication Engineering

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# DECLARATION

I hereby declare that the project work entitled “IBM MAXIMO 7.6.0” submitted to the Department of Electronics and Communication, Jaypee University of Information Technology, Solan is a record of an original work done by me. This project work is submitted as a part of partial fulfilment for the award of the degree of Bachelor of Technology under Jaypee University of Information Technology.

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Date: 22 MAY, 2019.



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### CERTIFICATE

This is to certify that the work titled “**IBM MAXIMO 7.6.0**” submitted by **Sachin Takyar** in partial fulfilment for the award of degree of Bachelor of Technology in Electronics and Communication Engineering of Jaypee University of Information Technology, Solan has been carried out under my supervision.

Signature of Supervisor

Name of Supervisor

- Mr. Sheetal Ramchandra Gadale

# ACKNOWLEDGEMENT

I take this opportunity to express my gratitude to my supervisor Mr. Sheetal Ramchandra Gadale for his insightful advice, motivating suggestions, invaluable guidance, help and support in successful completion of this project and also for her constant encouragement and advice throughout our Bachelors programme.

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## ABSTRACT

IBM Maximo is the Enterprise Asset Management product that provides the process of managing an organisation's assets throughout their life cycle-from purchase to decommissioning. The word 'enterprise' refers to several organisations, multiple departments, and functions and in some cases, business units. 'Assets' is defined as any equipment or facility that plays a key role in the core business of the enterprise. 'Management' refers to improving the utilisation and performance of an asset, and thereby improving Return on Investment (ROI).The asset life cycle typically contains the following phases:

- **Requisition** – It can be referred to as a formal request for an asset by a company that can be procured from a vendor or it can be inter-departmental transfer.
- **Procurement** – This phase includes the whole complete process of purchasing the asset, it includes creating Purchase Requisitions, Request for Quotations, Invoices and generating Purchase Orders, receiving assets at locations, etc.
- **Commissioning** – In this phase asset is allocated to its respective location, user or user group. The cost of asset is now on the owner of the asset and asset availability is the responsibility of the owner which includes proper maintenance of the asset from time to time in order to ensure that the asset is up and running whenever needed.
- **Retirement** – It is last phase and is also called as '**Decommissioning**' phase, this is the phase where the asset is replaced or removed but in certain cases the residual cost of the asset is calculated and maintained in order to benefit the company.

# CHAPTER 1

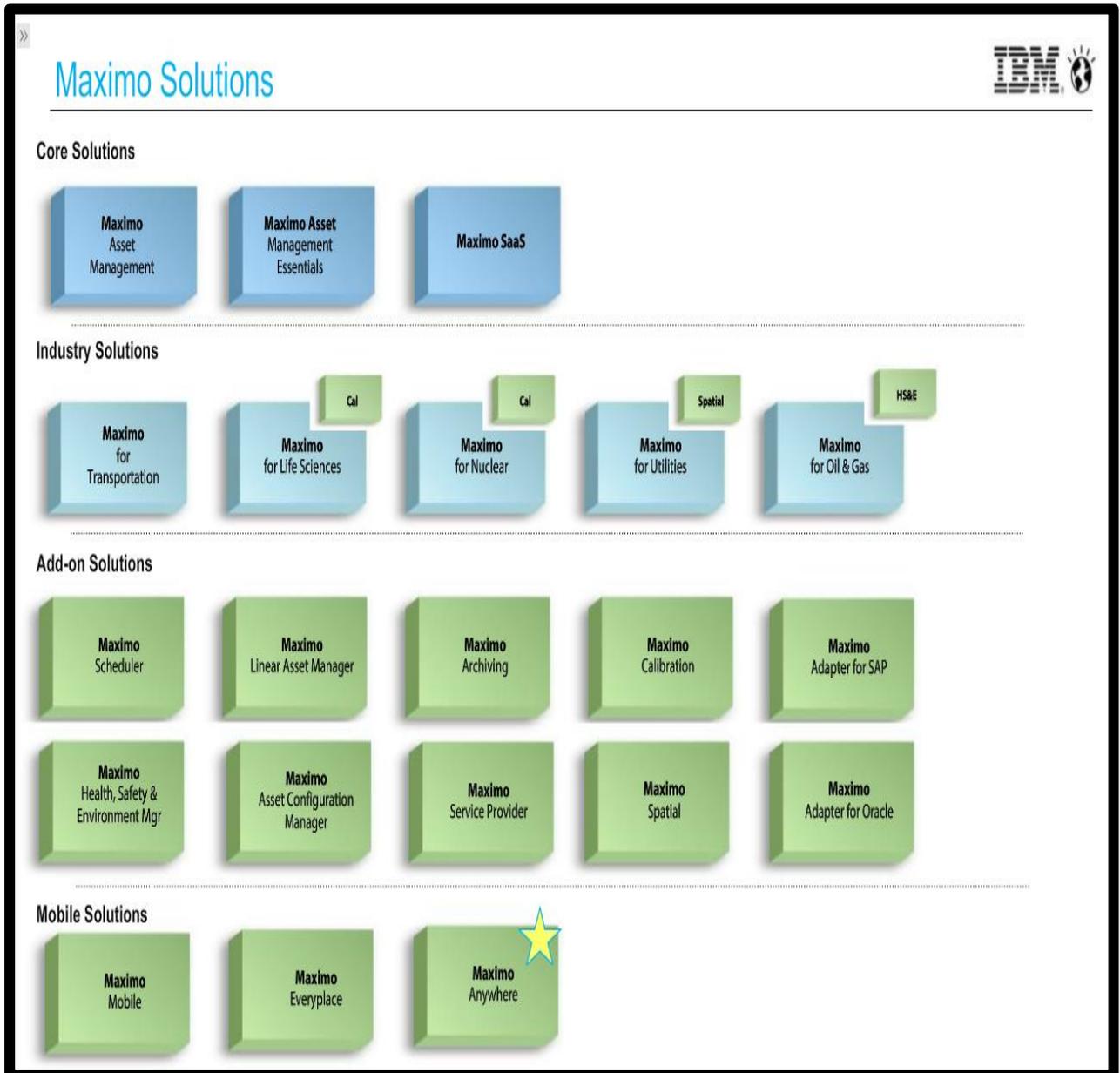
## INTRODUCTION

IBM Maximo is the Enterprise Asset Management product that provides user with the capability to manage the maintenance, repair and other operations of any asset and its types throughout its life-cycle in order to prevent early shutdown of the asset and to help the organisation to take up as much benefit from the asset as possible. Maximo has the following modules:

- **Asset Management** – It helps an organisation to efficiently track the assets throughout their lifecycle, this includes location of the asset, and safety related information, meter and meter readings of the assets which are used in Predictive and Preventive Maintenance of the asset.
- **Work Management** – It helps an organisation to manage both planned and unplanned work activities such as Preventive Maintenance in case of planned scenario or in an unplanned scenario Emergency Maintenance. It enables the planner/scheduler to identify labour, material, services and tools required to complete the work as well as check the availability of those items.
- **Inventory/Material Management** – It helps an organisation to ascertain the details related to inventory and its usage, this includes available balances, any issues and transfers, vendor details, economic order quantities.
- **Purchase Management** – It supports all the phases of the supply chain from vendor and item management to generating records such as a Purchase Request, Purchase Order, Invoice, etc.
- **Contract Management** – It helps in managing a number of contract types offered by vendors to the organisation these contract types include Purchase, Lease, Rental, Warranty, Labour Rate and User defined contracts.
- **Service Management** – It helps an organisation to define the service offerings, establish SLA (Service Level Agreement) and more proactively monitor the service level delivery.

- **Customer Management** – It helps an organisation to effectively and efficiently manage its customers by providing proper services as per SLA, providing proper billing, etc.

Following is snippet depicting the services provided by IBM Maximo are as follows:



Following is the snippet of the Start Center of MAXIMO 7.6.0:

Welcome, Mike Wilson Mike Wilson

Find Navigation Item

Administration Report Admin

Go To Applications

- My Recent Applications
- Administration
- Analytics
- Assets
- Change
- Contracts
- Financial
- IT Infrastructure
- Integration
- Inventory
- Planning
- Planning and Scheduling
- Preventive Maintenance
- Purchasing
- Release
- Security
- Self Service
- Service Desk
- Service Level
- System Configuration
- Task Management
- Work Orders

### Quick Insert

- New Person
- New User

### Bulletin Board

There are currently no bulletin board messages to view.

### Security, Users and Groups

- Users
- Security Groups
- People
- Person Groups

### Inbox / Assignments

No Assignments found for Mike Wilson

### Workflow Configuration

- Workflow Designer
- Roles
- Actions
- Communication Templates
- Workflow Administration
- Escalations

### PM vs CM Work - All Work Orders (%)

Last Run: 8/3/04 3:05 PM [Update](#)

#### PM Performance (%)

Status	KPI	Actual	Target	Variance
<span style="color: red;">↓</span>	PM Performance (%)	12.73	95	-82.27

### Reporting

- Report Administration
- KPI Manager

### Bedford Work Orders

Chart Type: [BAR](#) View By: [Priority](#)

X (By Priority)	Priority	Count	Percent (%)
1	1	7	1.69
2	2	78	18.89

## CHAPTER 2

### ASSET MANAGEMENT

Asset is anything that has a value to the company and its lifecycle is monitored and maintained by the company in order to attain maximum benefit. An asset has the following status when under an organisation:

- **Not Ready** – It is the default status for any asset, other names for this status are Installed, Commissioned, etc.
- **Operating** – This status denotes that the asset is being used, other names for this status are Active, Limited Use, etc.
- **Decommissioned** – This status denotes that the asset is now no longer used, other names for this status are Broken, Inactive, Missing, Sealed, Out-of-Service, etc.

There are two types of assets:

- **Rotating Assets** – An assets is a rotating asset if it is interchangeable such as motors, pumps, PC, etc.
- **Non-rotating Assets** – An asset is a non-rotating asset if is it consumed of the course of time, in simpler words asset that is use and throw and these don't move in or out of the storeroom.

Every asset has two numbers associated with it:

- **Inventory Item Number** – This number helps in tracking asset as a group that move in or out of the inventory or other applications.
- **Asset Number** – This number is unique for each and every asset and it is used to find out the location, individual instances, etc. for an asset.

An asset is of following types based upon its usage in area:

- **Production**
- **Fleet**
- **Facilities**
- **IT**

An asset has a user or a custodian, a user is the person that uses the asset while custodian is a person responsible for taking care of the asset.

## 2.1 Creating New Assets

Asset can be created by three methods:

- **Asset Application** – It is used to create, edit and delete an asset. Search, view, modify, add and delete records of asset. Manages Hierarchy, Subassemblies, Safety Records, Meters and Specification of assets.
- **Asset Template** – It is used to create new, modify existing assets. Manages Datasheets, Meters, Specifications and PM's.
- **Receiving Application** – It is used to receive items as rotating or non-rotating assets.

## Steps to create an **Asset** using **Asset Application**:

1. In the start center, go to Assets module.
2. Go to Assets application.
3. Click on New Asset button.
4. In the Asset field enter a new name (number or alphanumeric word).
5. Select the site for the asset.
6. Select the type of asset.
7. Select the manufacturer for the asset.
8. Enter the needed information in the given fields as per the need in the given tabs.
9. Change the status of asset to Operating and the click on Save.

Following is the snippet of the New Asset created in MAXIMO 7.6.0:

The screenshot displays the IBM Maximo 7.6.0 Assets application interface. The main window shows the 'Asset' record for 'MYNR01' with the name 'My non-rotating 01'. The status is 'NOT READY'. The site is 'BEDFORD' and the type is 'FACILITIES'. The interface includes a navigation pane on the left with 'Common Actions' such as 'New Asset', 'Save Asset', 'Clear Changes', 'Change Status', 'Move/Modify Assets', and 'Swap Assets'. The main area is divided into tabs: 'List View', 'Asset', 'Spare Parts', 'Safety', 'Meters', 'Specifications', 'Features', 'Relationships', 'Work', 'Service Address', and 'Map'. The 'Asset' tab is active, showing fields for 'Parent', 'Maintain Hierarchy?', 'Location', 'Bin', 'Rotating Item', 'Condition Code', 'Meter Group', 'Calendar', 'Shift', 'Priority', 'Serial #', 'Failure Class', 'Item Type', and 'Tool Rate'. The 'Attachments' section is also visible on the right side of the record.

## Steps to create **Asset** using **Asset Template**:

1. In the start center, go to Assets module.
2. Go to Asset Template application.
3. Click on New Asset Template Record button.

4. In the Asset Template field enter a new name (number or alphanumeric word).
5. Select the type of asset.
6. Select the manufacturer for the asset.
7. Select the vendor for the asset.
8. Enter the needed information in the given fields as per the need in the given tabs.
9. Change the status of asset to Operating and the click on Save.

Following is the snippet of the New Asset Template created in MAXIMO 7.6.0:

The screenshot displays the 'Asset Templates' form in MAXIMO 7.6.0. The interface includes a top navigation bar with the title 'Asset Templates', a user profile 'Mike Wilson', and a notification 'BMXAA4205I - Record has been saved.'. Below the navigation bar is a search field for 'Find Asset Template' and a 'Find Navigation Item' field. The main content area is divided into several sections:

- Asset Template:** Contains fields for 'Asset Template' (HVAC001) and 'Asset template for HVAC unit'.
- Status:** Set to 'DRAFT'.
- Organization:** Set to 'EAGLENA'.
- Attachments:** A section for adding attachments.
- Details:** A section containing:
  - Asset Description:** 'HVAC unit from template'
  - Asset Type:** 'FACILITIES' (Facilities Assets)
  - Manufacturer:** 'WES' (Westinghouse Electric Corporation)
  - Vendor:** 'TKING' (Thermo King)
  - Usage:** An empty field.
  - Purchase Price:** '50,000.00'
  - Replacement Cost:** '80,000.00'
  - Budgeted:** An empty field.
  - Priority:** '3'
- Calibration Details:** A section with:
  - Calibration?:** An unchecked checkbox.
  - Model Number:** An empty field.
  - M&TE Classification:** An empty field.
  - Internal Calibration?:** Radio buttons for 'Yes' and 'No'.
  - Is M&TE?:** Radio buttons for 'Yes' and 'No'.
  - Operating Range From:** An empty field.
  - To:** An empty field.
  - Units:** An empty field.

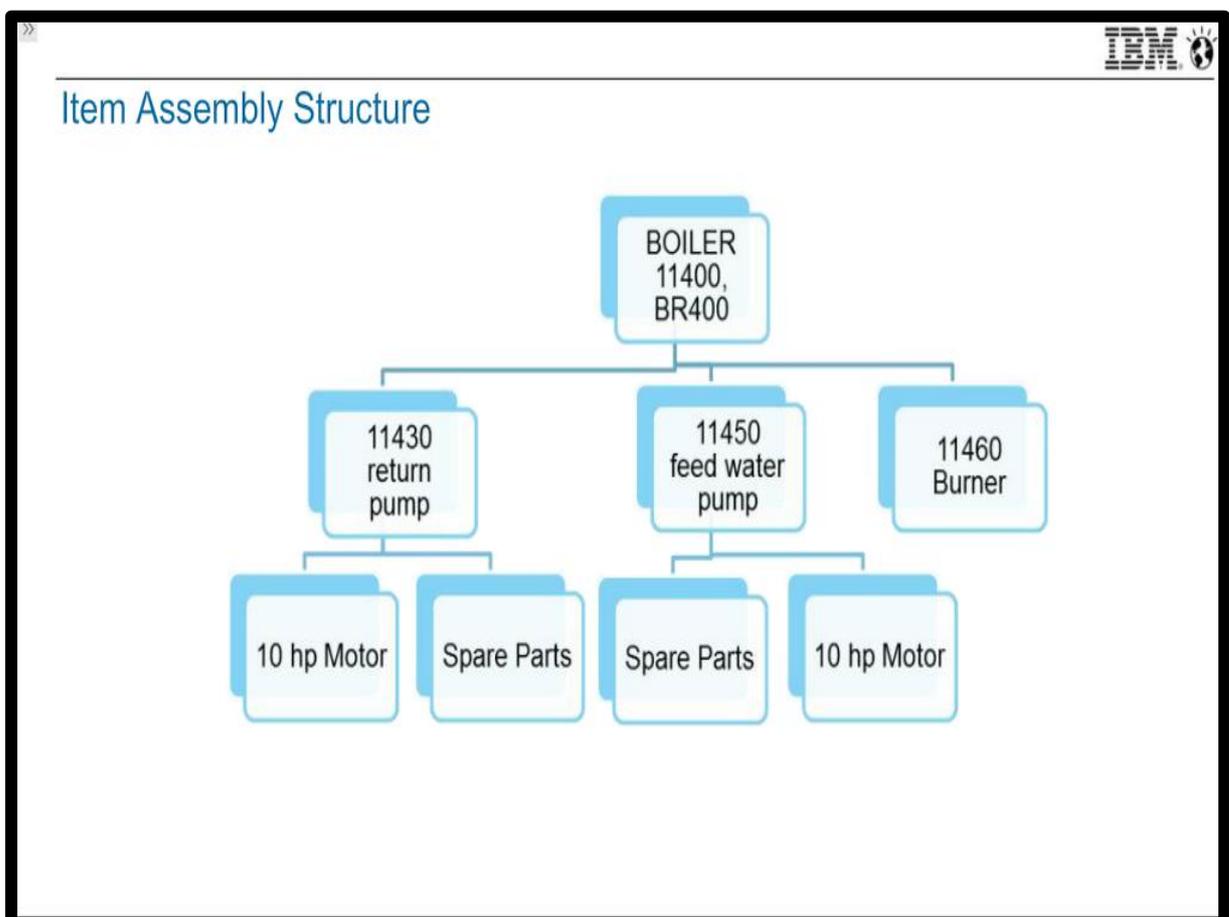
A left-hand sidebar contains navigation and action items such as 'Go To Applications', 'Available Queries', 'Common Actions' (including 'New Asset Template', 'Save Asset Template', 'Clear Changes', 'Change Status', 'Generate New Assets', 'Apply to Existing Assets'), and 'More Actions' (including 'Duplicate Asset Template', 'Add to Bookmarks', 'Delete Asset Template', 'Run Reports', 'View Asset Template Usage').

## 2.2 Asset Subassemblies

It is used to attach Item Assembly Structure (IAS) to both rotating and non-rotating items. An IAS includes spare parts, subassemblies or both that are needed to build an item for location requirement. IAS can only be applied to an asset or to an operating location if the parent item is a rotating item. There are some rules to apply IAS and they are as follows:

- If parent is a rotating item then IAS can be applied to both rotating and non-rotating items.
- If parent is a non-rotating item then it can add only non-rotating item to the IAS.

Following is the snippet of IAS example in MAXIMO 7.6.0:



Steps to add a **Rotating Item** and **Spare Parts** to a rotating item:

1. In the start center, go to Inventory module.
2. Go to Item Master application.
3. In Description field enter pump.
4. Select the pump.
5. Go to IAS tab.
6. In Children tab add new row and add items.

Following is the snippet of the IAS tab of Item Master Application in MAXIMO 7.6.0:

The screenshot displays the 'Item Master' application interface. At the top, there is a navigation bar with a home icon, a menu icon, the text 'Item Master', and a user profile 'Mike Wilson'. Below this is a search bar labeled 'Find Item' with a magnifying glass icon and several utility icons. A horizontal menu contains tabs for 'List View', 'Item', 'Storerooms', 'Vendors', 'Specifications', and 'Item Assembly Structure'. The 'Item Assembly Structure' tab is active. Below the tabs, there are fields for 'Top Level Item:' (P-896), 'Current Level:' (P-896), 'Belongs To:', and 'Remarks:'. The 'Children' section features a table with columns 'Item', 'Description', 'Quantity', and 'Remarks'. The table contains three rows of data. A 'New Row' button is located at the bottom right of the table.

Item	Description	Quantity	Remarks
11453	Seal, Mechanical, Self Aligning- 1 In ID	1.00	
MOT10	Motor- 10hp/1750rpm/TEFC/254T Frame/4	1.00	
XMP-3200	Gasket- AA268A	1.00	

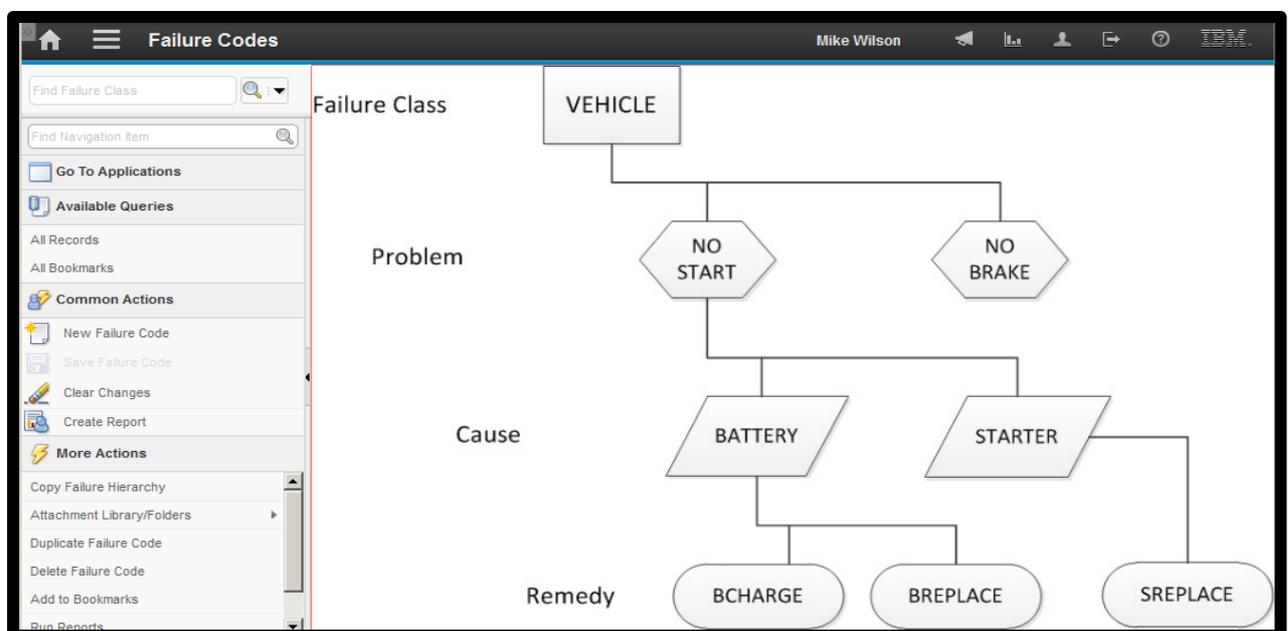
## 2.3 Failure Codes

A failure code is an element of failure hierarchy, a failure code can have one or more child failure code. Failure codes are specified on asset and location records. Failure codes are linked in parent child relationship to form a failure hierarchy. A failure hierarchy is a set of data on the problems, the causes and the remedies for the asset failures and for the operating location failures. A failure hierarchy is identified by its failure class. Using failures hierarchy can help construct an accurate history of problem that leads to asset and location failures. Failure codes are at organisation level. Following three failure reports can be seen from Asset application:

1. Details of Asset Failure
2. Summary of Asset Failure By Location
3. Drilldown of Asset Failure

Reports are used to analyse failure trends and take preventive measures to help reduce future failures.

Following is the snippet of Failure Class hierarchy in MAXIMO 7.6.0:

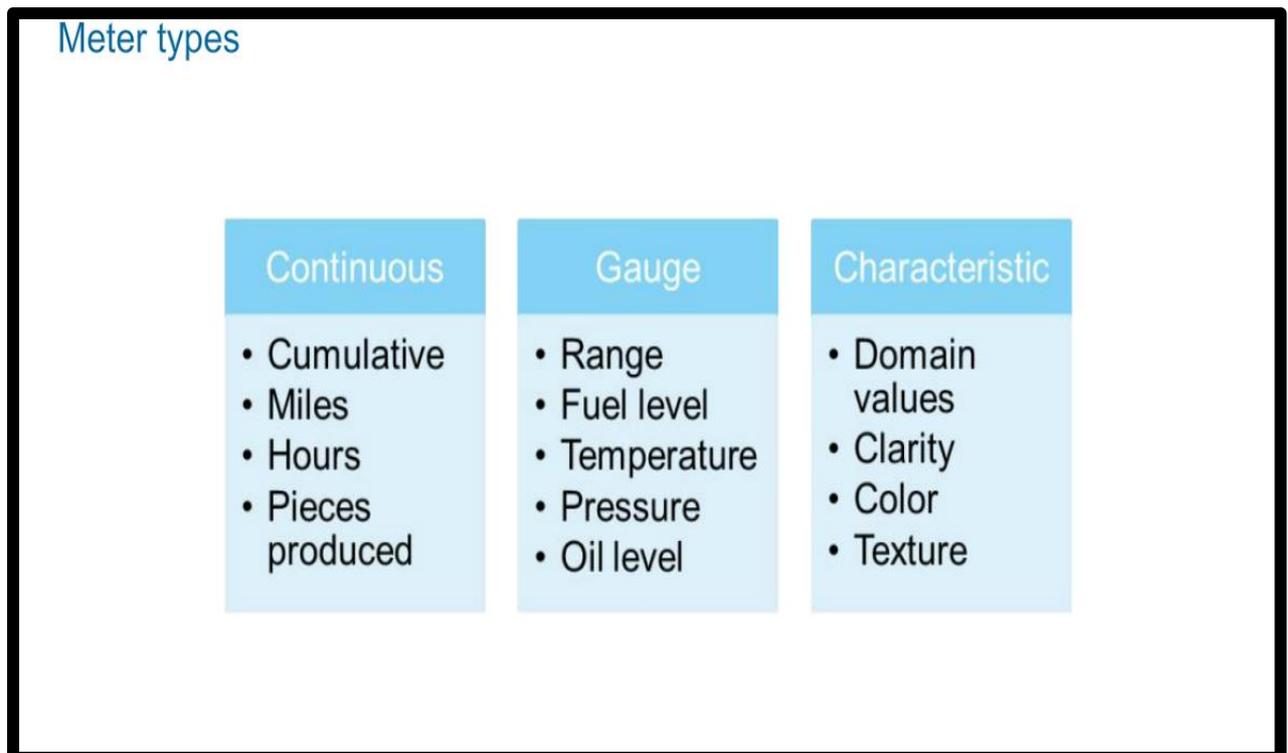


## 2.4 Meters

Meters in Maximo are same as normal meters i.e. they are used to measure any quantity. Maximo 7.6.0 offers 3 types of meters to the user:

1. **Continuous Meter-** These are the cumulative meters that are used for measuring consumption or accumulation.
2. **Gauge Meter-** These meters are used for performing condition monitoring on assets or locations, they are used for measuring range of values.
3. **Characteristic Meter-** These are the observational meters that have a list of possible values derived from the domains in Maximo.

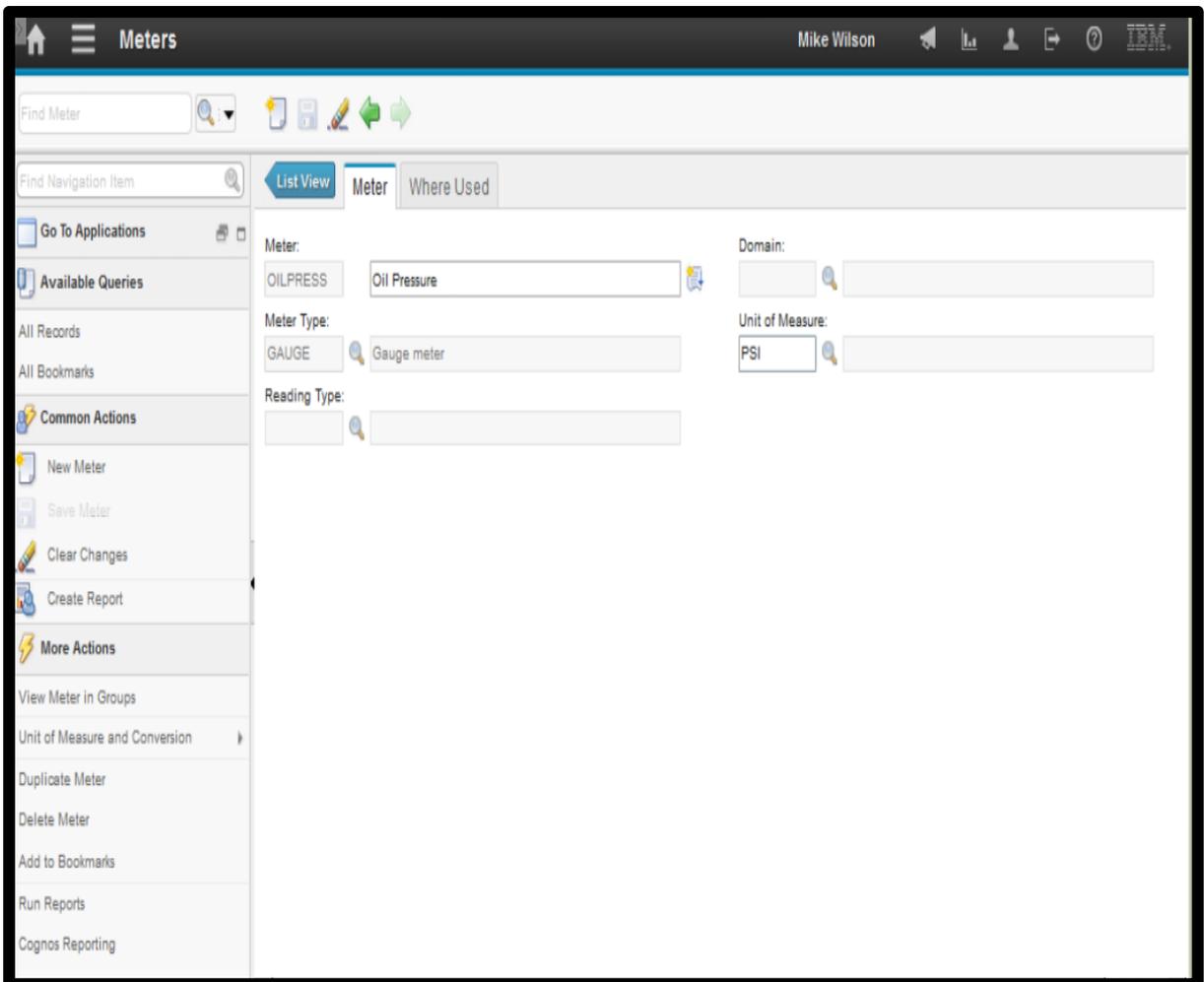
Following is snippet that depicts what all these Meters measure in MAXIMO 7.6.0:



## Steps to add a new **Meter**:

1. In the start center, go to the Assets module.
2. Go to the Meters application.
3. Click on the New Meter button.
4. Enter the name in Meter field (oilpress).
5. Select the type of meter.
6. Enter the value in Unit of Measure field.
7. Save.

Following is the snippet of a new Meter added in MAXIMO 7.6.0:



The screenshot displays the 'Meters' application interface in MAXIMO 7.6.0. The top navigation bar shows the user 'Mike Wilson' and various system icons. Below the navigation bar, there is a search field for 'Find Meter' and a 'Find Navigation Item' field. The main content area is divided into a left sidebar and a central form. The sidebar contains a 'Go To Applications' button and a list of actions: 'Available Queries', 'All Records', 'All Bookmarks', 'Common Actions', 'New Meter', 'Save Meter', 'Clear Changes', 'Create Report', 'More Actions', 'View Meter in Groups', 'Unit of Measure and Conversion', 'Duplicate Meter', 'Delete Meter', 'Add to Bookmarks', 'Run Reports', and 'Cognos Reporting'. The central form is titled 'Meter' and 'Where Used'. It contains several input fields: 'Meter' (with a dropdown set to 'OILPRESS' and a text field containing 'Oil Pressure'), 'Domain' (with a search icon), 'Meter Type' (with a dropdown set to 'GAUGE' and a text field containing 'Gauge meter'), 'Unit of Measure' (with a dropdown set to 'PSI' and a search icon), and 'Reading Type' (with a search icon).

## Steps to add a **Meter** to an Asset:

1. In the start center, go to Assets module.
2. Go to Asset application.
3. Search and open any asset.
4. Open Meters tab for that asset.
5. Click on Add New Meters button.
6. Search for the required meter and add.
7. Save.

Following is the snippet of a Meter added to an asset in Maximo 7.6.0:

The screenshot displays the IBM Maximo 7.6.0 user interface. At the top, the user is identified as Mike Wilson. The main navigation bar includes tabs for Asset, Spare Parts, Safety, Meters, Specifications, Features, Relationships, Work, Service Address, and Map. The 'Meters' tab is currently selected.

The 'Asset' section shows the following details:

- Asset ID: 11300
- Description: Reciprocating Compressor- Air Cooled/100 CFM
- Site: BEDFORD

The 'Meters' table below shows one entry:

Sequence	Meter	Description	Meter Type	Unit of Measure	Active?
1	PRESSURE	Pressure	GAUGE	PSI	<input checked="" type="checkbox"/>

The 'Meter Details' section for the selected meter includes the following information:

- Sequence: 1
- Meter: PRESSURE (Pressure)
- Meter Type: GAUGE
- Unit of Measure: PSI
- Active?:
- Last Reading: 97
- Last Reading Date: 4/8/15 9:34 AM
- Last Reading Inspector: WILSON
- Remarks: (empty field)

## CHAPTER 3

### PREVENTIVE MANAGEMENT

Reliability Centred Maintenance (RCM) is an analytical process used to determine an optimum maintenance strategy for physical assets. It is an advanced maintenance strategy for increasing asset availability by minimizing downtime caused by failures, reducing an asset in total cost of ownership and increasing overall equipment effectiveness. Following are terms used in maintenance:

- **Equipment-** These are the physical tangible items.
- **Assets-** These are the physical item equipment, component, machinery, facilities and infrastructure.
- **System-** A series of equipment that function together as a single unit such as production line, chilled water system etc.
- **Function-** These are the actions or requirements that a component/system must accomplish.

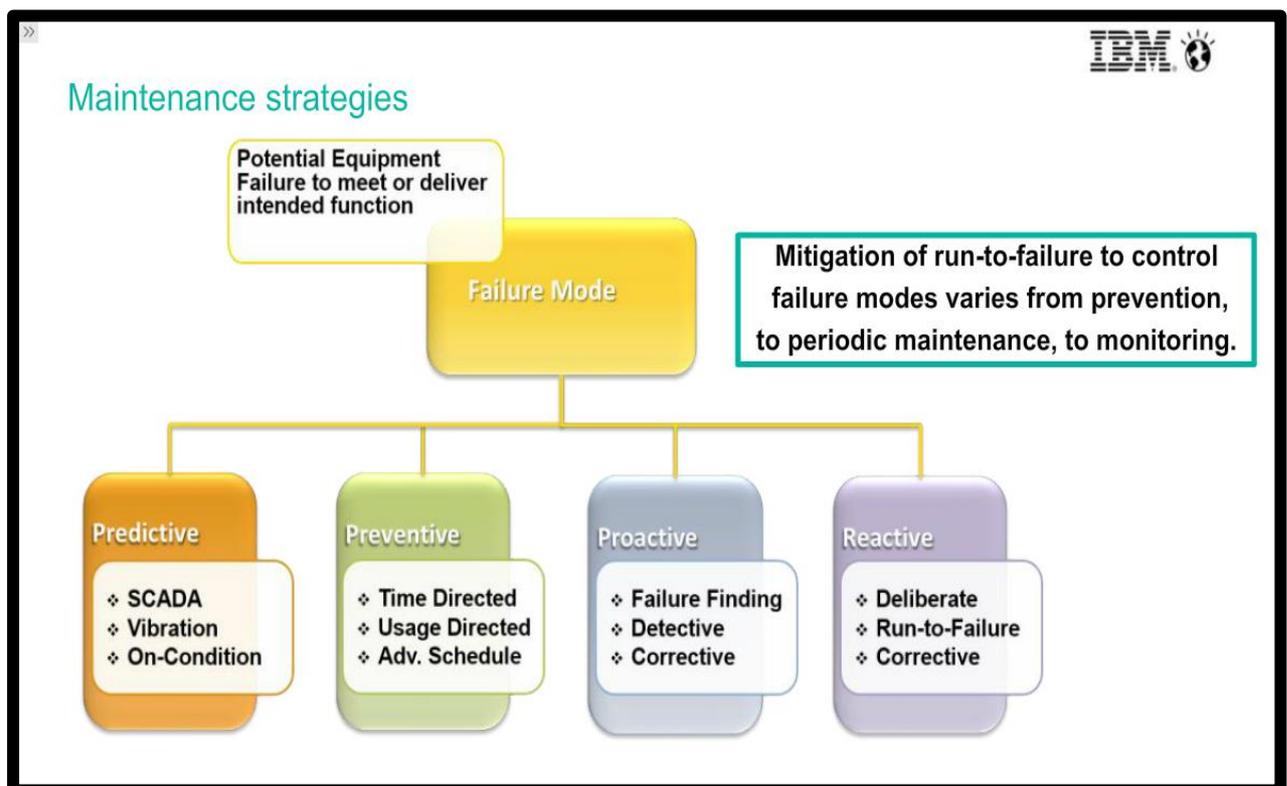
RCM acknowledges 3 principal maintenance strategies plus mitigation of run to failure to failure modes that are as follows:

- 1. Predictive Maintenance-** These are the maintenance task performed to detect impending failures by using both non-intrusive testing techniques such as visual inspection and performance to assess equipment condition. On condition techniques dictates that maintenance should only be performed when certain indicator shows signs of decreased performance and face below the established acceptable limits.

2. **Preventive Maintenance-** It is the process of performing maintenance tasks to minimize the probability and severity of lost or degraded functions. These tasks are performed on a recurring basis related to calendar time, equipment age or operating time without regard to equipment condition.
3. **Proactive Maintenance-** Failure finding tasks are performed on a regular basis to detect hidden failures that have yet to fail or have failed without giving evidence of pending failure.
4. **Reactive Maintenance-** In this run to failure is a deliberate decision to run the equipment to failure and fix it when it fails.

Failure Mode and Effective Analysis (FMEA) is a methodology central to the RCM process. It is structural format to ascertain a detail description of the asset function, the possible failures of the function, causes, etc.

Following is the snippet showing Maintenance Strategies in MAXIMO 7.6.0:



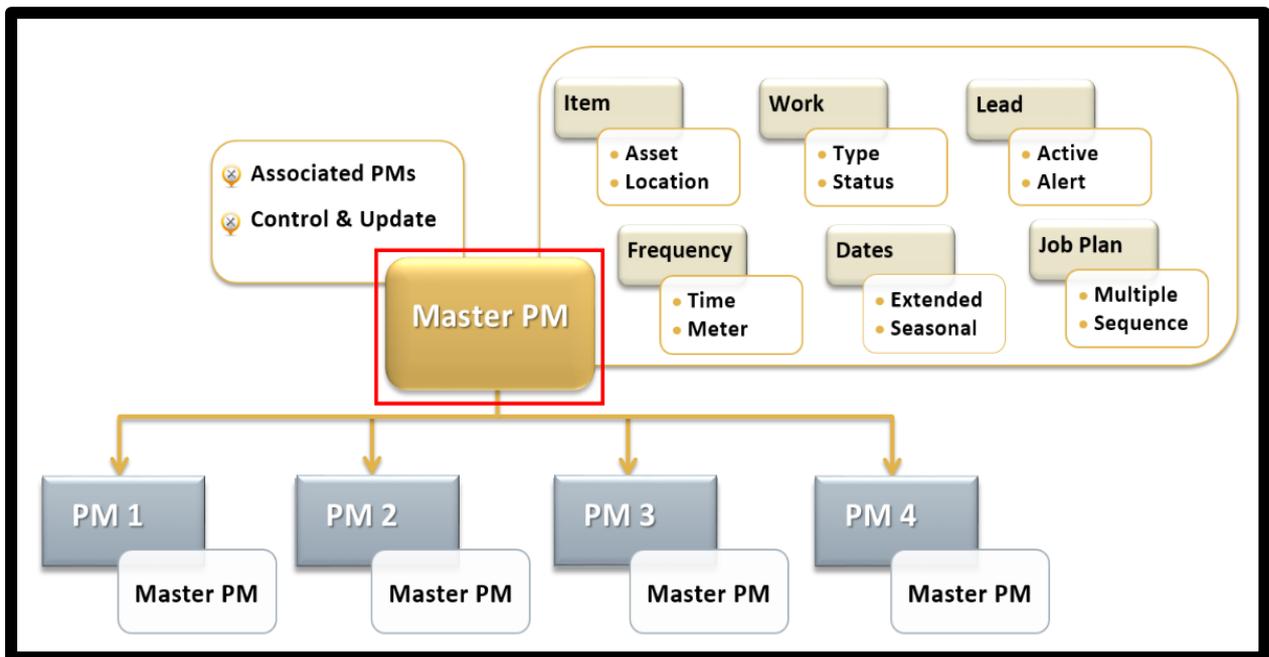
### 3.1 Preventive Maintenance (PM)

Preventive Maintenance is planned maintenance of facilities and equipment that is designed to improve equipment life and avoid any unplanned maintenance activity. We can create a PM for asset, location and route. PM's are the templates for preventive maintenance work orders that specify when, what and how often work must be performed. There are several methods in which to automate the process related to the generation of PM work orders:

- **Operator-** In this there is the selection of upcoming or almost due PM's. Setup and enablement of Alert Notifications for upcoming PM's in the Organisations application.
- **Crontask-** In this system generates the work orders based on frequency data and condition. Measure's Passage of Time and Meter Usage on a PM record. Measure's Unacceptable Level and Condition on a Condition Monitoring record.
- **Real Time-** In this system generates work orders at that moment of time.

Master PM's are PM's that serve as a template for its associated PM's i.e. whenever any change is made in the Master PM, it is automatically transferred to its associated PM's. Master PM's do not generate work orders.

Following is snippet showing Master PM and its associated PM's in MAXIMO 7.6.0:



### 3.2 Job Plan Sequencing

Every PM in Maximo has a job plan associated with it, with respect to the task for which that PM is created. Job plan can be defined as the steps that are required to be carried out in sequential/planned manner while performing a particular job. On the other hand, Job Plan Sequencing allows more than one job plan to be used with an individual PM, Job Plan Sequencing is used when we have different maintenance tasks with different intervals. Maximo determines which job plan to use whenever a work order is generated from a PM. There is one more term Nested Job Plan, this is used when tasks for each sequenced period are so different that you create individual job plans for each sequenced period. Rules for applying job plans according to situations:

- Use Individual Job Plan where tasks are dissimilar.
- Use Inclusive Job Plan where some prior tasks are included.
- Use Nested Job Plan when all prior tasks are included.

Following is the snippet depicting where to use Individual, Inclusive, and Nested Job Plan in MAXIMO 7.6.0:

Individual	Inclusive	Nested
<ul style="list-style-type: none"><li>• Monthly tasks</li><li>• Quarterly tasks do not include/require monthly tasks</li><li>• Annual tasks do not include/require monthly nor quarterly tasks</li></ul>	<ul style="list-style-type: none"><li>• Monthly tasks</li><li>• Quarterly tasks include some of the monthly tasks</li><li>• Annual tasks include some of the monthly and / or quarterly tasks</li></ul>	<ul style="list-style-type: none"><li>• Monthly tasks</li><li>• Quarterly tasks include all of the monthly tasks</li><li>• Annual tasks include all of the monthly tasks, quarterly tasks, or both</li></ul>

Steps to create a **PM** with **Sequenced Job Plan** for monthly, semi-annually and annual work:

1. In the start center, go to Preventive Maintenance module,
2. Go to PM application.
3. Click on New PM button.
4. Enter name in PM filed.
5. Enter value in Location field.
6. Go to the Frequency tab.
7. In Time Based Frequency tab, enter 1 in Frequency field and months in Frequency Units field and enter other details as per requirement.
8. Go to Seasonal Dates tab, uncheck the days on which you don't work.
9. Go to Job Plan Sequence tab.
10. Click on New Row for Job Plan Sequence.
11. Select the Job Plan and enter 1 in Sequence field to run it monthly,
12. Again click on New Row, select the Job Plan and enter 6 in Sequence field to run it semi-annually.

13. Again click on New Row, select the Job Plan and enter 12 in Sequence field to run it annually.

14. Change status to active.

15. Save.

Following is the snippet of Sequenced Job Plan in a PM in Maximo 7.6.0:

The screenshot displays the IBM Maximo Preventive Maintenance (PM) configuration interface. The main window is titled "Preventive Maintenance" and shows a notification "BMXAA42051 - Record has been saved." The user is identified as "Mike Wilson".

The interface includes a search bar for "Find PM" and a navigation menu with options like "Go To Applications", "Available Queries", and "Common Actions". The "Job Plan Sequence" tab is selected, showing the following details:

- PM: 1029, My PM - breaker maintenance
- Site: BEDFORD, Status: DRAFT
- Location: BR431, Motor- 10hp/1750rpm/TEFC/254T Frame/440v/3ph/60hz
- Asset: (empty), Storeroom: (empty)
- Job Plan: BREAKER01, Breaker Inspection

The "Job Plan Sequence" table is displayed below, showing three rows:

Job Plan	Description	Sequence
BREAKER01	Breaker Inspection	1
BREAKER01	Breaker Maintenance	6
BREAKER01	Breaker Overhaul	12

The "Details" section shows the selected Job Plan: BREAKER01, Breaker Inspection, with Sequence: 1. A "New Row" button is visible at the bottom right of the table.

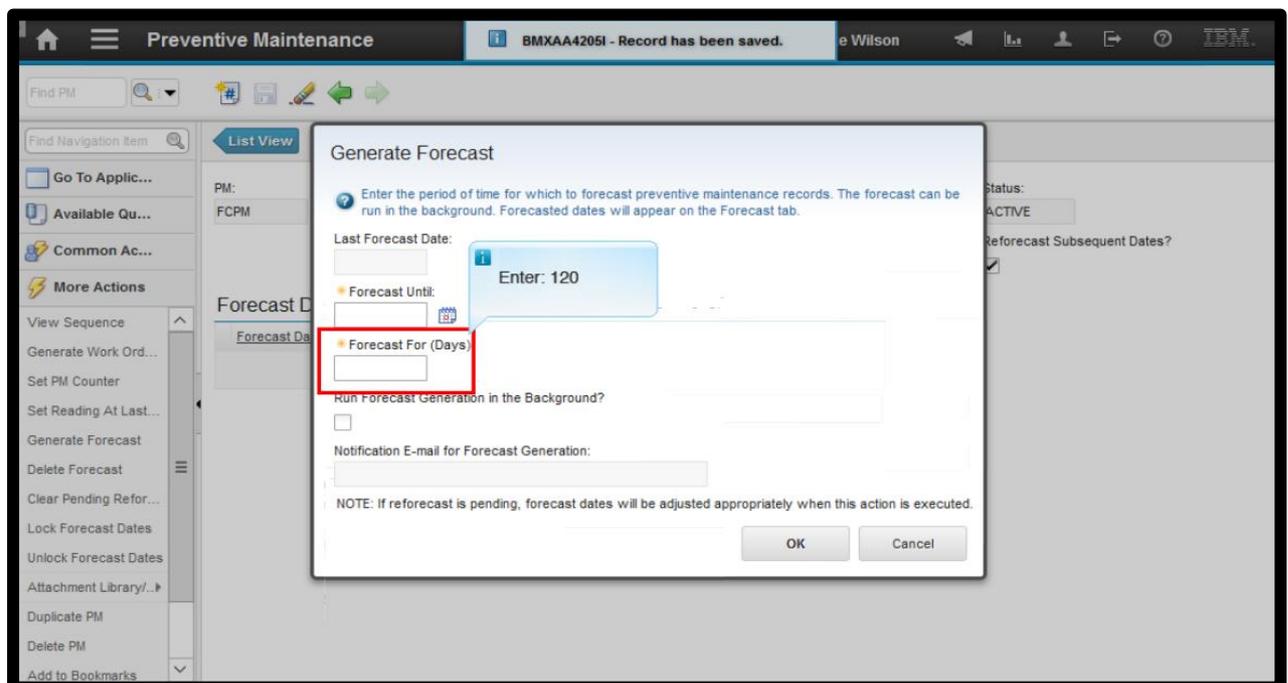
### 3.3 PM Forecast

Forecast means predicting or estimating a future event or trend. PM forecasting enables the maintenance organization to generate projected due dates for anticipated PM work without having to generate work orders, this can be generated by PMForecast cron task or by using Generate forecast.

Steps to add a **Forecast** to a PM:

1. In the start center, go to PM module.
2. Go to PM application.
3. Select any PM (For our instance we selected FCPM).
4. Go to Forecast tab.
5. Click on Generate forecast in more actions and enter details as per need.
6. Check the Reforecast Subsequent check box.
7. Save

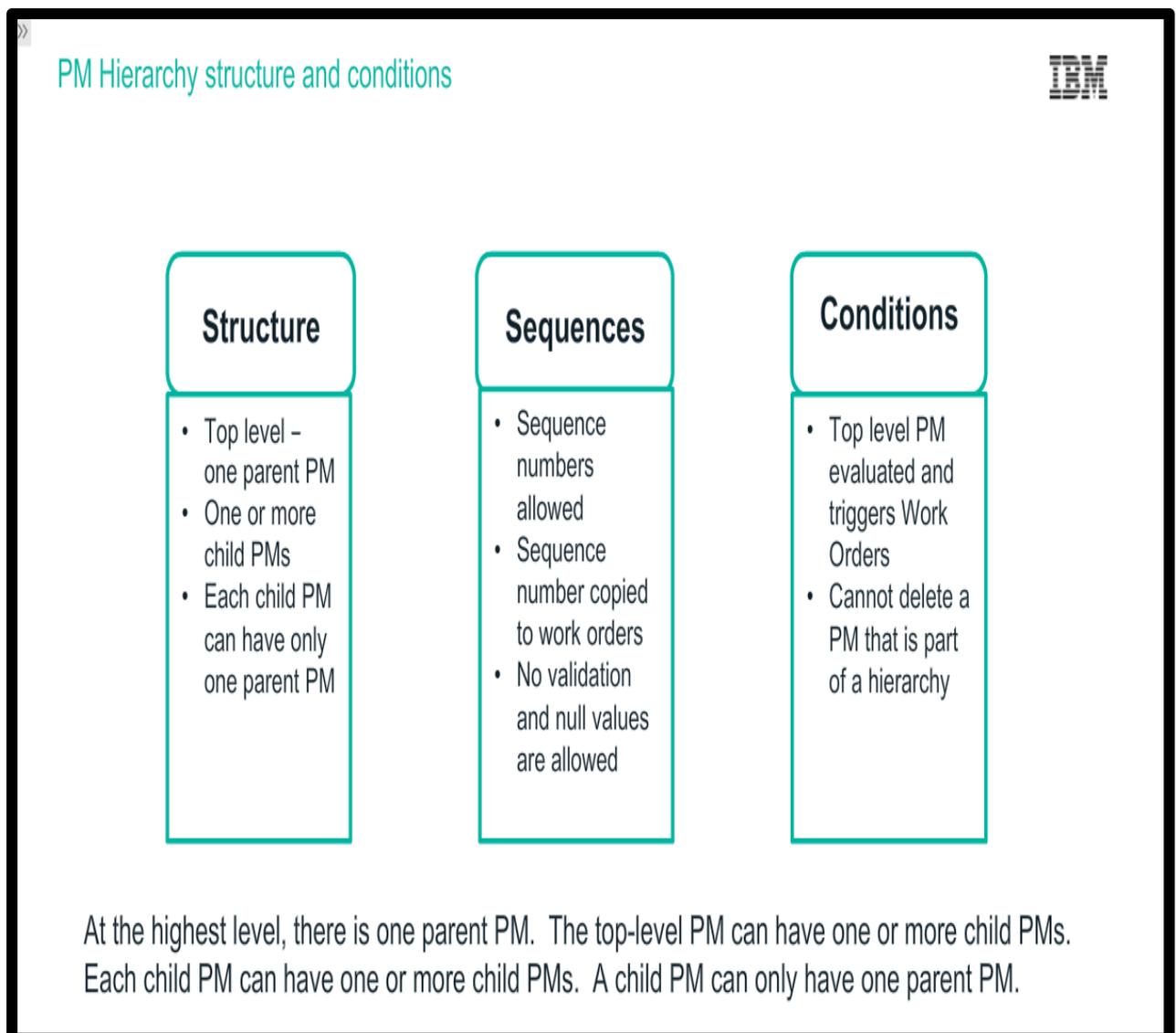
Following is the snippet of Generate Forecast dialog box in MAXIMO 7.6.0:



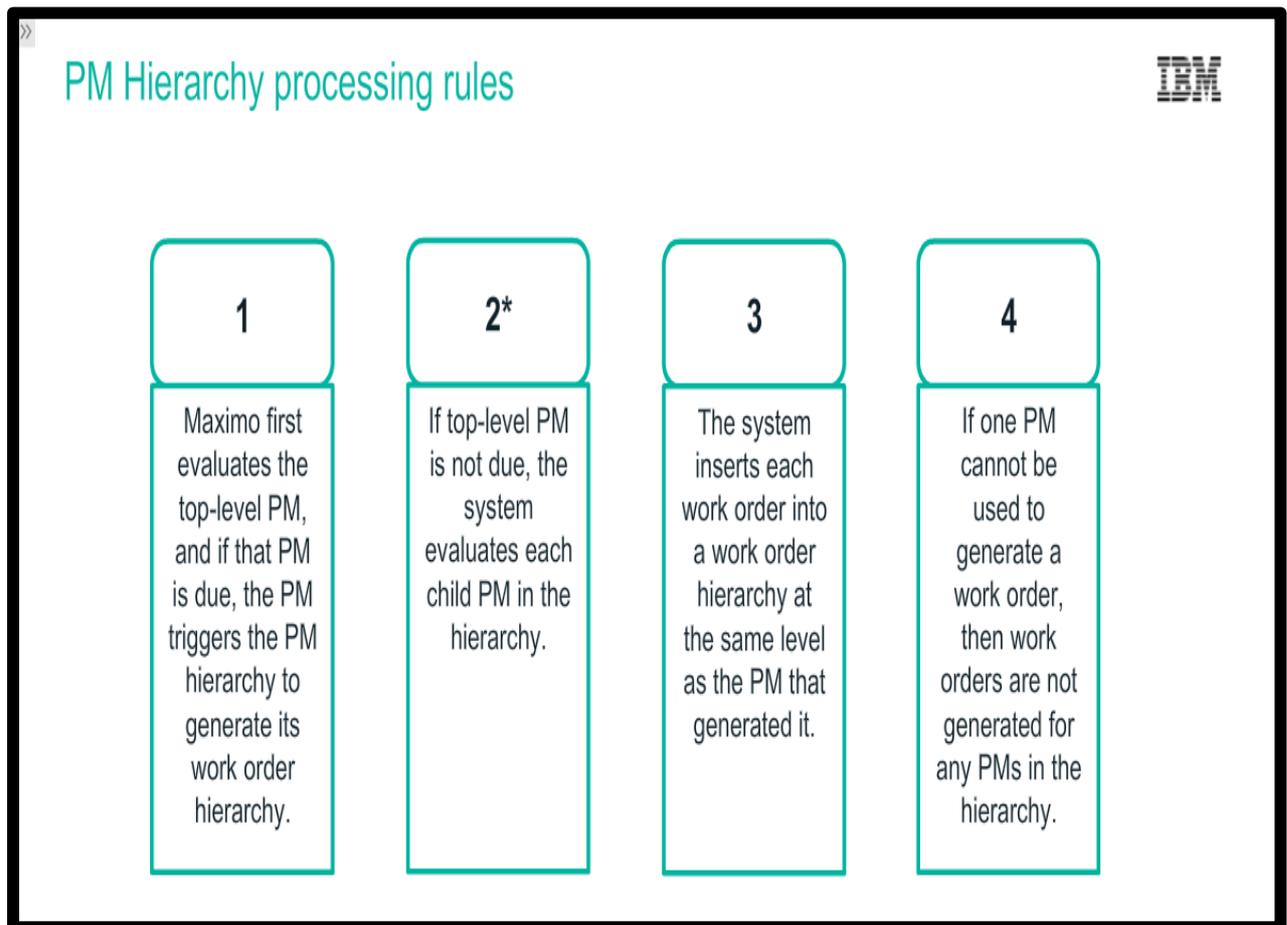
### 3.4 PM Hierarchies

PM Hierarchies generate an organised group of work orders for an asset or location hierarchy and work is typically organised this way for inspections and large projects. A PM Hierarchy is a group of PM's with a parent-child relationships and you use a PM Hierarchy to schedule the group of work orders.

Following is the snippet depicting PM Hierarchy Structure and Conditions in MAXIMO 7.6.0:



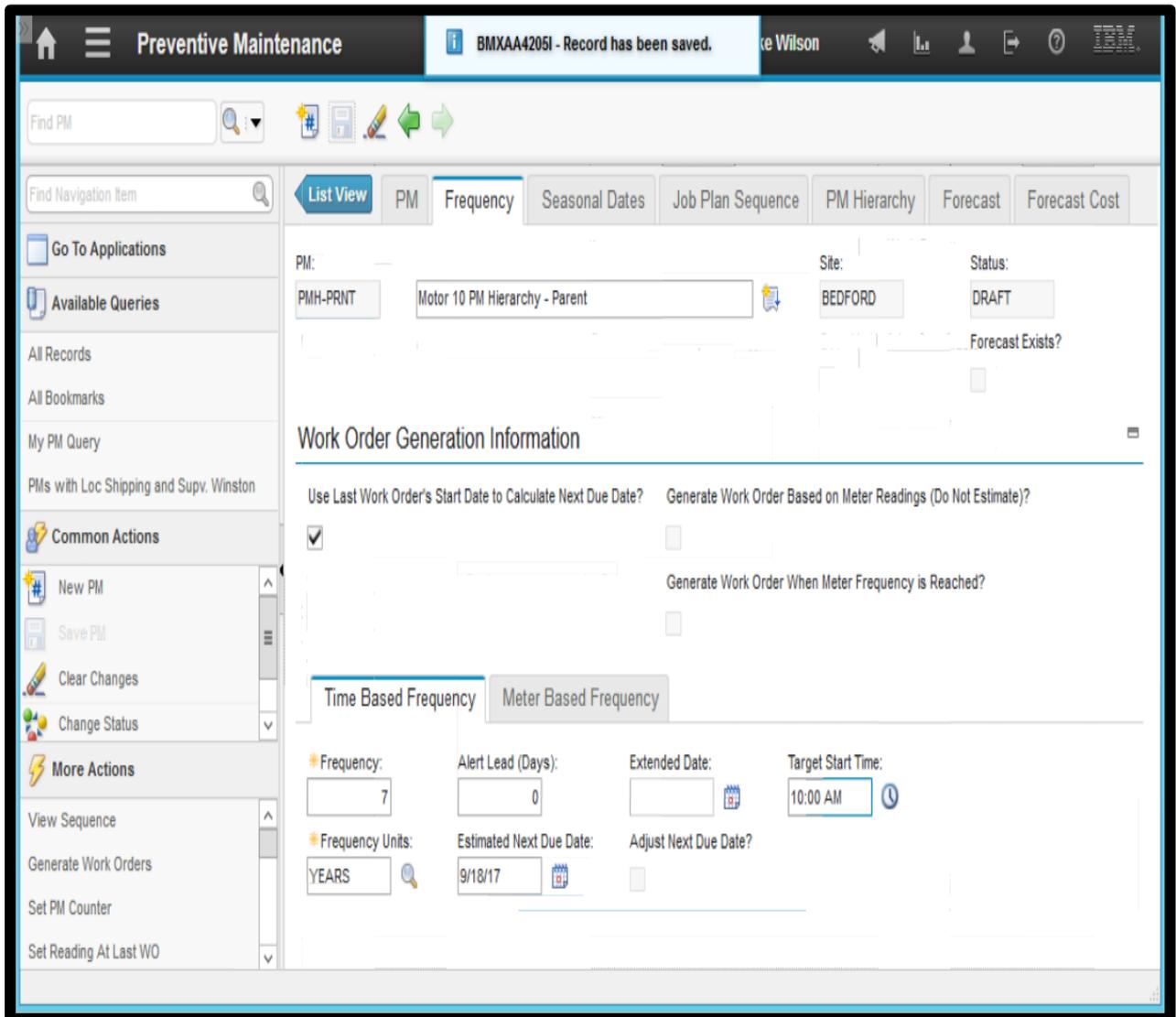
Following is the snippet of PM Hierarchy Processing Rules in MAXIMO 7.6.0:



Steps to create a **Top level/Parent PM**:

1. In the start center, go to PM module.
2. Go to PM application.
3. Click on New PM button.
4. Enter name in PM field (pmh-prnt).
5. Select asset in Asset field.
6. Enter PM in Work-Type field.
7. Check Required Asset Downtime check-box.
8. Select a value in GL Account field.
9. Go to Frequency tab.
10. Enter the details in fields as per need in Time Frequency sub-tab.
11. Save

Following is snippet of the Parent PM created in MAXIMO 7.6.0:

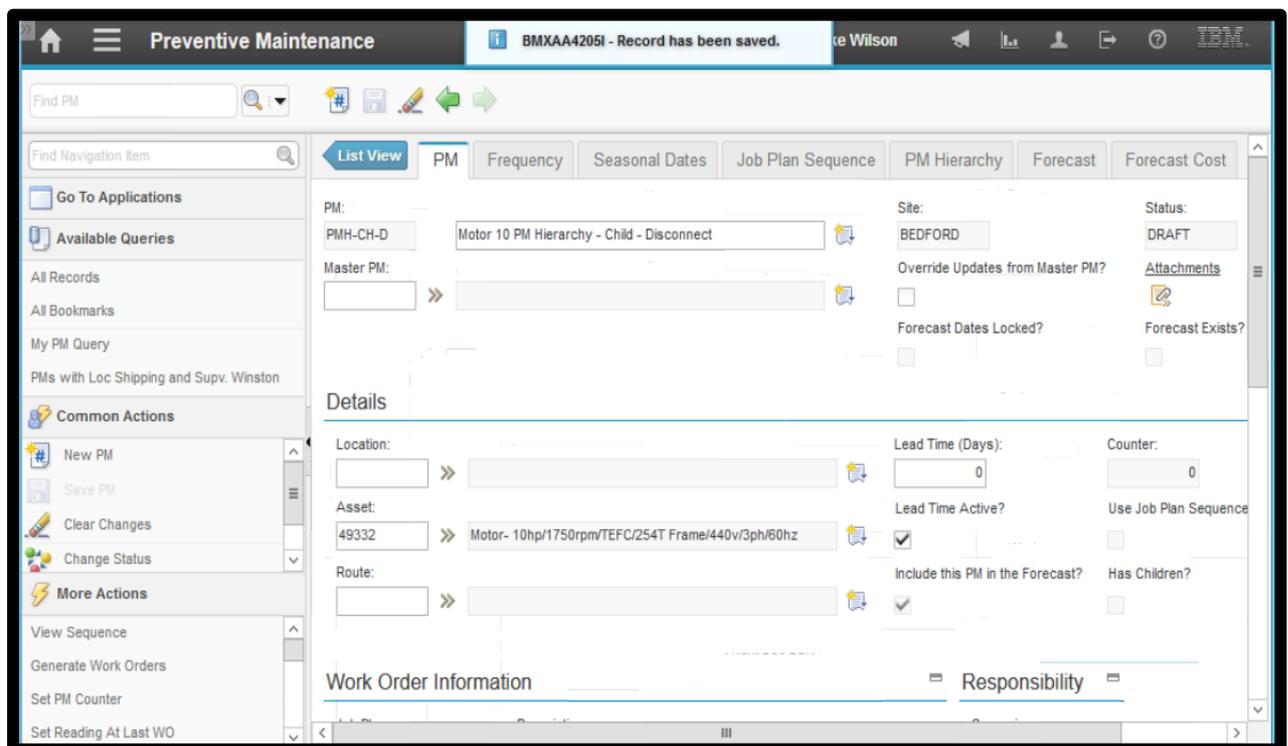


Steps to create **Child PM** for the above Parent PM:

1. In the start center, go to PM module.
2. Go to PM application.
3. Click on New PM button.
4. Enter name in PM field (pmh-ch-d).
5. Enter the same asset as entered in Parent PM above.
6. Select a value in Job Plan field.
7. Enter PM in Work-Type field.
8. Enter the GL Account as entered in Parent PM.

9. Go to Frequency tab.
10. Enter the details as in Parent PM.
11. Go to PM Hierarchy tab.
12. In the Parent field enter Parent PM name (pmh-prnt).
13. Similarly create other child by using Duplicate PM option in more actions.
14. Save
15. Change the status of Parent PM to Active and select Roll New Status To All Child PM's check-box.

Following is the snippet of Child PM in MAXIMO 7.6.0:



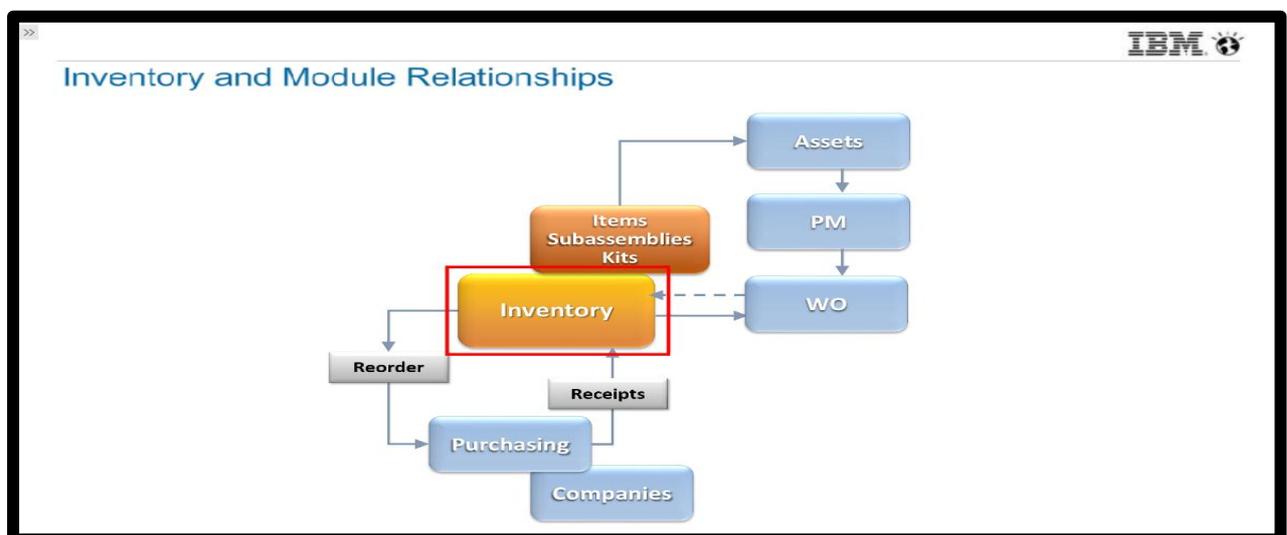
## CHAPTER 4

# INVENTORY MANAGEMENT

Inventory Management tracks materials needed for maintenance related work, it allows to track items in Stock, Replenish, Balances, Procurement and Transactions. This all helps to identify when item falls below user-defined reorder points, perform cycle counts and make balance adjustment, create purchase requisitions and purchase orders to restock needed items. Inventory Management helps balancing two opposing objectives:

- Maximize the availability of items for future work tasks and reduce excess inventory balances with their relative carrying cost.
- To find a balance of inventory stock that lets the maintenance work be performed with minimum delays due to unavailable materials and still keep unnecessary or seldom used items of the shelf.

Following is the snippet depicting Inventory relationship with other modules in MAXIMO 7.6.0:



Inventory application in Inventory module is used to manage and store information about all aspects of inventory. It enables one to keep track of inventory items, it is also used to enter, display and update information for a specific item at a specific storeroom location. Organizations consume the items in inventory storerooms in different ways like Issues, Transfers and Returns. Different costing methods available in the Inventory application are:

- **Average Cost-** It is average cost of inventory during a period, it is computed by dividing the cost of goods in inventory by the number of goods in inventory.
- **LIFO (Last In First Out)-** This costing methods uses the receipt cost of the items that were most recently purchased and are newest in the storeroom.
- **FIFO (First In First Out)-** This costing method uses the receipt cost of the oldest items in the storeroom.
- **Standard Cost-** It is the estimated cost of the material, labor, overhead and other costs for each unit of production or purchase in a given accounting period.

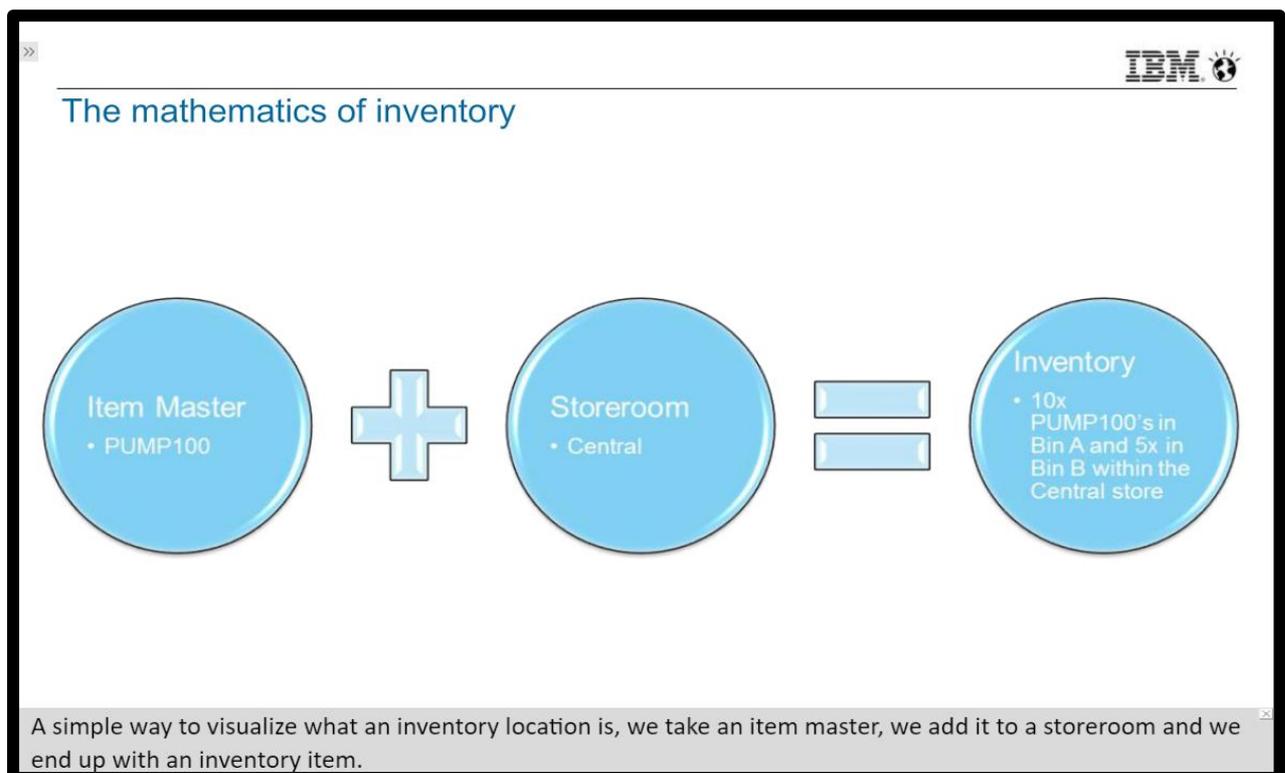
## 4.1 Inventory Locations

Inventory Locations are used to issue items and tools, transfer items and tools and stock control. There are 4 types of inventory locations in MAXIMO 7.6.0:

- **Storeroom-** Each storeroom can be broken into bin system, a bin represents a specific location within a storeroom and is broken into three parts: a row, rack and shelf such as AA-22-BC. A storeroom is used a place to reorganize stock levels held within a specific location.

- **Vendor**- These locations are used when the rotatable items are sent off site repair, this again for total life tracking and accumulating repair cost.
- **Labor**- These locations are used to record an internal issue of specialized tools or personal protective Equipment (PPE) rather than consumables from a storeroom.
- **Courier**- These locations are generally used for transiting items from one storeroom to another, where it is then received in. This allows for total tracking of all the items throughout its life.
- **Holding**- These locations are used to similar to a bond store where an item has been received, but can't go into its final location until it has been inspected and/or serialized into an asset.

Following is the snippet depicting The Mathematics of Inventory in MAXIMO 7.6.0:



## Steps to create a **New Storeroom**:

1. In the start center, go to Inventory module.
2. Go to Storerooms application.
3. Click on New Storeroom button.
4. Enter name in the Location field (mystore).
5. Select a value in GL Account field.
6. Select a value in Shrinkage Account field.
7. Select a value in Cost Adjustment Account field.
8. Select a value in Invoice Variance Account field.
9. Select a value in Receipt Account field.
10. Select a value in Currency Account field.
11. Select a value in Tool Control Account field.
12. Select default storeroom check-box.
13. Save.

Following is snippet of the New Storeroom in MAXIMO 7.6.0:

The screenshot displays the 'New Storeroom' form in the MAXIMO 7.6.0 application. The form is titled 'Storerooms' and shows the following fields and values:

- Location:** MYSTORE (selected), My storeroom (text input)
- Site:** BEDFORD (selected)
- GL Control Account:** 6000-200-000 (selected)
- Shrinkage Account:** 6000-200-000 (selected)
- Cost Adjustment Account:** 6000-200-000 (selected)
- Invoice Variance Account:** 6000-200-000 (selected)
- Receipt Variance Account:** 6000-200-000 (selected)
- Currency Variance Account:** 6000-200-000 (selected)
- Purchase Variance Account:** (empty)
- Tool Control Account:** 6000-200-000 (selected)
- Recent Lead Time Weight in %:** 10
- Ship to Labor:** (empty)
- Ship to Address:** BEDFORDMAN (selected), Main addr Bedford MA Site of EAGLE Inc. NA
- Bill to Labor:** KATHYB (selected), Kathy Buckner
- Default Storeroom?:**
- Use in PO/PR?:**

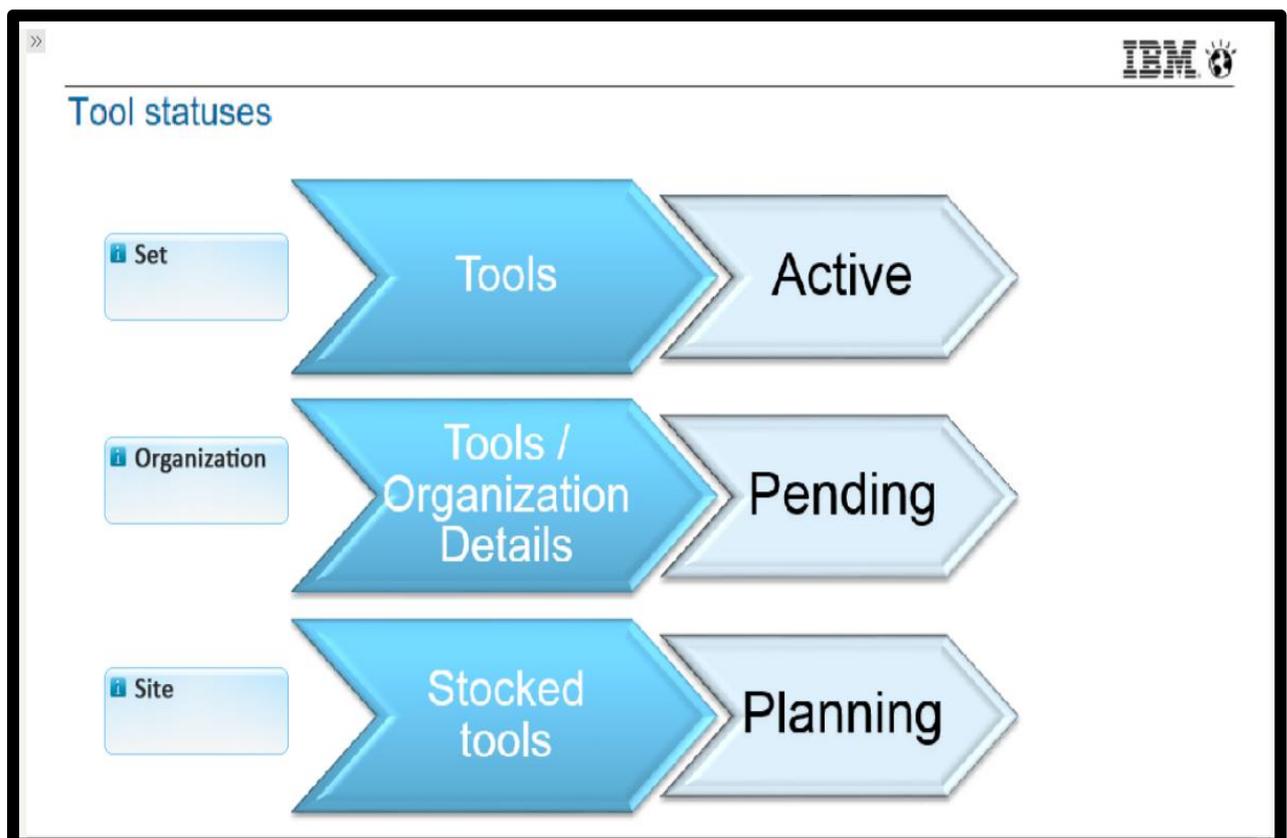
The interface includes a navigation pane on the left with 'New Storeroom' highlighted, and a top bar with the user name 'Mike Wilson'.

## 4.2 Stock Tools in Inventory

Tools are devices or can be referred to as equipment's that are used to carry out a certain task or function. Tools range from hammers to vehicles, they can be required to open, examine, clear and test. In Maximo tools are non-consumables and can be assigned a qualification. All tools are charged at hourly usage rate that is set at organizational level. There is a difference between Tool and Stock Tool in Maximo and they are as follows:

- Tools are in Item Master application while Stock Tools are in Inventory application or in Items in Storerooms.
- Tools are at set level can be used by one or more organization while Stock Tools are at site level.

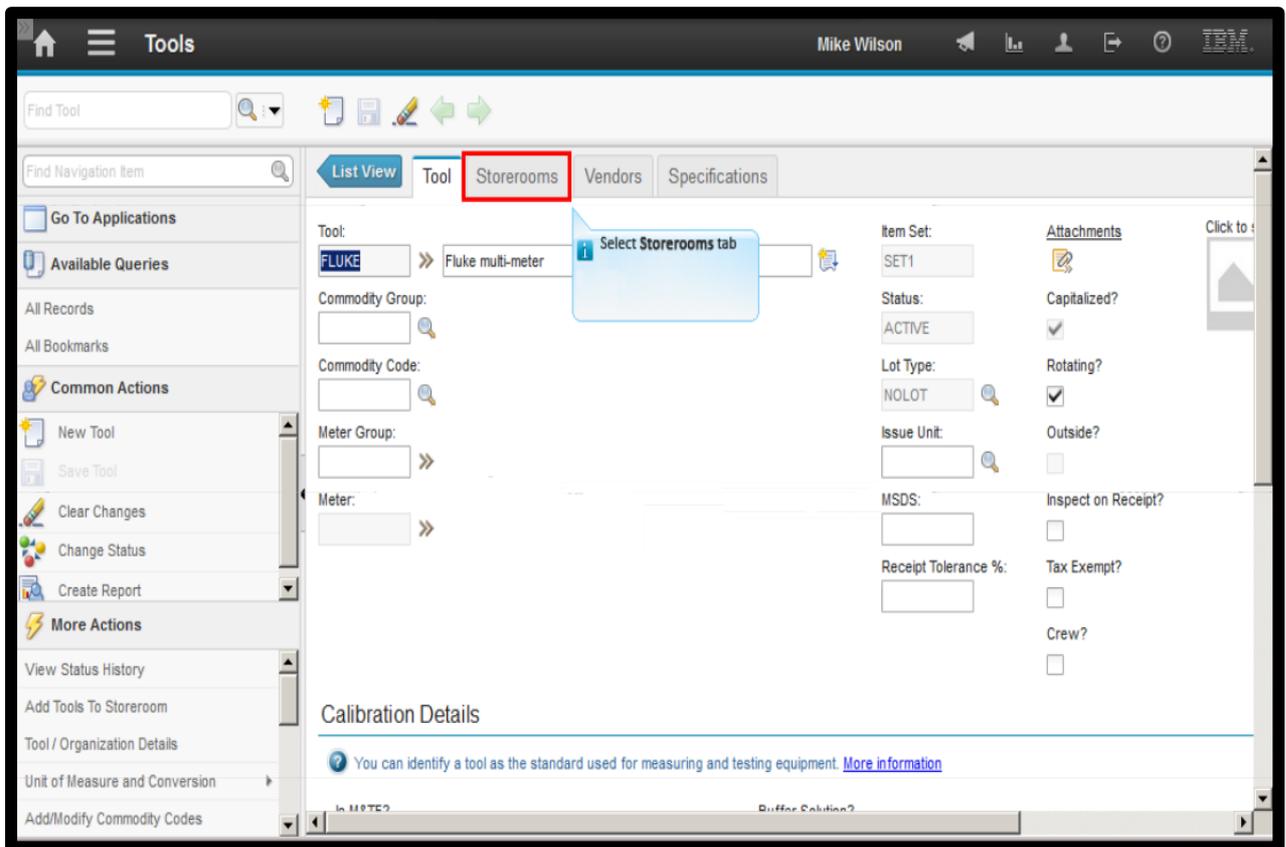
Following is the snippet depicting Tool statuses in MAXIMO 7.6.0:



Steps to create a **New Tool**:

1. In the start center, go to Inventory module.
2. Go to Tools application.
3. Click on New Tool button.
4. Enter name in Tool field (fluke).
5. Check Rotating check-box.
6. Save.
7. In more actions, select Tools/Organization Details.
8. Enter a value in GL Account field.
9. Enter a value in Tool Rate field.
10. Click Ok and then click on Add Tools to Storeroom.
11. Select the storeroom.
12. In Default Bin field enter Tools.
13. Enter a value in Issue Unit field (each) and click Ok.
14. Change status to Active.
15. Now go to Storerooms application.
16. Go to Vendors tab, click on New Row.
17. Enter a name in Vendor field.
18. Enter a value in Order Unit field (box).
19. Save.

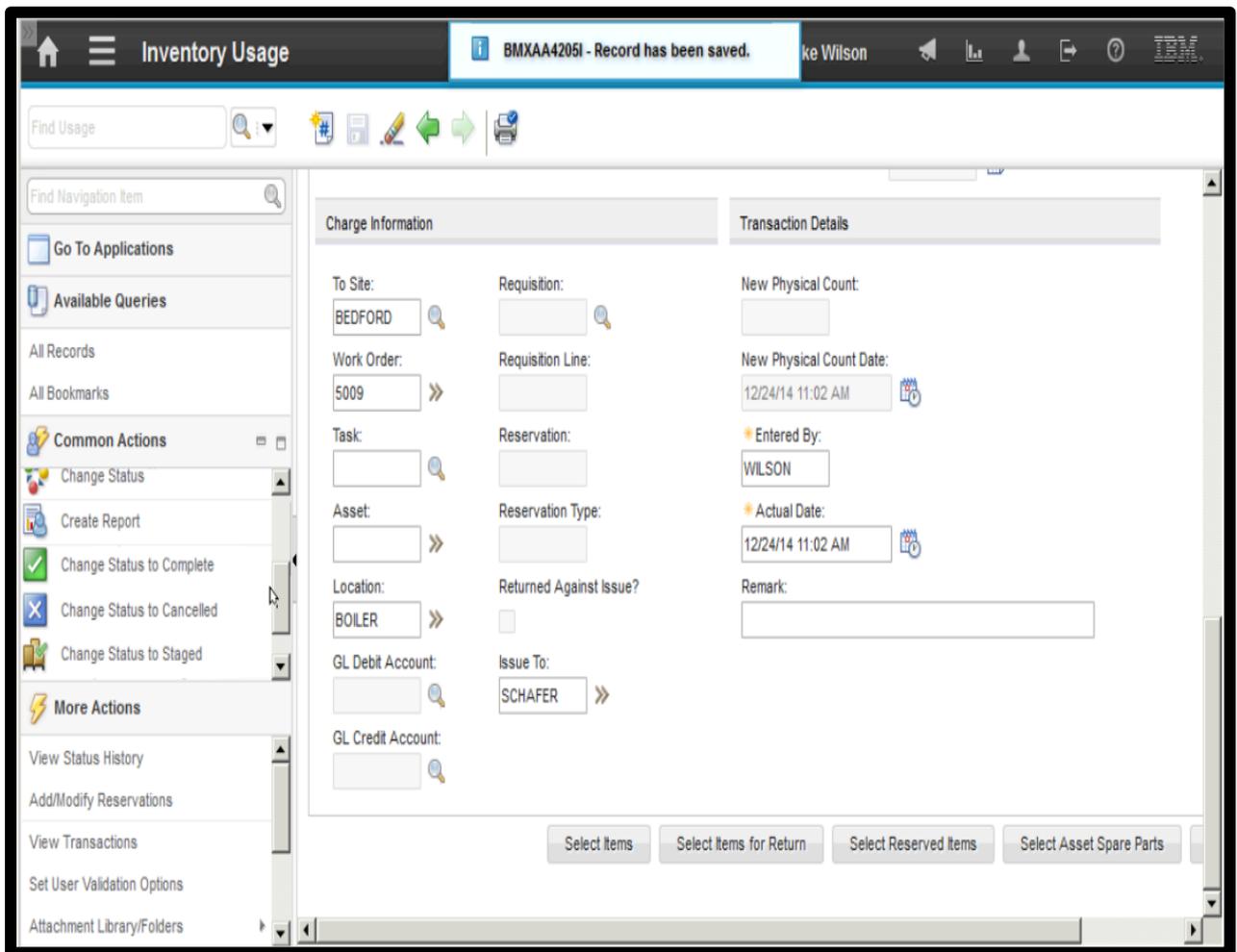
Following is the snippet of the New Tool in MAXIMO 7.6.0:



Steps to **Issue** the tool to a **Person** or **Work Order**:

1. In the start center, go to Inventory module.
2. Go to Inventory Usage application.
3. Click on New Inventory Usage button.
4. Enter name in Usage field.
5. Enter a value in From Storeroom field (Garage).
6. Click on Select Items button.
7. Select the needed items (fluke).
8. Click on detail menu button.
9. Select a value in Rotating Asset field.
10. Select a value in Work Order field.
11. Enter a value in Issue To field (Schafer).
12. Change status to Complete.

Following is the snippet of New Inventory Usage in MAXIMO 7.6.0:



### 4.3 Inventory Cycle Counts

Cycle Counts is a process of continually validating the accuracy of the inventory in the system on a daily or weekly basis. There are some principles to perform a Cycle Count and that are as follows:

1. List items to count.
  - a) No current balances needed.
  - b) Export to a mobile solution or use printed sheet.
2. Perform Cycle Count.
  - a) Record actual count.

b) Update the physical count.

**3. Review Discrepancies.**

- a) Recount where necessary.
- b) Investigate further if needed.

**4. Reconcile Balances.**

- a) Confirm the cycle count.
- b) Maximo update current balance.

Cycle Counts in Maximo may use ABC concept, it is a method in which we categorize inventory items into three groups: fast moving, average and low moving. This concept also identifies the items that represent the greatest investment for the company in terms of monetary value and turnover rate. Breakpoints percentage based on type are as follows:

- A type has a breakpoint of 30%.
- B type has breakpoint of 30%.
- C type has breakpoint of 40%.

A type has the highest valued items and lowest turnover while C type has the lowest valued item and highest turnover.

Following is the snippet depicting ABC concept in MAXIMO7.6.0:

## The ABC concept

- All items in a store need to be counted at least once or more a year.
- ABC concept spreads the load over the year

**A**

- > 5 per annum
- Count every 30 days

**B**

- >3 <5 per annum
- Count every 60 days

**C**

- <3 per annum
- Count every 90 days

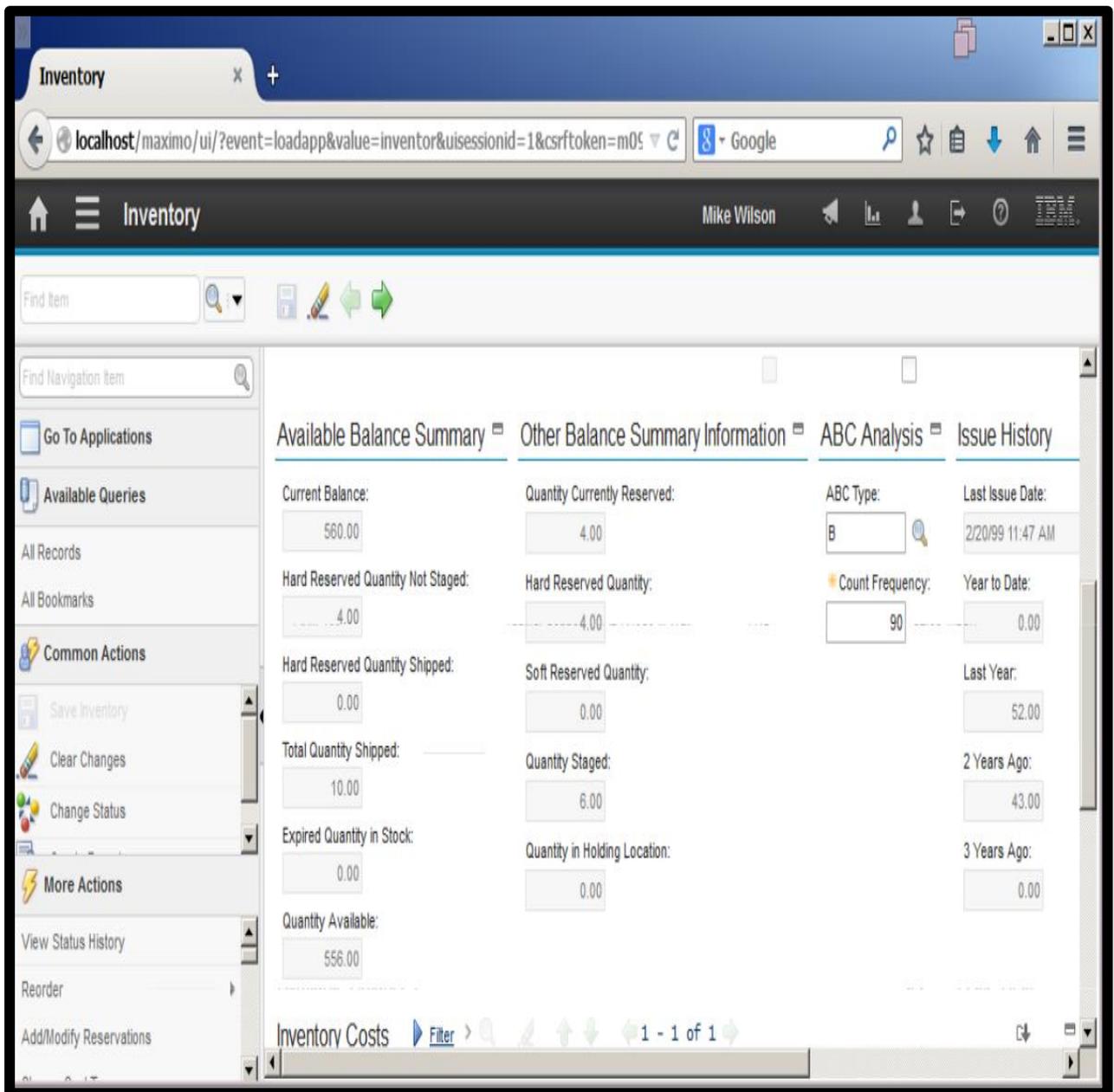
**N**

- Do not count
- Normally “insurance” spares or high value/unique items

Steps to perform **Cycle Count** on a rotating item:

1. In the start center, go to Inventory module.
2. Go to Inventory application.
3. Select any value in Item field (560-00).
4. In more actions, go to Inventory Adjustments.
5. Select Physical Count option.
6. Enter a value in New Count field.
7. In more actions, go to Inventory Adjustments.
8. Select Reconcile Balances option.

Following is the snippet of Cycle Count performed in MAXIMO 7.6.0

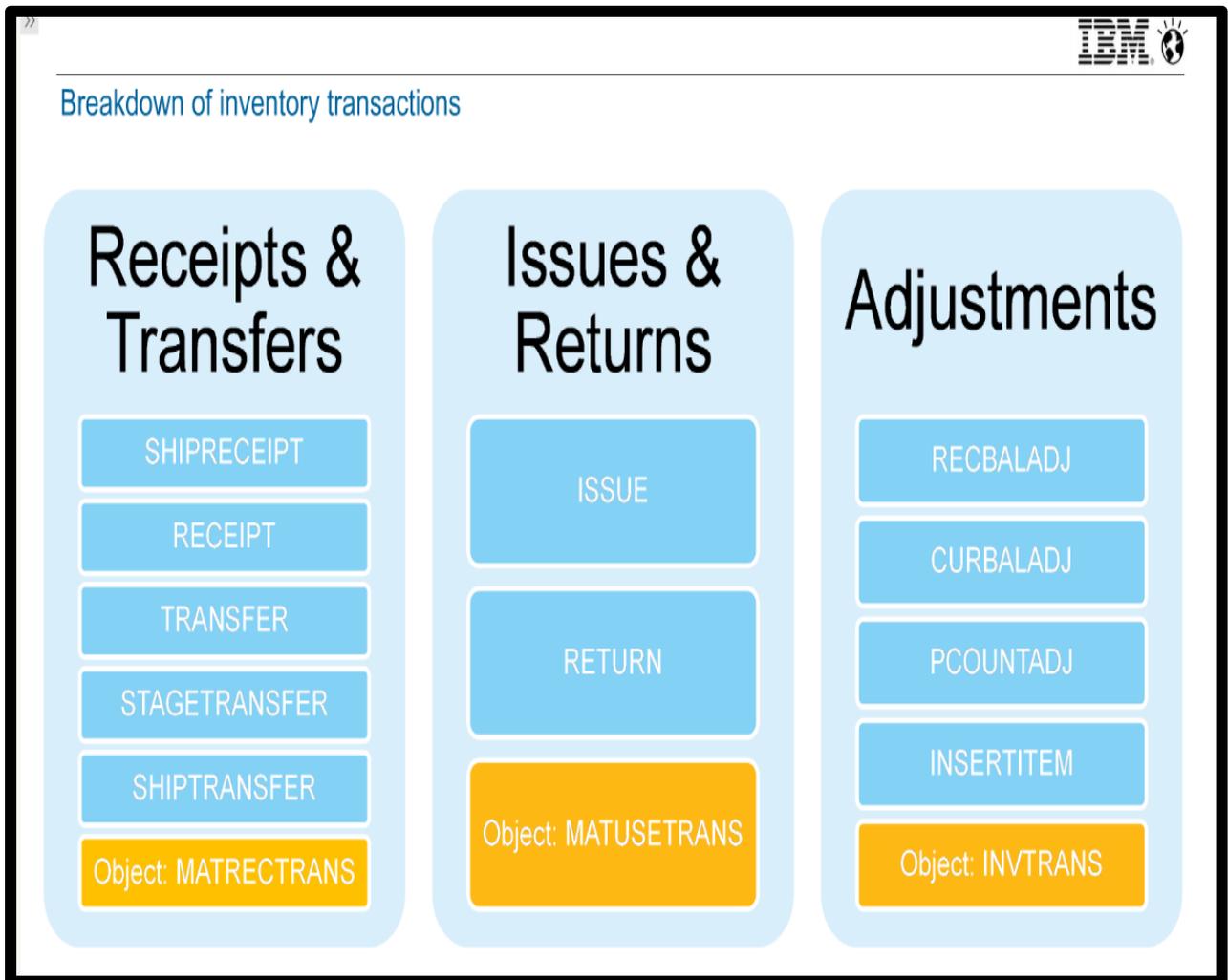


## 4.4 Inventory Transactions

Inventory Transactions are the transactions that are related to the incoming or outgoing of the items to and from inventory. There are three types of transactions in inventory and they are as follows:

- **Receipts and Transfers**- These transactions are about recording purchase receipts and shipments receipts i.e. receiving an item into a storeroom or transferring from one storeroom to another. It is instant for transfer type or intermediate for stage transfer.
- **Issues and Returns**- These transactions deal with items that have been issued from a storeroom or returned to a storeroom.
- **Adjustments**- these transactions come from adding a new item into the storeroom or entering a cycle count value i.e. physical count or have been adjusting the current balance.

Following is the snippet depicting the Breakdown of Inventory Transactions in MAXIMO 7.6.0:



There are four types of Adjustments and that are as follows:

1. **INSERTITEM**- It is when the item was first created.
2. **PCOUNTADJ**- It is when item was done and counted as a part of the stock.
3. **CURBALADJ**- It is when a manual adjustment of its balance in the store was performed.
4. **RECBALADJ**- It is result of performing a reconciliation of the physical count from the stock take.

Implications involved in Inventory Transactions are as follows:

1. A current balance adjustment will attract transaction that is expensive to company's bottom line.
2. An issue will decrease store's value.
3. A return will increase store's value.
4. A receipt will increase store's value.
5. A transfer will decrease store's value.
6. A physical count adjustment will do nothing in store's value.

## 4.5 Reservations

Reservations are made in Maximo to ensure that inventory items and tools can be replenished in the inventory stock on time. There are three types of reservation in Maximo:

- **Hard Reservation**- It is a request for materials that is defined by the need for an item within a specific time frame, this type of reservation remains unless manually changed by the requester. **Backorder Reservations** indicates that an inventory item can have only hard reservation, in-order to use Backorder Reservation, organization

must disallow negative availability. Backorder Reservation can be set manually or automatically.

- **Soft Reservation-** It is a request for material that is not time sensitive and remains until manually changed by the requester.
- **Automatic Reservations-** It is used for the system to decide whether it needs Soft or Hard Reservation based on the date on which that material is needed.

Following is the snippet depicting types of Reservations and their information in MAXIMO 7.6.0:

The screenshot shows the 'Reservation Types' configuration page in MAXIMO 7.6.0. It includes a top navigation bar with 'Labor', 'Materials', 'Services', and 'Tools'. Below this is a 'Materials' filter section and a table showing reservation details for item 1002. A dropdown menu for 'Reservation Type' is open, showing options: AUTOMATIC, HARD, and SOFT. To the right, a callout box for 'HARD' explains that it is user-set via inventory settings and requires a specific date, with a checkbox for 'Requires hard reservation on use?' checked. A callout for 'SOFT' explains it is user-set and not subject to a time frame. A callout for 'AUTOMATIC' explains it is determined via a cron task named 'InvResResTypeUpdateCron Task'. Below the main interface is a table titled 'Ad Modify Reservations' with columns for 'Item', 'Reservation Type', 'Storeroom', 'Reserved Quantity', and 'Work Order'. The table lists several reservation types: BACKORDER, APHARD, HARD, APSOFT, and SOFT. A red box highlights the 'Reservation Type' column in this table.

Item	Reservation Type	Storeroom	Reserved Quantity	Work Order
1109	BACKORDER	Legal Pump	1.00	1002
1108	APHARD	ch Dia	1.00	1002
1107	HARD	CENTRAL	1.00	1002
1080	APSOFT	In D X.030	1.00	2004
1076	SOFT	CENTRAL	5.00	1035

Following is the snippet depicting Types of Automatic Reservations in MAXIMO 7.6.0:

## Automatic Reservation Types



APHARD  
APSOFT

InvResResTypeUpdateCronTask

- AP (Automatic Processing) Reservation type (APHARD or APSOFT) determination is based on the required date

BACKORDER

- Org. disallows negative balance
- Balance on-hand is insufficient to satisfy a hard reservation

- Specific to HARD or APHARD
- System cannot create reservation in excess of what can be satisfied by the Available balance

Steps to set **Hard Reservation** for an item:

1. In the start center, go to Inventory module.
2. Go to Inventory application.
3. Select any item in Item field (1002).
4. Check Requires Hard Reservation on Use check-box.
5. Go to Reorder Details tab.
6. Click on View Details icon.
7. Go to Work Order Tracking application.
8. Select work order in Work Order field (RESXP).
9. Go to Plans tab.
10. Click on View Details icon of (1002) item.
11. Select Hard Reservation in Reservation Type field.
12. Change status to Approved.

Following is the snippet of Item and corresponding Work Order set to Hard Reservation in MAXIMO 7.6.0:

The screenshot displays the 'Work Order Tracking' interface in MAXIMO 7.6.0. The user is Mike Wilson. The interface is divided into several sections:

- Header:** 'Work Order Tracking' with user name 'Mike Wilson' and navigation icons.
- Search Bar:** 'Find Work Order' with search and filter icons.
- Navigation:** 'Labor', 'Materials', 'Services', 'Tools' tabs.
- Materials Table:** A table with columns: Task, Item, Description, Quantity, Unit Cost, Line Cost, Storeroom, and Direct Issue?. The table shows three items:
 

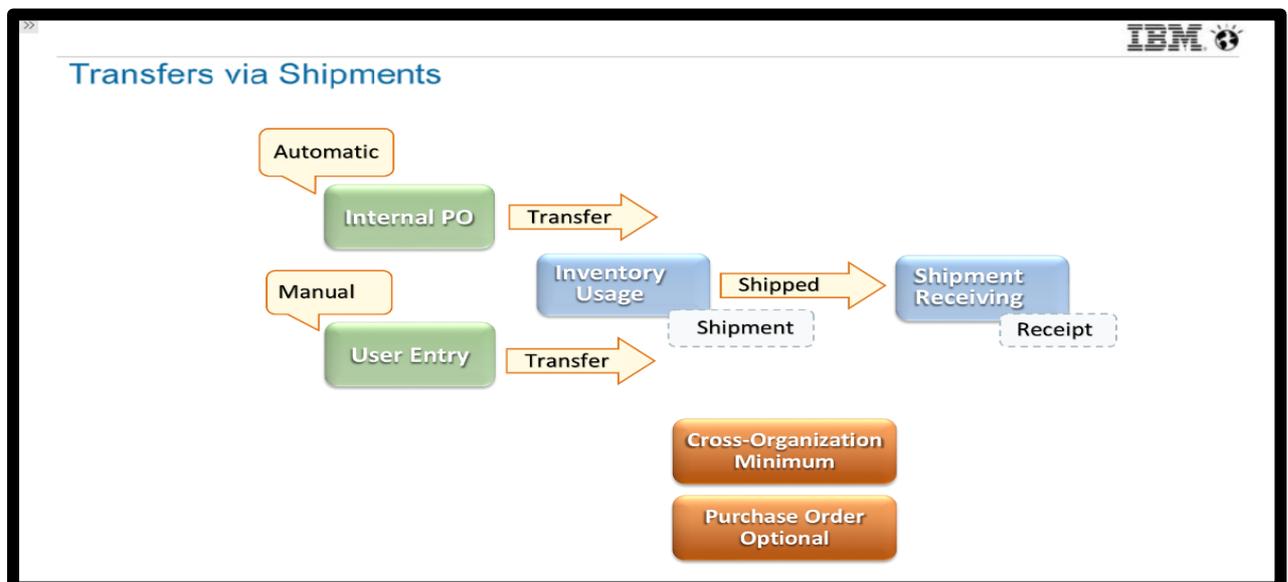
Task	Item	Description	Quantity	Unit Cost	Line Cost	Storeroom	Direct Issue?
	1002	5 ft. X 6 ft. window pane	1.00	100.00	100.00	CENTRAL	<input type="checkbox"/>
	11453	Seal, Mechanical, Self Aligning- 1 In ID	3.00	130.45	391.35	CENTRAL	<input type="checkbox"/>
	FLT001	Filter	2.10	4.50	9.45	CENTRAL	<input type="checkbox"/>
- Details Section:** A form for the selected item (11453) with the following fields:
  - Task: [Empty]
  - Item: 11453 Seal, Mechanical, Self Aligning- 1 In ID
  - Line Type: Item
  - Quantity: 3.00
  - Order Unit: [Empty]
  - Unit Cost: [Empty]
  - Storeroom: CENTRAL
  - Storeroom Site: BEDFORD
  - Reservation Type: HARD
  - Direct Issue?:
  - Vendor: [Empty]
  - Stock Category: [Empty]
  - PR: [Empty]
  - PR Line: [Empty]
  - Issue To: [Empty]
  - Required Date: 7/21/15 1:15 PM
  - Requested By: WILSON

## 4.6 Internal Shipments

Internal Shipments in Maximo allows one to transfer inventory items or tools between storerooms within the same site or across sites and organization and track their delivery through use of shipment records. When the status of a usage record is changed to Shipped, a Shipment is created along with financial transaction for the deduction from the supplying room. There are three Shipment Receipt status and they are as follows:

- **WINSP**- Waiting for Inspection indicates that the item is in the process of being received but is not entered in inventory.
- **WASSET**- Waiting for Serialization indicates that the item is rotating item and that the review and acceptance of the asset number in the receipt is required.
- **COMP**- Complete indicates that the item has been received and if necessary inspection and serialization of the item has occurred.

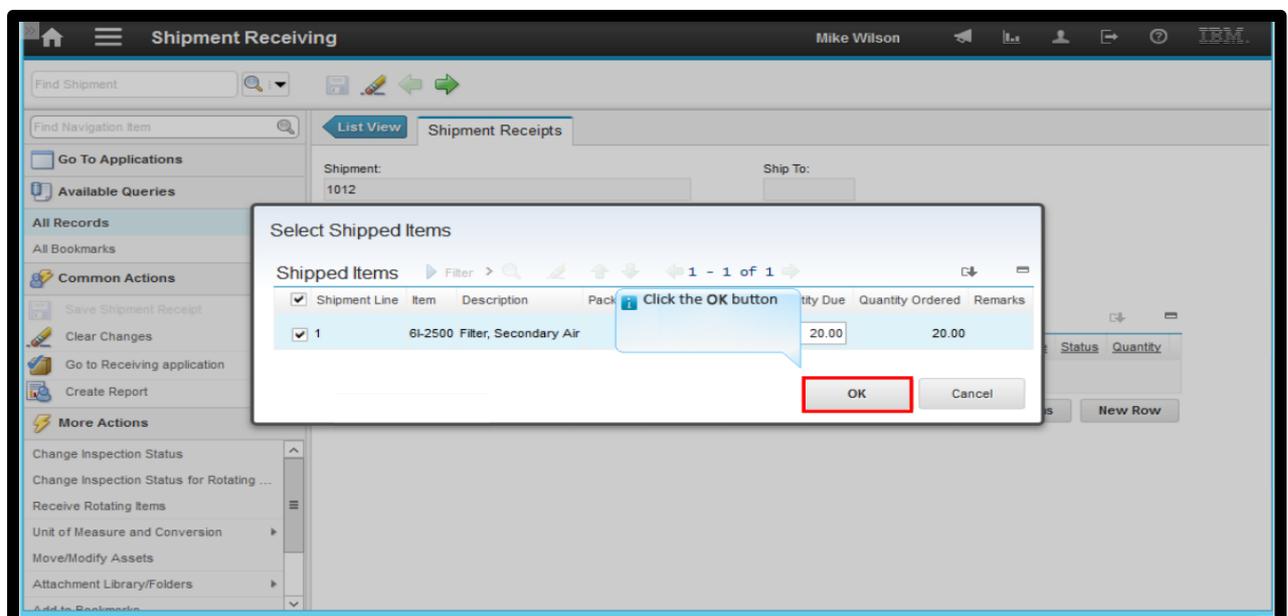
Following is snippet of Transfers via Shipments in MAXIMO 7.6.0:



## Steps to create a **Shipment**:

1. In the start center, go to Inventory module.
2. Go to Inventory Usage application.
3. Click on New Usage button.
4. Enter a name in Usage field (1044).
5. Select a value in Usage Type field (Transfer).
6. Select a value in From Storeroom field (Central).
7. In the Usage Line tab, click on New Row button.
8. Select a value in Item field (61-2500).
9. Enter a value in Quantity field (20).
10. Select a value in To Site field (Fleet).
11. Select a value in To Storeroom field (Atlanta).
12. Change status to Shipped.
13. Create Shipment window opens.
14. Go to Shipment Receiving application in Inventory module.
15. Select the shipment (1012).
16. Click on Select Shipped Items button.
17. Select the line showing item (61-2500).

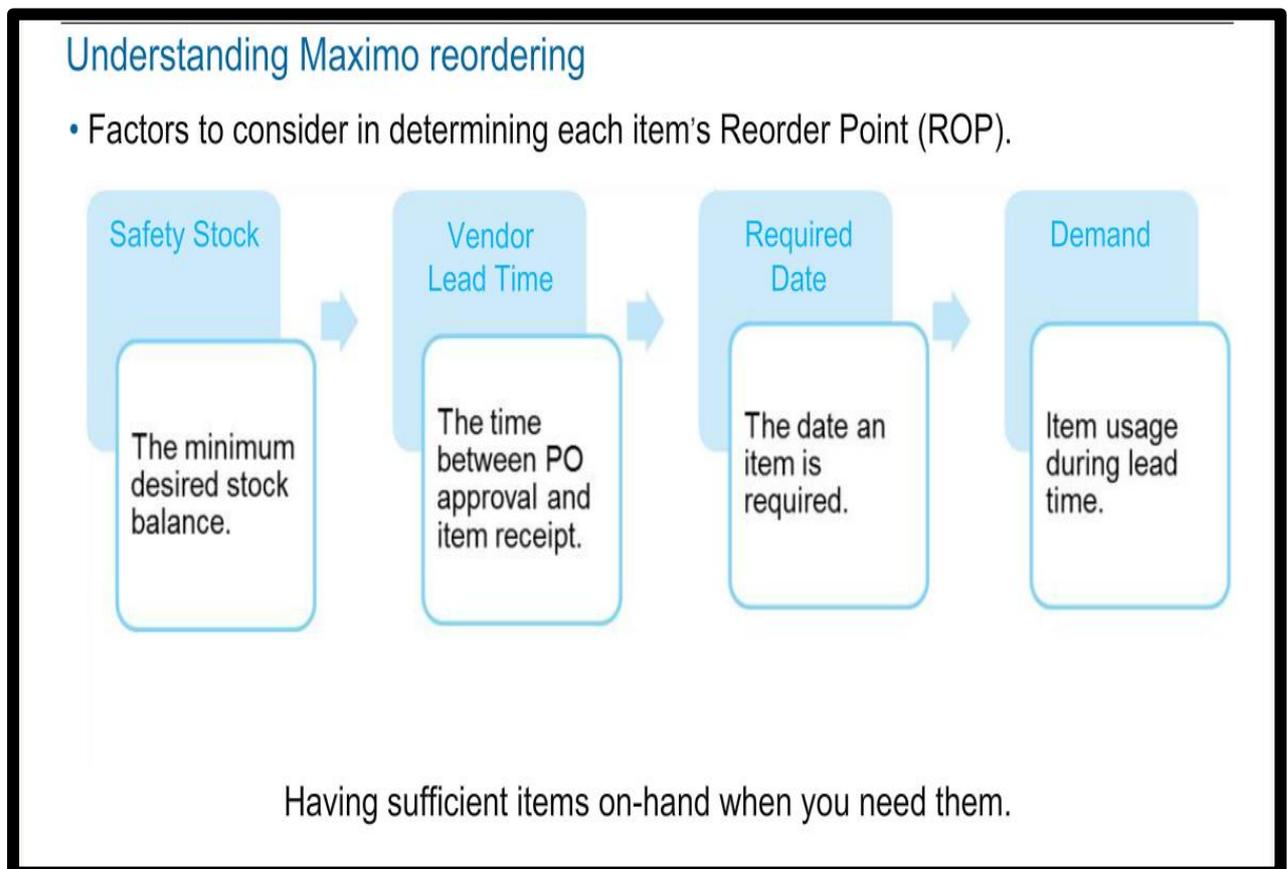
Following is the snippet depicting the Shipped Item in MAXIMO 7.6.0:



## 4.7 Inventory Reorder Theory

A store when replenishing its stock or to meet its forecast demand, places an order with an external vendor or to an internal storeroom. The central storeroom and satellite storeroom maintain their own reorder points. This creates a demand when their items balance falls below their Reorder Point (ROP). Consignment items are considered in reorder process if the reorder check-box is selected in inventory. The vendor is required for each consignment item in each storeroom. The Maximo Reorder Point is the balance level that is set for an item below which Reorder Process takes place.

Following is the snippet depicting the factors for Reorder Point (ROP) for an item in MAXIMO 7.6.0:



## FUTURE SCOPE

Maximo Asset Management has a wide scope in the industry as it provides very efficient and effective solution to the client from ground level to the very top, it is a software that will continue to provide new advancements to the user in different and easy ways, moreover in latest seminar held to modernize user experience, the upcoming Maximo updates include:

- **Refreshed Look and Feel-** A global approach will be used to refresh all Maximo interfaces and work centers will be aligned to new updated style sheet.
- **Supply Chain and Inventory-** IBM is planning to introduce net new capabilities to create and manage bins with storeroom and keep a record when an item is not available.
- **Asset Health-** It will be improved in order to provide visibility to asset conditions from lifecycle perspective and can offer visibility into the next predicted failure.
- **Machine Learning and Analytics-** IBM plans to use machine learning and analytics for operational data to build predictive maintenance models and to manage reliability risks.
- **Manage work effectively-** IBM Maximo Scheduler and IBM Maximo Scheduler Plus provide the ability to plan, schedule, dispatch and track work. These products offer scenario-based work planning, graphical crew management capabilities, optimized spatial scheduling, etc.

## CONCLUSION

At the point when an organization centers around an appropriate assembling considering, squander is expelled from the esteem chain and leaves solid assets as a flat out need for business achievement. Maximo Asset Management gives a system to improving the unwavering quality of assets while working in this kind of asset compelled condition. Maximo Asset Management additionally gives lower cost of possession choices by supporting the usage of a solitary stage over different asset classes. This gives management better perceivability of asset execution and institutionalized work forms over the association. The new updates made Maximo available on cloud and due to this it is accessible from almost everywhere. The centralized functionality of Maximo Asset Management make sure that the users have the control and visibility of asset processes and conditions to increase productivity and decrease downtime. Maximo incorporates a full suite of tools, including resource and stock administration, predictive and preventive maintenance, and work order management on board. Online help assets and preparing pages enable clients to extend their item learning at their own pace. Reporting, KPIs, and dashboards help managers work together and see patterns.

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