

# Support Technical Exchange: Maximo Work Management

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# Introduction

- Abstract:
- This presentation will highlight the recent enhancements and new features added to the work management applications in Maximo
- Objectives:
- Each objective should answer the question:
  - After attending the audience will know:
    - What new features and enhancements have been added to Maximo's work management functionality in release 7.5.

## Contents of Presentation

- **Primary Enhancements:**
  - Material Availability on Work Orders
  - Job Plan Revisions
  - View Costs Action
  - Assignment Tab added to Work Order Tracking
  - Owner / Owner Group changes
  - Conditional Job Plans
  - Status Inheritance when Flow Control is used

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    - features, function and details of future releases and future GA or RTM dates
    - future architectural direction for the product or pillar, strategy regarding our competition
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## Product Overview

- The IBM Maximo Work Management applications are a group of Maximo applications focused on the planning and execution of work
- These applications include Work Order Tracking, Job Plans, Safety Plans, etc.
- This training assumes a working knowledge of the previous releases of Maximo and only covers the new enhancements in the Maximo AM 7.5 release.

## Material Availability Status on Work Orders

- Use Case
- When a work order requires materials, the work cannot start until those materials are available. Planning and scheduling will depend on this information. They will need to know all of the details about the required materials and which ones are available and which are still waiting.
- The status of the work order should reflect the state of the availability so that schedulers will not try to schedule work that does not have its required materials.

## Material Availability Status on Work Orders

- General Approach
  - The Work Order Tracking application (and WOTRACK-based apps) will have four new read-only attributes added:
    - Storeroom Material Status
    - Direct Issue Material Status
    - Work Package Material Status
    - Material Status Last Updated
  - Each of these fields will be tied to a Domain (MTLSTATUS) with only four valid values:
    - Null
    - None
    - Partial
    - Complete

Storeroom Material Status:  ⓘ

Direct Issue Material Status:  ⓘ

Work Package Material Status:  ⓘ

Material Status Last Updated:  ↻

# Material Availability Status on Work Orders

- When a Work Order's status is changed to "Approved", the system will conduct a series of checks to determine the state of availability for the three material availability status fields. (NONE, PARTIAL, COMPLETE)
- If no planned materials exist, the three availability status fields will remain null
- The three item availability status fields will have a post validation action that updates the work order's status.
  - The rules for this are the same as what is already included for direct issue (If the materials are not available, then the status of the work order is set to WMATL. Once the items become available and the availability statuses are set to COMPLETE, the work order's status is then set back to APPR so the work can be scheduled to begin.
- 'Material Status Last Updated' Field
  - Holds the date and time that this work order's availability status was last updated.
  - This field will provide a view to the user of when the last time the status was updated either by the cron task or the refresh button.
- 'Update Material Status' Action Button
  - Provides the ability to manually trigger an update to the fields so they have the most up to date availability information.



# Material Availability Status on Work Orders

## ■ WPEDIT Settings

- There is a configuration setting that clients can define for what is editable on a work order under certain statuses. One option is for planned materials. The client is allowed to define at which statuses the planned labor table is editable.
- Usually (out of the box) you cannot edit the plan after it is approved, but a client could change this.
- Currently, when a work order is approved, its availability status is determined and if all planned materials are available it goes to APPR, but if the materials are not available, the APPR status change will result in the work order being placed in a status of WMATL until the materials become available.
- If WPEDIT settings allow for planned material changes AFTER someone approves the work order, then after any changes to the planned material, the availability for that work order must be recalculated at that time to determine if the work order should be APPR or WMATL.
- Once the work order goes to INPRG or beyond, no more updates to the status are required because work has already started and we would not revert back to WMATL/APPR at that point.

# Material Availability Status on Work Orders

## ▪ **Storeroom Material Status**

- If the quantities for all required storeroom items can not be met, the Storeroom Material Status is set to “NONE”
  - If the required quantities of some, but not all, of the required storeroom items are available, the Storeroom Material Status is set to “PARTIAL”.
  - If the quantities of all required storeroom line items can be met, reservations are made as per normal operation, and the Storeroom Material Status is set to “COMP”.
- An information icon adjacent to this field will yield availability details relevant to the Storeroom Items required for this work order. This will allow the Planner or Tradesperson to decide if, in the event of a “Partial” material availability status, if they would like to continue with the plan to execute the work, or wait until full availability is achieved. The information dialog box for Storeroom Materials will appear similar to the one below:
- Note: The setting of the Storeroom Material Status to “COMP” will only indicate that based on current availability, reservations can be satisfied. A customer's internal process will determine if the reservation will still be able to be satisfied at the time which the tradesperson requires the material. Without adequate safeguards, the available material may be issued to meet other demands, sacrificing the availability for this reservation(s).

# Material Availability Status on Work Orders

- Storeroom Material Status Screenshot

Direct Issue Material Status: NONE

Current Work Order Storeroom Materials

Storeroom Materials: Filter > 1 - 1 of 1

Item	Description	Storeroom	Storeroom Site	Required Quantity	Staged Quantity	Available Quantity
560-00	Tubing, Copper-1 In ID X .030 In Wall	CENTRAL	BEDFORD	14.00	0.00	593.00

Close

# Material Availability Status on Work Orders

## ▪ Direct Issue Material Status

- Direct Issue items are different than storeroom items in that they always require procurement. As such, the Direct Issue Material Status will, in effect, be providing an updated status of all receipts resulting from the procurement of the required Direct Issue items. This field, or any of the functionality described in these sections will not impact the procurement cycle in any way. Upon Work Order approval, the Direct Issue Material Status field will be updated based on the availability of the required items.
- If none of the quantities of any of the required Direct Issue items is yet available (usually the case upon initial Work Order approval), the Direct Issue Material Status will be set to “NONE”. As receipts are processed for the required materials, and at least one but not all Direct Issue materials are available, the Direct Issue Material Status will be updated to “PARTIAL”. When all required Direct Issue items have been received, the Direct Issue Material Status will be updated to “COMP”.
- An information icon will be available adjacent to this field. Selecting this icon will yield availability details relevant to the Direct Issue items required for this work order. This will allow the Planner or Tradesperson to decide if, in the event of a “Partial” material availability status, if they would like to continue with the plan to execute the work, or wait until full availability is achieved. The information dialog box for Direct Issue Items will appear similar to the one below:
- Note: The setting of the Direct Issue Material Status to “COMP” will only indicate that based on the current availability, the requirement can be satisfied. A customer's internal process will determine if the material quantity will still be able to be satisfied at the time which the tradesperson requires the material. Without adequate safeguards, the available material may be issued to meet other demands, sacrificing the availability for this requirement.

# Material Availability Status on Work Orders

- Direct Issue Material Status Screenshot

Direct Issue Material Status: NONE      Suspend Flow Control?

Current Work Order Direct Issue Materials:

Direct Issue Materials: Filter > 1 - 1 of 1      Download

Item	Description	Required Quantity	Quantity Received	Receipts Complete?	PR	PR Status	PO	PO Status	Vendor	Anticipated Delivery	Delivery Date
	Specialized Flange for pump housing	1.00		<input type="checkbox"/>	1020	CLOSE	1078	APPR	IR	4/1/10	

Close

# Material Availability Status on Work Orders

## Work Package Material Status

- In such cases where work is comprised of multiple work orders within a hierarchy, the Work Package Material Status field will reflect the material availability status for the current work order and that of any children of that work order.
- The NONE, PARTIAL, or COMP designation in this field will apply for all materials, regardless of their nature (Storeroom or Direct Issue). For example, if a parent work order is being viewed, and the Work Package Material Status is “PARTIAL”, then it reflects the fact that at some point within the hierarchy, the parent or a child work order does not have “COMP” resident within either its Storeroom Material or Direct Issue Material Status fields (NONE or PARTIAL). The only way that a Work Package Material Status field for a parent work order can read “COMP” is if the parent and all child work orders have both of their material status fields reading “COMP”.
- The Work Package Material Status field, like the others, will have an information icon present adjacent to the field. Selecting this icon will yield required material availability details relevant to the entire hierarchy including (and beneath) the current work order. This information will allow the Planner or Tradesperson to have a complete picture of the status of all required materials for this work package. It will also allow them to decide if, in the event of a “Partial” material availability status, if they would like to continue with the plan to execute the work, or wait until full availability is achieved. The information dialog box for Work Package Material Status will appear similar to the one below:

# Material Availability Status on Work Orders

- Work Package Material Status Screenshot

Work Pack Materials

Work Pack Materials 1 - 2 of 2

Work Order	Task ID	Item	Description	Required Quantity	Staged Quantity	Available Quantity	Storeroom	Storeroom Site	Direct Issue?	PO	PO Status	Company	Anticipated Delivery	Delivery Date
1151			Specialized Flange for pump housing	1.00					<input checked="" type="checkbox"/>	1078	APPR	IR		
1151		560-00	Tubing, Copper-1 In ID X .030 In Wall	14.00	0.00	593.00	CENTRAL	BEDFORD	<input type="checkbox"/>					

Close

# Material Availability Status on Work Orders

## Work Package Material Status – Modifying Hierarchies

- When work order parent/child relationships change, the Work Package Material Statuses (WPMS) may be affected. Planners will often move work orders from one work package to another. This changes the parent/child relationships. Because the Work Package Material Status reflects the material availability for all of the work orders in the work package, it must be recalculated when a change is made to the hierarchical structure.
- Basically, three possible scenarios can occur:
  - A child work order is removed from a parent work order
  - A work order is added as a child to a work order
  - A new Work Package is created using the Create Work Package action
- In each of these scenarios, the Work Package Material Status fields must be re-calculated to properly reflect the material availability of the newly constructed hierarchy. In all of these cases, the actual item availability is not used to update the statuses. The statuses are updated purely on the current availability statuses defined on the work order records in question.
- When a new direct issue is added to a work order record in a hierarchy that will impact the Direct Issue Availability Status of that work order, the Work Package Availability Status must be re-evaluated. If that Work Package Status changes, the code will have to look up the hierarchy to see if this change impacts the work order's parent's Work Package Status. If so, the parent needs to be updated. This would have to work its way up the hierarchy until you reach a point where the Work Package status is not impacted.



# Material Availability Status on Work Orders

## Cron Task & Scratch Table

- A new cron task called MaterialStatusCronTask will be created to facilitate background polling, and the update of the material status fields for a work order.
- A new scratch table (WOMATSTATUSSYNC) will be created and used to hold the list of items in storerooms that have had modifications made to their available quantities.
  - This table will not be displayed or seen by users. Its only purpose is to improve the performance of the code when finding all of the work orders that need to be updated based on availability changes to the items.
  - The fields on this table will be ITEMNUM, LOCATION, SITEID and ITEMSETID.
- Anytime any invreserve record is created or modified in a way that would affect the available quantity of an item in a storeroom, a record will be written to this new scratch table. Any given item would only be listed once, there is no need to list each change. We are only interested in creating a unique list of items.
- Transactions will only get written to the table when hard reservations are created (written to the INVRESERVE table) and/or when the storeroom balance is changed. No transactions will be written to the table when a soft reservation is made.

# Material Availability Status on Work Orders

## WMATL Status Implications

- The automatic update of the work order's status from APPR → WMATL can be turned on or off by the user. This can work in two ways:
  - First, customers have indicated that they wish to have the ability to have insufficient Storeroom Material availability cause the work order status to be set to WMATL, just as it is today with Direct Issue items. Given the current Direct Issue receipt status functionality, both types of material requirements would be respected and dealt with consistently in contributing to the setting of the WMATL work order status.
  - Conversely, customers have requested the ability to have Direct Issue item status dealt with just the same way as current storeroom requirements, in that neither will have an affect on the setting the work order status. Opposite from the first case, but based on exactly the same reasoning, they will consistently operate together, and never set the work order status to WMATL.
- As such, four maxvars will be added to MAXVARINPUT that will permit the over ride of the WMATL work order status setting for each type of material requirement.
  - Two will be set at the Org level, and two will be set at the Site level.
  - These are defined in the Organization application
- The Org level maxvars are:
  - “Ignore Direct Issue Availability For Work Order Status” (ORGIGNOREDIAVAIL)
  - “Ignore Storeroom Availability for Work Order Status” (ORGIGNORESRMAVAIL)
- The Site level maxvars are:
  - “Ignore Direct Issue Availability For Work Order Status” (SITEIGNOREDIAVAIL)
  - “Ignore Storeroom Availability for Work Order Status” (SITEIGNORESRMAVAIL)

# Material Availability Status on Work Orders

## WMATL Status Implications

- The Org and Site Level settings can be further refined at the work order level. As such, defaults set at the Org level will trickle to the Site level, and then on down to the Work Order level. The settings will populate two new work order object attributes:
  - IGNOREDIAVAIL
  - IGNORESRMAVAIL
- The user will be able to establish preferences specific to the work order by virtue of a new Action called “Change Work Order Options”.
- The action will be accessible via the Work Order action menu. It will yield a dialog box that will allow the users to:
  - Ignore Direct Issue Availability for Work Order Status
  - Ignore Storeroom Availability for Work Order Status
- The dialog box presented to the user will also allow them to select “Apply to Work Package” or “Apply to Current Work Order”.
  - Selecting to apply to the work package will take the setting being changed, and apply it to the current work order plus all of its children and tasks. Selecting to apply to current work order will take the settings as chosen and apply them to the current work order only.
- Not all customers will want the ability to alter the manner in which work order status is handled regardless of the material availability conditions. Therefore, the default settings at the Org level will be:
  - Ignore Storeroom Material Availability For Work Order Status – checked
  - Ignore Direct Issue Availability For Work Order Status – unchecked
- These defaults will trickle down to the Site level, and on down to the Work Order level, and ensure that the Maximo work order status functionality is maintained exactly the same as it is in current versions of the product, as long as the customer does not change the default settings.

# Availability Status Migration Concerns

- As users upgrade from prior versions of Maximo, open work orders will need to be scrutinized in much the same way that the cron task does, for the purpose of updating the new Storeroom and Direct Issue Availability Status fields. The upgrade process will not update Closed or historical work order records.
- The upgrade process will evaluate current records for the purpose of updating the availability status fields in the following manner:
  - Look at all work order records with status APPR, WMATL, INPROG (or synonyms)
  - Identify any WPMATERIAL records
  - Check Storeroom availability of each line item that is status null, NONE, or PARTIAL – update where needed
  - Check DI availability of each line item that is status null, NONE, or PARTIAL – update where needed
  - Cron task will update the Work Package Material Availability
- The options that exist for altering the way in which work order status is updated based upon material availability (i.e. changes brought about by the new maxvars) will not be considered in the upgrade process. The defaults have been set such that current wostatus functionality does not change. As such, the upgrade would be completed, and a system administrator may, at that time, specify Org, Site, or work order changes. Changes to how the wostatus is set will only occur for new work orders, and not existing work orders present during the upgrade.
- This process would evaluate all of the current availability data for all items on all work orders and each work order's availability status fields must get properly updated (and subsequently update the main status of the work order)

## Job Plan Revisions

- Job Plans will now support the concept of versions and revisioning. This will work the same way as Contracts and Purchase Orders.
  - This can be turned on or off under Organisations – System Settings
  - Three new statuses: ACTIVE, REVISED, PNDREV
- When a Job Plan is 'ACTIVE', it will be available for use and will not allow modification except for the list of work assets associated with it
- When a Job Plan is being modified, it will be in 'Pending Revision' status while the existing Active version is still 'in use'.
- View Revision History action shows history of all changes
- Use on PMs:
  - The Job Plan defined on the PM will not be a specific version.
  - The current 'active' version will be determined and used when the PM creates new work order records.
- Use on Work Orders:
  - Only 'active' versions will be allowed. Maximo will determine the current version
  - A Revision field will display the version being used.
  - Future revisions of the Job Plan will NOT update the Work Order

# View Costs Table Improvements

Work Order Tracking - Mozilla Firefox: IBM Edition

File Edit View History Bookmarks Tools Help

http://qarhvm02.swg.usma.ibm.com:7001/maximo/ui/?event=loadapp&value=wotrack&uisessionid=348

Work Order Tracking

Bulletins: (1) Go To Reports Start Center Profile Sign Out Help

**View Costs**

The Work Order Totals table shows the labor and cost information for the current work order and related tasks. The Work Package Totals table shows the labor and cost information for the entire work order hierarchy, starting from the current work order.

**Work Order Totals**

Resource	Current Estimate	Approved Estimate	Actual	Exceeds Estimate by
<b>Internal Labor Hours</b>	60.00	60.00	0.00	0.00
External Labor Hours	0.00	0.00	0.00	0.00
Labor Hours	60.00	60.00	0.00	0.00
Internal Labor Cost	1,110.00	1,110.00	0.00	0.00
External Labor Cost	0.00	0.00	0.00	0.00
Labor Costs	1,110.00	1,110.00	0.00	0.00
Material Cost	839.93	839.93	0.00	0.00
Tool Costs	0.00	0.00	0.00	0.00
Service Cost	0.00	0.00	0.00	0.00
<b>Total Cost</b>	<b>1,949.93</b>	<b>1,949.93</b>	<b>0.00</b>	<b>0.00</b>

**Work Package Totals**

Resource	Current Estimate	Approved Estimate	Actual	Exceeds Estimate by
<b>Internal Labor Hours</b>	60.00	60.00	0.00	0.00
External Labor Hours	0.00	0.00	0.00	0.00
Labor Hours	60.00	60.00	0.00	0.00
Internal Labor Cost	1,110.00	1,110.00	0.00	0.00
External Labor Cost	0.00	0.00	0.00	0.00
Labor Costs	1,110.00	1,110.00	0.00	0.00
Material Costs	839.93	839.93	0.00	0.00
Tool Costs	0.00	0.00	0.00	0.00
Service Costs	0.00	0.00	0.00	0.00
<b>Total Costs</b>	<b>1,949.93</b>	<b>1,949.93</b>	<b>0.00</b>	<b>0.00</b>

Safety Plan:  Charge to Store?  Risk Assessment:

# Add Assignment Tab to Work Order App

The screenshot displays the 'Work Order Tracking' application in a Mozilla Firefox browser. The page title is 'Work Order Tracking - Mozilla Firefox: IBM Edition'. The address bar shows the URL: http://qarhvm02.swg.usma.ibm.com:7001/maximo/ui/?event=loadapp&value=wotrack&uisessionid=348. The application header includes navigation links like 'Go To', 'Reports', 'Start Center', 'Profile', 'Sign Out', and 'Help'. A toolbar with various icons is visible below the header.

The main content area features several input fields for work order details:

- Work Order: 1002
- Parent WO: >>
- Rebuild Feedwater Pump
- Site: BEDFORD
- Status: APPR
- Scheduled Start: >>
- Scheduled Finish: >>
- Target Start: 1/1/99 7:00 AM
- Target Finish: 1/5/99 12:00 AM

The 'Assignments' tab is active, showing a table with 4 rows of assignment data. The table columns are Task, Description, Craft, Skill Level, Labor, Scheduled Start, Hours, and Status. The first row is selected, showing a task of 'Rebuild Feedwater Pump' assigned to a 'MECH' craft at a 'FIRSTCLASS' skill level, with 20:00 hours and a status of 'WAITASGN'.

Task	Description	Craft	Skill Level	Labor	Scheduled Start	Hours	Status
▶	Rebuild Feedwater Pump	MECH >>	FIRSTCLASS	>>	>>	20:00	WAITASGN
▶	Rebuild Feedwater Pump	MECH >>	FIRSTCLASS	>>	>>	20:00	WAITASGN
▶	Rebuild Feedwater Pump	ELECT >>	FIRSTCLASS	>>	>>	10:00	WAITASGN
▶	Rebuild Feedwater Pump	ELECT >>	FIRSTCLASS	>>	>>	10:00	WAITASGN

At the bottom of the table are three buttons: 'Available Labor', 'Complete Assignment', and 'New Row'. The status bar at the very bottom of the browser window says 'Done'.

## Owner/Owner Group Change

- A new attribute is added, “Owner Group Assign”, that will keep track of the Owner Group value, and be updated with group information when the Owner is changed. The new “Owner Group Assign” field will be used to keep track of the actual group ownership.
- The behavior of the Owner and OwnerGroup fields will remain unchanged—continue to be mutually exclusive
- The Owner Group Assign field will not be exposed in the UI by default with the EAM install. When SRM or CCDMB is installed, the Owner Group Assign field will be exposed to Ticket/WO related applications. This will include Incident, Problem, Service Request. Activities/Tasks inside Ticket will display the new field.
  - SRM install will not expose this field in WORKORDER applications.
  - CCMDB install will not actively expose this field.
- New MAXVAR options will be used to control Owner Group Assign behavior.
- Henceforth, reference to Owner Group Assign is renamed to Assigned Owner Group.



# Owner/Owner Group Change

## Controlling the Various Options

- The options to control the behavior of the new field are defined in the Organization application (GOTO->Administration->Organization). All options are system level options unless specified.
- The CCMDB product does not necessarily see the need of an Assigned Owner Group field and wants to have separate control over the ownership behavior.
- The basic behavior supported through the UI interactions is be enabled by default for both Tickets and Workorders.
- This default behavior is simply storing the Assigned Owner Group value on the record, and in the TKOWNERHISTORY and WOOWNERHISTORY.
- This option is not enabled with EAM only environments. Another way to say this is the TKUSEASSIGNEDOWNERGROUP is by default FALSE with EAM install, and set TRUE with SRM install.

# Conditional Job Plans Overview

- Customer Profiles
  - Clients use Job Plans to describe repeatable work and use them as templates to build work orders
  - This enhancement will allow clients to design Job Plans that can act dynamically based on conditional criteria
  - Clients will create Job Plans where some of its components are conditionally applied.
  - This tool will allow them to be more efficient in the sense that they can create and maintain a single job plan that can be used for many different scenarios. Otherwise, they would need to create individual specific job plans for every possible scenario.
- Product (high level)
  - This new feature introduces ‘Condition’ fields on the individual components of a job plan. When applied to a work order, these conditions are evaluated. If true, they copy to the work order. If false, they do not.
  - In previous versions, this was only possible based on Org/Site. Now it can be done on any condition

## Conditional Job Plans Overview (Cont)

- **Status Change Inheritance when using Flow Control**
  - In an effort to provide the best all around solution for the client, and enhancement/fix was also done to the way status inheritance works with Flow Control.
  - Essentially, non flow controlled statuses need to be able to inherit down the hierarchy.

# Use of Conditions in Job Plans

## ■ Steps

- Clients who turn on the conditional job plan feature will be able to create conditions in the Conditional Expression Manager and associate those conditions with the components of a Job Plan
- When the Job Plan is applied to the Work Order, the conditions are evaluated
  - If True the component copies
  - If False the component does not copy

## ■ Benefits

- This new feature allows a client to create a single job plan that can dynamically alter itself based on the conditions of a Work Order

## Use Cases – Conditional Job Plans

- Planners will want to create one job plan that can be used in many situations for a group of similar assets or locations. In some cases, all of the job details will be identical for two different work orders with just one small exception. That exception could be almost anything.
- Examples of conditional scenarios:
  - Pumps located outdoors require non corrosive seals. Inside pumps use the lesser expensive seals.
  - One client requires an additional safety check task at the end of the job.
  - High priority work orders require a supervisor to also be planned for.
  - When working on THIS SPECIFIC asset, the first 7 tasks are all completely different than for all other assets.
  - The new laptops get the different memory chips.
  - These elevators are the only ones that we use Otis Services to do the work on.
  - All of these resources are for Task 20, but we only need them if we do Task 20 and we only do Task 20 in the summertime.

## Deep Dive – Conditional Job Plans

- New 'CONDITION' fields were added to the following tables
  - JOBTASK
  - JOBLABOR
  - JOBMATERIAL
  - JOBTOOL
  - JOBSERVICE
  
- These fields will be hidden via Conditional UI if the Conditional Job Plans are not enabled in the Organizations application
  
- Users will create the conditions in the Conditional Expression Manager
  
- These new fields have been added to the Task, Labor, Material, Tools and Services table windows in Job Plans with the label  
    'Set a Condition'

# Deep Dive – Conditional Job Plans

## Job Plan Tasks

The screenshot displays the 'Job Plans' web application interface. At the top, there is a browser window with the URL 'qawin11.swg.usma.ibm.com:9999/maximo/ui/?event=loadapp&value=jobplan&uisessionid=206&csrftoken=u7tnui7'. Below the browser window is a navigation bar with 'Job Plans' and various menu items like 'Bullets: (0)', 'Go To', 'Reports', 'Start Center', 'Profile', 'Sign Out', and 'Help'. A search bar and 'Select Action' dropdown are also present.

The main content area shows a table of 'Job Plan Tasks'. The table has columns for 'Sequence', 'Task', 'Description', 'Nested Job Plan', 'Duration', and 'Meter'. The tasks listed are:

Sequence	Task	Description	Nested Job Plan	Duration	Meter
10	Check pump operation.			0:20	
20	Check pump float switch.			0:30	
30	Check housing for leaks.			0:10	
40	Replace mechanical seal.			1:00	

Below the table is a 'Details' section for the selected task '10 Check pump operation.'. It includes fields for Organization (EAGLENA), Site (BEDFORD), Task (10), Sequence, Nested Job Plan, Classification, Class Description, Launch Entry Name, and Set a Condition. On the right side of the details section, there are fields for Duration (0:20), Meter, Owner, Owner Group, Flow Controlled?, Suspend Flow Control?, Flow Action, Flow Action Assist?, and Predecessors.

# Deep Dive – Conditional Job Plans

## ■ Job Plan Labor

The screenshot shows the IBM Maximo Job Plans interface. At the top, there is a browser window with the URL `qawin11.swg.usma.ibm.com:9999/maximo/ui/?event=loadapp&value=jobplan&uisessionid=206&csrftoken=u7tnui74lh2ib0vo8177ebqq14`. Below the browser window is a navigation bar with tabs for Labor, Materials, Services, and Tools. The main content area displays a table of Planned Labor with the following data:

Task	Crew Type	Craft	Skill Level	Labor	Crew	Quantity	Hours	Rate	Line Cost
		MECH	FIRSTCLASS			1	2:00	25.00	50.00
		ELECT	FIRSTCLASS			1	2:00	22.00	44.00

Below the table is a 'Details' section with the following fields:

- Organization: EAGLENA
- Site: BEDFORD
- Task: [empty]
- Crew Work Group: [empty]
- Set a Condition: [empty]
- Labor: [empty]
- Craft: MECH
- Skill Level: FIRSTCLASS
- Vendor: [empty]
- Labor Contract: [empty]
- Crew Type: [empty]
- Crew: [empty]
- Quantity: 1
- Hours: 2:00
- Rate: 25.00
- Line Cost: 50.00



# Deep Dive – Conditional Job Plans

## Job Plan Materials

The screenshot shows the Maximo Job Plans interface. At the top, there is a browser window with the URL: `qawin11.swg.usma.ibm.com:9999/maximo/ui/?event=loadapp&value=jobplan&uisessionid=206&csrftoken=u7tnui74lh2ib0vo8177ebqq14`. The page title is "Job Plans". Below the browser window is a navigation bar with "Bullets: (0)", "Go To", "Reports", "Start Center", "Profile", "Sign Out", and "Help".

The main content area is titled "Planned Materials" and contains a table with the following data:

Task	Item	Description	Storeroom	Item Quantity	Unit Cost	Line Cost	Vendor
40	11453	Seal, Mechanical, Self Aligning- 1 In ID	CENTRAL	1.00	130.45	130.45	
50	11241	Contactora, Renewal Kit	CENTRAL	1.00	109.00	109.00	
60	XMP-9500	Gasket- AR46	CENTRAL	1.00	3.73	3.73	

Below the table is a "Details" section with the following fields:

- Organization: EAGLENA
- Site: BEDFORD
- Task: 40
- Item Set: SET1 (Item set 1)
- Item: 11453 (Seal, Mechanical, Self Aligning- 1 In ID)
- Item Quantity: 1.00
- Vendor: (empty)
- Storeroom: CENTRAL
- Storeroom Site: BEDFORD
- Unit Cost: 130.45
- Line Cost: 130.45
- Direct Issue?

At the bottom of the details section, there is a "Condition" section with the following fields:

- Condition Enabled?
- Condition Code: (empty)
- Condition Rate: (empty)
- Stock Category: STK

At the bottom right of the interface, there are two buttons: "Select Spare Parts" and "New Row".

# Deep Dive – Conditional Job Plans

## ■ Job Plan Services

The screenshot shows the IBM Maximo Job Plans interface. At the top, there is a browser window with the URL: `qawin11.swg.usma.ibm.com:9999/maximo/ui/?event=loadapp&value=jobplan&uisesessionid=206&csrftoken=u7tnui74lh2ib0vo8177ebqq14`. The page title is "Job Plans". Below the browser window is a navigation bar with "Buletins: (0)", "Go To", "Reports", "Start Center", "Profile", "Sign Out", and "Help". A search bar and "Select Action" dropdown are also present. The main content area has tabs for "Labor", "Materials", "Services", and "Tools". The "Services" tab is active, showing a table of "Planned Services".

Task	Service Item	Description	Quantity	Unit Cost	Line Cost	Vendor
			1.00	0.00	0.00	

Below the table is a "Details" section with the following fields:

- Organization: EAGLENA
- Site: BEDFORD
- Task: [empty]
- Set a Condition: [empty]
- \* Item Set: SET1 (Item set 1)
- \* Service Item: [empty]
- \* Quantity: 1.00
- Unit Cost: 0.00
- Line Cost: 0.00
- Vendor: [empty]

# Deep Dive – Conditional Job Plans

## ■ Job Plan Tools

The screenshot displays the 'Job Plans' interface in a web browser. The browser address bar shows the URL: `qawin11.swg.usma.ibm.com:9999/maximo/ui/?event=loadapp&value=jobplan&uisessionid=206&csrftoken=u7tnui74lh2ib0vo8177ebqq14`. The page title is 'Job Plans'. Below the browser window, there is a navigation bar with tabs for 'Labor', 'Materials', 'Services', and 'Tools'. The 'Tools' tab is selected. Below the navigation bar, there is a 'Planned Tools' section with a 'Filter' button and a 'Download' button. The main content area contains a table with the following columns: 'Task', 'Tool', 'Description', 'Tool Quantity', 'Tool Hours', 'Rate', and 'Line Cost'. The table has one row with the following values: 'Task' (empty), 'Tool' (empty), 'Description' (empty), 'Tool Quantity' (1.00), 'Tool Hours' (0.00), 'Rate' (0.00), and 'Line Cost' (0.00). Below the table is a 'Details' section with various input fields: 'Organization' (EAGLENA), 'Site' (BEDFORD), 'Task' (empty), 'Set a Condition' (empty), '\* Item Set' (SET1), '\* Tool' (empty), '\* Tool Quantity' (1.00), '\* Tool Hours' (0.00), '\* Rate' (0.00), 'Item set 1', 'Storeroom' (empty), 'Storeroom Site' (empty), 'Reservation Required?' (checkbox), and 'Line Cost' (0.00). There is a 'New Row' button at the bottom right of the details section.

Task	Tool	Description	Tool Quantity	Tool Hours	Rate	Line Cost
			1.00	0.00	0.00	0.00

Details

Organization: EAGLENA  
 Site: BEDFORD  
 Task:   
 Set a Condition:

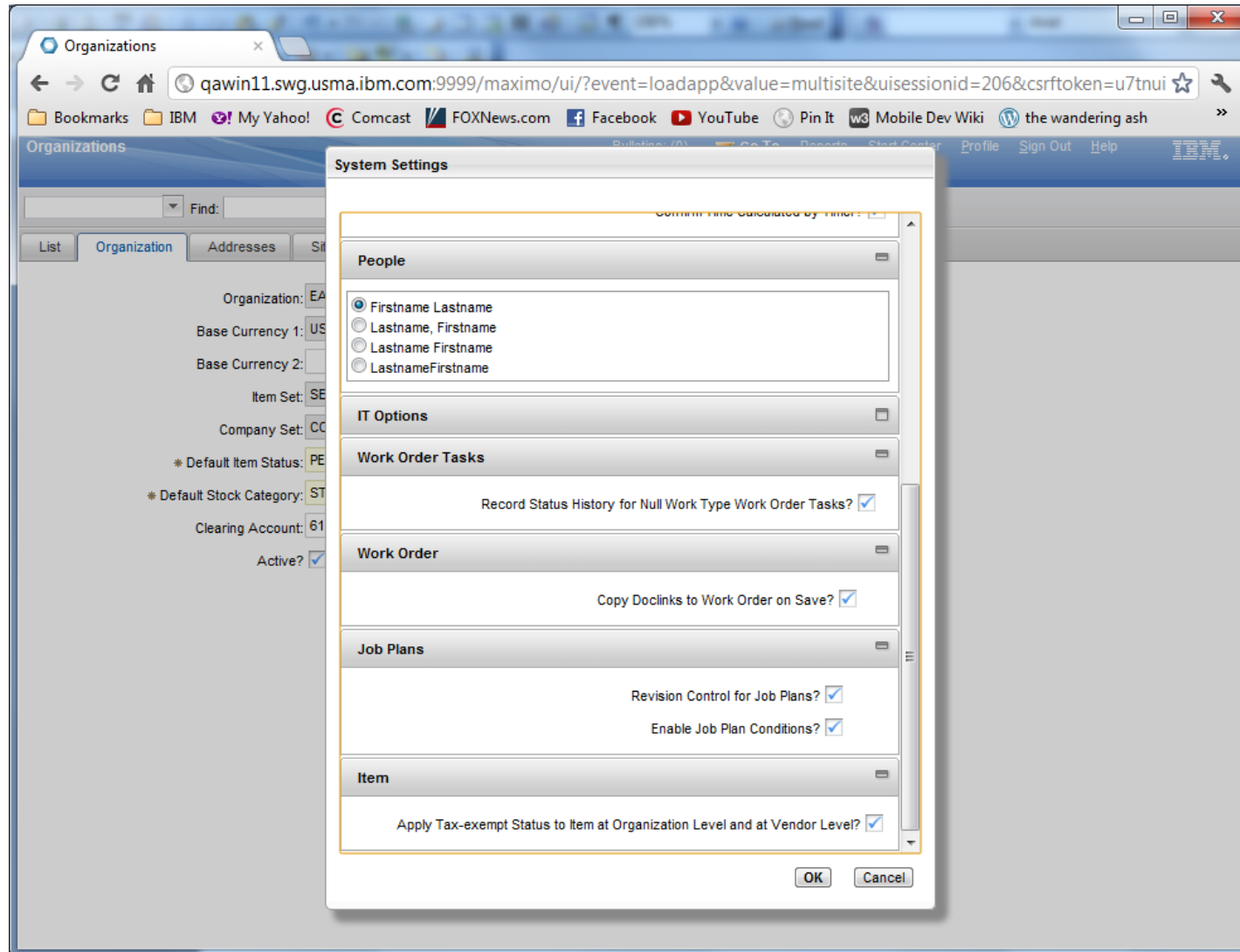
\* Item Set: SET1  
 \* Tool:   
 \* Tool Quantity: 1.00  
 \* Tool Hours: 0.00  
 \* Rate: 0.00

Item set 1  
 Storeroom:   
 Storeroom Site:   
 Reservation Required?   
 Line Cost: 0.00

## Deep Dive – Conditional Job Plans

- **Configuration – Turning Conditional Job Plans ‘ON’**
  - A new maxvar called USECONDITIONALJP will be added to allow clients to turn this feature on/off. Its description will be ‘Enable Job Plan Conditions?’
    - This is a system level maxvar.
    - This new function may have negative performance impacts and clients must be able to turn it off if not necessary. Its default value will be N.
  - If turned off the Condition fields should not be displayed in the UI (via Conditional UI) and the validation engine will be skipped when job plans are applied to work order records.
  - If this feature has been enabled and Conditions have been defined on Job Plans and then a user turns this feature off in the Organizations app, the UI will no longer display the Set Condition fields, but the data WILL remain in the database for any conditions that might have been defined. These Conditions will NOT be evaluated when the Job Plan is applied to the work order if the USECONDITIONALJP is set to No.

# Deep Dive – Conditional Job Plans



## Deep Dive – Conditional Job Plans

- Applying a Conditional Job Plan to a Work Order
  - The conditions are only evaluated if the feature is turned on.
  - When a job plan is applied to a work order each condition is evaluated
    - If the condition is true, it copies
    - If the condition is false, it does not copy
  - If a Task is not copied to a Work Order, none of the Resources (Labor, Material, Tools and Services) for that Task will copy to the Work Order either – even if their Condition is null or executes and returns true.
    - If the Task won't be on the Work Order, the resources for it should not be there either.
  - Resources for a Task can also have their own Conditions defined – A Task might copy to the Work Order, but that does not mean all of its resources must copy. Only the ones whose conditions are null or return true will be copied.
  - Task #s will not change or act in any dynamic way. If there is a Task 10, 20 and 30, and Task 20 does not copy, you will end up with Task 10 and 30. (30 would not somehow change to 20).

## Deep Dive – Conditional Job Plans

- Applying a Conditional Job Plan to a Work Order (Cont.)
  - Nested Job Plans will function as the used to
    - If the Task that has the nested Job Plan does not copy, then that nested Job Plan will not copy.
  - Duplicating and Creating Follow-Up work orders will not come into play as in both cases, job plans are not ‘re-applied’, so the conditions are not re-evaluated.
  - Once the job plan is copied to a work order and its conditions have been evaluated, no further evaluation of those conditions will occur.
  - For instance:
    - A job plan has a conditional task that only copies over to work orders of `WORKTYPE='EM'`. You insert a work order and do not yet enter a Work Type. You apply the job plan. Because it is not an EM type work order, the task does not copy to the work order. If you change the worktype to EM now, NO CHANGES will be made to the work plan on that work order. That job plan task will NOT be copied over after the fact.

## Deep Dive – Conditional Job Plans

- **Conditional Job Plans with Flow Control**
  - Using Job Plan Conditions AND Flow Control at the same time on a Job Plan can present ambiguous scenarios and ‘gaps’ in the flow defined in the flow control. If Predecessor relationships are defined, but point to a Task that did not get copied to the work order a ‘gap in the flow’ might be created. It will be the responsibility of the person creating the Job Plan to make sure they design it in a way that any of those potential ‘gaps’ would be bridged.
  - When a Task is NOT copied to a Work Order because of a Condition, it must be removed from any other tasks that are referencing it as a Predecessor (as well as the predecessor relationship – FF,FS, SF, SS).



## Deep Dive – Conditional Job Plans

### ■ Example:

#### Job Plan 1

Task	Predecessor	Condition
10	null	null
20	10FS	null
30	20SS	Condition defined – could be TRUE or FALSE
40	30FS	null

The above job plan scenario could end up with a gap at Task 30 because Task 30's condition could prove false and will not copy to the Work Order.

If this happens, you end up with this:

#### Work Order 1

Task	Predecessor
10	null
20	10FS
40	null

## Deep Dive – Conditional Job Plans

### ■ Example:

The way to design this job plan so that it will 'bridge the potential gap' would be as follows:

#### Job Plan 2

Task	Predecessor	Condition
10	null	null
20	10FS	null
30	20SS	Condition defined – could be TRUE or FALSE
40	20SS, 30FS	null

By defining both 20 and 30 as predecessors, Task 40 now has built a bridge across Task 30 in case it does not get copied.

If this happens, you end up with this if the Condition proves false:

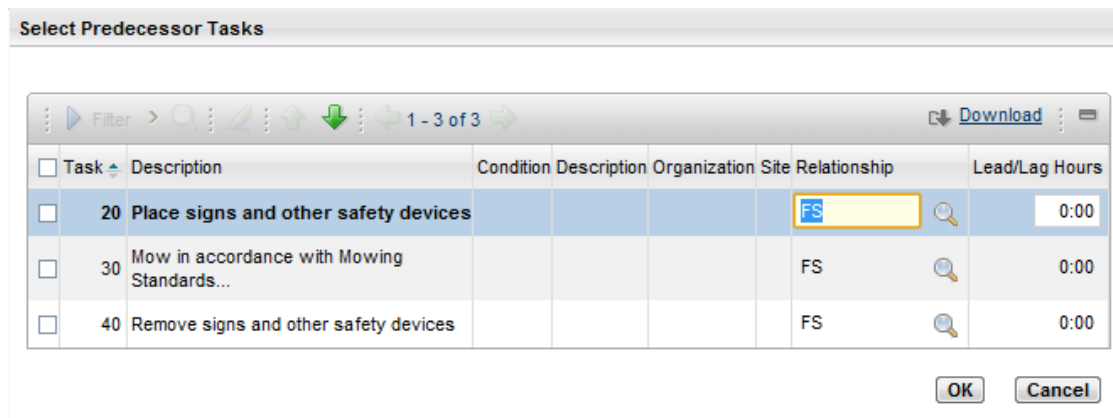
#### Work Order 2

Task	Predecessor	Condition
10	null	
20	10FS	
40	20SS	

## Deep Dive – Conditional Job Plans

### ■ Select Predecessor Dialog

- The CONDITION field will also be added to the Select Predecessor lookup dialog box. This will allow the person creating the job plan to clearly see which predecessors have conditions defined on them making it easier to ‘bridge any potential gaps’. This Condition column will only be added to the Job Plan version of the Select Predecessor lookup. The Work Order Tracking version will remain the same with no additional column. This will only be displayed if Job Plan Conditions have been enabled.



## Deep Dive – Conditional Job Plans

- **Warning Message Using Job Plan Conditions & Flow Control**
  - A warning message will be displayed to users in the Job Plan application when they have entered both Flow Control Predecessors AND Conditions.
  - This message will essential warn them that there is a possibility of a gap being created in their flow if some of the tasks are not copied because of their Conditions.
    - Defining Conditions on the resources (Labor, Material, Tools and Services) of a Job Plan would not conflict with Flow Control, so no special attention will be required with those. It would only be when Conditions on Tasks are defined and Flow Control Predecessors are defined that could cause the ‘gaps’.
    - This warning should only be shown to a user once – when the conflict first is created (or re-created if they removed all of the Conditions and then added one back or removed all of the Predecessors and then added one back).

## Deep Dive – Conditional Job Plans

- Warning Message Using Job Plan Conditions & Flow Control
  - There will be two possible ways this warning message is triggered
  - From the Predecessor field on Job Plan Tasks. When a user enters the very first Predecessor on any Task on a Job Plan (No other predecessors yet exist on any Task on this Job Plan) AND at least one Condition is defined on any of the Tasks, the following warning message will be presented.
    - "Conditions are defined for tasks in the current job plan. When the job plan is applied to a work order, some tasks might not be copied to the work order if the conditions are not met. Tasks that are not copied to a work order can cause a disruption to the sequential flow of the work order. Define predecessor relationships to reduce the disruption for tasks that are not copied to the work order."
  - From the Condition field on Job Plan Tasks. When a user enters the very first Condition on any Task on a Job Plan (No other Conditions yet exist on any Task on this Job Plan) AND at least one Predecessor is defined on any of the Tasks, the following warning message will be presented.
    - "Flow control predecessor relationships are defined in the current job plan. If you define conditions for tasks and the job plan is applied to a work order, some tasks might not be copied to the work order if the conditions are not met. Tasks that are not copied to a work order can cause a disruption to the sequential flow of the work order. Define predecessor relationships to reduce the disruption for tasks that are not copied to the work order."

## Deep Dive – Conditional Job Plans

- A special note regarding Nested Job Plans:
  - Nested job plans create child work orders. The conditions defined on that nested job plan are evaluated against the child work order that gets created, not the original parent work order that the main job plan was applied to.
  - Lets use an example of a condition that looks at specification attributes on an SR that is the ORIGINATING record to my work order. In this case, the condition looks at a specific attribute on the spec table of the originating record.
  - If you plan to use Nested Job Plans (if you don't then there is no issue), you need to make sure that any conditions on the nested job plan are written with the fact in mind that you are now down at the child work order level. The condition here would have to be defined to look at the specification attributes on the originating record of my parent work order. This is because conditions are always validated against the "the work order that the job plan is being applied to". In this case, the nested job plan is being applied to the child work order, not the parent work order.

## Status Inheritance with Flow Control

- Allow Status Inheritance with Flow Control Turned On
  - Currently, when flow control is turned on for a work order, no status inheritance is allowed. This is a problem, because there is no way to approve or close a work order and all of its tasks with one event. Every task must be approved or closed independently. This is wrong and bad and adds significant burden to the client for no real reason.
  - Status inheritance WILL now be allowed for all statuses other than the two statuses defined for Flow Control. Flow Control will continue to 'own' the 'when work begins' and 'when work is complete' statuses.
  - In order to not impact existing clients who may have gotten used to the old way it works, a system property will be added to turn this new functionality on or off. By default it will be set to work the way it always used to. Clients must flip this switch if they want the non-controlled statuses to inherit down the work order hierarchy when flow control is turned on.
  - The system property will be named:  
`mxe.app.wo.flowControlStatusInheritance`

Thank You!

# Questions?



Thank You!

# Extra

# Slides . . .

# Material Availability Status on Work Orders

## Work Package Material Status – Recalculation Rules

- A child work order is removed from a parent work order
  - If the parent work order’s Work Package Material Status (WPMS) is Null, NONE or COMPLETE, no updates will be required because the child that has been removed could not have any impact on this.
    - If it was already NONE, it would still be NONE
    - If it was already COMPLETE, it would still be COMPLETE
    - If it was already Null, it would still be Null
  - If the parent work order’s Work Package Material Status (WPMS) is PARTIAL, then it needs to be determined if the removal of the child work order will change this status.
    - If there were no other children of that parent (the one removed was the only child), then the parent’s WPMS would be set based on the parent’s material availability alone.
      - o Null if the parent has no materials
      - o None if none of the parent’s material is available
      - o Partial if only some of the parent’s material lines are fully available
      - o Complete if all of the parent’s material is available.
    - If there are other children still remaining under this parent work order, their WPMS must be evaluated. If after removing the child work order in question...
      - o All remaining children have a WPMS of COMPLETE or Null, then the parent’s WPMS will be set to COMPLETE
      - o All remaining children have a WPMS of NONE, then the parent’s WPMS will be set to NONE
      - o All remaining children have a WPMS of Null, then the parent’s WPMS will be set to Null
      - o In any other case, the parent’s WPMS is left as PARTIAL – no change is made and the process would stop here
  - Whenever the parent’s WPMS is changed based on these rules, the business rules must move up the hierarchy one level and re-evaluate the level above in the same fashion as the previous level. This will continue up the hierarchy until a point that no change is required to the parent’s WPMS. If no change is required, then everything above this in the hierarchy will not require any changes.
  - There will be no new recalculation of the availability in inventory. This update to the WPMS will be based entirely on the current statuses (that may be as old as the last cron was run).

# Material Availability Status on Work Orders

## Work Package Material Status – Recalculation Rules

- A work order is added as a child to a work order
  - If the parent work order's Work Package Material Status (WPMS) is PARTIAL, no updates will be required because the child that has been added could not have any impact on this.
  - If the parent work order's Work Package Material Status (WPMS) is Null, NONE or COMPLETE, then it needs to be determined if the addition of this child work order will change this status.
    - If there are other existing children under this parent work order, their WPMS must be evaluated along with the new child's to determine the WPMS for the parent work order. With the addition of the new child, if...
    - All children have a WPMS of COMPLETE or Null, then the parent's WPMS will be set to COMPLETE
      - All children have a WPMS of NONE, then the parent's WPMS will be set to NONE
      - All children have a WPMS of Null, then the parent's WPMS will be set to Null
      - In any other case, the parent's WPMS is set as PARTIAL
    - Whenever the parent's WPMS is changed based on these rules, the business rules must move up the hierarchy one level and re-evaluate the level above in the same fashion as the previous level. This will continue up the hierarchy until a point that no change is required to the parent's WPMS. If no change is required, then everything above this in the hierarchy will not require any changes.

# Material Availability Status on Work Orders

## Work Package Material Status – Recalculation Rules

- A new Work Package is created using the Create Work Package action
  - When the Create Work Package action is called, a new work order is inserted and the selected group of work orders are defined as children of this new work order record.
  - The existing work orders that are now children will require no changes to any of their statuses
  - The new work order that becomes the parent of the selected children, will need its WPMS updated according to the standard rules.
    - If all the children are Null, the parent is Null
    - If all children are COMPLETE or Null, the parent is COMPLETE
    - If all children are NONE, the parent is NONE
    - In any other case, the parent will be PARTIAL