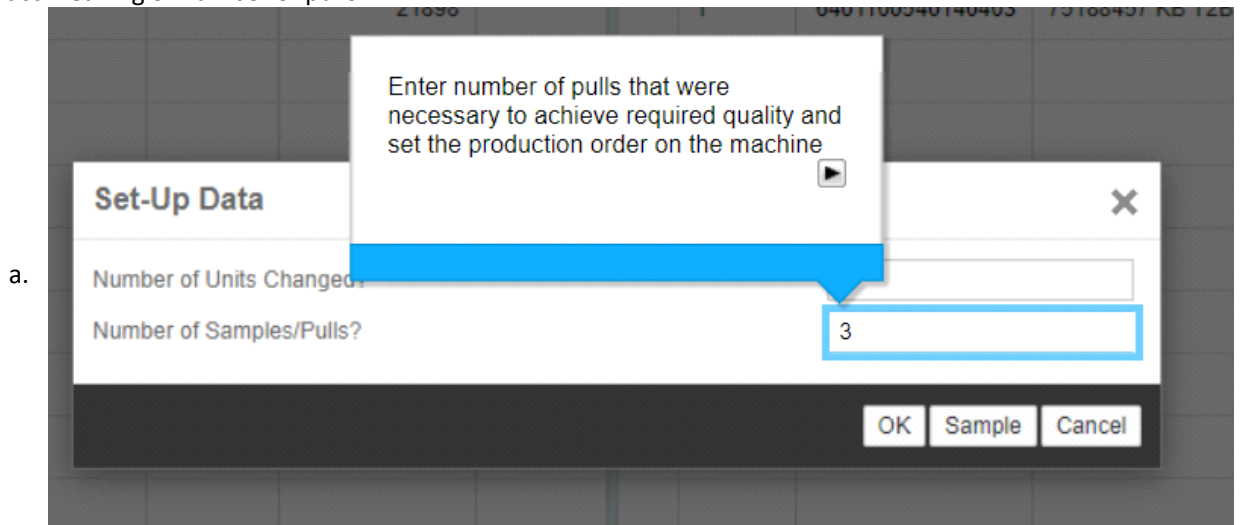


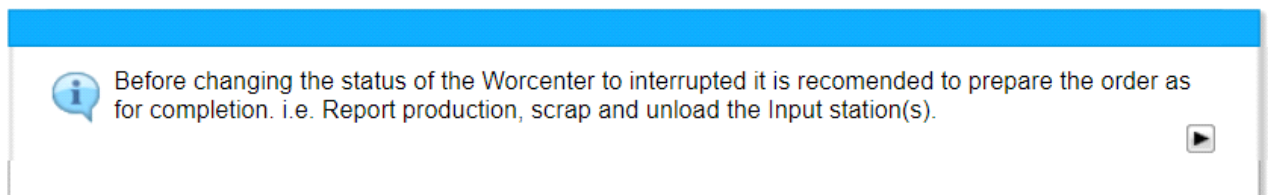
Doubts

09 March 2022 13:39

1. Partial confirmation during shift End - 5.1
2. Concept of Team in Shift selection.
3. Correct Order for shift selection and user logon.
4. Multi User Logon scenario - Can multiple users work on the same Production Order.
5. What is Lacquering process?
6. Exact meaning of number of pulls.



7.

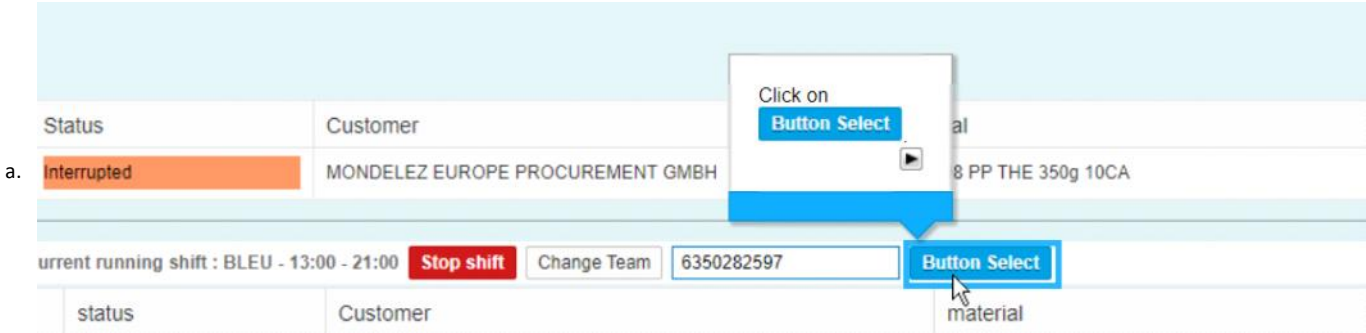


8. Trim data from the information menu.
9. 5.2, 5.3 & 5.4 => Separate Sessions or Videos.
10. Lane concept in flag raising functionality.

Polaris MII Suggestions

09 March 2022 13:46

- 1. Change "Button Select" text.



Learnings/Improvements

16 March 2022 19:17

- Move the reports towards the end of the TFA workshops.
- Get some analytics for SSRS report for the frequency of usage.
- Make a general roadmap for the TFA sessions to make them smooth.

Kick-Off

14 March 2022 16:19

All sites are into snacks and confectionaries.

Plants will adopt (NOT ADAPT) the standard Polaris template.

Responsibility assignment matrix (RACI)



R = Responsible

The person who does the work to **complete the task**.

A = Accountable

The person ultimately answerable for the correct and thorough completion of the deliverable or task, the one who ensures the prerequisites of the task are met and who **delegates the work to those responsible**.

C = Consulted

Someone whose **opinions are sought**, typically subject-matter experts; and with whom there is two-way communication

I = Informed

Someone who is **kept up-to-date on progress**, often only on completion of the task or deliverable; and with whom there is just one-way communication.

ID1 - PM

15 March 2022 14:33

AGENDA

Polaris-PM-TFA-ID1_Introductions, BPML, Process Maps, Flows 120 minutes

Topic	Time (Mins)	Accumulated Time (Mins)
Team introductions – Polaris & Amcor teams give 1 minute introduction for each person to everyone	20	20
TFA explanation and overview	10	30
BPML explanation	30	60
Production management Process Maps & Flows	30	90
Polaris Mii Interface explanation	15	105
Session Q&A	15	120

Mark Fry
- Polaris Manufacturing Execution System Expert

Adam Kocieba
- Polaris Manufacturing Execution System Specialist

Andre Gouveia Melim
- Cap Gemini consultant

Ankur Sharma
- Cap Gemini consultant

Mark Fry Adam Kocieba Andre Gouveia Melim Ankur Sharma

KEY USERS:

Roman - 13 years in Amcor, Process Engineer

Belen - 15 years in Amcor, Quality

Fernando - From Alzira

Barry - Pre-Press Manager, Rugby coach

Tomas -

Guillermo - From Cumbria

BPML:

- Indicate full ETE processes across all streams.
- PM focusses on "Demand to Supply" more.
- Heavily involved in "Produce Quality Product" high level process in the BPML.

-> How different are the processes that are performed by the key users currently and how the Polaris template will fit into the current processes.

-> Timesheet Editing in Polaris, Concerned about Shift related functionalities - Barry

-> Belen's question on Production Order interruption

-> Alzira - 2 Labels scenario?

-> Connetivity of PLC to Polaris SAP MII feasibility in Alzira. (Fernando).

ID2 (1) - PM

15 March 2022 18:31

Production Order Papers, Labels, Picking List:

- Production Order Papers basics
- Transfer of PO from SAP to MII
- Type of PO Papers
 - EQL (Pre-Press Papers) related to equipment
 - DET
 - Covers the req of all individual operations planned in the BOM Routing
- Different segments explanations in the PO Papers with example.
- Inclusion of tool details relevant to a particular PO that is part of PO Paper.
- Different segments in the DET PO paper
 - Operation Header
 - Qty req
 - Operation specs
 - Input req
 - Operation instruction
- DET example walkthrough with 9 operation with the explanation of the operations specs, input/output characteristics
- A bit about the rework operations on how they're there and not being there at the same time.

LABELS:

- Basics about label on how they enable easy identification, traceability, etc.
- Different types:
 - Supplier
 - SAP - allocated upon GR
 - Shopfloor - MII labels
 - Return
 - Output
 - Laboratory(quality check)
 - Container e.g. palet label
 - Customer ZFG label (Semi finished goods)
 - Derogation (Subsystem - additional info/facts during production without affecting the quality of the product) - informing the down-streams about it
 - Scrap - Rejecting some material, waste management, the type of scrap like repair/reject
 - Sample - generated when sample taken from the output with information related to sampling
 - Cylinder - identification of the cylinder, later linked to subsequent operations with one to many or many to 1 relationships
 - Container content label / (cylinder/tool) container content label - content related information
- QA - Combined PO - way of working and their feasibility
- QA - Possibility of seeing all the operations in the labels
- QA - Possibility of Flag related info on labels like the identification from labels

Label configuration - to be done for each template for each wc and to be done by the supervisor

- Explanation about the label naming convention
- QA - Can all other departments/streams e.g. pre-press... use the labels that are being used in

Production?

- The access will be given and all having access can use the labels

PICKING LISTS:

- Help to monitor req in various areas and address them accordingly
- It's necessary to ensure availability of all tools prior to production date/time.

QA - Movement of cylinders.. Is it not with the warehouse team??

WIP material...is it not with the Planning department?

How to avoid the clash like who is responsible for what and what departments and users should be engaged for training by the KUs.

Depends from plant to plant. Access to move and see the stock will be made available to all the appropriate users.

We deliver a flexible approach, where you can have the access and run the required picking list

QA - Can we include more material types to these picking lists like inks?

-> Possible but only after meeting all the pre-requisites like coordinating with the other teams like master data team and managing the stock qty, etc.

QA - Possibility of Modification/correction of the stocks.

ID3 - PM

16 March 2022 14:31

Dashboards and Cockpits to be discussed

Production Reports:

- Polaris Label MD
 - Label configuration detail report
- Polaris MES Flags
 - Flags set on the specific reels
 - Operator, flagged qty, reason desc
- GI and GR
 - GIs/GRs that have been done/posted
 - Everything related to Postings is traceable
- Logistic Movement
 - Traceability of types of movements associated with the raw material supply or storage of the produced goods.
- View Report Select
- MES Traceability
- MES Trim Waste Detail

- Amcor Historical Data Dashboard - Machine
 - OEE indicator
 - Machine specific characteristics
 - PO data which the machine was used for

- Amcor Live Data Dashboard - Group Of Machines
 - Representing same family of machines
 - Characteristics like Production, Speed,

- Amcor Live Data Dashboard - Machine
 - Speed
 - Waste percentage
 - No. of Flags
 - Blocked item info
 - Qty
 - Breakdown

- Polaris MES Cockpit details
 - Shift events, time events, output, scrap event chronologically, cylinder set used for a particular operation, GI
 - More or less displays everything

- POLARIS MES Cockpit summary extrusion:
 - What was produced with what input
 - Operation, PO Number, batch that was used

- Polaris MES Cockpit Details Extrusion

Logistic Report:

- MES Curing Report
- MES Container Stock
- MES ERP Interface Messages
- MES Packing Certificate
- MES Stock Report

- MES Picking List Batch Material
- MES Zero Pull

Process Parameter:

PLC Dashboard

Process parameter Historian

Quality:

- MES IQF Monthly tracker
- MES Quality

SSRS - Polaris MES MII Reporting:

- Tool from SQL
- Fetches data directly from the DB
- Been here for 2 years
- Categories based on the functional areas.
- Goal is to provide the production data related insights
- Feed data to the OpEx data for their respective functional areas and decision making
- More than 100 reports available.
- Real-Time data fetching from the PLCs and reporting the same.

QA Belen - Alzira - An order being worked across multiple shifts, how the report will look like?

-- The lead operator will be changed as per the shifts.

QA - Barry - Cumbria - Target qty population is as per OEE or based on the output being produced by the machine or what?

QA - Belen - Alzira -Who is actually responsible for the target setting?

Because targets are different for Planning and Production

--From SAP as part of the Master Data Setup.

QA - Julian - Alzira

Is it possible to configure an auto-refreshing interval or mechanism for these reports in order to display them on a big screen?

QA Fernando Alzira -

Is it possible to filter data for a particular order on Historical data Machine report?

--Appropriate time selections.

QA - Carlos

Is it possible to change the name of the wc?

-- No, using the same as SAP

QA - Belen

Can machine characteristics be modified like instead of mins to linear meters in the Live Dashbpard - Group of machines?

QA - BELEN

In Zero pool - can we identify if the record is repetitive or new?

Issue - Column E is having issue in Zero pool report (Cockpit report)!!

QA - Fernando

Is it possible to view the reels that are present in the pallet or container?

-- Yes Container Stock report.

QA - Barry

Add/remove items from the pallet and does the change will reflect in the container stock report?

QA - Belen

What quantity a particular cylinder has produced?

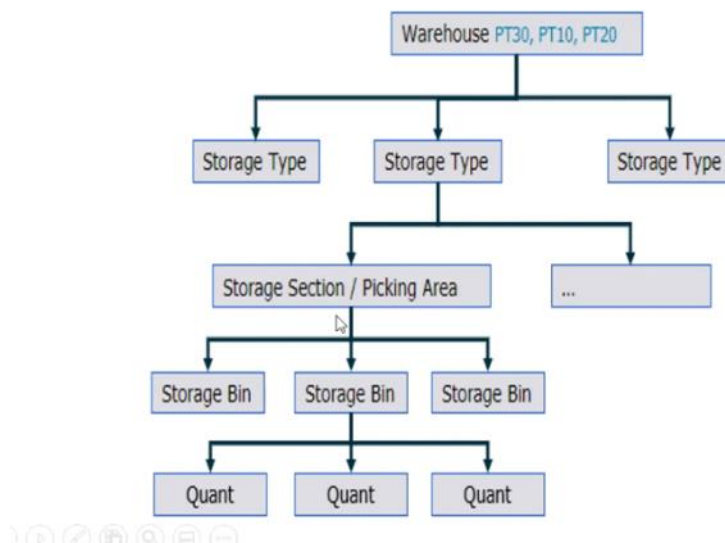
- Discussion of cylinder reports

ID4 - Logistics & Procurement

21 March 2022 18:32

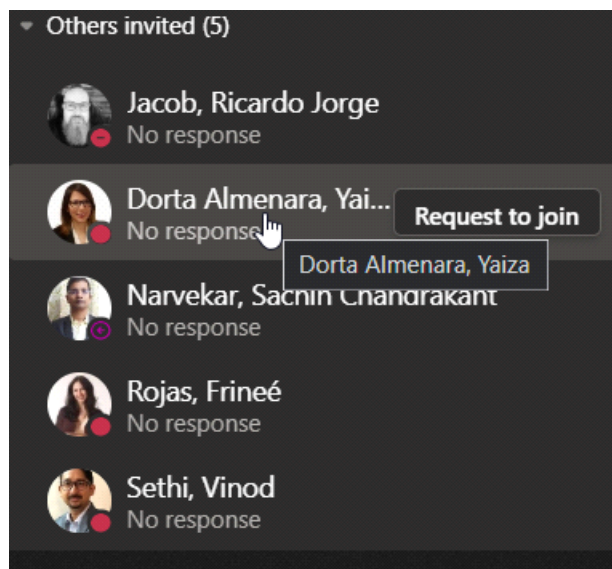
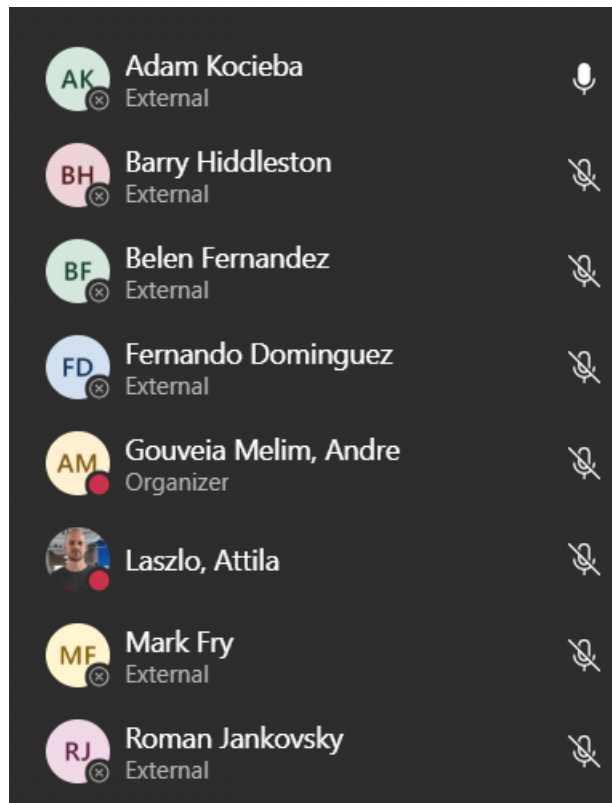
- SAP WM Basics:
 - SAP WM is able to control virtually anything that comes and leaves the warehouse.
 - Able to monitor the movement of stock and process their differences
 - Able to process all the transactions that are carried out in the warehouse including GI, GR and any stock transfers.
- Organization Structure:

Organization structure of Warehouse



ID4 - PM

22 March 2022 14:34



PLC Concept Overview:

- Basic
- Typical architecture explanation and

PLC prerequisites:

- Agreement on the tags from the site which are useful and meaningful for them
- Site need to decide process control parameters:
 - Target
 - Lower and upper limits
 - Lower and upper control points

QA - Fernando

--Is speed only the important parameter for PLC?

It's upto the site, there are multiple parameters/characteristics that might be of interest like temperature

- Energy consumption monitoring possible as well with PLC
- Things to consider as PLS prerequisites:
- PLC Possibilities:
 - 2 main areas:
 - Monitor live data with regards to process conditions and react accordingly
 - Observe live analysis
 - Live data feed can trigger actions in the system directly

Historian Database:

QA - Fernando

Automatic working of the machine can be a use-case.

- Triggering the downtime automatically if required but we will never restrt the system automatically.
- Functional areas utilities:
 - Production -
 - Quality

- Energy monitoring
- Data Load
 - Agreed data tag list to be compiled and mass uploaded in the system
- Resource monitoring examples:
 - PLC Dashboard
 - Live values of a chosen WC
 - Trend tracking
 - SOC
 - SPC
 - Process Parameter Historian
 - Process Parameter Historian - Energy
 - Energy Dashboard
 - Process Parameter Historian Average Item

Process parameter Control Examples for different process like lamination, etc.

- Quality monitoring and traceability examples:
 - Quality Dashboard
 - Quality Dashboard Visual
 - Quality performance of process on specific wc.

QA - Belen what sites are connected today?

--extrusion site in Italy, Zlotov, Wuhtz, daxo in france, switzerland
benefits are quite large

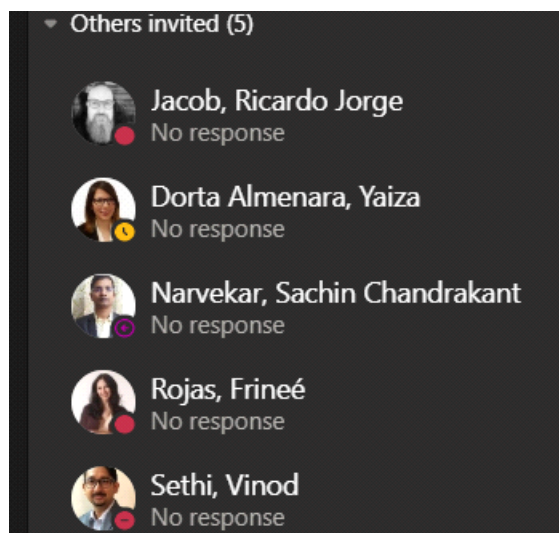
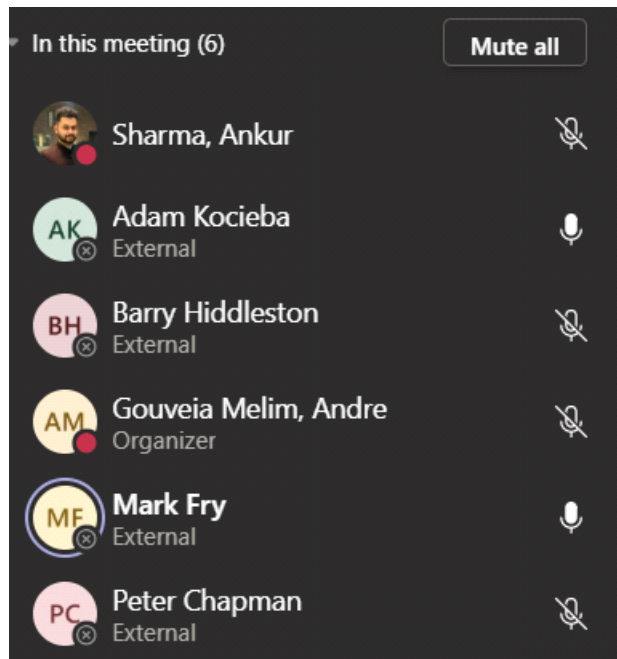
QA - Belen - Do we need to give you the contact person to get started?

-- Our IT team will be responsible for setting it up and a poc will be req who has the most working/functional knowledge about the site.

Action - KU to check who will be the best people to work witht the IT team work parallely to get started with PLC.

ID11 - PM

22 March 2022 16:33



- Agenda discussion:
- Extrusion Management in MII - Shop Floor Papers
 - Shop Floor papers PO Header detail explanation
 - Shop Floor Paper Production operation instructions example
 - Shop Floor papers formulation example with detailed explanation
 - Extrusion Shop Floor papers operation example
 - Packing instructions/specifications
- Additional documents:
 - Can be accessed through MII from Document Management
- Trim Conformation per production Order

- Trim values are in the Master Data in SAP and sent to the MII with the Production Order MD but this value can be changed
- Difference in the BOM view in SAP and MII
 - In MII, it displays the layers, thickness, material ref and the % quantity per material within the structure
- Recipe management in MII - Only for a specific Production Order
 - With supervisor access, recipe can be changed with the relevant structure impact knowledge and it will change the standard BOM consumptions
 - Walkthrough of WPB document for recipe management
- Resin Consumption Overview in Polaris
- Regrind Creation and consumption
- Demo from Production:

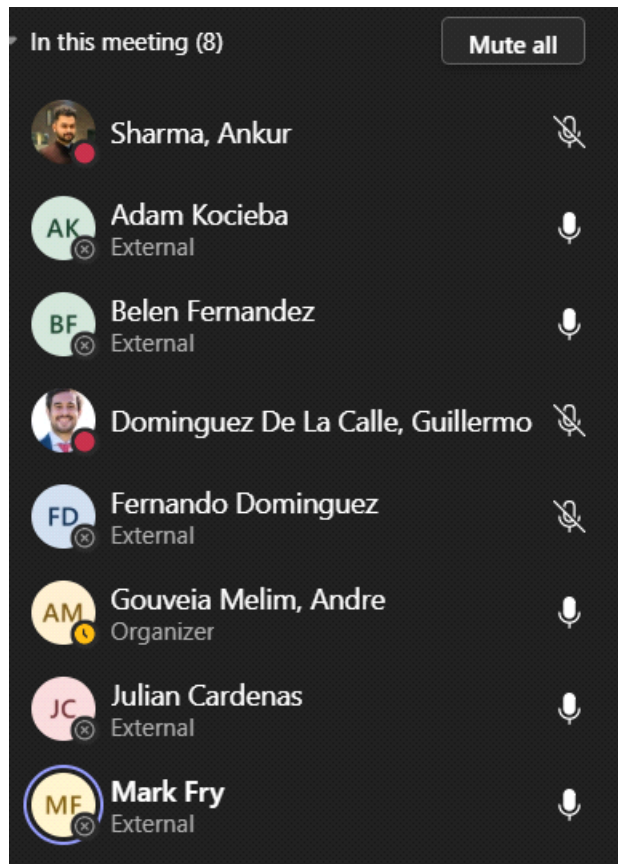
QA - Barry

Weight conversion incorrect, will the system give an error during output?

- Qty check Pop-up

ID7- PM - Q&A Alzira

23 March 2022 14:32



Belen - Internal discussion about Wets:

Fernando -

- PLC -
- Robot packing line is a bit of a concern
 - o Fully automatic but all the other machines are semi-automatic.
- Returns management:
 - o Return claim - How to enter pallet detail in the system when customer return.

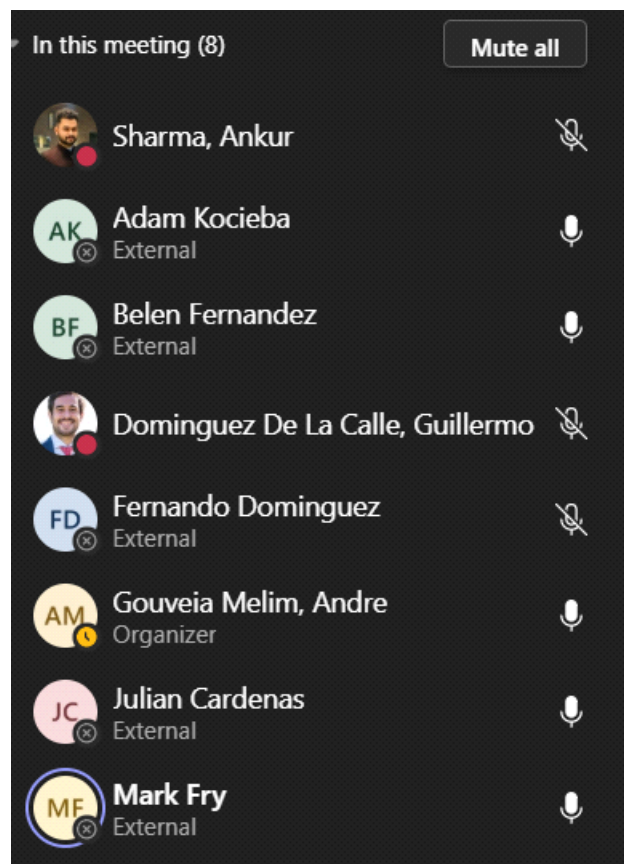
• Julian:

- Color management in MII - Is that a possibility?
 - o No.

ID8 - PM - Q&A Cumbria

23 March 2022

15:32




Concern - Additional user support for Barry from training and etc perspective.

- Initially train the shift managers

ID9 - PM - Q&A Novy



23 March 2022



16:31



 **Share invite**



▼ In this meeting (8)



Mute all



 **Sharma, Ankur** 



 **Adam Kocieba**
External 



 **Dominguez De La Calle, Guillermo** 

 **Gouveia Melim, Andre**
Organizer 


 **Jacob, Ricardo Jorge** 


 **Laszlo, Attila** 

 **Mark Fry**
External 

 **Roman Jankovsky**
External 

▼ Others invited (4)

 **Dorta Almenara, Yaiza**
No response

 **Narvekar, Sachin Chandrakant**
No response

AMCOR Page 20

KU Training - Session 1

23 May 2022 15:09

Q&A:

Rui --> Is Supervisor segregation possible with different supervisor accesses?

Fernando --> Is it possible to change the group of machines on the Summary Page?

Rui --> What kind of roles can modify the Pallet/Item config / Can an operator do it?

Barry --> Closing/Complete a Pallet?

Rui --> Will Change in plan overwrite the defined sequence in Production?

KU Training - Session 2

24 May 2022 15:06

Q&A:

Belen --> How the PO numbers are generated i.e. Is there any logic defined to generated the PO numbers?

Fernando --> Can shift timings be changed as per site specific shifts?

Andrew --> Same Shift but different timings in different departments of the Production?

Rui - Automatic shift close - Does it end @ 00:00:00 (End of defined schedule)?

There are tolerance that can be defined as well for start and End of an shift that can be defined in the tables.

Belen - Can mandatory questions be something other than a YES/NO question?

KU Training - Session 3

24 May 2022 18:10

Q&A:

Belen - Can any material be loaded be it Setup or normal?

Rui - In each input station can we load multiple items per input station - the multiple load parameter is configurable or not?

Rui - For Input type 4 - Is it mandatory to load all input type 4?

KU Training - Session 8

27 May 2022 15:09

Q&A -

1. 31 Min
2. 45 Min

Scrap from Packing

Session -17

06 June 2022 15:15

Rui - Raw material qty change... how the systems will be sync in terms of the consumptions

RUI - Message text while changing the thickness to be changed to make it more clear.

Session 19-20

07 June 2022 18:24

1. Possibility to scan multiple items ?
2. Unblock authorization - Can anyone with log access can do it or only the QM guys?
3. Q - From Carlos
if we need to move storage units. (wets or packaging) . do we use the same program?

Session 21

08 June 2022 15:16

Q from Rui - Will the cylinder labels be printed when goods receipt for them is done?

Q from Marcio - Can we reprint Cylinder labels from Maintenance Screen?

Session 22, 23

08 June 2022 11:29

Doubts:

Polaris

Sharma, Ankur

STARTSUMMARYPRODUCTIONPACKINGMAINTENANCEQMCONFIGURATIONSLOGISTICPROCESS PARAMETERADMINSCRAPMACHINE MAINTENANCE

New Configurations TabResourcesLabel AssignmentMaster Data

Production Order: 6350420278Operation: 0010Search

1.

Configurations for Production Order and Operation

Configuration Type	Configuration	Production Order	Operation	Value	New Value
Order (Operation) Details	Number of Outputs	006350420278	0010	1	
Dimensions	Trim (Natural Process) Waste	006350420278	0010	0	
Accept Updates From SAP	SAP_UPDATE_Locked	006350420278	0010		
Weight Factor Actual	Weight Factor Actual	006350420278	0010	15.285	

3.

Configurations for Production Order

Configuration Type	Configuration	Production Order	Item	Value	New Value
Dimensions	Thickness (or height)	006350420278	0001	20	
Dimensions	Diameter (if round)	006350420278	0001	0	
Lane Configuration	Lane Item(Box)	006350420278	0001	0001	
Lane Configuration	Item(Box)	006350420278	0001	0	
Lane Configuration	Container_Position	006350420278	0001	0	

Save

4.

Session 25

09 June 2022 18:05

Q from Rui - Possibility of import of the reports from Spider?

Session 26

13 June 2022 15:09

Q from Carlos -

Can we filter out the records in the report like **Container Stock Report/Curing Report** as per different business that are there is Alzira like Amcell, Pharma etc. (It can be done in SAP)

(Different WC, MRP Controllers, Same Number Ranges among different businesses)

Same in case of Cumbria like Amcell, Flexo, Extrusion.

Q from Rui - Can we have next operation data in the stock/WIP report that lets us know about the status of a material or tells us about its utilization?

Q from Marcio - Any report which can give details like Container ID, Item ID, input material, Output Material, base qty, etc?

Session 31

20 June 2022 15:06

Q from Marcio:

Work Width from Cockpit report?

Q from Belen:

Workcenter overview to check Belen's requirement of a report to view status of multiple wc in one screen with setup and downtime durations details as well.

Organization Structure - Basic Configuration

29 August 2022 19:57

SAP system versions in the existing systems in the 4 Wave 2 sites ? - Clarification to be given by Sachin.

Wave 2 TFA Preparations:

1. Attendance sheet population for TFA tracker.
2. Combined sessions to be
3. Id7 - Pre-press
4. ID4, ID10 - Raghoba > Fabio - Logistics
5. ~~ID6 quality - Deeptam~~
6. ID3 - Presentation Files

To be discussed with Mark & Adam:

1. MII System readiness after ECC configurations are complete - Timeline for it, etc. - Need to check with Mark - End of September as per the communicated by Mark during Project weekly call.
2. SAP Table's data in MII DB - (Basic config of all the plants)
 - a. Bin Locations
 - b. Plant Characteristics

Plant Presentation - 17th October

17 October 2022 13:27

Local Project Managers:

01. AF Horsens – Mette Hansen

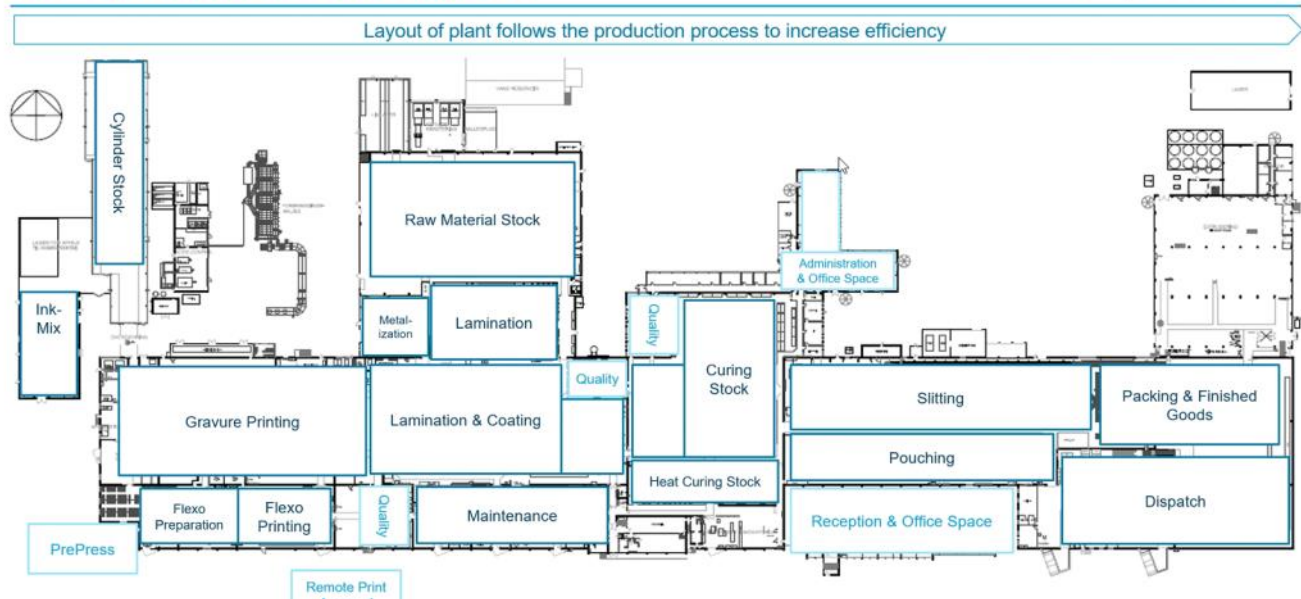
01. AF Arenzano – Raffaella Tufoni

03. AF Barcelona – Toni Mata

AF HORSENS:

- Speciality Reels
- Technical Laminates
- Custom designs
- Lidding Foil
- Deep Draw
- HFFS, VFFS
- Pouches
- Bags
- Wallets

AF Horsens Plant Layout



- Have their own Prepress department
- Ink kitchen - Traceability in Ink Maker - Ing maing and managin software
- Cylinder Stock - Over 8000 Cylinder stoick
- 2 Gravure Printing macjines (8+1 Colors)
- 2 Flexo Printing (10+1 Colors)
- Duplex/triplex laminations (Solvent based/ Solvent free)
- Coating - Sustainable
- Metallization - Alluminium coating of transparent films
- Quality Control
- Curing (Standard 4 days - temp 42-44 Degree Celcius)
- 8 Slitting Machines, 3 Doctor Machines, Slit upto 16 reels, Width 20mm to 1650 mm
- Pouching - Medical Applications
- Packing - Semi-automated packing of pallets

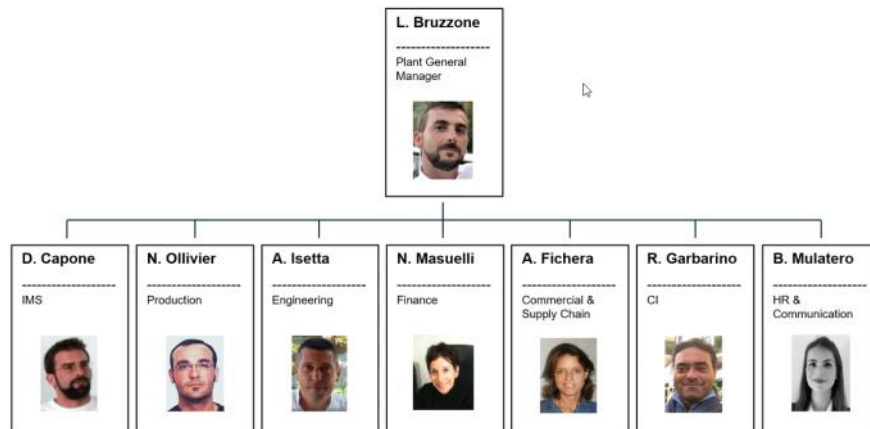
(Lot of data flowing from Slitter to the Packaging area - Modernization is required/expected)
Uploading to Aladdin, electronic performance systems

AF Arenzano:

- Converting Plant - 171 employees
- Specialities:
 - o Multi layer Laminates
 - o Premade gusseted bags
 - o Small Order quantity
- Purchases are made from Amcor extrusion plants

About Amcor Arenzano

Management Team



- Printing(Rotogravure - 8/9 colours), Lamination (Duplex/Triplex Solvent based), Slitting (Laser Scoring 1D), Bag making, Rewinding, Curing, Applicator (Labels, handles)
- 2 printing press
- 2 laminators
- 2 rewinders
- Curing Rooms
 - o C1, C2 (100, 200 with low and high temp resp.)
- 5 slitters
- Ink management and traceability - Do it in a separate software - Excel or Access - Expectations high from Polaris about the Ink management and traceability

AF Barcelona:

- Conversion Plant (Print, Lam, Slit, Pouches)
- Small plant with 108 employees (Co-workers) + 40 hosted
- 170+ Customer (Mainly meat and Dairy)
- Lot of transition history with the org and layouts

AF Barcelona: Organization Chart



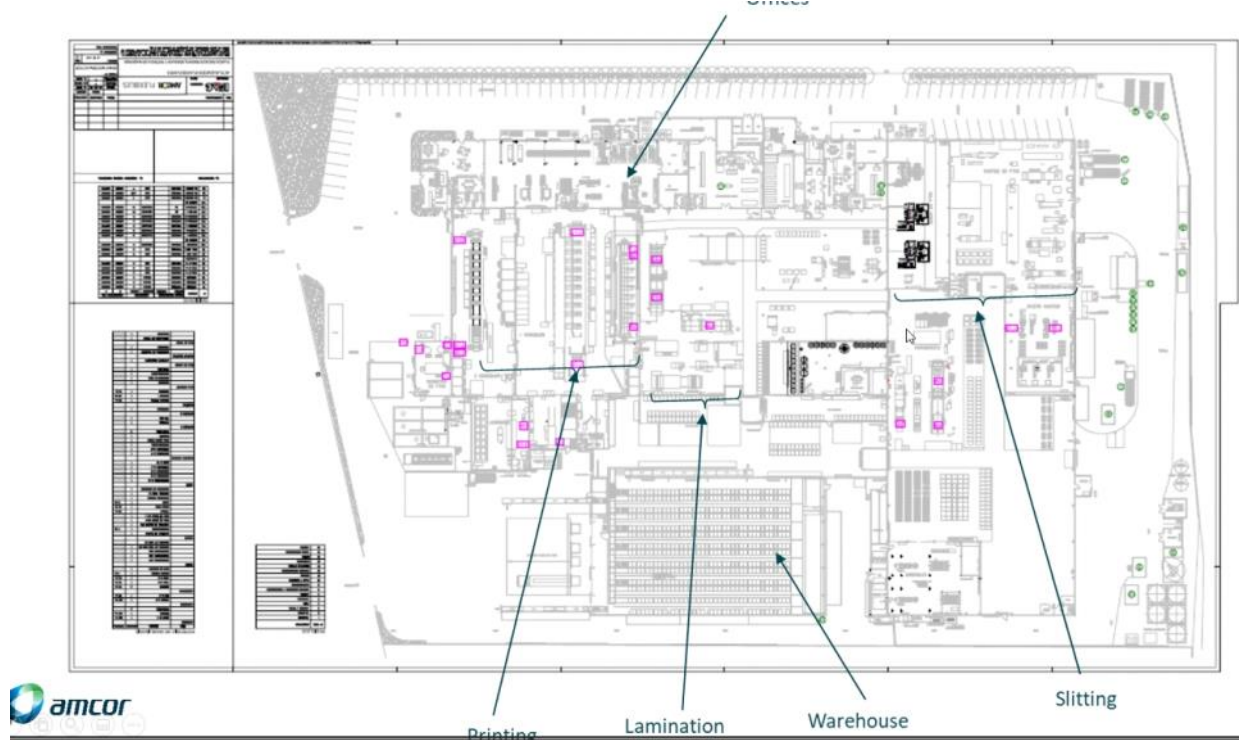
- Asier promoted to General Manager
- 2 Printing Fravure Machines (1 with inline lamination) - upto 1280 mm width

- 2 lamination machines (Solvent based and solvent less) - upto 1270 mm width
- 5 slitting machines
- Pouches - 1 bag machine lines (3 seal pouches)
- Cylinder engraving (Alzira - Kanoschka)
- Ink stock & prp - Sun Chemical (90% Sun chemical - Consignment stock) - Managed by excel files about the consumptions

AF Barcelona: Portfolio Overview



Features	Capabilities	Effects			
<ul style="list-style-type: none">• High, medium and low barrier to gases and aroma• Printed and plain• Sealables/peelable to PE, PP or PET• Macroperforated	<ul style="list-style-type: none">• Thermoforming• Pasteurize and retort• Reclosable (via hot melt coating, tape & mechanical)	<ul style="list-style-type: none">• Anti-fog• Anti UV• Cold Seal coating• Paper effect (AmPaper)• Matt effect			
					
Processed Meat	Fresh Ready Meals	Fresh Pasta	Fresh Pizza	Hard Cheese	



AF Horsens Clarification Call - RIDA Items

19 October 2022 18:46

- Packing Robo - RIDA ID6/ID8:
 - There are 2 robots - 1 connected with slit on 1 WC:
 - Documentation exists
 - Technical knowledge / resource exists
 - Should be able to implement easier as it is relatively new.
 - Logic from Wuhz/Cumbria can be used.
 - Labelling - manage the label risk separately
 - Next Steps:
 - Identify Risk
 - Raise it as a risk when Risk/Issues Start
 - Series of meetings for acquiring the documentation
 - Feedback on the documentation provided
 - 1st Robot should be fine because supplier company exists but for the second one - help might have to be seek from external vendor or use some trial and error methodology.
 - Coordinate the meetings for these Robots or at least be involved and keeping track of all the activities related to it.
- RIDA ID9:
 - Need to monitor the behaviour of the users when we share the Polaris Knowledge
 - Good feature - not necessarily to be delivered during the Go-Live.
 - Can be a CI.
- RIDA ID11:
 - Not our problem
 - **Lies more with the MD/Logistics streams.**
- RIDA ID16:
 - Additional job info is stored in folders (job packs) where they put the designs / master samples
 - Customer approvals on the job/colours
 - Sample of end of reels
 - To be considered as a Risk especially for the **Case Number - To be suggested by Lucie (Master Data) for the communication among the departments.**

TFA Prep Action Items:

25 October 2022 13:09

1. ~~ID1 PPT corrupted~~ → ~~BPML~~
2. ~~ID6 PPT~~ → ~~HUM Part missing~~
3. ~~Attendance List update for Horsens~~
4. ~~ID5 scheduling~~ → ~~Pre-press session~~
5. ~~ID3-ID7~~ → ~~Quality reporting session~~
6. ~~Response tracker~~ → ~~Send to Frinee~~

TFA ID 7, 8, 9

03 November 2022 14:40

RIDA Update required before Status call today.

ID2 - Question:

- ID7:

~~Curing - Scenario 2 scenario to be discussed again: - New RIDA Item~~

~~Q1 - Official comm to PGM - Plants - PLC Costs - New RIDA Item~~

Call with wave 1 plant for relabelling preferably Alzira

HORSENS:

RIDA ID 16 - Case Number - To be followed up with Master Data.

Labels:

ARENZANO:

Power failure / Network Outage:

What happens to the data can it be put back or can be recovered ?

Server will be onsite - We have outages - servers needs to be restarted - but we never lose any existing information.

But if something was done after the downtime - it needs to be re-aligned.

Wil provide BCP documentation

Stefanini monitorig 24/7 the servers and having some KB articles

Questions from TFA Sessions:

Marc – How the linking of Positive Release functionality will work?
- The Positive Release functionality will work as the configuration done for the relevant WCC (Work Center Characteristic) under “Master Data” configuration in the Polaris MII system. Hence, it can be enabled/disabled per machine/work centre based on the decision made by the site.

Antoni – Is it possible to Split/join 2 containers?
- For the Join Scenario à We can transfer all the content of a pallet container to another pallet completely but while doing so we need to make sure that we do not cross the “Items per container” value in terms of the number of reels we are moving to the target container. However, if the user still does that, then the system will give you a warning that you are trying to move items to a container more than it’s defined capacity. MII will only allow the same SKU on the container. Mixed SKU pallets is not allowed in the system

- For the Split Scenario à We can move items from a pallet container and transfer the same into any number of new/existing containers keeping the container capacities in mind.

Antoni – How the net weight calculation and Gross Weight calculation is done?
- For Individual Reels à The net weight of the individual reels is calculated according to the material classification characteristics master data which is setup in SAP and comes down to MII. The gross weight however takes into consideration the Item tare weight as well which again comes from SAP and gets calculated using certain material classification characteristics. If the sales UOM of the FG is KGS then we can configure MII to allow the operator to declare the actual KG value rather than the conversion from meters by the master data conversion factors.

- For the Pallet/Container à The net weight of the container would be the total gross weight of the individual reels and the gross weight of the container would take into consideration the packing material that is used like the bubble wrap, the wooden pallet base, etc.

Marc – Is it possible to do Movement of reels in container of different Production orders in the following scenarios?
- If the FG material is same in two Production Orders?
- Not in MII, this is only possible to pack reels from different production orders when the stock arrives in SAP

- If the FG material is different in two Production Order?
- Not possible.

Marc – Who is responsible for the maintenance and checking of schedulers in MII in the System Management menu.
- The MII scheduler configuration is a one-time activity done by the Amcor IT team of developers while setting up the site specific servers. It is a one-time activity that does not require frequent monitoring. However, it might happen sometimes that there might be an issue in any of these schedulers do to any reason and there are not able to transfer data between SAP and MII systems. This case can be identified by a long delay in the processing of Goods Receipt or Quality Data or any action being delayed that these interfaces are responsible to execute. In that case the PM stream with the help of Amcor IT team will be looking into the issue and will try to fix the issue at the earliest.

Marc – What is the recommendation for interface management – from which stream the person should be chosen?
- As communicated earlier, we do recommend that the sites should choose a dedicated person who will take the responsibilities of monitoring these interfaces and works collectively with different streams in order to resolve the errors/issues found on MES Interface monitoring page.
This person should have EZE knowledge about the business process because that will make sure that the person works and points in the right direction while resolving the issues either individually or along with other stream for a cross-functional topic. Other live Polaris sites have a mixture of people from different departments monitoring the interface errors. These range from people linked Finance, Production, controlling, logistics. Ultimately it needs to be someone who can communicate well with their colleagues across multiple functions as the root cause of the issue can vary.

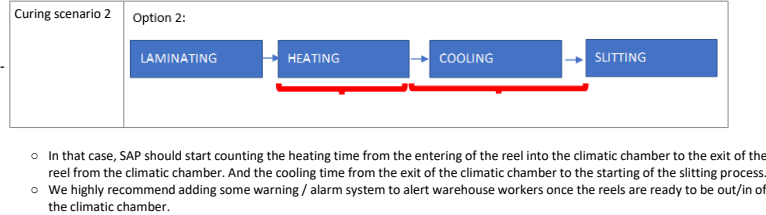
Other Questions:

- Could the Positive Release be established for a production order?

Positive release process is controlled by the Workcenter Characteristic in the base configuration of MII system
We can only have it switched on/active or off/deactivated by machine/workcenter (meaning that entire production output from machine will be subject to additional inspection/ Positive Release when the function is active)
There is no possibility to control it by Production Order or at Material level.

For scenario you have specified new functionality/logic will be necessary meaning you would have to raise the demand.
This would than go through standard process:

- Business case will be necessary
- Pre DAB investigation will be triggered to determine feasibility and usefulness for other Amcor sites
- DAB will be raised if change supported
- DAB will be submitted to the authority board
- Decision will be made:
 - Approval (for Go-live)
 - Approval (CI – next release)
 - Rejection of the demand



TFA 17 - Q&A 2 Horsens

17 November 2022 13:47

- **Questions from TFA Sessions:**

- Fleming – Today in Horsens the Quality results are only captured in SAP, with Polaris, will it will be typed in MII and sent to SAP ?
 - Yes, depending upon the defined Quality Plan and other Quality related Master Data that is defined in SAP, MII will receive the same inspection points defined at different levels. These will be captured for the required WIP, SFG and FG stocks and once the data is captured, it can be confirmed from the Usage Decision. Once the usage decision is completed, the Quality data will be posted to SAP by a background interface. However, the possibility to have Quality Inspection for Raw Material from suppliers/vendors can still be done and captured in the Polaris SAP system.
- Fleming – Is it possible for different users to have different visibility of MII features?
 - Yes, majority of the core functionalities from Supervisor Tasks are controlled with a different authorization role which can be assigned or removed to/from a user id as per the requirement e.g. Curing Time Change, Item Maintenance, etc.
- Fleming – When a Change of recipe is done by an authorized user, is it traceable somewhere in the system and will the log be present at all times?
 - We can make a trace from a change in the configuration page but the recipe changes are only relevant / valid for Extrusion plants
- Fleming – While performing Curing time change – is it the change in Master Data for Production Order or in SAP Master Data?
 - The change in the curing time in MII by a supervisor is basically a Master Data change limited to that particular Production Order in MII only. If the same cure time values for that FG material needs to be produced in MII on subsequent production orders, then the Master data should be updated in SAP to avoid the cure time change in MII. However, the cure time can be changed as per a need/requirement at a certain time in MII itself.

TFA 18 - Q&A 2 Arenzano

17 November 2022 13:50

- **Questions from TFA Sessions:**

- Ricardo - What happens to a reel/item when the inspection values captured against it are out of tolerance or specified control limits?
 - Once a inspection characteristics' (Mandatory / Required) value is captured and falls outside the range of specific control limits, the HU is blocked immediate for Quality reasons. The same can be seen in the "Maintenance" screen and the Item status would be "Quality Blocked". The blocked item can be unlocked after appropriate quality check from either "Polaris Logistics" or "Positive Release" page. Moreover, please note that the blocking will block the next processing of the individual item until it is unblocked. This action is only relevant for MII stock and if the stock has already been consumed or posted to SAP before the saved QM result then further manual action in SAP is required to block the relevant item(s)
- Ricardo – What does Empty Values button does on the "Usage Decision" Screen?
 - Once the button is clicked, it shows the user all the QM characteristics, that are yet to be provided a value for the indicated Production Order/Inspection Point/Item HU.
- Ricardo - SAP Error - Where to see the details and how to resolve and who will resolve?
 - The SAP ERR status updated against each of the Pallet container can then be traced back in Maintenance screen in the "SAP Response" tab. In there, you can see all the Goods movements, Goods Issue, Goods receipt and confirmations related errors. It will also show the error number and a short description explaining briefly why we have a posting failure in SAP. However, please remember that although these errors are visible in MII but majority of the times, these needs to be troubleshooted in SAP system as MII is just giving us the response of the postings done from MII to SAP.
- Ricardo - How rework will be done ?
 - Rework/Rewind is a different process in Polaris. We recommend each site to incorporate optional rework process for each operation in original BOM routing which may/may not be used as per the requirement.
 - By default all rework operations are hidden in the running queue.
 - Those rework/rewind operations can be seen by selecting the Show Rewind Operation box (optional)
 - Operations can be search as standard using the search box
- Another type of rework approach is there which is applicable for the case of FG that have already been reported to SAP. This will be discussed in more detail in the TFA session for Rework/Waste Management.
- Ricardo – What is the feasibility of Status open and adjusting Pallet Containers ?
 - When Container not Completed → The content of the pallet container can be updated/moved to/from the container if it is not completed and then can be marked for completion once all the updates are made.
 - When Container is already completed → If the status column is not updated with "SAP ERR" | "SAP OK", that means the background interface has not picked up the container for postings yet and that gives us the chance to reopen the container again and make the required adjustments. **However**, if the container has a status updated already, that means from now onwards, all the adjustments for the container will required to be made in SAP and then, the same can be made in MII to maintain the synchronization between the two systems in terms of the traceability.
- Ricardo – Can we control Reason code(Enable/Disable) ?
 - Yes, we can control the visibility/ display pop-up of a predefined set of Reason codes in different cases like in Status Change, Input Scrap, etc.
- Ricardo – Shift data posting to SAP manually also possible or automatic posting in SAP?
 - It is highly recommended that the shift data is manually posted to SAP (usually completed by the relevant shift leader / supervisor / manager) for at least the first 6 months after go live as this is the opportunity to find any errors that the production teams have made before it pots to SAP with potential wrong values that will cause wrong post production calculations in SAP at production order level. When you are confident the values are realistic and consistent as recorded by the production team we can configure the system to automatically post

the data to SAP. Only 2 Polaris live sites have so far requested automatic data posting and they post the data 48 hours after the shift end.

- Ricardo – What is the No. field in the SAP Interface page in MII?
 - The “No.” field in the SAP Interface page is basically the error number returned from SAP when MII attempted to post any data to SAP. Each error No. corresponds to a different Error Type and is unique. In simple terms, it is basically the response returned from a RFC or a BAPI call made in SAP from MII for any of the scenarios like GR, quality data transfer, etc.
- Arnaud – Possibility to see the warnings that we see in ZPOLINTLOG in MII as well.
 - As of now, we receive only the errors in MII for the postings that fails in SAP. Moreover, the warnings in SAP system might or might not be relevant for the MII system to display. Hence, we do not see the warnings, just the errors.

PM Internal Alignment - 23/11/22

23 November 2022 16:18

1. ~~Training approach for the Champions who will be training the end users – Should they be trained together with the KU or not?~~
 - a. ~~Can have all users (KU and Champions) in the sessions but test data would be only prep for the primary KU.~~
2. ~~Hardware and software requirements for the KUT.~~
 - 1. I am starting to prep the teaching environment
 2. We have 8 pc's in our teaching room
 3. What do I need When I start the KU training
 4. Template/programs for translating user manuals and how do I upload these
 5. Do we need teams on the pcs? can you send me a list of what I need to have installed on the machines
1 Printer (1 A4, 1 thermal per room), 1 Scanner for each PC, Network connectivity, Google Chrome browser, Projector for the broader audience in the training room.
3. ~~Training Documentation Translation – WPB approach – Only the Demo/Practice/Concurrent needs to be translated or the underlying Word Documents as well – If yes, how is that handled?~~
4. Access for the KU in the Quality / Training system - When to Provide?
 - a. Can be done once the list of KU is provided.
5. KU identification for the labels - Communication/Follow-up - ETA ?
 - a. To do on priority and update RIDA action Item accordingly.
6. KU identification for the translation of the training documentation - Communication/Follow-up - ETA
 - a. 1 or 2 KU more than enough. (2 recommended)
 - Multiple KU should be in sync
7. ~~Document management from the Sheq system for Horsens – Feasibility check / Next course of action?~~
 - a. ~~To be investigated in terms of the feasibility with the standard Polaris template.~~
 - i. ~~Any additional access required?~~
8. Site's decision on the PLC and it's cost estimation for 1 machine connectivity sponsorship - Further communication/ETA ?
 - a. TO DO:
 - i. If the site is actually looking for the PLC connectivity or not?
 - ii. IF not done (estimates submission) by the time build phase is finished, it would have to be done post Go-Live
9. Curing/Heating/Cooling - Barca / Arenzano
 - Barcelona -> Had a discussion with Burgdorf and feel that it can be handled with the standard Polaris template.
 - Arenzano -> Riccardo mentioned that before moving ahead with the CR, he will have a discussion with AF Burgdorf similar to Barcelona
 - Internal call to be scheduled with IP/MD/QM
10. Arenzano - Possibility to manage the stock and consumptions of Liquid RM (Inks/Resins/Adhesives) in Polaris MII.
 - a. System wise - Possible.
 - b. They need to discuss with the MD first
11. Horsens Visual Indicator CR for the Running Queue:
 - Review the Business Case presentation by Fleming
 - Revert back to get the Business Case PPT Revised
12. Horsens Case Number - Next actions from our side?
 - a. Other sites using something similar - PDM Number (AS Material Charac)
 - b. Follow up with MD.

Task Alignment WE - 9/12/22

06 December 2022 16:13

1. Case number from Horsens in the Material level Master Data:

Case Number requirement for Horsens → Case Number Design Number used by multiple departments (Pre-press, Onboarding CS team, Print and Quality) This number is linked to a specific design folder which is created and used across the site. Each material is linked with one Case number. (Similar examples can be found in Atlas template NAD number, PDM number)

- a. Please follow it up with the MD stream to see if they have in their action items or not and communicate accordingly.

Actions: Reviewed with MD stream and they considered the "Case number" on General tab (Material master)

Values for Class POK_PG_SFG - Object 84601435

Characteristic	Description	Value
Contract person sales		
Contract person technic		
Ship-to party		
Final Ship-to from Distributor		
Old customer number		
Reference Material		
Change origin		
Plan of the customers machine		

Fleming requested to display the "Case number" in the MII running queue, but Mark/Adam are not accepting to change the running queue. Please inform Fleming about that.

- To inform Fleming about the progress on the Case number progress and the decision taken by the Adam/Mark and MD.



SAP MD
Character...

2. Follow up on the Curing topic for Barcelona and Arenzano:

- a. **Barcelona** - They would go with the Standard template offering but still want to keep the RIDA item open. Need to check with them and close the action item if possible.
- b. **Arenzano** - Need to get a clarity on the topic and the internal updates from Plant regarding this topic and update the RIDA accordingly.

3. Visual Indicator for Horsens:

1. CR needs to be raised in the Service Now portal. But before that, need to get in synchronization with Mark/Adam.
2. Proposal 1 is preferred.
3. Schedule a call with Fleming for finalization of the business case.



I-0482_kør
elistsens f...

4. Wets consumption/ stock management in MII for Arenzano:

- a. Need to check with Riccardo on the update on this topic and present him all the possibilities for this with all the details like the complexity of the configuration of the underlying Master Data.

5. Safety checklist in Barcelona:

Meeting scheduled and demo to be given about the availability of the questions before starting of the shift.



Security
Questions

6.

KUT - Q&A 4

20 March 2023 15:09

Quality Reports:

QM Dashboard:

CPK = Process Performance Index (Deviation from Standard) = Process Capability Index

- If PLC not connected then it shows the value recorded by the operators
- Testing equipment (Measuring) values available as well
- Not many sites have this today but yes it's something good to have.

Quality Dashboard Report:

- Just Select a WC.
- Graphical dashboard/overview of QI they doing for a particular PO
- Color is an indicator of values and how close they are to the limits specified.

IQF Monthly Tracker:

IQF - Internal Quality Failure

- Usually fetched on a monthly basis
- Data fed to the Quality guys as well as OPEX teams
- Material that is identified internally in a factory being defected
- Reason Codes defined as IQF
- Anything highlighted with Reword/Blocked - Will be in the report if Reason Code specified is IQF Type
- Purely for material HU which was identified as quality problem and then rejected

Polaris MES Quality:

Initial overview with Filippo

22 May 2023 19:02

MII Differences:

AF Rorsasch- faprappp0007:

1. No Re-work optional operation available currently
2. No Dummy-Material usage so far
3. 4220 - Automatic Tare Weight Population
4. Cylinder Management training should be provided
5. Slightly different Quality Inspection
6. Additional user fields that can be integrated on the Labels e.g. Mother Reel Number (MD topic to create these)

AF Kreuzlingen- faprappp0007:

1. Enable Disable output lanes with Combined Orders - To create multiple WIP for various scenarios (Condenser)

TFA Delivery

24 May 2023 17:26

Sessions to be delivered by me:

1. **ID4 - PLC overview - 30th May - 2 Hours - Only Zutphen - Completed**
2. **ID2 - Production order papers, Labels, Picking List - 13th June - 2 Hours - Completed**
3. **ID10 - Quality (Integrated with Quality stream ID6) - 5th June - 2 Hours - Only Zutphen - Completed**
4. **ID12 - Packing - 6th June - 2 Hours - Completed**
5. **ID14 - Supervisor task overview - 7th June - 2 Hours - Only Zutphen - Completed**

TFA ID4 - PLC Overview:

- PLC - Programmable Logic Controller - How does it work, what is it, etc.
- Existing Setups ? Interested to connect your system/machine to Polaris MII ?
 - o Pre-requisites lookup.
- New functionalities will be adds as the opportunity with the data is immense and have a great potential to have the insights from it
-
- PLC:
 - o Nervous system of the machine
 - Input Unit - signal coming into the machine
 - CPU - Thinking and decision maker - Program stored in the PLC Unit
 - Output - Send signal from the CPU using the Program stored in the PLC
 - o Signals:
 - Digital - High and Low = Basically 0 and 1
 - Analog = Signals from Loading Cells / Proximity Sensor, temperature sensors, etc.
- Other Ports/Modules:
 - o Communication /Memory - Connect it to a terminal to load or check the program
 - o Can be also connected directly to the Line using the available TCP/IP port with Siemens or LG, etc with their services
 - o
- Prerequisites:
 - o Connection of each PLC to a network / Ethernet Network
 - o Connection From Network to a OPC Server
 - o First Half is the responsibility of the Plant - Their engineers, specialist or external help
 - o OPC server and connection to our system - Polaris responsibility
 - o A separate network to connect the PLC and extract the Data
 - o PLC Tags = Identify the tags you gonna need or monitor - Process Control Parameters
 - o Cross functional meetings to define the process control limits
 - o
 - o
- Energy Consumptions - Nice to have
-
- Possibilities with the Data:
 - o Comparison of same machines with different energy consumptions
 - o
 - o
- Data Load:

TFA ID10 - Quality Management:

- **Data for Demo:**
 - o **PO - 6350420162**
 - o **WC - 2490**
- **NOTES:**

TFA ID2 - Shopfloor Papers

EQP Papers

- Unwind Direction - 100 of those
- Screen & Angle - For plates
- Storage of the Production Order Papers

DET Papers

- Document Header same for all operations with minor changes
- Different Specifications for each operations
- Data in SAP influence what we see in the papers
- Specifications coming from material characteristics
- MD team is the main party in terms of having data onto these papers
- Gross & Net Qty difference is due to the estimated waste
- Unwind direction imp for printing

Additional Docs

- Not standard and needs to supplied by local user
- Packing specification, lamination drawings
- To follow specific naming convention - name to reference Material number - stored on local shared folder - every time you process that material

Labels

-

TFA ID1 - BPML

30 May 2023 13:51

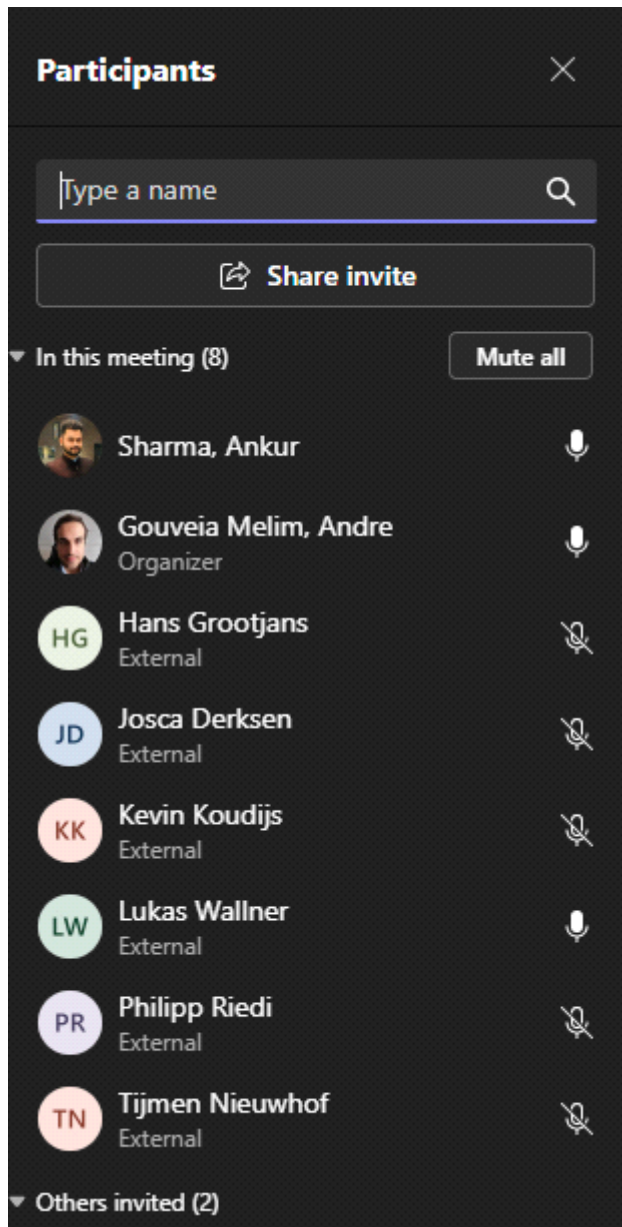
Zutphen - Josca

- No MES system currently and a Separate system used to track & trace production process

TFA ID 15 - MES Interfaces

07 June 2023 17:33

Attendance:



Zutphen Labels

14 June 2023 13:56

TFA ID3 SSRS Reports

14 June 2023 17:50

Zutphen - Connection to tools possible like Power BI for additional analysis

Participants

Type a name

Share invite

In this meeting (12)

Mute all

Sharma, Ankur

DS

Driton Sulejmani

External

NF

Fonseca, Natalia

Gouveia Melim, Andre

Organizer

HG

Hans Grootjans

External

JD

Josca Derksen

External

MS

Marc Schaerer

External

ML

Michael Lenherr

External

MZ

Muslum Zeki

External

PJ

Peter Freund jun

External

PR

Philipp Riedi

External

SO

Sven Olsen

External

AMCOR Page 51

General Information

19 February 2024 18:10

Types of Production:

1. Order Oriented production with Production Orders
2. Period and Quantity oriented production with repetitive orders

Describing SAP DM

01 February 2024 14:03

- SAP DM bridges the gap between the top-level decisions and ground-level actions.

Top Floor	<ul style="list-style-type: none">- Manages companywide activities and broader company processes such as<ul style="list-style-type: none">• Production Planning• Quality Management• Procurement• Accounting- All the above are managed by the ERP system SAP ECC or SAP S/4HANA
Shop Floor	<ul style="list-style-type: none">- Manages hands-on manufacturing<ul style="list-style-type: none">• Managing manufacturing operations• Tracking production in real-time• Ensuring smooth communication b/w machines, workstations and operators

- SAP DM also empowers the shop-floor with advanced tools and capabilities such as:
 - Set-off automation systems for streamline production workflows
 - Interact with physical entities like machine, tools
 - Send vital production and quality data back to the system (ERP) for future analysis
- KEY CAPABILITIES:
 - Maximize Productivity (Resource Optimization according to Production Needs)
 - Increase Customer satisfaction (Simplified Order execution interface, document integration, historical reports, NCM)
 - Operational Excellence (Reviewing Manufacturing insights using automatic KPI across all the plants)
 - Recording tool usage during Production
 - Integration with ECC or S/4HANA in such a way that SAP Digital Manufacturing transmits yield, scrap, and activity confirmations posted by the shop floor worker to SAP S/4HANA
 - SAP Digital Manufacturing transmits component consumption and goods receipt postings to ensure accurate inventory in SAP S/4HANA
 - Apart from operation duration, SAP Digital Manufacturing records quality and resource usage information for calculating OEE.
- FOR DISCRETE INDUSTRIES:
 - Management and enhancement of Production Routings
 - Order Execution
 - Record non-conformances and repair defective products
- FOR PROCESS INDUSTRIES:
 - Enhance Master Recipes with Work Instructions and Process Parameters
 - Creates & assess batches for main products, co-products and by-products
 - Quality Management

Discrete v/s Process Manufacturing

01 February 2024 20:25

Discrete

- Assembly of distinct items such as cars, electronic, or furniture

Process

- Continuous or batch production methods for chemicals, fluid, oil or powdered products

DMC Integration with S/4HANA | ECC

02 February 2024 18:18

- SAP S/4HANA serves as the core ERP system managing various production relevant Business Processes such as:
 - Procurement
 - Production Planning
 - Inventory Management
- Master Data Objects:
 - Material
 - Work Center | Resource
 - BOM
 - Routing | Recipe
 - Production Version
- Transactional Data (From ERP to SAP DM)
 - Production or Process Orders
 - Inventory Data
 - Quality Inspection Info
- Transactional Data (From SAP DM to ERP) --> Maintains real-time production monitoring and inventory Updates
 - Operation confirmations with yield. Scrap and time confirmations
 - Quality Inspections results
 - Component Consumptions & GR

SAP DM integration with Shop-Floor System

02 February 2024 19:51

- Each machine has a set of static properties such as:
 - o Model
 - o Location
 - o Description
- Dynamic Properties such as:
 - o Energy consumption (Beyond operator's control)
 - o Position of Grabbing arm of a machine (Values the operator can change)
- Digital Twin:
 - o A virtual counterpart of a physical machine mirroring it's static and dynamic properties and is connected to its physical counterpart through an INTEGRATION ENGINE.

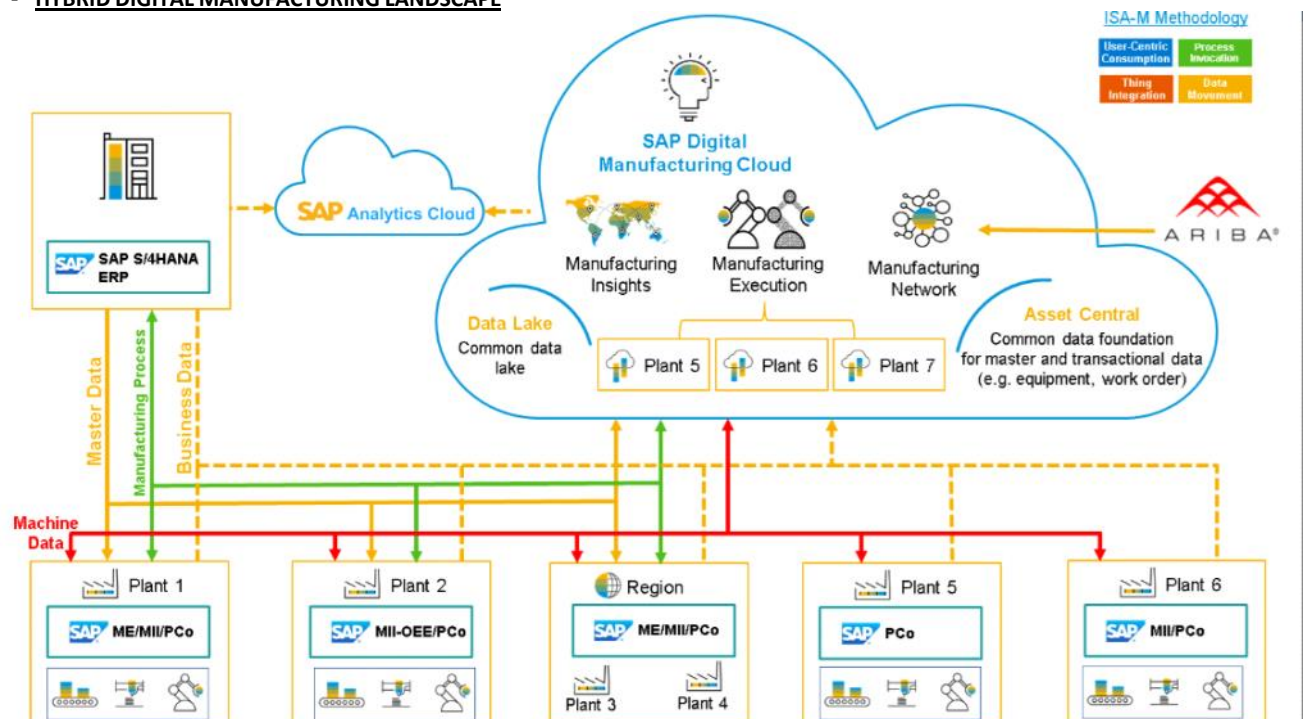
SAP Digital Manufacturing Portfolio

05 February 2024 18:08

SAP offers both cloud and on-premise solutions:

- SAP Digital Manufacturing Cloud(DMC) offers Public cloud based solutions providing Top floor to Shop Floor visibility
 - o Manufacturing Insights
 - o Manage and control the production systems with real time insights and root cause analysis.
 - o Detect quality defects and utilize built-in machine learning for predictive quality.
 - o Manufacturing Execution
 - o Manage your production using the latest technology built on the SAP Cloud Platform.
 - o Orchestrate and control the shop floor with out-of-the box integration to SAP ERP and S/4HANA
 - o Predictive Quality
 - o Manufacturing Network
 - o Collaborate with network partners to build digital inventory to optimize the offerings.
 - o Allow SAP's software partners to provide extensions.
- SAP Manufacturing Suite offers on-premise solutions and provide visibility with feature-rich solutions connecting machinery to your enterprise solutions
 - o MII
 - o ME
 - o PCo
- SAP S4/HANA Manufacturing provides additional Shop-Floor solutions for planning and scheduling, engineering change driven complex manufacturing as well as environment, health and safety solutions.
 - o Production Engineering and Operations
 - o Planning and scheduling
 - o Environment, health & safety

- HYBRID DIGITAL MANUFACTURING LANDSCAPE



High Level Key Capabilities of DMC

06 February 2024 19:12

- Manufacturing Execution
- Manufacturing Insights
- Manufacturing Network
- Electronic Buyoff
- Quality and NCM
- Component Assembly
- Certifications
- Work Instructions
- Label Printing
- SAP ERP integration
 - Download master & production data from SAP S/4HANA or ERP to DMC:
 - Material Master
 - Master BOM
 - Master Routing
 - Production Order
 - Order BOM
 - Order Routing
 - Work Instruction
 - Upload of execution data from DMC to SAP S/4HANA and ERP:
 - Order and yield confirmations
 - GI during yield confirmations
- Resource Orchestration & Dispatching
 - SAP ME on-premise integration with Resource Orchestration
- Design Production Process - Machine & Process Orchestration
- Manage subscriptions will replace the manage PCo subscription in future
 - A subscription is to subscribe the indicator value change of equipment in shop floor and then calls a following-up action on DMC.
- Plant Connectivity

Enables the data exchange between the IT systems (SAP) & operational technology (Logic controller, devices, plant historians systems) in a manufacturing environment.

Shop Floor Worker Experience

06 February 2024 20:56

Different Types of Production Operator Dashboard (POD):

- Operation POD
- Work Center POD
- Order POD
 - o More commonly utilized in the Process Industry for the order based execution of the process orders

Different Flow Resources:

- Discrete Flow Resource
The same operator must start and complete the SFCs at the resource
- Process Flow Resource:
the system allows different operators to start and complete the same SFCs

General Notes

26 February 2024 15:02

Disparity systems and Data in Manufacturing Domain:

- Due to tech changes, price points, competition and growth through acquisitions, companies infrastructures lacks standardizations.
- In case of application that orchestrate and manage plant floor operations, like MES, data collections, asset and inventory management, etc.
Some of these systems are automation vendor and software provided while others are just SQL databases based system with a custom front-end

Fundamental problems faced by manufacturers:

- Lack of visibility to information
- Sync across their manufacturing operations
- Disconnection between shop floor and enterprise cost millions of dollars through waste, rejects and reorders.

SAP MII Overview

27 February 2024 20:47

Overview:

- SAP MII is a framework for rapid delivery of composite applications for manufacturing.
- It leverages the existing investments in shop floor applications, service oriented architecture, streamlining app integration and speeding their deployment.
- It is a web server-based application with 0-client design.
- SAP MII runs on the SAP NW platform, leveraging SAP NW AS, the Java stack and the database.
- Benefit of running under SAP NW is platform independence, as it can be hosted on many OS and run with many different database s.
- MII leverages NWDI for transport, Projects can be cataloged, version controlled and deployed from a central point through SAP NW.

Connectors:

- OPC-UA
- OPC-DA
- OLEDB
- ODBC/JDBC
- OPC-HDA

DATA Services:

- Provide bi-directional access to data in plant systems through rapid configurations of query templates.
- MII normalizes data into standard XML structure regardless of it's source.
- Data can be extracted from source in real time managed by templates

BLS:

- Transactions are executed via the time-based schedulers, external triggers like Web Service calls, Web page events and so on.
- Transactions are solved Left-to-Right and Top-to-Bottom.

Analytic Services:

- Full-featured Statistical Process Control (SPC) engine, with full Western Electric Rules, allows data analysis in real time of data sets from all applications.
- SPC analysis can be run in the background as a BLS action block

Visualization Services:

- MII provides a rich set of applets as visualization services to deliver views of data in numerous forms.
- MII is fully extensible in the web environment, and leverages JavaScript to drive events from the page to the applets at run time.

Security Services:

- Administer authorizations for individual SAP MII functions.
- Integrate to SAP SSO for user authentication through UME.

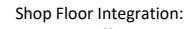
Message Services:

- Includes all functions for sending and receiving messages from other systems.
- Transfer data using IDocs, RFC and web service

Source Control Service:

- Allows you to configure a link between SAP NWDI to centrally manage the SAP MII content.
- NWDI is responsible for the versioning, build and lifecycle management of applications.

28 February 2024 16:41



- PCo offers a service oriented connection technology that can bind to a data source and provide events back to MII based on a trigger or a rule violations.
- It is a mechanism for communicating to shop floor systems.

SAP ECC Integration:

- Ability to integrate to any function in ECC that uses BAPIs, RFC or IDocs - both standard and custom.
- Transactional integration to ERP can be accomplished directly to ERP through JCO or JRA.
- JCo provides the highest performance.
- MII can also integrate to enterprise systems through straight web service calls.
- Information can also be pushed from SAP ECC to SAP MII using IDOCs or RFCs.

MII Basics

28 February 2024 18:59

- Meta-Inf tab holds the project-specific shared properties and localization tokens that can be utilized within a project like creating global variables for a project

MII Data Servers & Connectors:

- JDBC drivers to connect to JDBC compliant data source like relational-databases.
- Pco provide interface to the 3rd party data sources on the shop floor using custom connectors or OPC-DA & OPC-HAD
- Virtual servers allows to utilize a data server connection on another SAP MII instance
- Pco simulator
 - o It is a simulated tag database used for development and demo purposes if there is no real connection to an actual tag -based system.

Query Templates Types:

- Aggregate Query:
This is used to combine the results of multiple query templates into a single data set.
- TagQuery:
To create queries that will access tag-oriented data sources such as Historians or HMIs.
- XacuteQuery:
To create queries that can access the results of a MII BLS transaction.

Parameters:

- Placeholders in the query templates that will be replaced at the runtime
- Max 32 Parameters can be setup with default values which can be overwritten dynamically from a web-page.

Transformation Screen:

- MII query results can be transformed using XSLTs. This manipulation is known as Inline Transformation.
- MII provides some redefined stylesheets.

SAP MII XML Format:

```
<?xml version="1.0" encoding="UTF-8" ?>
- <Rowsets DateCreated="2009-08-25T22:44:33" EndDate="2009-08-25T22:44:33" StartDate="2009-08-25T21:44:33" Version="12.1.3"
  Build(59)">
- <Rowset>
- <Columns>
  <Column Description="DateTime" MaxRange="0" MinRange="0" Name="DateTime" SQLDataType="93"
    SourceColumn="DateTime" />
  <Column Description="Cake Unit Batch ID" MaxRange="100" MinRange="0" Name="CCF_Cake.UBID" SQLDataType="12"
    SourceColumn="CCF:Cake.UBID" />
</Columns>
- <Row>
  <DateTime>2009-08-25T22:44:28</DateTime>
  <CCF_Cake.UBID>Cake-UBID: 3482</CCF_Cake.UBID>
</Row>
</Rowset>
- <Rowset>
- <Columns>
  <Column Description="DateTime" MaxRange="0" MinRange="0" Name="DateTime" SQLDataType="93"
    SourceColumn="DateTime" />
  <Column Description="Crust Unit Status" MaxRange="0" MinRange="0" Name="CCF_Crust.AP" SQLDataType="12"
    SourceColumn="CCF:Crust.AP" />
</Columns>
- <Row>
  <DateTime>2009-08-25T22:44:28</DateTime>
  <CCF_Crust.AP>Inactive</CCF_Crust.AP>
</Row>
</Rowset>
</Rowsets>
```

Rowsets

- Rowset
 - o Columns
 - column
 - o Row

Columns Meta Data:

- Description
On an iChart, it can be configured to appear in the chart legend or below x-axis.
- MinRange, MaxRange
These can affect the way the y-axis of ani Chart is plotted

Different formats for the data in MII:

- text/xml
- Text/html
- Text/csv

You can execute query templates in MII using <http://<server>:<port>/XMII/IlluminatorOData/QueryTemplate?QueryTemplate=<template name>>

Stored Procedure calling:

Task 2: Execute an SQL Stored Procedure

Call up the depicted stored procedure.

Server: Northwind

Mode: FixedQuery

Stored procedures in databases are equivalent to functions in ordinary programming languages. They can be assigned input parameters and return corresponding output.



Hint:

- The input for calling up the “stored procedure” is made on the *Fixed Query Details* tab.
- In contrast to queries or tables in the database, stored procedures are not displayed in SAP MII. That means, you must know the name of the procedure you wish to call.
- Use the following expression to call up the procedure depicted below:
execute CustOrdersDetail @OrderID= '10248'
- Replace the order number used with a corresponding parameter.
- File name for saving: **sql_storedProcedure**

```
CREATE PROCEDURE CustOrdersDetail @OrderID int
AS
SELECT ProductName,
       UnitPrice=ROUND(Od.UnitPrice, 2),
       Quantity,
       Discount=CONVERT(int, Discount * 100),
       ExtendedPrice=ROUND(CONVERT(money, Quantity * (1 - Discount) * Od.UnitPrice), 2)
FROM Products P, [Order Details] Od
WHERE Od.ProductID = P.ProductID and Od.OrderID = @OrderID
GO
```

Figure 23: Stored Procedure in the Database

1. The stored procedure **CustOrderDetails** expects an order number (“OrderID”) as a parameter and then returns the order details.

SPC

04 March 2024 14:58

Statistical Process Control:

- Used to monitor the consistency of a process
- To ensure the product is being manufactured as planned
- Goal of SPC is to keep the process under control
- Reduced costs and improved quality

One tool for monitoring the process is the SPC chart

- It enables the recording of the data over time,
- Allows you to detect when the process is moving away from the pre-determined limits
- In time action can be taken to stabilize the process

SAP UI5 & Web Scripting

04 March 2024 16:24

- HTML5 UI framework for client-side UI rendering and programming
- You can create custom controls or extend standard existing controls
- Can be rendered in any device
- Provides standard and 3rd party system data access via ODATA, XML or JSON models.

Servlets:

- Java programs that runs on the web-server (server side) and build web-pages
- Return them to the browsers and display to the user
- Useful in dynamic web-page building based on user-driven data

Sessions:

- Container of information about a browser instance
- Consists of session properties that are name/value pairs
- Can be shared among the pages of a web application

Session Properties:

- MII includes a number of session properties that are automatically used in a user-session.
- Defined in UME
 - o IllumloginName
 - o IllumLoginRoles
 - o Locale

Custom Attributes:

- MII's custom session properties, which you assign values to and then maps to specific user/roles
- It becomes part of user's sessions

Session Properties via JS:

- Can be created using setPropertyValue(name, value)
- Can be passed between web pages in the same session
- They are not sticky (non-persistent) unlike the system level session properties and custom attributes
- Value can be obtained using getPropertyValue(name)

PropertyAccess Servlet

- Can view the session properties and their values for the current user's browser session via URL req to Property Access Servlet
- Generates a HTML table of session properties and their values
- XMII/PropertyAccessServlet?Mode=List

IRPT Page:

- Referred to as SAP MII report
- Uses SAP MII irpt file extension rather than standard .html
- Page is sent to a specialized servlet called Report Servlet that provides the following abilities:
 - o Pass session properties between pages
 - o Capture parameters passed to a Web Page via a URL request
 - o Embed placeholders in web pages for dynamic content insertion
 - o Leverage XSL style sheets for output formatting
 - o Create printable reports with/without embedded images
 - o Localize pages for a particular user language

Localization

06 March 2024 18:43

- Process of adapting a product to a particular language
- In SAP MII, localization is reflected at three different levels:
 - o System
 - MII environment supports multiple languages
 - UI language will corresponds to the language configured in UME
 - Covers all the administrative menu items and workbench
 - o Project & Global
 - Used to customize the web-pages to a user's language
 - A localization key - name/value pair is defined for the desired language
 - Special placeholder -- {##keyName} e.g.{##greeting}
 - Page must be saved with .irpt extension
- Precedence for Localization Keys:
 - Look for user language
 - Look for system-defined language
 - Look for system-default language
 - Else return the Key name
- If language preference found
 - o Project specific key
 - o Global Key
 - o Else Key Name

MVC

06 March 2024 19:12

- The concept is used in openUI5 to separate the representation of information from the user interaction
- Model
 - Manages application Data
- View
 - Defines and renders the UI
- Controller
 - Reacts to view events and user interaction by modifying the view and model
- This separation provides better readability, maintainability and extensibility
- Allows you to change the view without touching the underlying business logic and define several views of the same data

SAP Integration

07 March 2024 18:58

- SAP JCO interface actions are used to instantiate a runtime connection to SAP ECC server by means of Java Connector Interface

General Notes

08 March 2024 14:58

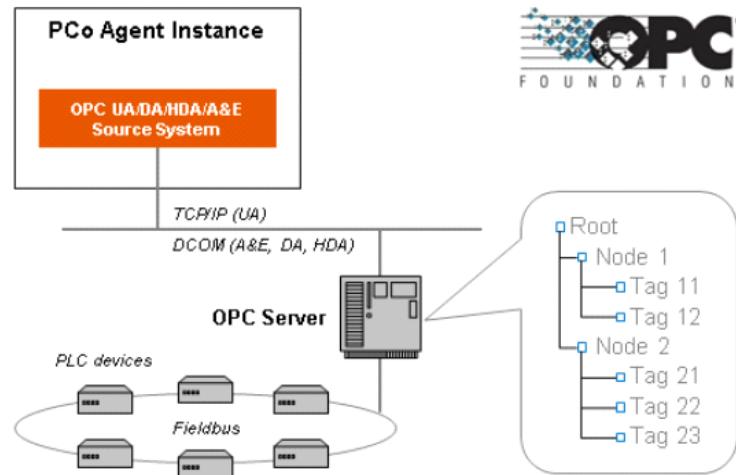
- PCO is a MS Windows based application built on .NET framework.
- Data exchange tasks are performed by Agent-Instances
- Agent instance corresponds to a windows service that can run in the background without user intervention.
- Agent instances can be connected to each other to interact
- Agent instance can accept request from multiple clients or connect to a single tag-based server to read and write tag values
- It can receive tag value change events and send request to multiple servers (notifications)
 - o Depending on the server type, PCO can also receive the server response and use the data for further processing.
- It supports notifications and bidirectional queries
- It can act as a OPC UA and a web server

- Source system:
 - o It is an adapter to a tag-based server
 - o Pco act as a client to query data tag values from the server and receive tag change events.
- Destination system:
 - o It is an adapter to a server
 - o Pco act as a client and sends information to the server in a notification process
 - o Depending on the server type, Pco can process the server response as well
- Agent Instances:
 - o It is the central component of the PCO. They establish the data flow between the client and server components of Pco
- Notifications:
 - o We define under which circumstances and conditions, we need to send information and to which destination when a specific event occurs.
- Servers:
 - o A Pco agent instance can act as a server, receiving req from various types of clients and forwarding the req to source and destination systems.

OPC Source Systems

29 March 2024 18:18

OPC Source Systems



- Originally called object linking and embedding for process control
- Now known as Open Platform Communication
- It is used where sensors and controllers from different vendors are combined in a common and flexible network.
- It is sufficient to provide an OPC compliant driver for every network device
- Can be used for real time information exchange, data archiving, alarms, controlling PLCs
- Divided into several sub-standards:
 - o Alarms & Events (A & E)
 - o Data Access (DA)
 - o Historical Data Access (HDA)
 - o Unified Architecture (UA)
 - Intended to replace all the above
 - Based on TCP/IP communication
 - Platform independent

HTML

09 March 2024 02:00

- HTML
 - o Hypertext Markup Language
 - Hypertext - text contains link to other text or hypermedia
 - Markup - Mark something up to annotate inside something like html tags
- HTML - Defines the structure and annotate content
- CSS - Defines the style/appearance
- JavaScript - Provide behaviour/functionality to the page
- Anatomy of an HTML tag
 - o `<p>` : p is the element, `<p>` is the Tag
 - o `
`, `<hr>` : no closing tags
 - o `<p id="myid"></p>`
 - Id: attribute (Name-Value Pair)
 - myid: Attribute Value
 - o `<p/>` : Self closing tag
- Every html file must start with a doctype tag - tells the browser to get ready to render the html
 - o `<!doctype html>`
- Content Models
 - o OLD Models
 - Block-level element:
 - Render to begin on a new line by default
 - May contain other inline or other block level elements
 - `div`
 - Inline element:
 - Render on the same line by default
 - May only contain other inline element
 - `span`
 - o HTML5 Content Models:
 - Block-level ~flow
 - Inline ~ Phrase
- HTML Semantic Elements:
 - o Semantic means relating to meaning in language or logic
 - o HTML definition - Element that tells you something about the content or implies some meaning to the content
 - o Human or machine can understand better the content surrounded by a semantic element
 - o May help in Search engine ranking SEO
 - o Other examples are Article, Section, Aside Header - All are block level elements
- Lists
 - o Unordered List: ``
 - o Ordered List : ``
 - o Often, used for structuring the navigation portion of the web page
 - o Grouping of content
- Character entity references:
 - o 3 character should always be escaped
 - `< -- <`
 - `> -- >`
 - `& -- &`
 - Coyright -- `©`

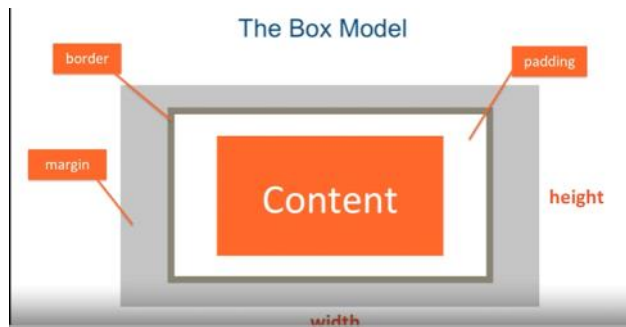
- Non breaking space (always wrap together) --
- " -- "
- LINKS:
 - Link Body
 - <a> element is both a flow as well as a phrase element
 - Target attribute -- Open the external link in a new window/TAB
 - Target="_blank"
 - Fragment identifier "#" for same page linking
- IMAGES:
 -
 - Always recommended to specify the dimensions to keep a space-holder for the image if the link breaks down

CSS - Cascading Style Sheets

09 March 2024 02:12

- Content is King
- Provides styling capabilities and is an incredibly powerful technology
- UX matters
- Anatomy of a CSS rule:
 - o `P {`
 `color: blue;`
 `}`
 - o P -- selector (All P tags in the html document)
 - o Color -- Property
 - o Blue -- value
 - o Property and value are separated by a `:` and ends with a `;` (best practise)
- Selectors
 - o Element
 - Name of the element e.g. p, div, span, etc.
 - Applicable to all the elements
 - o Class
 - `.blue { }`
 - Class attribute should be added to the element with which the class is to be associated
 - o ID
 - `#name { }`
 - Name -- id attribute of the element
- Combining Selectors:
 - o `p.big` -- Target every p element that has its class attribute defined as "big"
 - o `Article>p` -- Every p element that is a direct child of an Article element
 - o `Article p` -- every p element inside an article element (Descendant selector)
- Pseudo-Class selectors
 - o Selectors based on the user interaction on the page
 - o Link
 - o Visited
 - o Hover
 - o Active
 - o Nth-child
 - o Selector:pseudo-class e.g `section h2:hover`
- Style Placement
 - o Inline styling using style attribute in an element
 - o Head styling - Using the Style element in the Head element of the page
 - o External Styling
 - External stylesheets
 - `<link rel="stylesheet" href="/">`
- Conflict Resolution:
 - o Origin Precedence
 - Last declaration wins if multiple declarations are assigning same properties to the same target
 - If the properties targeted in the declarations of the same target, then the declarations are merged
 - o Inheritance
 - In terms of a DOM tree, the properties applied to the top-level element will be applicable to the underlying elements
 - o Specificity
 - Most specific selector combination wins

- The Box Model:



- Box-sizing: border-box (This property is not inherited)
 - " *{ box-sizing: border-box; }

- Background Property:

- Background-image: url("")

- Responsive Web site / Design:

- A site designed to adapt its layout to the viewing environment by using fluid, proportion-based grids, flexible images and CSS3 media queries
- Most popular responsive layout is 12-Column grid responsive layout
- `<meta name="viewport" content="width=device-width, initial-scale=1">`
- The above LOC is to tell the browser to use the default scaling and respect the responsive layout.

- BOOTSTRAP:

- The most popular HTML, CSS framework designed by the engineers at Twitter for developing responsive, mobile first projects.
- Bootstrap Grid System:
 - Grid must always be in a "container: /"container-fluid" wrapper class.

JavaScript

08 March 2024 18:29

Why Learn JavaScript?

- Almost the most popular programming language in the world
- Language of the web
- Written by Brandon Eich in 10 days in 1995
- Not the same as Java and initially named Mocha
- The first version of the standard was released in 1997 created by ECMA (European Computer Manufacturers Association)
- `Console.log()`;

Variable, Functions:

- No types are declared and are figured out during run
- Same variable can hold different types during the life of the execution
- `Var x= <>;`
- `Function xyz() { };`

TYPES:

- Built-in types can be used to define other data structures
- JS has 7 built-in types
 - o 6 primitive : single & immutable (once set cannot be changed) value
 - Boolean
 - Undefined - no value have ever been set
 - Null - lack of value
 - Number (double precision 64-bit floating)
 - String
 - Symbol (new to ECMA6)
 - o 1 object
 - collection of a name/value pairs
- `===` Strict equality
- Passing Variables:
 - o Primitives are passed by value and objects are passed by reference
- Looping through the Object:
 - o

```
For(var prop in Obj) {  
  console.log(prop + " : " + Obj[prop]);  
}
```
- DOM Manipulation:
 - o Document represents entire HTML page.
 - o `document.querySelector("#id");`

AJAX:

- Client-Server communication happens with HTTP protocol which is stateless (response corresponds to the most recent request)
- URN (Unique Resource name) identifies the resource or its name
- URI (Uniform Resource Identifier) identifies the resource or its location
- URL (Uniform Resource Locator) form of URI that provides info on how to get the resource

HTTP Request Structure (GET):

- GET: retrieves the resource from a particular location
 - o Data is passed to the server as part of the URI i.e. query string
- POST: sends the data to the server to get processed
 - o Data is sent In the message body
 - o Response is more of an acknowledgement for the processing

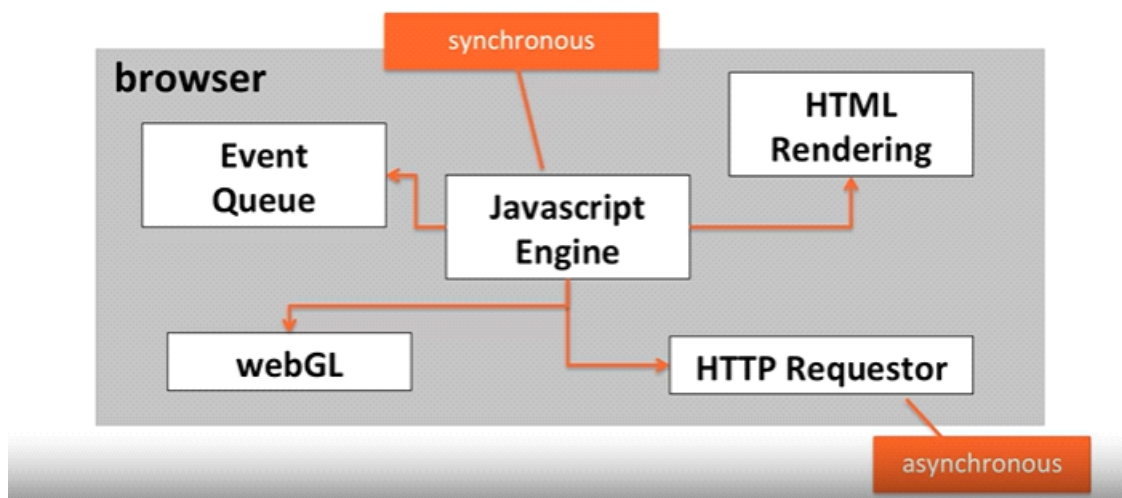
HTTP Response Structure:

- HTTP/1.1 200 OK
 - o HTTP/1.1 - Http version
 - o 200 - Response Status Code
 - o OK - English describing the status code
 - o Other status codes:
 - 404 - Not found
 - 403 - Forbidden
 - 500 - Internal server error

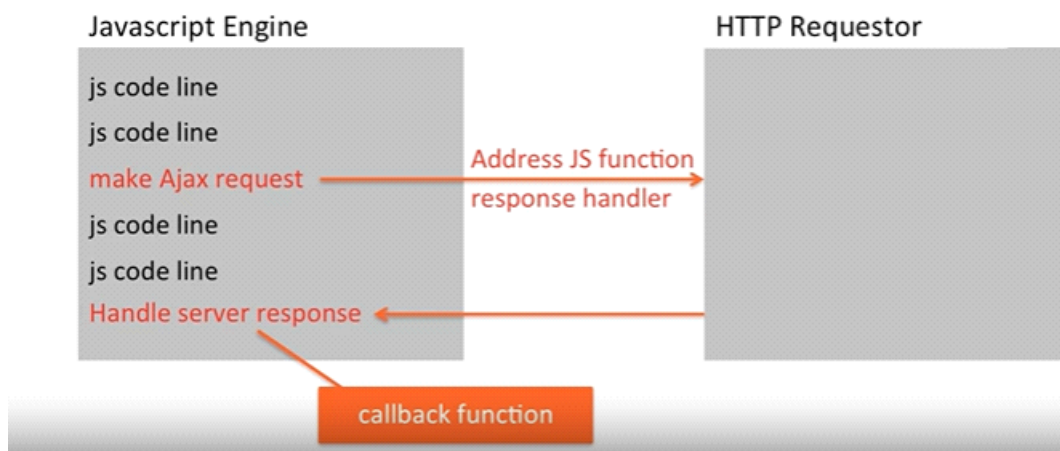
AJAX Basics:

- Stands for Asynchronous JS And XML
- Faster response
- It is possible due to the HTTP Requestor component of the JS engine which is basically asynchronous

How Does Ajax Work Then?



Ajax Process



JavaScript IBM

02 April 2024 20:28

- Used in both client and server side
- It is an OOP language that uses objects as building blocks
- Uses design patterns to create reusable solutions
 - o Singleton
 - o Factory
 - o Observer
- It powers interactivity and dynamic behaviour on the websites
- Front-end frameworks like React, Angular and Vue.js uses JS extensively
- Node.js is a server side JS runtime popular for building back-end services
- Alert(), confirm(), prompt()

SAP Fiori Elements

03 April 2024 14:26

- It is a framework that comprises of the most commonly used floorplans templates.
- It is designed for the following:
 - o Speed by the development of SAP Fiori apps by reducing the amount of front-end code that are based on Odata services and annotations that don't need Javascript UI Coding
 - The resulting app uses predefined views and controllers tht are provided centrally
 - SAPUI5 interprets meta data and annotations of the underlying Odata service and use the corresponding views of the SAP fiori start up
 - o Stable and optimized code out of the box
 - o Deliver high quality SAUI5 applications to the end user

SAP Fiori Elements app are:

- Responsive and can run on any device.
- Application UI is generated runtime from the metadata
- 80% of the SAP Fiori apps for S4/Hana are built with SAP Fiori elements

Odata:

- Standard protocol for creating and consuming data using HTTP/REST APIs for CRUD operations
- Enables the integration of data from wide variety of sources
- Default way to communicate with a SAP back-end be it for SAPUI5 front-end

SAP FIORI ELEMENTS GENERATES THE APP AT RUNTIME BY COMBINING 3 FUNDAMENTAL BUILDING BLOCKS:

- ODATA SERVICES
- ODATA ANNOTATIONS
- SAP FIORI ELEMENTS PAGE TYPES

Bootstrapping

05 April 2024 15:07

Bootstrapping:

- Must load and initialize the SAPUI5 library
- Sap-ui-core.js is the standard bootstrap file which is recommended for typical use cases
 - o It already contains jQuery, jQuery-ui-position

```
<script
  id="sap-ui-bootstrap"
  src="resources/sap-ui-core.js"
  data-sap-ui-theme="sap_fiori_3"
  data-sap-ui-libs="sap.m"
  data-sap-ui-compatVersion="edge"
></script>
```

- Load options:
 - o It can be loaded locally with a relative path on an SAP web server as above.
 - o Externally from a CDN by specifying the below url in the src attribute of the script tag.
 - <https://ui5.sap.com/1.96.16/resources/sap-ui-core.js>
 - A specific version can also be mentioned
 - Default version of the SAPUI5 libraries (which is constantly upgraded):
<https://ui5.sap.com/resources/sap-ui-core.js>
- SAPUI5 runtime can be configured using the configuration options by specifying the attributes in the script tag:

```
o
  <script
    id="sap-ui-bootstrap"
    src="resources/sap-ui-core.js"
    data-sap-ui-theme="sap_fiori_3"
    data-sap-ui-libs="sap.m"
    data-sap-ui-compatVersion="edge"
  ></script>
```

Modules

05 April 2024 15:59

- They are defined by calling the `sap.ui.define()` method
- Modules are basically JS files
- The typical use of `sap.ui.define` is a single top level call to this method in a JS file

Simple module explanation:

```
JS index.js ×
webapp > JS index.js > ...
1  sap.ui.define(["sap/m/Text"], function (Text) {
2      "use strict";
3
4      new Text({ text: "Hello World" }).placeAt("content");
5
6  });
```

1. Initially, `sap.ui.define` method is called
2. It can be passed an array
 - a. Each entry in this dependency array represents a module on which current module depends.
3. Each SAPUI5 control is consistently implemented as modules
4. The modules names are derived from the class names by replacing the "." in the class name with a forward slash "/"
5. The order of the factory function parameters matches the order of the modules in the dependency array

Async loading of modules - Configuration Options:

```
<script
  id="sap-ui-bootstrap"
  src="resources/sap-ui-core.js"
  data-sap-ui-theme="sap_fiori_3"
  data-sap-ui-libs="sap.m"
  data-sap-ui-compatVersion="edge"
  data-sap-ui-async="true"
  data-sap-ui-onInit="module:sap/training/exc/index"
  data-sap-ui-resourceroots='{
    "sap.training.exc": "./"
  }'
></script>
```

MVC - Views

05 April 2024 21:02

- MVC is used to separate the presentation of SAPUI5 app from user interaction
- XML views are declarative views in which UI is defined in a file or string in XML format

Typed View:

- The UI is defined in a programmatic way using JS.
- View is defined using a separate view class

Components & Fragments

15 April 2024 13:08

- Independent and reusable parts of SAPUI5 applications
- 2 types
 - o Faceless (class: sap.ui.core.Component)
have no UI and are used for coding when no UI elements are needed. e.g. for a service that provides data from a back-end system
 - o UI Components (Class: sap.ui.core.UIComponent)
They extend the faceless Component and add rendering functionality to it
- Fragments:
 - o Reusable UI parts which can be reused in multiple views
 - o Do not have their own controller instead call/use the controller of the invoking view
 - o Created in separate file based on the Fragment type which are as follows:
 - XML - *.fragment.xml
 - HTML - *.fragment.html
 - JS - *.fragment.js
- Dialog in a fragment:

o

```
anyControllerMethod: function () {  
    if (!this.pDialog) {  
        this.pDialog = this.loadFragment({  
            name: "sap.training.exc.view.Dialog"  
        });  
    }  
    this.pDialog.then(function (oDialog) {  
        oDialog.open();  
    });  
}
```

```
onCloseDialog: function () {  
    this.byId("dialog").close();  
}
```

Models & Data Binding

16 April 2024 18:52

- It holds the application data and provides methods to retrieve, set and update the data.
- Types
 - Client side models - Operations such as sorting and filtering are done on the client side
 - JSON
 - XML
 - Resource
 - Server side Models - Only loads the data requested from the server.
 - Odata v2
 - Odata v4
- Binding Modes
 - 1 way - binding from the model to the view and updates the view when data changes in the model
 - 2 way - used by default in the JSON model
 - 1 time - values for the view are read only once from the model
- Odata Models:
 - Enables binding of controls to data from Odata services
 - It is a server side model where the data set is located on the server side only
 - The client knows about only the requested data (visible data)
 - Operations such as sorting and filtering are done at the server itself

MISC Notes

16 April 2024 13:13

- Content Densities:
 - o Cozy - sapUiSizeCozy
 - o Compact - sapUiSizeCompact
- Media queries based responsive margins
 - o Class - sapUiResponsiveMargin