

Apparel & Footwear

Production Planning and Scheduling

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1. Production Planning and Scheduling

1.1 Introduction

The following information will help to understand how to make production planning & execution a faster and more accurate activity.

1.2 Basic Concepts

In order to understand the planning module we present some of the basic information

SAM: Standard Allowance Minute. Time required to manufacture a garment. This time could be segmented by operations (cutting, sewing, packing, QA, etc). In our example the SAM will be for an entire send out process.

Resources: machines / employees (internal or external) performing manufacturing operations. We will setup these resources as finite capacity sewing lines.

Manufacturing Operations: tasks to be performed in order to complete a semi or finished product

Operation Templates: order an operation quantities based on product complexity

Cost Sheets / Neutral BOMs: this object controls the production routing as well as materials needed for the manufacturing process. At least a default cost sheet needs to be created for the style.

SKUs – BOMs: individual color – size combinations generated from the style attributes. In order to run a manufacturing order at least one SKU and BOM are needed

1.3 The example

Lest take an example of a simple Polo Shirt with its basic information:

1. SAM of the Polo Shirt (i.e. 16 minutes) – CMT operation
2. How many machines will be used to make the order (i.e. 20 machines)
3. Daily working hours (i.e. 8 hours)
4. Line efficiency (i.e. 100%)

To make 5000 polo shirts-

Capacity required = 5000 X 16 minutes = 80,000 minutes = 1333 Hours

Available Capacity/Day = 20 X 8 hours = 160 Hours

Assumes that line works at 100% efficiency.

So, the days required (theoretical) to produce 5000 polo shirts = 1333 / 160 = 8.3 days (usually rounding up to 9 days)

Op	Resource	Efficiency	Pieces	SAM	Total Min	Total hrs	Capacity	Days
MAN	SEWING	100	5000	16	80000	1333	160	9

For planning add one more day as in practical, one day will be lost for loading and line setting.

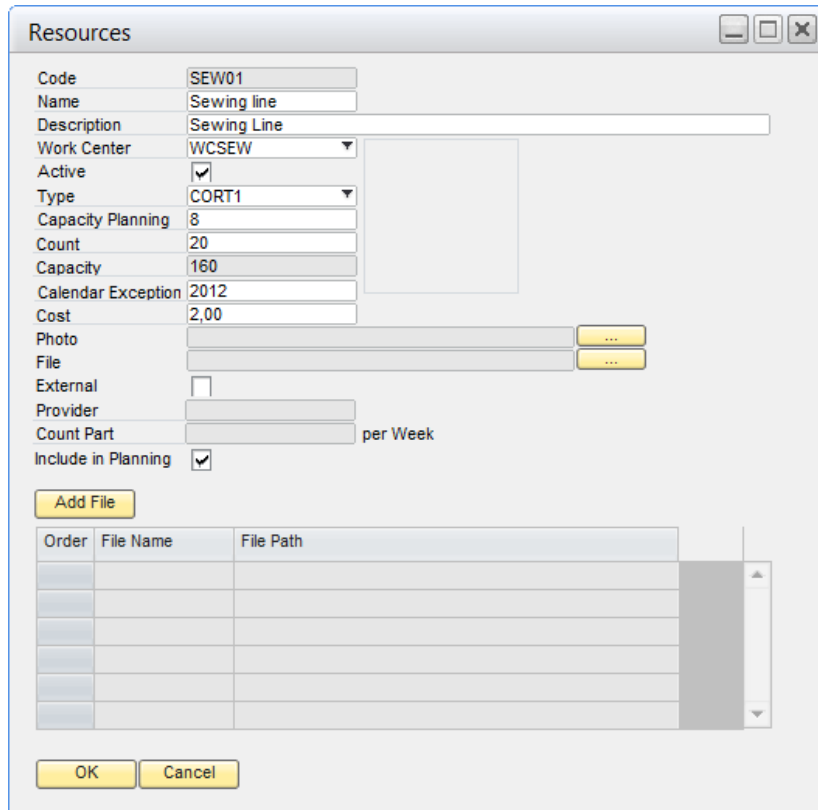
If you production is calculated at 50% efficiency then you need 19 days to complete the above order.

1.4 The process

This is how we can implement this in AFS for SAP Business one.

1.4.1 Resource Master

Add the sewing line. In our example the line or cell is composed by 20 employees working 8 hrs.



The screenshot shows the 'Resources' dialog box in SAP. The 'Code' field is 'SEW01'. The 'Name' field is 'Sewing line'. The 'Description' field is 'Sewing Line'. The 'Work Center' dropdown is set to 'WCSEW'. The 'Active' checkbox is checked. The 'Type' dropdown is set to 'CORT1'. The 'Capacity Planning' field is '8'. The 'Count' field is '20'. The 'Capacity' field is '160'. The 'Calendar Exception' field is '2012'. The 'Cost' field is '2,00'. The 'Photo' and 'File' fields have browse buttons (...). The 'External' checkbox is unchecked. The 'Provider' field is empty. The 'Count Part' field is empty, followed by 'per Week'. The 'Include in Planning' checkbox is checked. There is an 'Add File' button. Below it is a table with columns 'Order', 'File Name', and 'File Path'. At the bottom are 'OK' and 'Cancel' buttons.

Order	File Name	File Path

When it's Outsource production mark it as External and complete Supplier code and How many items per Week this supplier will manufacture according the contract.

Resources

Code: SEWLINE2
 Name: Sewing Line 2
 Description: Sewing Line Senior
 Work Center: WRKONTRSEWING
 Active: ☒
 Type: SEWERS
 Capacity Planning: ☐
 Count:
 Capacity:
 Calendar Exception: ☐
 Cost: 0,0000
 Photo:
 File:
 External: ☒
 Supplier: S_0002
 Count Part: 1000 per Week
 Include in Planning: ☒

Order: File Name

OK Cancel Add File

1.4.2 Manufacturing Operation (send out)

Create a manufacturing routing linked to the style with just one operation called send out. SAM is set to 16 minutes.

Operations Template

Code: SO
 Description: Send Out
 Comments: Send Out Vendor
 Active: ☒

Code	Description	Sub-Oper Template	Preferred Vendor	Lead Time	Seconds	SAM	Resource	End Production	Cost	Qty	U	Price Unit	Currency	Price T
OP02	Send Out	CTM				16	SEWM001			1.00	1.00	Price U		0.00
										0.00				0.00

OK Cancel

Total Operations (in local Currency): 0.00
 Total SAM: 16
 Total Seconds: 0

1.4.3 Style Master


Add the style with the required data. The process will create bill of materials (BOMS) based on the costing sheet selected.

Product

Doc. Numbering: Manual
 Code: P99288
 Description: Polo Shirt
 Foreign Description: Polo Shirt
 Status: Production
 Product Line: Men
 Product Group: Apparel
 AF Segmentation: Materias primas
 SAP Item Group: PRIMAVERA VERA
 Collection: CONTRYCLOSET
 Sub-Collections:
 Composition:
 Symbols Group:
 Brand:

Designer:
 Department:
 Year:
 Merchandiser:
 Country of Origin:
 Ship Start Date:
 Ship Cancel Date:
 Customer:
 Vendor:
 Main Warehouse: 01
 Secondary Warehouse:
 Price List: Retail
 Currency: EUR
 Price: 23,00

☒ Inventory Item
☒ Sales Item
☒ Purchased Item
☐ Fixed Assets
☒ Active
☐ Raw Material
☐ Embroidery-Engraving



Size: C... Variable... WorkFL... Prepa... Design and Lo... P... Constructions Det... Logos / Acceso... Cost Sheets - BO... Prod Devel... Comme... St...

Color Chart: TRIUMPH Add Colors

#	Code	Description	Color	Active
1	100	Flash		<input type="checkbox"/>
2	029	Ivory		<input type="checkbox"/>
3	039	Cornflower		<input type="checkbox"/>
4	200	Black		<input type="checkbox"/>
5	2388	beige-naturele		<input checked="" type="checkbox"/>
6	384	Café Laté		<input checked="" type="checkbox"/>
7	4152	Sapphire		<input checked="" type="checkbox"/>
8	928	Charbray		<input checked="" type="checkbox"/>

OK Cancel Copy From Duplicate Approve Events and Activ... Create UPC Codes Generate Master Data

1.4.4 Customer Order

The planning is based on a Make To Order process (MTO). Usually the planning is based on delivery date and customer priority. This information is set during order entry and validated by the manufacturing department. This is not mandatory as the user can allocate manufacturing orders based on MTS – make to stock


Sales Order

Customer: C00034
 Name: Walbrant
 Contact Person:
 Customer Ref. No.:
 Local Currency:

No. Primark: 284
 Status: Open
 Posting Date: 15/05/14
 Delivery Date: 15/05/14
 Document Date: 15/05/14

Contents Apparel Content Logos Accounting Attachments

Ship To	Runsizecode	Style	Style Desc	Color	Color Desc	S	M	L	XL	XXL	Qty Tot
Case Central		P99288	Polo Shirt	2388	beige-naturele	1,000	1,000	1,000	1,000	1,000	5,000,000
						1000	1000	1000	1000	1000	5,000,000
											8,000

Style Tech Pack Picture Preview
 P99288 Polo Shirt


Total Before Discount: 115,000.00 EUR
 Discount: %
 Freight: 10.00 EUR
 Tax: 25,790.00 EUR
 Total: 135,710.00 EUR

Totals View Apparel Conte...
 Copy from Blanket... Update A. P. Items... Copy From... Copy To...

1.4.5 Cut Ticket / manufacturing order

The order information is then transferred to a cutting ticket.

The screenshot displays two SAP Business One windows. The top window, 'Relationship Map', shows a diagram where 'Business Partners' (C00034, Walmart) and 'Item Master Data' (Polo Shirt beige+naturelle..., PS9288-2389-L) are linked to a 'Sales Order' (204, 16/06/14, 135.710,00 EUR, BP Reference No.). The bottom window, 'Manufacturing Order', shows the 'Planning' tab with a table of quantities for the 'PS9288-Polo Shirt' across various sizes and quantities.

Relationship Map

Business Partners
C00034
Walmart

Item Master Data
Polo Shirt beige+naturelle...
PS9288-2389-L

Sales Order
204
16/06/14
135.710,00 EUR
BP Reference No.

Marketing Document: Related Items

OK Go Back Go Forward

Manufacturing Order

Order Number: 213 Cut Ticket Date: 16/06/14
Doc Numbering: Manual Due Date: 16/02/15
Code: 213 User: manager Customer: C00034 Priority:

Content Details Operations Cost Summary Planning

Style	Color	S	M	L	XL	XXL	Qty/Tot
PS9288-Polo Shirt	2389	1000	1000	1000	1000	1000	5.000,000
	WIP	1000	1000	1000	1000	1000	5.000,000
	Completed	0	0	0	0	0	0,000
	Rejected	0	0	0	0	0	0,000

OK Cancel Add Any Item Add A. P. Items

1.4.6 Planning

Based on SAM and manufacturing capacity in the sewing line, the resources are allocated accordingly to the planning board. Users can allocate to a different resource (resource leveling) based on the capacity of the sewing line.

1. Go to Production → Production Schedule → New Planning

[illegible]

2. Select the order/s to include in the planning.

[illegible]

- Run planning calculation, review the results. Enter a code and name for the planning (as the user can run different planning scenarios) and click ADD

Planning

Code

Name

Description ☐ Current

■ Available Resources
■ Overload Resources

CutTicket	Job	Operation	Op. Description	Resource
⇒ 56	⇒ 169	⇒ OP001	Cutting / Corte	⇒ CUT
⇒ 56	⇒ 170	⇒ OP002	Sewing	⇒ SW1
⇒ 56	⇒ 171	⇒ O004	Packing	⇒ PCK
⇒ 56	⇒ 172	⇒ O005	QA	⇒ QA
⇒ 112	⇒ 336	⇒ OP001	Cutting / Corte	⇒ CUT
⇒ 112	⇒ 337	⇒ OP002	Sewing	⇒ SW1
⇒ 112	⇒ 338	⇒ O004	Packing	⇒ PCK
⇒ 112	⇒ 339	⇒ O005	QA	⇒ QA
⇒ 113	⇒ 340	⇒ OP001	Cutting / Corte	⇒ EmptyRes
⇒ 113	⇒ 341	⇒ OP002	Sewing	⇒ EmptyRes
⇒ 113	⇒ 342	⇒ O004	Packing	⇒ EmptyRes
⇒ 113	⇒ 343	⇒ O005	QA	⇒ EmptyRes

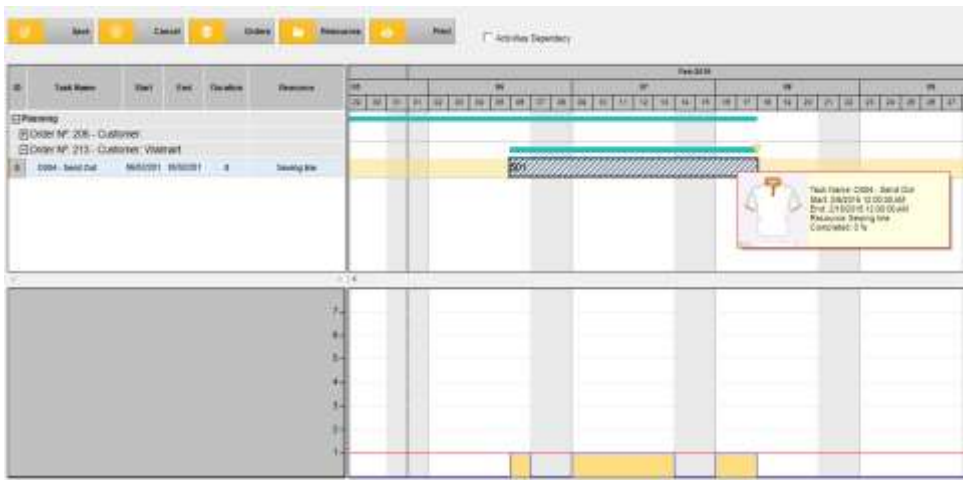
Available Resources to replace

Replace Rec.

#	Resource	Description

Add Cancel << Back

4. For the example above the polo shirts will be set for the sewing line for 8 days



1.5 Accessing Planning scenarios

In order to access the planning scenarios, Go to Production Schedule → Click Show to view all the planning scenarios.

Production Schedule

Code:

Name:

Description: ☐ Current

Code	Name	Current
⇒ GDI2	Nuevo GDI	N
⇒ GLAM	Glamorise 2015	N
⇒ Test	Test	N
⇒ LN	LNation Planning	N
⇒ JOAN	JOAN PLANNING	N
⇒ MULT	Multiple	N
⇒ NPD	New Planning Dubai	N
⇒ SAMPLEP	Sample Planning	N
⇒ Demo	Demo	N
⇒ NEW Planning	NEW	Y
⇒ GDI2015	GDI PLAN 2015	N

Click in the arrow to view the planning

1.6 Replacing resources

In order to replace resources select the resource and in the upper panel. In the lower panel all the same resource types available for the date planned will be displayed. Click on the replace Rec. button to replace the resource.

Planning

Code: ⓘ

Name: ⓘ

Description: ⓘ ☐ Current

☐ Available Resources
☐ Overload Resources

CutTicket	Job	Operation	Op. Description	Resource
⇒ 56	⇒ 169	⇒ OP001	Cutting / Corte	⇒ CUT
⇒ 56	⇒ 170	⇒ OP002	Sewing	⇒ SW1
⇒ 56	⇒ 171	⇒ O004	Packing	⇒ PCK
⇒ 56	⇒ 172	⇒ O005	QA	⇒ QA
⇒ 112	⇒ 336	⇒ OP001	Cutting / Corte	⇒ CUT
⇒ 112	⇒ 337	⇒ OP002	Sewing	⇒ SW1
⇒ 112	⇒ 338	⇒ O004	Packing	⇒ PCK
⇒ 112	⇒ 339	⇒ O005	QA	⇒ QA
⇒ 113	⇒ 340	⇒ OP001	Cutting / Corte	⇒ EmptyRes
⇒ 113	⇒ 341	⇒ OP002	Sewing	⇒ EmptyRes
⇒ 113	⇒ 342	⇒ O004	Packing	⇒ EmptyRes
⇒ 113	⇒ 343	⇒ O005	QA	⇒ EmptyRes

Available Resources to replace

#	Resource	Description
	SEWUK1	Sewing Line 1 UK
	SW2	Sewing line 2
	SEWUK2	Sewing Line 2 UK

1.7 Replacing using the gannt chart control

Planning

Code: SAMPLEP
Name: Sample Planning
Description: Sample Planning

Available Resources

Available Resources to replace

Replace Rec.

Context Menu:

- Cut
- Copy
- Paste
- Delete
- Remove
- Filter Table
- Show Gantt
- Print

CutTicket	Job	Operation	Op. Description	Available Resources
56	169	OP001	Cutting / Corte	source
56	170	OP002	Sewing	CUT
56	171	O004	Packing	SW1
56	172	O005	QA	PCK
112	336	OP001	Cutting / Corte	QA
112	337	OP002	Sewing	CUT
112	338	O004	Packing	SW1
112	339	O005	QA	PCK
113	340	OP001	Cutting / Corte	QA
113	341	OP002	Sewing	EmptyRes
113	342	O004	Packing	EmptyRes
113	343	O005	QA	EmptyRes

Select the task assigned to the resource and drop it to a different resource in the gannt chart. Only resources with tasks are displayed. Otherwise use the form replacement method explained before.

Manufacturing Scheduler - Gantt

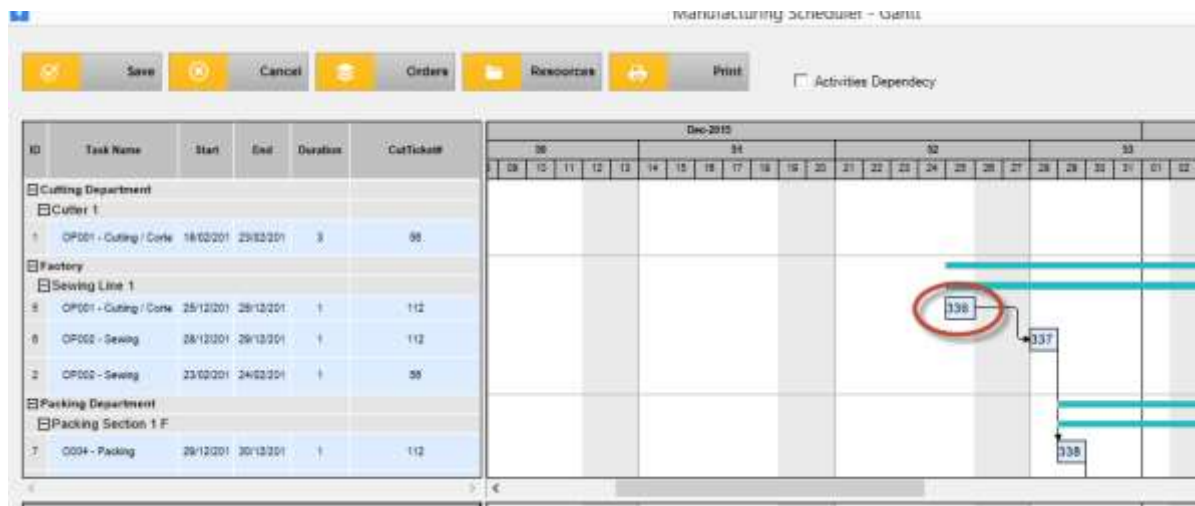
Sort Cancel Orders Resources Print

Activities Dependency

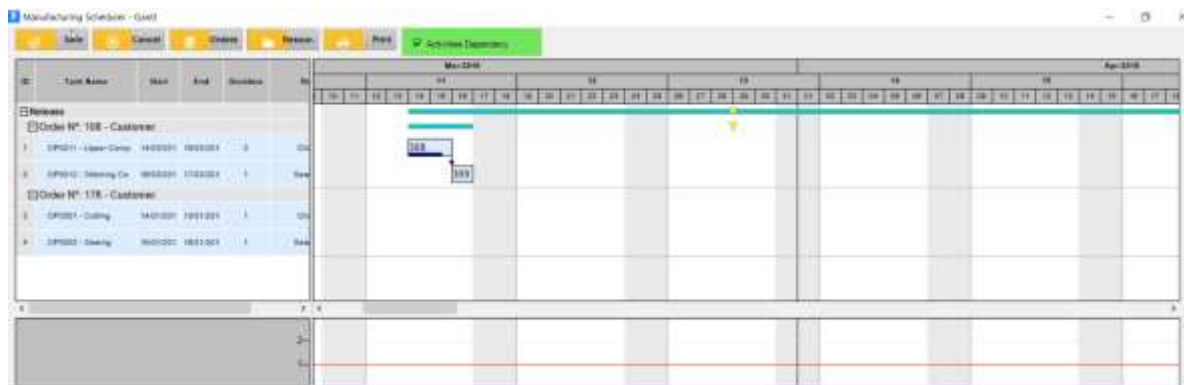
Dec 2015

Task List:

- OP001 - Cutting / Corte
- OP002 - Sewing
- O004 - Packing



If the Operations have dependency, in the Top is available the option Activities Dependency. Once this option is selected when changing any date in the Planning the Operations with dependency are updated accordingly.



1.8 Printing the planning

If you have the reports installed you can print the planning to share with all users

Planning

Code

SAMPLEP

Name

Sample Planning

Description

Sample Planning

CutTicket

Job

Operation

Op. Description

56	169	OP001	Cutting / Corte
56	170	OP002	Sewing
56	171	O004	Packing
56	172	O005	QA
112	336	OP001	Cutting / Corte
112	337	OP002	Sewing
112	338	O004	Packing
112	339	O005	QA
113	340	OP001	Cutting / Corte
113	341	OP002	Sewing
113	342	O004	Packing
113	343	O005	QA

Available Resources

Overload Resources

Resource
CUT
SW1
PCK
QA
CUT
SW1
PCK
QA
EmptyRes
EmptyRes
EmptyRes
EmptyRes

Available Resources to replace

#

Resource

Description

SEWUK1	Sewing Line 1 UK
SW2	Sewing line 2
SEWUK2	Sewing Line 2 UK

OK

Cancel

<< Back

SAP Business One

Apparel & Footwear

Planning Report

CutTicket N°

56

Due Date:

02/27/2016

Plan Code:

SAMPLEP

Priority:

Plan Name:

Sample Planning

Cust Code:

Cust. Name:

Job	Date From	Date To	Planned Qty	Operation Code	Operation Name	Resource Code	Resource Name
169	02/18/2016	02/23/2016	200	OP001	Cutting / Corte	CUT	Cutter 1
170	02/23/2016	02/24/2016	200	OP002	Sewing	SW1	Sewing Line 1
171	02/24/2016	02/25/2016	200	O004	Packing	PCK	Packing Section 1 F
172	02/25/2016	02/27/2016	200	O005	QA	QA	Quality Department

1.9 Adding a new order to a planning

Usually when a new production order is created in planned mode, it needs to be added to a planning version. in order to do this right click in the order and select ADD TO PLANNING

Manufacturing Order

Order Number: 113 Cut Ticket Date: 12/01/15 User: manager
 Doc. Numbering: Manual Due Date: 03/01/16 Customer: Priority: PDC Segmentation:

Content Details Operations Cost Summary Planning UDF

Set all status to: Choose All Clear Selection

#	Update	PO Entry	PO No.	Status	Model Product	Item Code	Item Description
1	<input checked="" type="checkbox"/>	523	523	Planned	NS0011	NS0011-000-S	Uniform for Dubai
2	<input checked="" type="checkbox"/>	524	524	Planned	NS0011	NS0011-000-M	Uniform for Dubai
3	<input checked="" type="checkbox"/>	525	525	Planned	NS0011	NS0011-000-L	Uniform for Dubai
4	<input checked="" type="checkbox"/>	526	526	Planned	NS0011	NS0011-000-X-L	Uniform for Dubai
5	<input checked="" type="checkbox"/>	527	527	Planned	NS0011	NS0011-000-2X-L	Uniform for Dubai

#	Item Code	Item Description	Base	Unit
1	F001-016	Fabric Demo Charcoal	3,200	16
2	RM002	Hantag	1,000	3
3	OP001	Cutting / Corte	1,000	3
4	OP002	Sewing	1,000	3
5	O004	Packing	1,000	3
6	O005	QA	1,000	3

Remarks: Add Any Item Add A. F. Items

View Balance
 Reload BOM
 Report Completion
 Bar Code Printing
 Add Any Item
 Import Sales Order
 Close all lines
 Release Order
 Copy Prod. Orders generated from MRP
 Print Production Order
 Copy from Demand Planning (Valogix)
 Import Individual orders
 Gantt
Add to Planning
 Set CutTicket Number
 Allocation
 View allocation data
 Generate Receipt from Production from Soft Allocation

Select the planning scenario

Manufacturing Order

Order Number: 113 Cut Ticket Date: 12/01/15 User: manager
 Doc. Numbering: Manual Due Date: 03/01/16 Customer: Priority: PDC Segmentation:

Content Details Operations Cost Summary Planning UDF

Set all status to: Choose All Clear Selection

#	Update	PO Entry	PO No.	Status	Model Product	Item Code	Item Description	Planned	Received From Contractor	C
1	<input checked="" type="checkbox"/>	523	523	Planned	NS0011	NS0011-000-S	Uniform for Dubai	32,000	0,000	0,0
2	<input checked="" type="checkbox"/>	524	524	Planned	NS0011	NS0011-000-M	Uniform for Dubai	40,000	0,000	0,0
3	<input checked="" type="checkbox"/>	525	525	Planned	NS0011	NS0011-000-L	Uniform for Dubai	30,000	0,000	0,0
4	<input checked="" type="checkbox"/>	526	526	Planned	NS0011	NS0011-000-X-L	Uniform for Dubai	70,000	0,000	0,0
5	<input checked="" type="checkbox"/>	527	527	Planned	NS0011	NS0011-000-2X-L	Uniform for Dubai	30,000	0,000	0,0

#	Item Code	Item Description	Base	Unit	Issued	Available
1	F001-016	Fabric Demo Charcoal	3,200	16	0,000	-767,400
2	RM002	Hantag	1,000	3	0,000	-14,279,000
3	OP001	Cutting / Corte	1,000	3	0,000	0,000
4	OP002	Sewing	1,000	3	0,000	0,000
5	O004	Packing	1,000	3	0,000	0,000
6	O005	QA	1,000	3	0,000	0,000

Remarks: Add Any Item Add A. F. Items

Select Planning

- NEW(Current)
- GDI PLAN 2015
- Nuevo GDI
- Glamorise 2015
- Test
- Union Planning
- JOAN PLANNING
- Multiple
- New Planning Dubai
- Sample Planning**
- dSALAS
- Demo

Total Units: 252,000

The cut ticket operations are added to the planning. Adjust the resource if necessary and save the form

CutTicket	Job	Operation	Op. Description	Resource
56	169	OP001	Cutting / Corte	CUT
56	170	OP002	Sewing	SW1
56	171	O004	Packing	PCK
56	172	O005	QA	QA
112	336	OP001	Cutting / Corte	CUT
112	337	OP002	Sewing	SW1
112	338	O004	Packing	PCK
112	339	O005	QA	QA
113	340	OP001	Cutting / Corte	EmptyRes
113	341	OP002	Sewing	EmptyRes
113	342	O004	Packing	EmptyRes
113	343	O005	QA	EmptyRes

1.10 How the planning allocates resources to manufacturing operations

User may be aware of default data for the planning process coming from the cost sheet. The planner follows this criteria:

1. Take the order and SAM of each operation from the cost sheet.
2. Select the default resource from the operation in the cost sheet. If no value is specified the solution cannot calculate availability
3. Take the delivery date and start planning backward
4. If the default resource is not available for the selected dates the planner looks for another resource available, same resource type in the same resource center. Make sure the resources are active and the "include in planning" check box is active.
5. If not available it looks for the same resource type in a different work center
6. If not available it looks for an external resource, same type
7. If no resource is found it will set to NO RESOURCE in the planning.

1.11 Closing remarks

The current version is a planning module or scheduler due to the concept that fashion is a dynamic scenario to create and advanced module or APS. This is based in the following concept:

1. A production order can be splitted up into a set of jobs which are then assigned to multiple parallel machines. The user can setup a cutting process and then run in parallel the sewing process to control both task in detail.

2. All customer orders are accepted and the available capacity is adapted accordingly, basically due to the ease of subcontracting. If no resource is available outsource to external shops is always a good practice. This is why the planner set NO RESOURCE in the initial planning. The user is then able to assign a resource manually.