

Apparel & Footwear

Production Planning & Scheduling

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Introduction

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

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

Example

Let's 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 = $5000 \times 16 \text{ minutes} = 80,000 \text{ minutes} = 1333 \text{ Hours}$

Available Capacity/Day = $20 \times 8 \text{ hours} = 160 \text{ Hours}$

Assumes that line works at 100% efficiency.

So, the days required (theoretical) to produce 5000 polo shirts = $1333 / 160 = 8.3 \text{ days}$ (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.

The process

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

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 SAP Resource Master dialog for resource SEW01. The fields are as follows:

- Code: SEW01
- Name: Sewing line
- Description: Sewing Line
- Work Center: WCSEW
- Active:
- Type: CORT1
- Capacity Planning: 8
- Count: 20
- Capacity: 160
- Calendar Exception: 2012
- Cost: 2,00
- Photo: [Browse]
- File: [Browse]
- External:
- Provider: [Blank]
- Count Part: [Blank] per Week
- Include in Planning:

Below the fields is an "Add File" button and a table with columns "Order", "File Name", and "File Path". At the bottom are "OK" and "Cancel" buttons.

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.

The screenshot shows the SAP Resource Master dialog for resource SEWLINE2. The fields are as follows:

- Code: SEWLINE2
- Name: Sewing Line 2
- Description: Sewing Line Senior
- Work Center: WRKCNTRSEWING
- Active:
- Type: SEWERS
- Capacity Planning: [Blank]
- Count: [Blank]
- Capacity: [Blank]
- Calendar Exception: [Blank]
- Cost: 0,0000
- Photo: [Browse]
- File: [Browse]
- External:
- Supplier: S_0002
- Count Part: 1000 per Week
- Include in Planning:

Below the fields is an "Add File" button and a table with columns "Order" and "File Name". At the bottom are "OK", "Cancel", and "Add File" buttons.

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.

Code	Descri...	Sub Oper Template	Preferred Vendor	Lead Time	Seconds	SAM	Resource	End Production	Cost	Qty	U.	Price List	Currency	Price	T.
1	OP002	Send Out	CTM			16	SEWMOR1	<input type="checkbox"/>		1.00	1.000	Price Li		0.00	0.
								<input type="checkbox"/>		0.000				0.00	

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

Style Master

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

Product Master dialog box showing various fields for product configuration, including Doc. Numbering, Code, Description, Status, Product Line, Product Group, SAP Item Group, and a list of colors with their respective codes and descriptions.

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: Walmart
 Contact Person:
 Customer Ref. No.:
 Local Currency:
 No. Primary: 204
 Status: Open
 Posting Date: 16/06/14
 Delivery Date: 16/02/14
 Document Date: 16/06/14

Contents | Apparel Content | Logistics | Accounting | Attachments

Ship to	Runsizecode	Style	StyleDesc	Color	ColorDesc	S	M	L	XL	XXL	QtyTot
Casa Central		PS9288	Polo Shirt	2389	beige-naturale	1,000	1,000	1,000	1,000	1,000	5,000,000
						1000	1000	1000	1000	1000	5,000,000
											0,000

Style Tech Pack Picture Preview
 PS9288 Polo Shirt

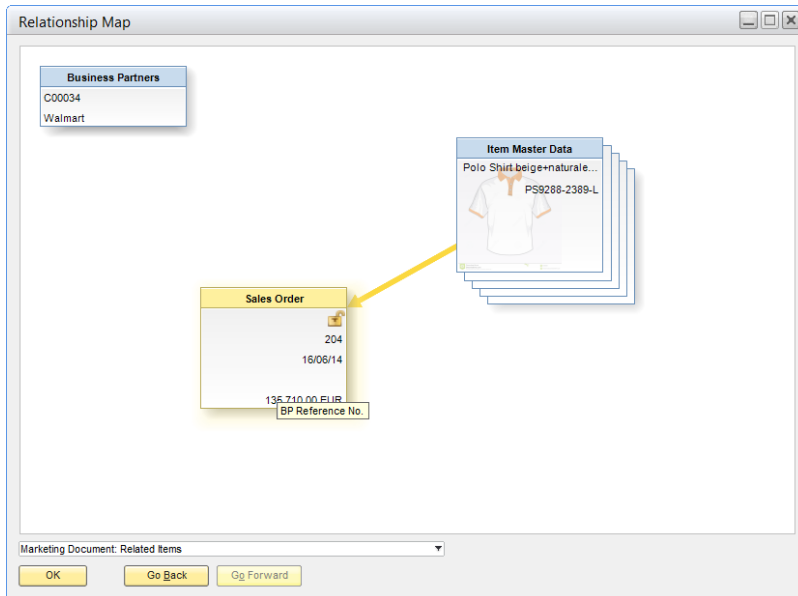


Total Before Discount: 115,000.00 EUR
 Discount: %
 Freight: 10.00 EUR
 Tax: 29,700.00 EUR
 Total: 135,710.00 EUR

Buttons: Totals, Copy from Basket, Update A. F. Items, Copy From, Copy To, View Apparel Conte

Cut Ticket / manufacturing order

The order information is then transferred to a cutting ticket.



Manufacturing Order

Order Number: 213
 Doc Numbering Code: 213
 Manual
 segmentation
 Cut Ticket Date: 16/06/14
 Due Date: 18/02/15
 User: manager
 Customer: C00034
 Priority:

Content | Details | Operations | Cost Summary | Planning

Style	Color	S	M	L	XL	XXL	QtyTot
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

Buttons: OK, Cancel, Add Any Item, Add A. F. Items

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

Create New Planning

Due Date: 12/28/15 To:

Model:

Customer:

Use Alternative and Simultaneous Resources

Select	Cut Tick	Type	Customer Order	Priority
<input checked="" type="checkbox"/>	56	MTS		Low
<input checked="" type="checkbox"/>	112	MTS		Low
<input checked="" type="checkbox"/>	113	MTS		Low

Show Cancel << Back Run Planning Calculation

3. 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 (Green) Overload Resources (Red)

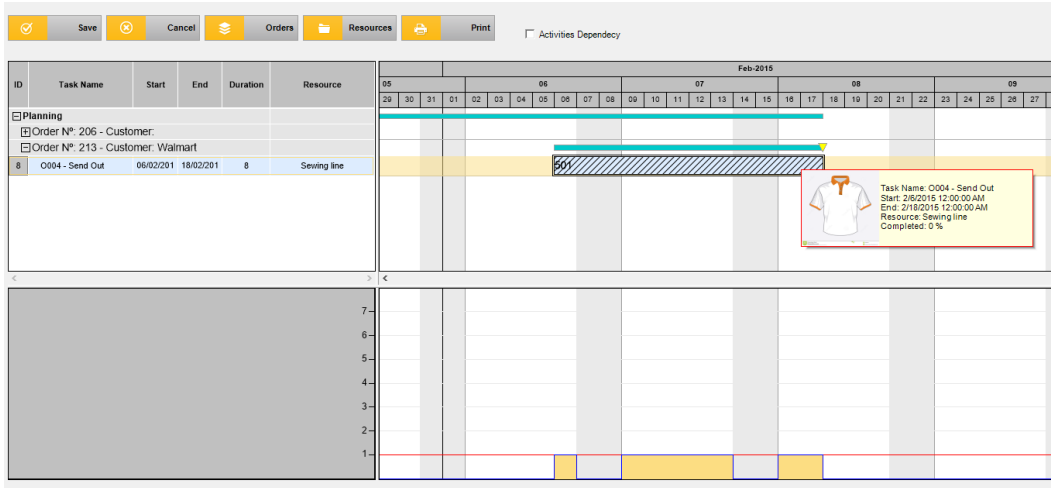
CutTicket	Job	Operation	Op. Description	Resource
56	169	OP001	Cutting / Corte	CUT
56	170	OP002	Sewing	SW1
56	171	OP004	Packing	PCK
56	172	OP005	QA	QA
112	336	OP001	Cutting / Corte	CUT
112	337	OP002	Sewing	SW1
112	338	OP004	Packing	PCK
112	339	OP005	QA	QA
113	340	OP001	Cutting / Corte	EmptyRes
113	341	OP002	Sewing	EmptyRes
113	342	OP004	Packing	EmptyRes
113	343	OP005	QA	EmptyRes

Available Resources to replace

#	Resource	Description

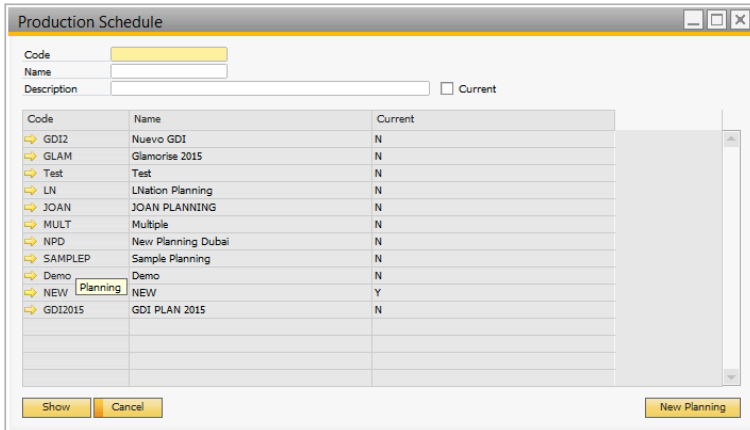
Add Cancel << Back Replace Rec.

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



Accessing Planning scenarios

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



Click in the arrow to view the planning

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: SAMPLEP
 Name: Sample Planning
 Description: Sample Planning

Available Resources: ■ 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
1	SEWUK1	Sewing Line 1 UK
2	SW2	Sewing line 2
3	SEWUK2	Sewing Line 2 UK

Buttons: OK, Cancel, << Back, Replace Rec.

Replacing using the gantt chart control

Planning

Code: SAMPLEP
 Name: Sample Planning
 Description: Sample Planning

Available Resources: ■ 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

Buttons: OK, Cancel, << Back, Replace Rec.

Context Menu: Cut, Copy, Paste, Delete, Remove, Filter Table, **Show Gantt**, Print

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

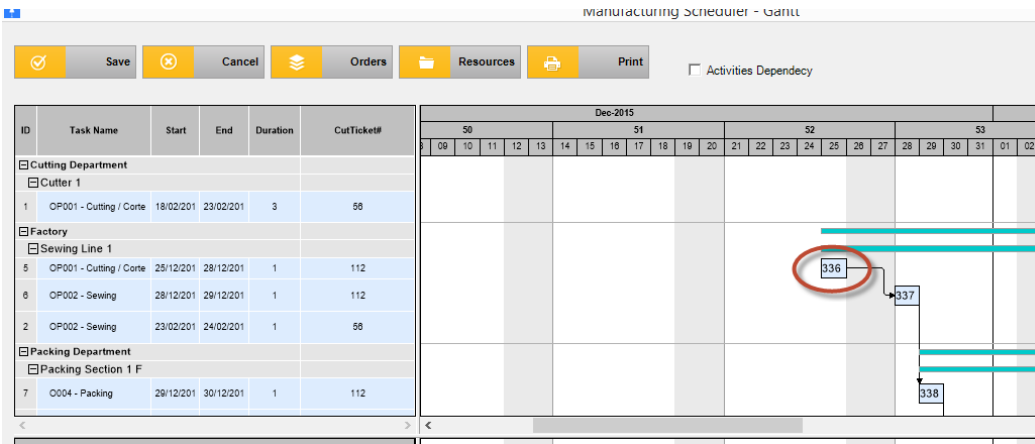
Manufacturing Scheduler - Gantt

Buttons: Save, Cancel, Orders, **Resources**, Print

Activities Dependency:

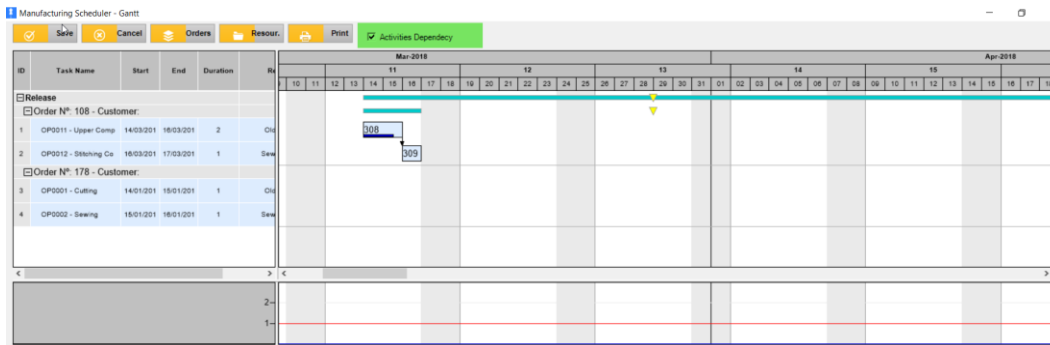
ID	Task Name	Start	End	Duration	CutTicket#
Cutting Department					
Cutter 1					
5	OP001 - Cutting / Corte	25/12/201	28/12/201	1	112
1	OP001 - Cutting / Corte	18/02/201	23/02/201	3	56
Factory					
Sewing Line 1					
8	OP002 - Sewing	28/12/201	29/12/201	1	112
2	OP002 - Sewing	23/02/201	24/02/201	1	56
Packing Department					
Packing Section 1 F					
7	O004 - Packing	29/12/201	30/12/201	1	112

Gantt Chart: Dec-2015 (Days 09-05). Shows tasks for Cutter 1, Sewing Line 1, and Packing Section 1 F. A red arrow points to task 536 being moved to resource SW1.



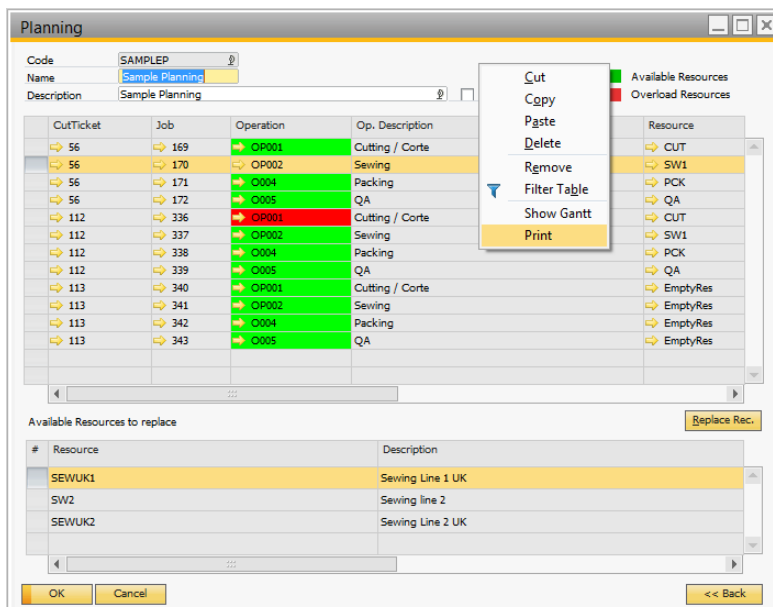
If the Operations have dependency, in the Top is available the option Activities Dependency.

Once this option is selected when changing any date in the Planning the Operations with dependency are updated accordingly.



Printing the planning

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



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

Adding a new order to a planning

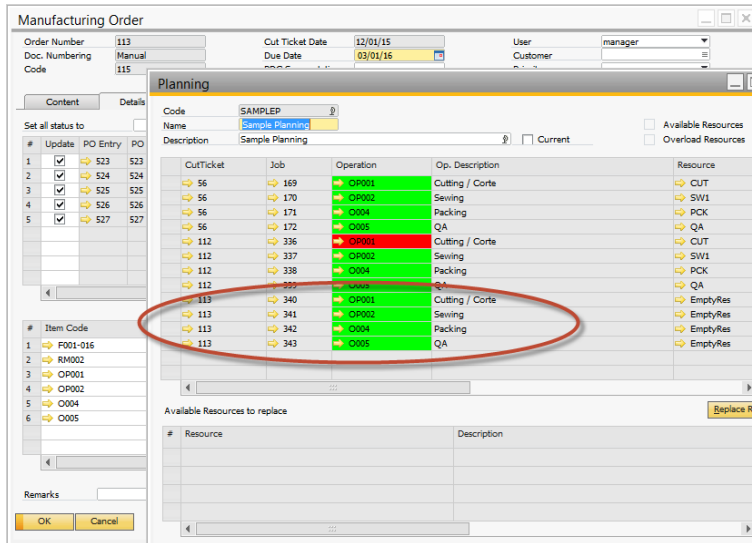
Usually when a new production order is created in planned mode, it needs to be added to a planning version. in order to do this right click in the order and select ADD TO PLANNING

The screenshot shows the SAP Manufacturing Order window for Order Number 113. The 'Planning' tab is active, displaying a list of items with their status and descriptions. A right-click context menu is open over the list, and the 'Add to Planning' option is highlighted in yellow. Other menu options include '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', 'Set CutTicket Number', 'Allocation', 'View allocation data', and 'Generate Receipt from Production from Soft Allocat'.

Select the planning scenario

The screenshot shows the same SAP Manufacturing Order window, but now the 'Select Planning' dialog box is open. The dialog lists various planning scenarios, and '17 - Sample Planning' is selected and highlighted in yellow. The background window shows the 'Planned' status for the items and a summary table at the bottom right with columns for 'Total Units', 'Issued', and 'Available'.

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



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.

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.