

Avanade External Production User Guide

Dynamics 365 for Operations



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1. Introduction

This document describes the functionality, which was provided by Avanade for Microsoft D365 External Production module and complements the existing standard functions.

The Avanade External Production module is intended specially for manufacturing companies which purchase services from third parties. In doing so, these services / orders can already be defined in the planning stage, for example from which vendor for what price will the item / service be purchased. Short-term decisions regarding an external production order can be handled with the system.

2. Supported forms of external production

The following forms of external production are supported by Avanade "External production" module:

An additional external service for a current production is purchased (Service)

- No products are delivered to the sub-contractor, only a service is being purchased.
 - E.g. External assistance e.g. with the assembly of a plant

An additional external service for a current production is purchased (Operation).

- The BOM item (semi-finished product) is supplied externally and taken back after the processing.
- A manufacturing step is externally purchased
- On the BOM marked provided Material could be delivered additionally.
- If desired, you could take back non required provided material after external Production
 - E.g. surface treatment, mechanical processing etc.
 - E.g. assembly work, packing work

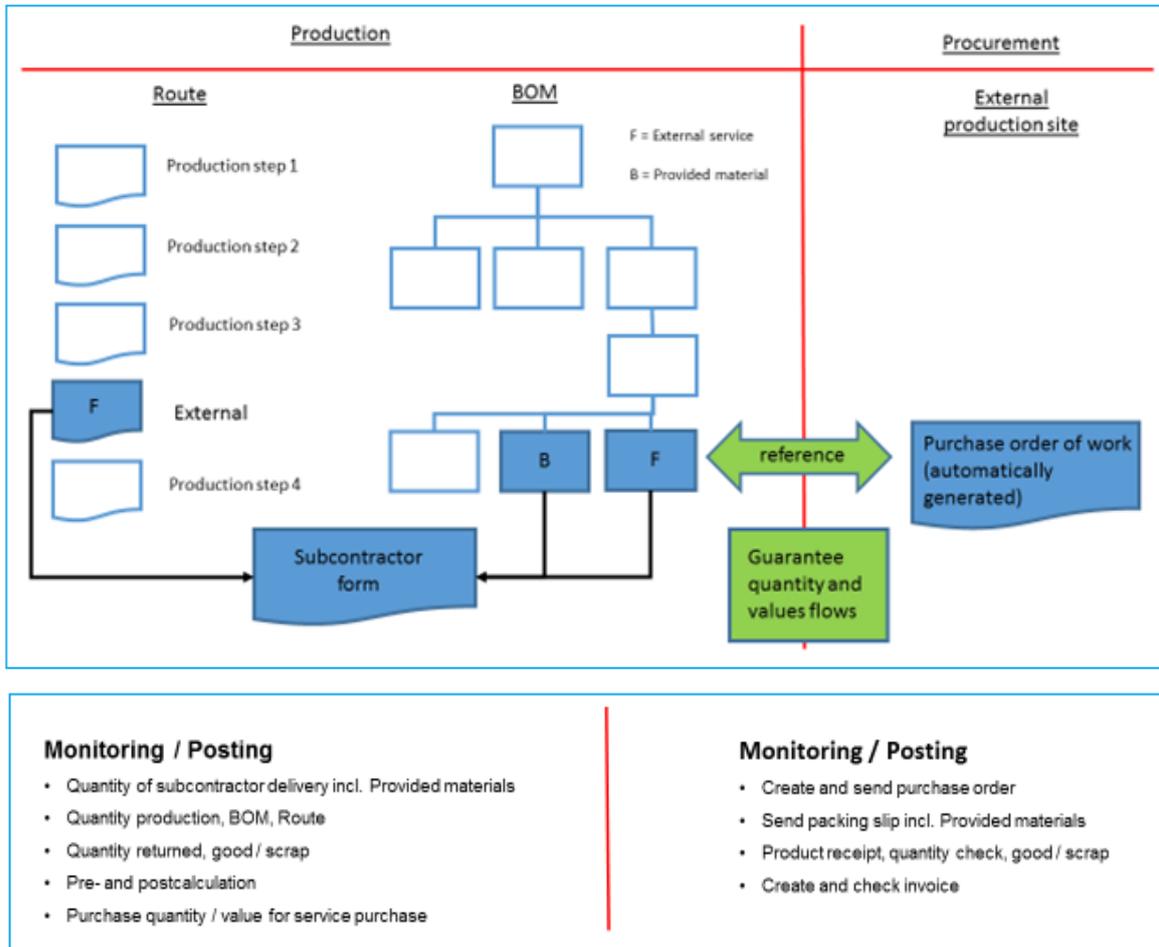
An additional external service for a current production is purchased (complete production).

- No Supply of the semi-finished product, the complete product is delivered from supplier after finished Manufacturing
- BOM Material could be stored at supplier or delivered as provided material with the order.

E.g. Complete Assembly of Group Assembly

- One additionally external service is purchased for a current production (some external supplies/productions)
- The Product is sent after external Production to the next external Supplier and to the customer or sent back again.
- The Demand for a fast reaction, due to utilization situation or concentration on their core business, forces nowadays manufacturing companies, make fast and flexible decisions on their productions sites or support by external suppliers.

2.1 Example scheme of an external production with provided material



3. Characteristics

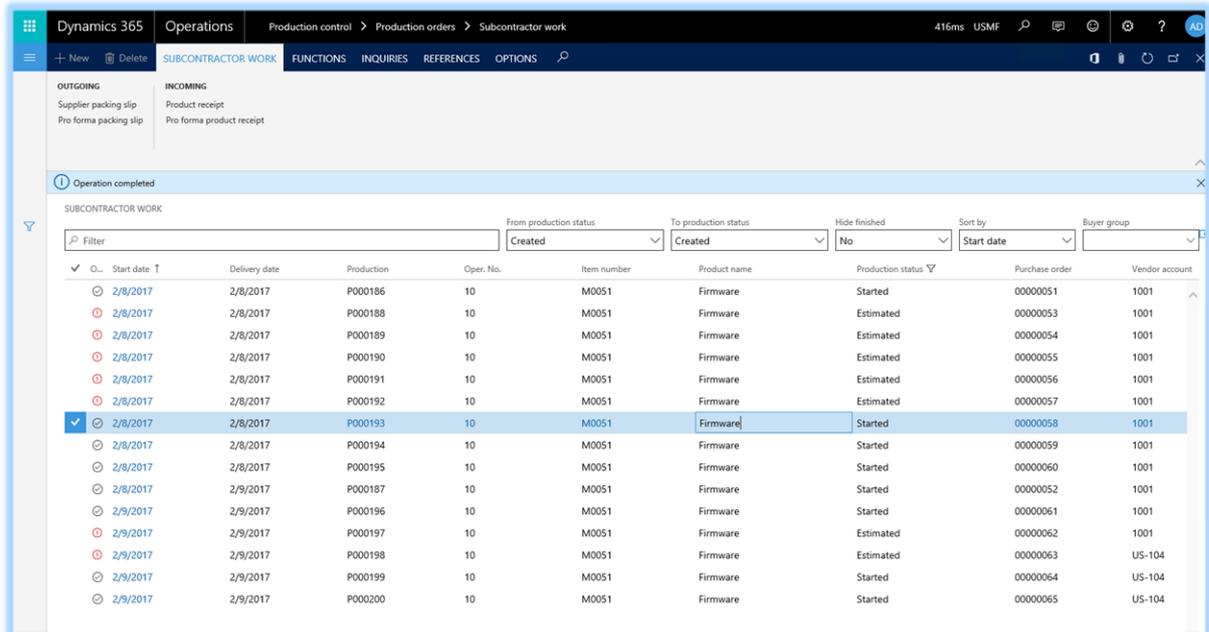
- The orders to the subcontractor for the external production are created prior to the delivery of products. This may take place as flexible as required after the selection of a subcontractor in the production order.
- The pricing shall be negotiated through the trade arrangements by the purchase department.
- This module enables the processing of simple and complex external productions, allowing the employee to always have a view of, for instance, the information on the quantities being in process resp. which sub-contractors provide what kind of external services.
- A "supplier packing slip" for the delivered products incl. the provided single components is made available for the output warehouse.
- The consumption posting of the single components and hence the capacity on the production order may be done with the delivery or return.
- The import arrivals shall take place according to the service in the purchase department and with the completion memo of the products in the production order, depending on the firm, these steps may be automated.
- Based on the posting of the service goods receipt, the work progress (quantities) and the capacity on the production order (cost allocation) shall be posted.
- Directed settlement of offhand internal efforts for the external service.
- The value flow between the purchase of the service and the capacity on the production order is guaranteed at 100%.

4. Additional forms, fields, parameters and flags

Following is the description of additional forms, fields, parameters, as well as flags available for you in Avanade External production module.

- Form **"Sub-contractor work"** in production module. It serves as the main form for the processing of external production.

Path: Production Control → Production orders → Subcontractor Work

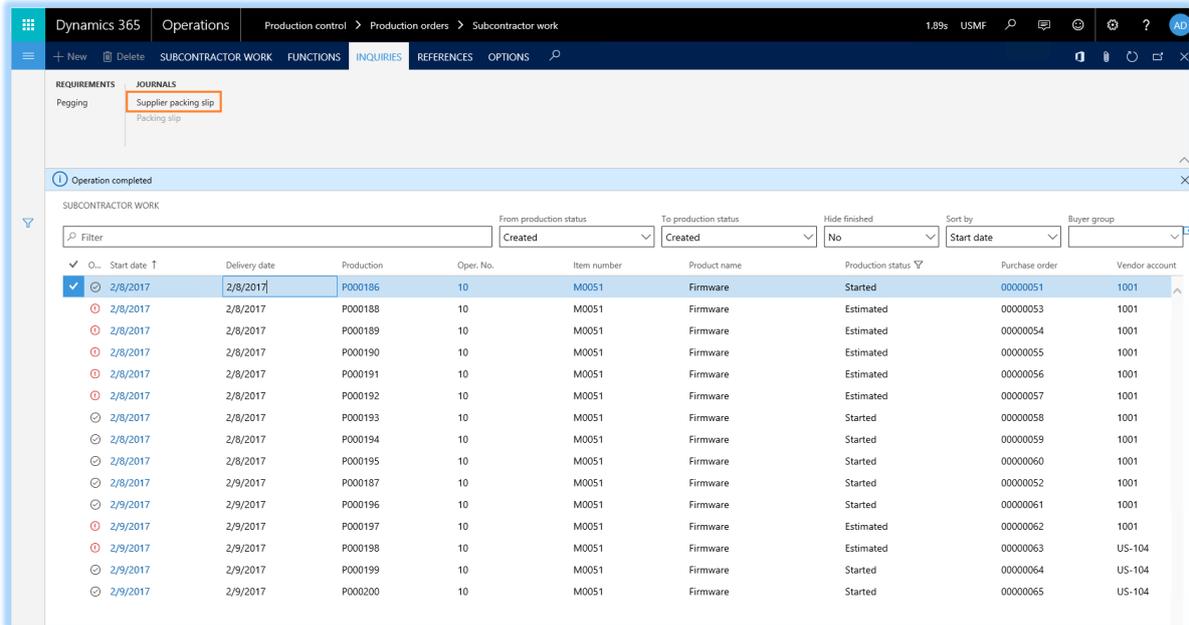


The screenshot shows the Dynamics 365 interface for the 'Subcontractor work' table. The table has columns for Start date, Delivery date, Production, Oper. No., Item number, Product name, Production status, Purchase order, and Vendor account. The data is filtered by 'Created' status and sorted by 'Start date'. The table contains 18 rows of data, with the 10th row (Production P000193, Item number M0051, Product name Firmware, Production status Started) highlighted in blue.

Start date	Delivery date	Production	Oper. No.	Item number	Product name	Production status	Purchase order	Vendor account
2/8/2017	2/8/2017	P000186	10	M0051	Firmware	Started	00000051	1001
2/8/2017	2/8/2017	P000188	10	M0051	Firmware	Estimated	00000053	1001
2/8/2017	2/8/2017	P000189	10	M0051	Firmware	Estimated	00000054	1001
2/8/2017	2/8/2017	P000190	10	M0051	Firmware	Estimated	00000055	1001
2/8/2017	2/8/2017	P000191	10	M0051	Firmware	Estimated	00000056	1001
2/8/2017	2/8/2017	P000192	10	M0051	Firmware	Estimated	00000057	1001
2/8/2017	2/8/2017	P000193	10	M0051	Firmware	Started	00000058	1001
2/8/2017	2/8/2017	P000194	10	M0051	Firmware	Started	00000059	1001
2/8/2017	2/8/2017	P000195	10	M0051	Firmware	Started	00000060	1001
2/8/2017	2/9/2017	P000187	10	M0051	Firmware	Started	00000052	1001
2/9/2017	2/9/2017	P000196	10	M0051	Firmware	Started	00000061	1001
2/9/2017	2/9/2017	P000197	10	M0051	Firmware	Estimated	00000062	1001
2/9/2017	2/9/2017	P000198	10	M0051	Firmware	Estimated	00000063	US-104
2/9/2017	2/9/2017	P000199	10	M0051	Firmware	Started	00000064	US-104
2/9/2017	2/9/2017	P000200	10	M0051	Firmware	Started	00000065	US-104

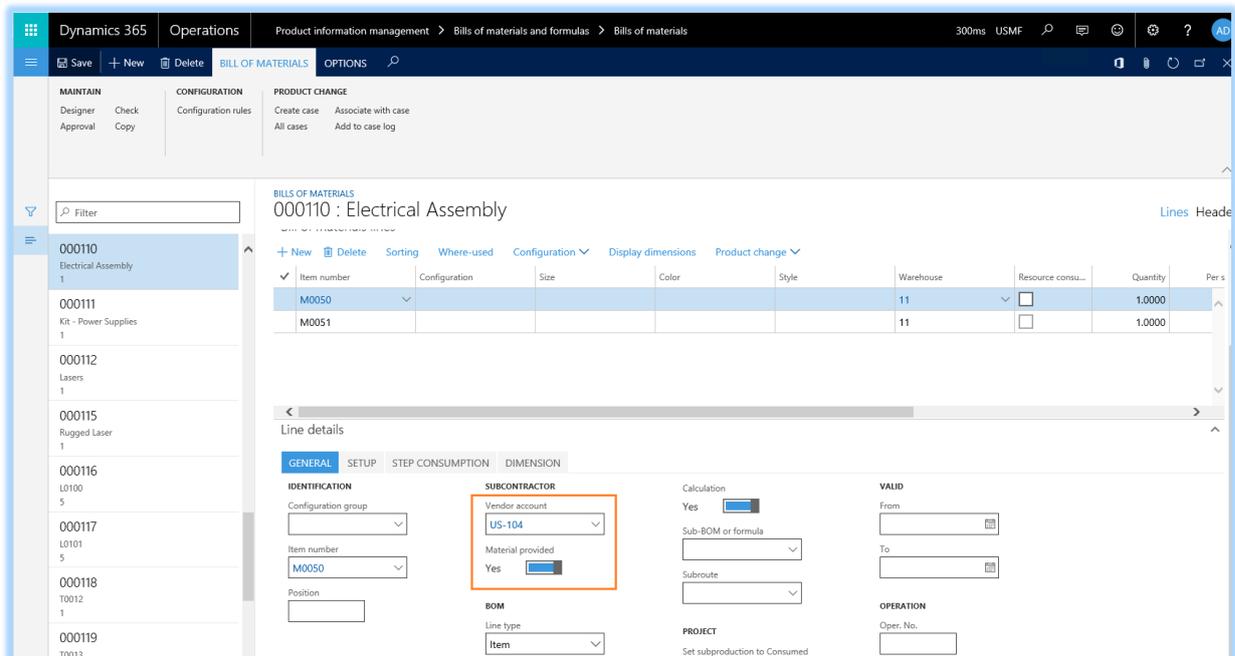
- **"Suppliers packing slip"** for the goods delivery to the external producer. Form settings are under "Vendor Forms"

Path: Production Control → Production orders → Subcontractor Work → Inquires



- Flag **"Material provided"** on the BOM position, General Tab
Specifies the designation of BOM items on the documents for the external work.

Path: Product Information Management → Bill of materials and formula → Bill of material



- Checkbox **"Subcontractor work"** in the header of the All purchase order list page
 - Signifies that it is an "External production purchase"
 - The flag can be edited via "Edit in Grid".

Path: Accounts payable → Purchase orders → all purchase orders

base type	Approval status	Purchase order status	Currency	Delivery date	Mode of delivery	Delivery terms	Purchase agree...	Quality order status	Direct delivery	Subcontractor work
chase order	Confirmed	Open order	USD	4/15/2016	10	FOB	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
chase order	Approved	Open order	USD	8/17/2016	10	FOB	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
chase order	Confirmed	Open order	USD	8/17/2016	10	FOB	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
chase order	Confirmed	Received	USD	2/8/2017			<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>
chase order	Confirmed	Open order	USD	2/8/2017			<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>
chase order	Confirmed	Open order	USD	2/8/2017			<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>
chase order	Approved	Open order	USD	2/8/2017			<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>
chase order	Approved	Open order	USD	2/8/2017			<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>
chase order	Approved	Open order	USD	2/8/2017			<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>
chase order	Approved	Open order	USD	2/8/2017			<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>
chase order	Approved	Open order	USD	2/8/2017			<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>
chase order	Approved	Open order	USD	2/8/2017			<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>
chase order	Confirmed	Open order	USD	2/8/2017			<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>
chase order	Confirmed	Open order	USD	2/8/2017			<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>
chase order	Confirmed	Open order	USD	2/8/2017			<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>
chase order	Confirmed	Open order	USD	2/9/2017			<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>
chase order	Approved	Open order	USD	2/9/2017			<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>
chase order	Approved	Open order	USD	2/9/2017	10	FOB	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>
chase order	Confirmed	Open order	USD	2/9/2017	10	FOB	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>

- Additional **Parameters** in the production parameters, which define the defaults.

Path: Production Control → Setup → Production control parameters → Subcontractor work

Production control parameters

General

Show good quantity according to production feedback
No

Journals

Prompt for changes on purchase or bom quantity
Yes

Automatic update

Initialize quantity for materials provided
Yes

Standard update

Check return delivery quantity
Yes

Status

Spontaneous purchase order reduces workcenter load
Yes

Inventory dimensions

Auto-report production as finished
Yes

Lean manufacturing

No route posting
No

Unit of measure

Number sequences

Number sequences

Subcontractor work

Cost posting on route feedback
Hours and quantity

MATERIAL PROVIDED

Posting type material provided
Issue

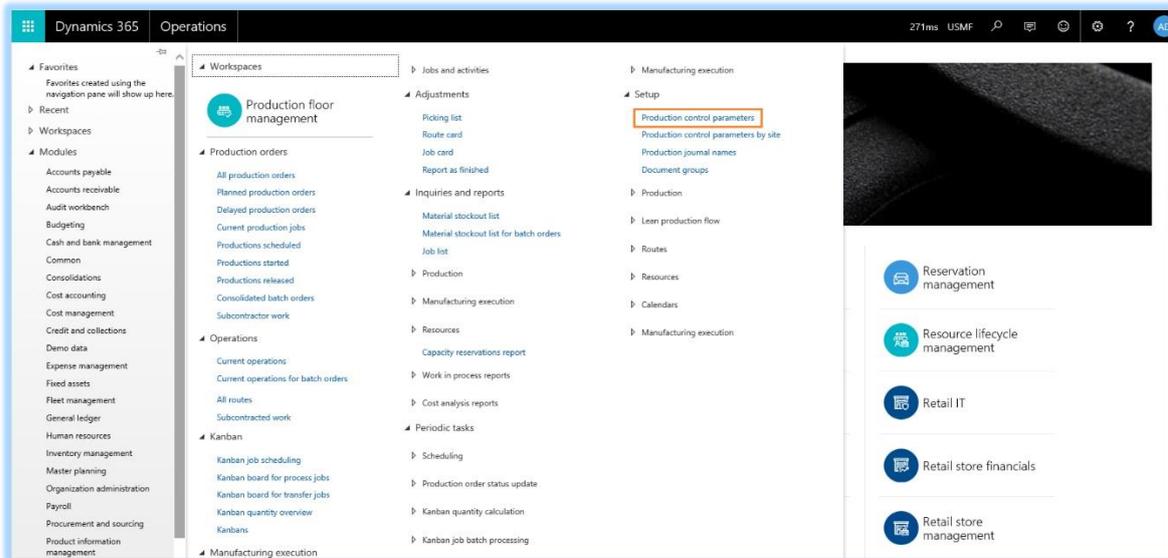
Warehouse for transfer

Location for transfer

Parameter	Note
Prompt for changes on purchase or BOM quantity	Is the change of the quantity required to be indicated at the delivery? Generates a notice, when the order quantity is changed.
Initialize quantity for 'Material Provided'	Produce a supplier packing slip at „dispatch“ / „transfer“ and produce a packing slip during a "transfer order"?
Check return delivery quantity	Is the returned quantity (packing slip) allowed to be higher than the delivery quantity (Sub supplier packing slip)? May the sub-contractor deliver more than he received?
No route posting	No posting of operations
Keep the relation to operation	Shall the relation to the operation be kept on the production BOM with respect to the reset of the production? BOM / Allocation of routes: When the production is reset to the status "Produced", the standard reset of the "BOM / Allocation of operations can be avoided, if this parameter is activated. Be aware when positions should be deleted!
Show good quantity according to the production feedback	Is the goods quantity required to be indicated at the posting of the supplier packing slip work according to the previous operation feedback?
Spontaneous purchase order reduces work center load	The load on the resource can be reduced with a new order for subcontractor work, if this parameter is activated. Open the form by <i>Functions / New order</i>
Auto-report production as finished	Production order is reported as finished, when the checkbox "Closing" is set during posting of a packing slip and it is the last operation.
Posting type 'Material provided'	Posting as dispatch resp. transferred to the indicated warehouse. Important This parameter can be set in the parameters individually for each vendor. Important! It's also possible to define the destination warehouse specifically for each production order.
Warehouse for transfer	Define stock location Active in the transfer process, material is transferred to this warehouse and won't be posted on the order.
Location for transfer	Position at the warehouse location Important! This field may be adjusted in the form "Vendor details "for each vendor.
Cost posting on route feedback	Defines which costs should be posted with the automatic route feed- back? In doing so, it can be made sure that the route never deducts a value- related posting, or only those ones required. The normal setting is „No costs“, as these flow into the production by the posting of the order via BOM.

NOTE: With Microsoft D365 and its multisite feature, it is allowed to have the production parameters to be individually adjusted for each site, whereas the parameter of the site overrides the general parameters.

The external production parameters are not intended to be applied to the definition for each site.



In the 'Accounts Payable parameters' the following number sequences are available.

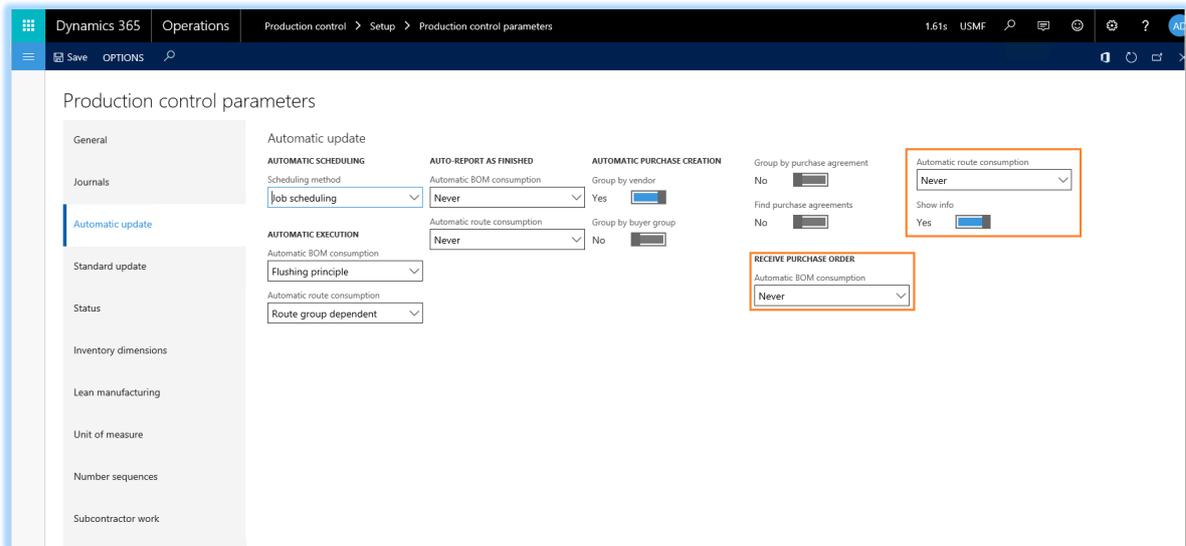
- It is a number sequence for the unique key for "Supplier Packing slip".
- It is a number range for the "Packing slip for cost charging"

Path: Accounts payable → Setup → Accounts payable parameter → Number sequence

Reference	Number sequence code	Reuse numbers	Use same number as	Description
Charges voucher	Acco_328	<input type="checkbox"/>		Unique key for voucher, used when adjusting the cost price
Prepayment voucher	Acco_329	<input type="checkbox"/>		Unique key for voucher, used when posting to the general
Prepayment application voucher	Acco_330	<input type="checkbox"/>		Unique key for voucher, used when posting to the general
Product receipt finalization voucher	Acco_1756	<input type="checkbox"/>		Unique identification for product receipt finalization voucher.
Royalty contract	RoyCon	<input type="checkbox"/>		Unique key for royalty contracts, allocated when royalty contracts
Royalty code	RoyCode	<input type="checkbox"/>		Unique key for royalties, allocated when royalty
Royalty claim ID	RoyClaim	<input type="checkbox"/>		Unique key for royalty claims, allocated when royalty claims are
Royalty claim vendor invoice ID	RoyCInv	<input type="checkbox"/>		Invoice ID of the vendor invoice when processing a royalty claim.
Broker claim invoice	BroClaim	<input type="checkbox"/>		Invoice ID of the vendor invoice when approving a broker claim.
Approved broker claim ID	ABroClaim	<input type="checkbox"/>		ID of the claim for the approved brokerage amount.
Purchase debit note voucher	Acco_14813	<input type="checkbox"/>	Purchase debit note	Unique key for the voucher, used when posting to the general
Internal product receipt number	Acco_14629	<input type="checkbox"/>		Unique key for product receipt. The key is used as unique
Consignment product receipt vo...	Acco_14653	<input type="checkbox"/>	Internal product receipt numbe	Unique key for voucher, used when posting to the general
Supplier packing slip	Acco_14838	<input type="checkbox"/>		Unique key for supplier packing slips.
Packing slip for cost charging	Acco_14863	<input type="checkbox"/>		Identification for packing slips

Production parameters "**Receive purchase order**" shall not be automatically performed when the Avanade External production module is in use. Both parameters can/should be changed to "Never".

Path: **Production Control** → **Setup** → **Production control parameters** → **Automatic update**



5. Processing / provisioning of the external production

In Microsoft D365, the internal control of the external production is carried out on the basis of the production order. The orders are directly created with a reference to the production. That way, the entire purchase functionality of Microsoft D365 can be applied for the processing.

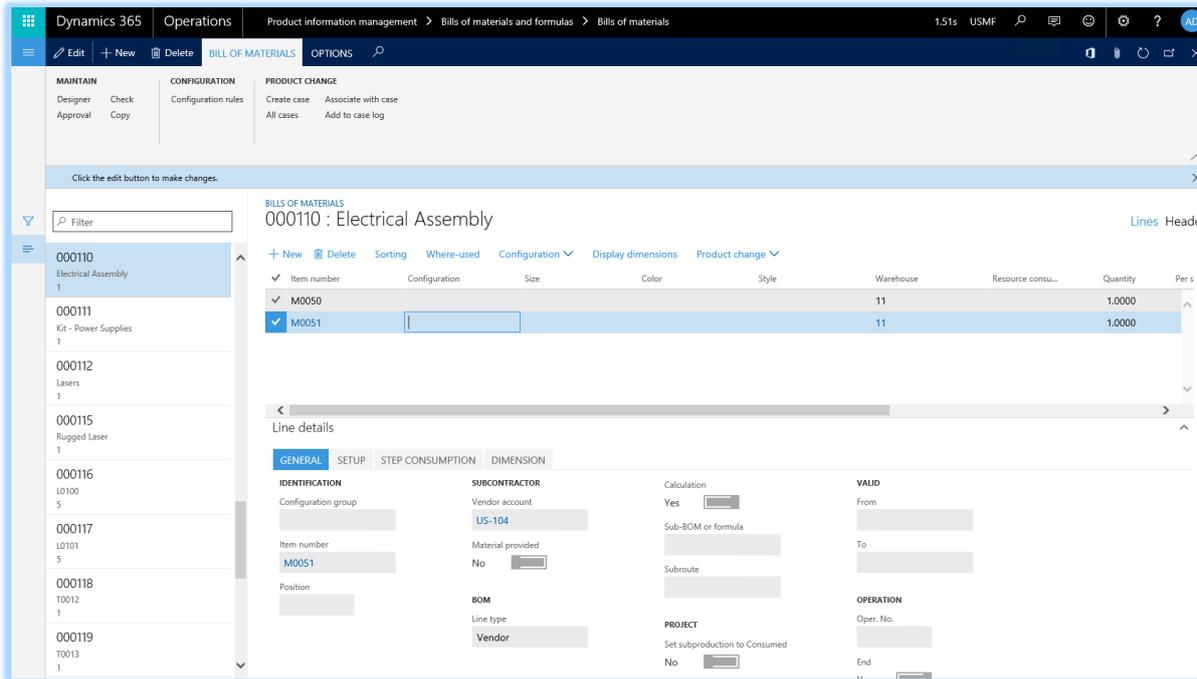
With regard to the execution of an external production, it's recommended to always generate a production order analogous to the internal production.

5.1 Illustration

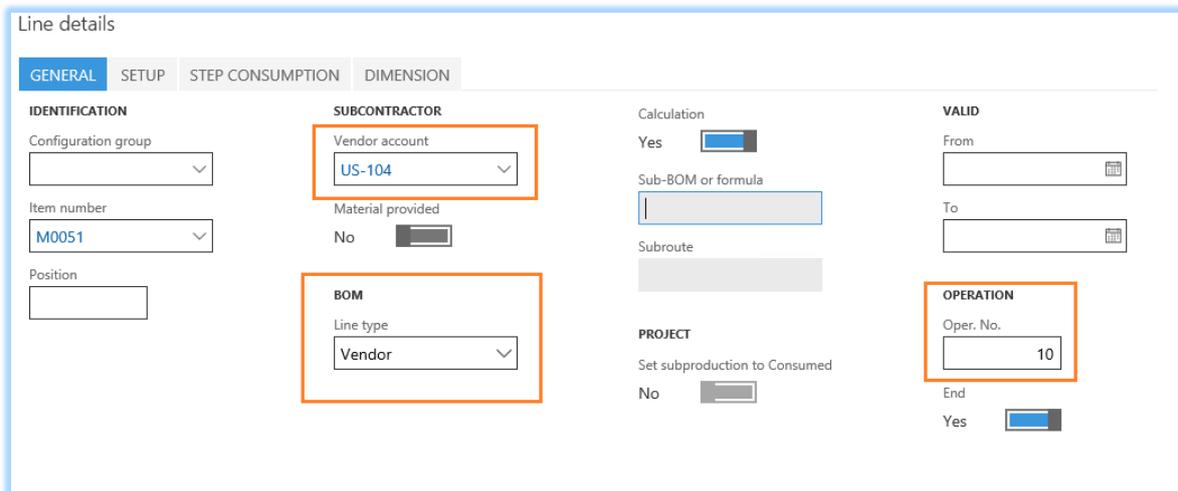
5.1.1 Example structure configuration "External Production with provided material" Example in Microsoft D365

- Set up items with BOM.
- Create a BOM position with a subcontracting service
Note: Subcontracting services are items of the items type "Service"

Path: Product Information Management → Bill of materials and formula → Bill of material



- Define items as position type “Vendor” in the BOM
- Define the vendor in the vendor account
- In the register “Settings” the parameter BOM procurement principle of the capacity unit must be set to “Manual”.



- The operation number must be specified as a reference in the BOM position of the service. The demand appointment can be scheduled at the start or at the end of the work cycle (BOM position, Register “General” / Checkbox “End”). The operation is updated when the service is getting posted (packing slip).

Note: The vendor can be allocated to the BOM position (Prio1), the capacity unit in the items master (Prio2), or by means of the operations allocation in the respective work plan position of the specified resource group (Prio3).

- Create a BOM position with a provided material (provided material items), and set the flag “Provided material”. The BOM procurement principle for the provided material items can be defined in the items master under Register “References → Field group Production → BOM procurement principle” or in exceptional cases as well on the BOM in the Register “Settings” (See chapter 5.1.5 for more details).

Line details

GENERAL SETUP STEP CONSUMPTION DIMENSION

IDENTIFICATION
 Configuration group

 Item number

 Position

SUBCONTRACTOR
 Vendor account

 Material provided

BOM
 Line type

Calculation
 Yes
 Sub-BOM or formula

 Subroute

PROJECT
 Set subproduction to Consumed
 No

VALID
 From

 To

OPERATION
 Oper. No.

 End

Setting = manual

Engineer

BILL OF MATERIALS
 BOM unit

 Constant scrap

 Variable scrap

 Level

Phantom
 No
 Auto-report as finished
 No

MEASUREMENT
 Height

 Width

Depth

 Density

CALCULATION
 Calculation group

PRODUCTION
 Production pool

Production group

 Property

 Arrival
 Yes
 Flushing principle

FORMULA PLANNING
 Production type

 Planning formula

 External Purchase
 Yes

The setting in the production parameters must be set to *Issue* for the parameter “Posting type material provided”

MATERIAL PROVIDED

Posting type material provided
Issue

Warehouse for transfer

Location for transfer

- With regards to the settings of the production parameters on the tab “Automatic update“, Receive purchase orders: set both settings to NEVER. Otherwise it may come to double postings of the materials on the BOM.

Group by purchase agreement
No

Find purchase agreements
No

Automatic route consumption
Never

Show info
Yes

RECEIVE PURCHASE ORDER

Automatic BOM consumption
Never

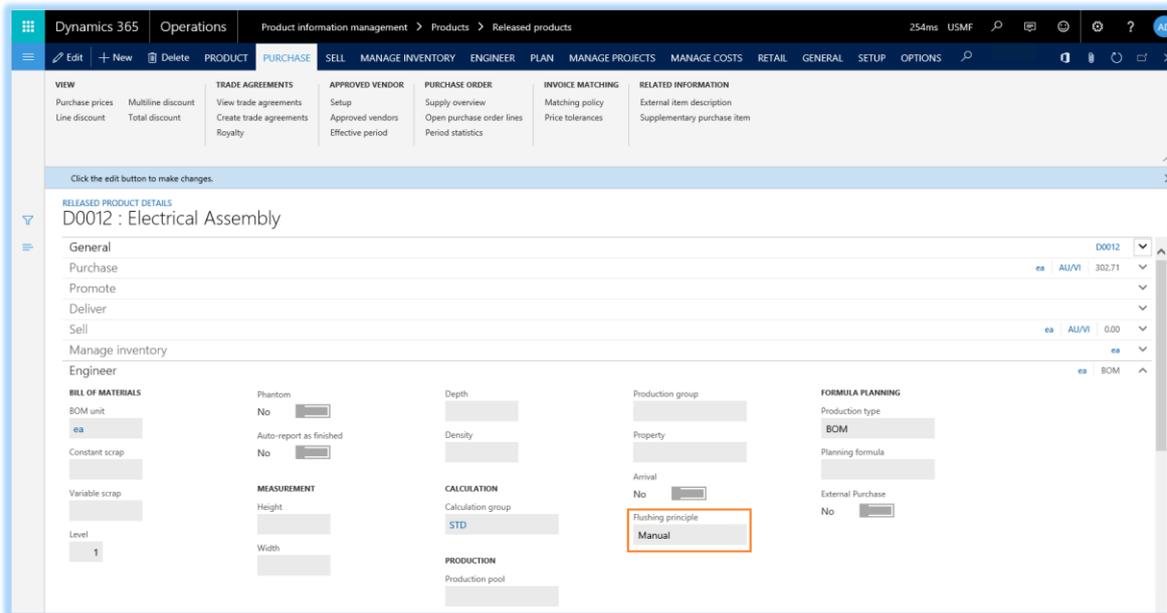
5.1.2 Service to be purchased

In general, the subcontractor work is activated (the purchase process is automatically generated with the production estimate) through an item of the type Service, which is marked as position type Vendor in the BOM.

The service item may be the description for the purchased service. The vendor is usually defined in the BOM position, but can also be saved as default in the item master, or must be determined by means of the trade agreement.

Note: Capacity units for the external production are not supposed to be automatically posted during update. You should have set the “Flushing principle” to “manual” in the items master in “references” Tab. Otherwise, corresponding update settings may cause an uncontrolled (double) posting of the quantities.

Path: Product Information Management → Products → Released products



5.1.3 Setting-up of price for a service item

The price **must** be available as cost value (example 1 pc = 1 price unit), otherwise there wouldn't be entered any value for the service with an estimate.

E.g. an item in 1.- € / Piece, then, it is possible to enter the direct additional costs as amount. Only service items should be used which do not have a set "standard price model".

Note

Inventory closing → service items without a reference (purchase order to a production order line) are always closed at the end, even when they are not balanced after FIFO. That's why the external service postings should be checked for existing references before inventory closing and if necessary marked manually.

An inventory model standard price for service items is generally not permissible (Microsoft) from Microsoft D365.

Recommendation: Choose the stock model "FIFO" for the service item in the item model group and do not define them by the flag "Fixed acquisition price".

When the prices (=physical posting costs) which are entered in the purchase order should be transferred to the BOM line during the posting of the packing slip, then the checkbox "Include physical value" must be activated in the item model group.

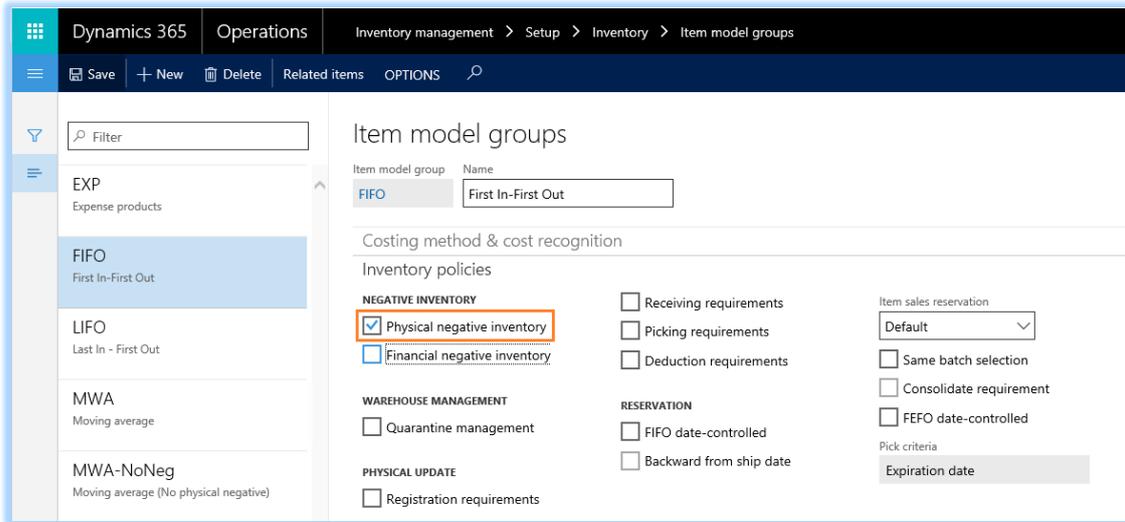
In such cases a separate item model group should be created and the checkbox should be set in the normal case.

5.1.3.1 Basic settings of inventory model group for items of type "Service"

These settings are to be considered as a suggestion and must be checked separately for each client, as certain deviations from the individual client demands may be possible.

The flag "Physical negative inventory" for service items is no longer necessary with Microsoft D365, hence availability check is no longer made (Microsoft).

Path: Inventory management → setup → Inventory → Item model group

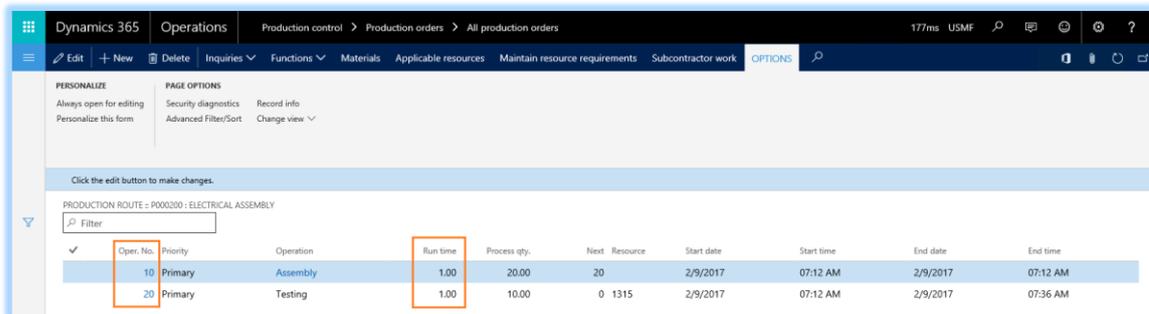


5.1.4 Operation

A route is not essentially necessary for the buildup of the external production; however it might turn out to be advantageous for the monitoring of the progress.

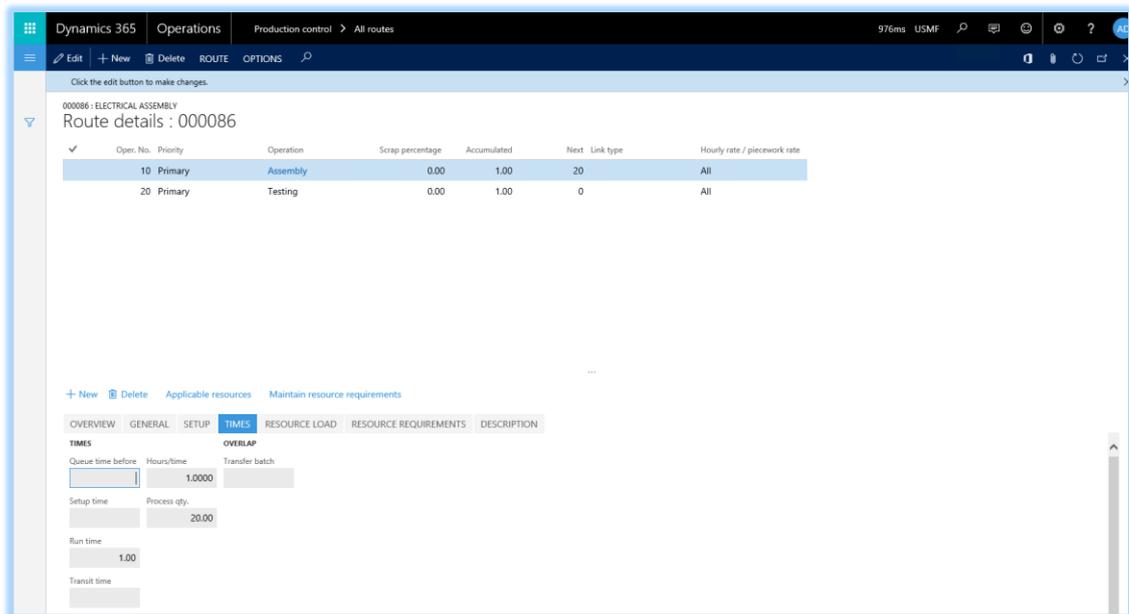
When automated steps are required during the “report as finished” process, the route may however become mandatory (report as finished of the production order with the delivery note of the external service).

Path: Production Control → Production Orders → All Production Orders → Production details Tab → Route

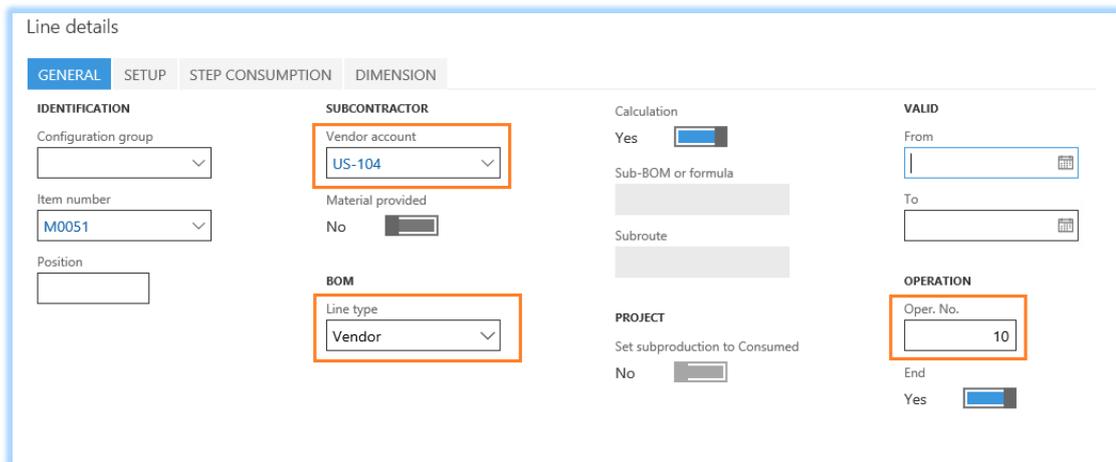


In order to define a turnaround time for the external work and schedule these with further operations, there must be available an operation with a turnaround time (TAT). The turnaround time may be indicated in form of a set-up and processing time; however, costs must not be incurred from that (value flow through the capacity unit / purchase).

Path: **Production Control** → **Operations** → **All routes** → **Route details**



The operation number shall be indicated as reference in the BOM position of the service. The date required can be scheduled at the start or at the end of the operation (BOM position, Register General / Field End). The operation will be correspondingly updated with the posting of the service.



The setup of an operation enables to create a description of the purchase text (for each route position, with the same service) by means of the text for the operation. This one will be copied into the order of the „External service) (Reference the BOM to the operation).

5.1.5 Provided Material

Provided material items are marked as “Provided materials” in the BOM. These are listed on the packing slip and may also be sent in partial deliveries to the external producer. The posting of the provided materials can be defined as “Dispatch” or “Transfer” (Production parameters, Register General, variances can be defined for each vendor). (See also chapter 5.1.1)

In the case “Dispatch”, provided material items are posted in the production parameters according to the settings in the „Items → References → Flushing Principle“. This means, that provided material items with the Flushing Principle = manual are in case of “dispatch” to be posted by means of the supplier packing slip and may be, in case of the Flushing Principle (Start / Ready), posted by means of the picking list. In both cases, the provided material items is mentioned on the supplier packing slip with the posted / estimated quantity (picking list >0!), but it’s only posted “manual” in case of the flushing principle.

5.1.6 Posting of the supplier packing slip

The screenshot shows the Dynamics 365 Operations interface for 'Subcontractor work'. The 'OUTGOING' section has 'Supplier packing slip' highlighted. The main table displays a list of production orders for 'Firmware'.

Start date	Delivery date	Production	Oper. No.	Item number	Product name	Production status	Purchase order	Vendor account
2/8/2017	2/8/2017	P000186	10	M0051	Firmware	Started	00000051	1001
2/8/2017	2/8/2017	P000188	10	M0051	Firmware	Estimated	00000053	1001
2/8/2017	2/8/2017	P000189	10	M0051	Firmware	Estimated	00000054	1001
2/8/2017	2/8/2017	P000190	10	M0051	Firmware	Estimated	00000055	1001
2/8/2017	2/8/2017	P000191	10	M0051	Firmware	Estimated	00000056	1001
2/8/2017	2/8/2017	P000192	10	M0051	Firmware	Estimated	00000057	1001
2/8/2017	2/8/2017	P000193	10	M0051	Firmware	Started	00000058	1001
2/8/2017	2/8/2017	P000194	10	M0051	Firmware	Started	00000059	1001
2/8/2017	2/8/2017	P000195	10	M0051	Firmware	Started	00000060	1001
2/8/2017	2/9/2017	P000187	10	M0051	Firmware	Started	00000052	1001
2/9/2017	2/9/2017	P000196	10	M0051	Firmware	Started	00000061	1001
2/9/2017	2/9/2017	P000197	10	M0051	Firmware	Estimated	00000062	1001
2/9/2017	2/9/2017	P000198	10	M0051	Firmware	Estimated	00000063	US-104
2/9/2017	2/9/2017	P000199	10	M0051	Firmware	Started	00000064	US-104
2/9/2017	2/9/2017	P000200	10	M0051	Firmware	Started	00000065	US-104

The update “supplier packing slip” is only active when the purchase order is confirmed. If this is not the case the purchase order can be confirmed.

Sample print of a subcontractor delivery note

Dynamics 365 Operations Production control > Production orders > Subcontractor work

OPTIONS

Display supplier packing slip

Go to > < << >> > Find > Zoom > < > Export > <

Contoso Entertainment System USA
 123 Coffee Street, Suite 300, USA-98052 Redmond

Telephone Email
 Fax Internet

Fabrikam Supplier
 789 Eighth Street
 Minneapolis, MN 55425
 USA

Redmond, 09.February 2017

Packing slip No. USMF-000003

Purchase order 00000065
 Production P000200
 Recipient
 Order account US-104

Item	Purchase quantity	Delivery quantity	Unit	Delivery date
D0012 Electrical Assembly	4.00	4.00	ea	2/9/2017
M0050 PCB Assembly	4.00	4.00	ea	

Test

Page 1 of 1

Note When the service is returned, it is possible to post the return delivery of the provided material which also discharges the production order accordingly.

6. External production step-by-step

- Create the production order (manual or by conversion of a „planned production order“).
- Update the production order to a higher status than “Created” so that a purchase order is created automatically.
- The scheduling of the production has to take place before the purchase order is posted. Otherwise the purchase order has to be confirmed again (in case of a change in the appointment) before the booking of the service (product receipt) takes place.
- Mandatory: Post the purchase order (eventually print)
- Mandatory: “Start” production order to enable postings on the production order (before the product receipt!)
- Update supplier packing slip
- (Parameter: Check return delivery quantity)
- Mandatory: Post packing slip upon receiving of the processed goods.
- Optional: Post internal post editing (unscheduled additional costs, reduction in terms of value of the external service)

6.1 Processing of external service using the “Subcontractor work” form

As soon as the production order has reached a higher status than “Created“, a referenced purchase order from the BOM line will be generated with an item position as item type “Service“ and will be created as BOM position of type „Vendor“. The order text may be defined through the assigned route or come from the items.

The further processing should to be done using the form “Subcontractor work”.

Path: Production Control → Production order → Subcontractor Work

The screenshot shows the Dynamics 365 interface for the 'Subcontractor work' form. The breadcrumb navigation is 'Production control > Production orders > Subcontractor work'. The form has tabs for 'FUNCTIONS', 'INQUIRIES', 'REFERENCES', and 'OPTIONS'. Below the navigation, there are sections for 'OUTGOING' (Supplier packing slip, Pro forma packing slip) and 'INCOMING' (Product receipt, Pro forma product receipt). A notification states: 'Posting Purchase order: 00000055 Item: M0051 Posting - Picking list Journal: 00951 Journal has been posted.' Below this is a table with the following columns: O., Start date, Delivery date, Production, Oper. No., Item number, Product name, Production status, Purchase order, and Vendor account. The table contains 10 rows of data for production orders with status 'Started' or 'Estimated'.

O.	Start date	Delivery date	Production	Oper. No.	Item number	Product name	Production status	Purchase order	Vendor account
✓	2/8/2017	2/8/2017	P000186	10	M0051	Firmware	Started	00000051	1001
○	2/8/2017	2/8/2017	P000188	10	M0051	Firmware	Estimated	00000053	1001
○	2/8/2017	2/8/2017	P000189	10	M0051	Firmware	Estimated	00000054	1001
○	2/8/2017	2/8/2017	P000190	10	M0051	Firmware	Estimated	00000055	1001
○	2/8/2017	2/8/2017	P000191	10	M0051	Firmware	Estimated	00000056	1001
○	2/8/2017	2/8/2017	P000192	10	M0051	Firmware	Estimated	00000057	1001
○	2/8/2017	2/8/2017	P000193	10	M0051	Firmware	Started	00000058	1001
○	2/8/2017	2/8/2017	P000194	10	M0051	Firmware	Started	00000059	1001
○	2/8/2017	2/8/2017	P000195	10	M0051	Firmware	Started	00000060	1001

The purchase order is marked with the new checkbox “Subcontractor work”.

Path: Accounts payable → Purchase orders → All purchase orders

count	Vendor name	Purchase type	Approval status	Purchase order status	Currency	Delivery date	Mode of delivery	Delivery terms	Purchase agree...	Quality order status	Direct delivery	Subcontractor work
	Contoso office supply	Purchase order	Approved	Open order	USD	2/3/2016	10	EXW				
	Contoso office supply	Purchase order	Approved	Open order	USD	2/3/2016	10	EXW				
	Ade Supply Company	Purchase order	Approved	Open order	CAD	4/13/2016						
	Fabrikam Supplier	Purchase order	Confirmed	Open order	USD	4/15/2016	10	FOB				
	Datum Receivers	Purchase order	Approved	Open order	USD	8/17/2016	10	FOB				
	Datum Receivers	Purchase order	Confirmed	Open order	USD	8/17/2016	10	FOB				
	Acme Office Supplies	Purchase order	Confirmed	Received	USD	2/8/2017						✓
	Acme Office Supplies	Purchase order	Confirmed	Open order	USD	2/8/2017						✓
	Acme Office Supplies	Purchase order	Confirmed	Open order	USD	2/8/2017						✓
	Acme Office Supplies	Purchase order	Approved	Open order	USD	2/8/2017						✓
	Acme Office Supplies	Purchase order	Approved	Open order	USD	2/8/2017						✓
	Acme Office Supplies	Purchase order	Approved	Open order	USD	2/8/2017						✓
	Acme Office Supplies	Purchase order	Approved	Open order	USD	2/8/2017						✓
	Acme Office Supplies	Purchase order	Approved	Open order	USD	2/8/2017						✓
	Acme Office Supplies	Purchase order	Confirmed	Open order	USD	2/8/2017						✓
	Acme Office Supplies	Purchase order	Confirmed	Open order	USD	2/8/2017						✓
	Acme Office Supplies	Purchase order	Confirmed	Open order	USD	2/8/2017						✓

With the filter function it is possible to filter for e.g. the production status, item number, vendor, vendor group. This filter has to be set manually through the user. The filter settings are saved when the form gets closed (user specific).

SUBCONTRACTOR WORK

Filter From production status: Created To production status: Created Hide finished: No Sort by: Start date Buyer group:

Furthermore, the button “References” allows for switching to the appropriate form.

PRODUCTION	PURCHASE	SUBCONTRACTOR
Production order	Purchase order	Subcontractor work
BOM		
Route		

6.2 Additional functions in the form “Subcontractor work”

6.2.1 Supplier work purchase order

As soon as the purchase order has been “ordered” (=confirmed), it will appear in form of an icon (ordered = green) on the “subcontractor work” form.

The screenshot shows the Dynamics 365 interface for the 'Subcontractor work' form. The top navigation bar includes 'Dynamics 365', 'Operations', 'Production control', 'Production orders', and 'Subcontractor work'. The main area is divided into 'PRODUCTION' and 'PURCHASE' sections. The 'PURCHASE' section contains buttons for 'Confirm purchase order', 'New purchase order', 'Charge cost on Purchase', and 'Split purchase order'. Below this is a table with columns for 'Start date', 'Delivery date', 'Production', 'Oper. No.', 'Item number', 'Product name', 'Production status', 'Purchase order', and 'Vendor account'. The table contains six rows of data, all with a 'Created' status and a '2/8/2017' start and delivery date.

Start date	Delivery date	Production	Oper. No.	Item number	Product name	Production status	Purchase order	Vendor account
2/8/2017	2/8/2017	P000186	10	M0051	Firmware	Started	00000051	1001
2/8/2017	2/8/2017	P000188	10	M0051	Firmware	Estimated	00000053	1001
2/8/2017	2/8/2017	P000189	10	M0051	Firmware	Estimated	00000054	1001
2/8/2017	2/8/2017	P000190	10	M0051	Firmware	Estimated	00000055	1001
2/8/2017	2/8/2017	P000191	10	M0051	Firmware	Estimated	00000056	1001

6.2.2 Supplier packing slip

In order to create the packing slip for the supply of the components and including all provided materials to the external producer, it is not necessary that there has been generated an order for this, thus the packing slip can be printed directly. The packing slip update can only be done with the status “Started” (the status “Started” is required to make postings on the production order). In the packing slip update, the indicated quantity is updated in the column “Delivered” on the subcontractor work form.

The form “update, print, edit and inquire regarding packing slip” is modified by the new register “Materials provided”:

The screenshot shows a table titled 'MATERIALS PROVIDED'. The table has columns for 'Item number', 'Quantity', 'Delivered', 'Deliver now', 'Unit', 'Net weight', 'Transaction', and 'Description'. The first row shows 'M0050' with a quantity of 5.00, delivered 5.00, unit 'ea', and a checked 'Transaction' box. The description is 'Debit from stock'.

Item number	Quantity	Delivered	Deliver now	Unit	Net weight	Transaction	Description
M0050	5.00	5.00	ea			<input checked="" type="checkbox"/>	Debit from stock

The material marked as provided material items in the BOM on the “General” tab will be shown on the packing slip by its posting and will be, according to the settings in the production parameters and the Flushing principle posted on the items in the production order, resp. transferred to the defined storage location or not posted. BOM procurement principle “manual” means a posting by the sub-contractor-delivery note with the posting principle “Dispatch”.

A possible subsequent delivery of provided material without capacity increase is currently not intended and to be defined individually per posting principle in the execution.

In order to enable the selection of an alternative setting for Dispatch / Transfer (storage location / area) per vendor, it’s necessary to adjust the corresponding setting in deviation to the parameter settings in the vendor under Vendor in the register “Settings” under “Sub contractor work”.

Path: Accounts payable → Vendors → All vendors

The screenshot shows the Dynamics 365 interface for setting up a vendor. The vendor name is '1001 : Acme Office Supplies'. The 'SUBCONTRACTOR WORK' section is highlighted with an orange box and contains the following fields:

- Active:
- Posting type material provided: Issue
- Warehouse for transfer: [Empty]
- Location for transfer: [Empty]

6.2.3 Delivery (packing slip) of the subcontractor work

The posting of the service can be done through the button “Subcontractor work → Supplier Packing slip”. Quantity adjustments are to be entered on the “Lines” tab. Materials provided can be reposted on the tab “Materials provided” (discharge of the order).

Path: Production Control → Production order → Subcontractor Work → Supplier packing slip

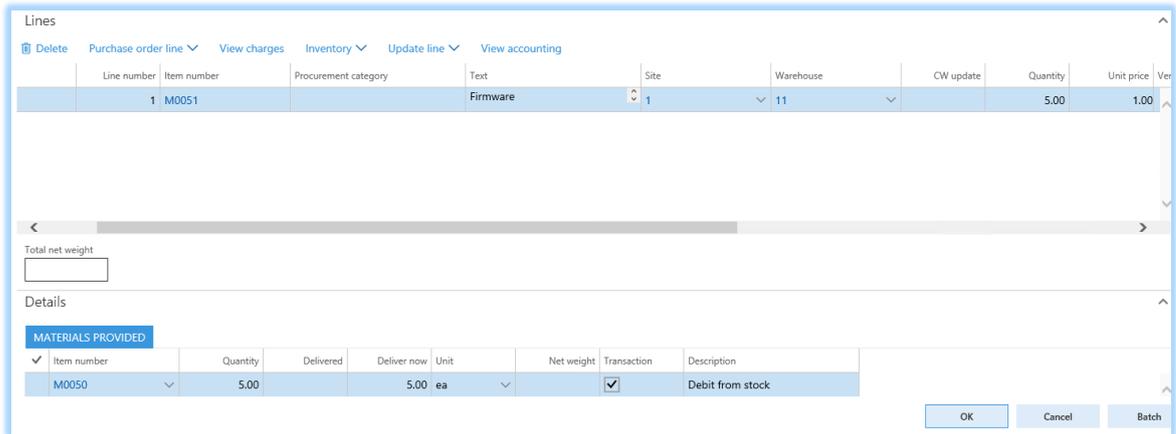
Update, print, edit and inquire regarding packing slip.

The screenshot shows the settings for a supplier packing slip. The 'Quantity' is set to 'Ordered quantity'. The 'Print' option is set to 'After'. The 'Use print management destination' is set to 'Yes'. The 'Check credit limit' is set to 'None'. The 'Summary purchase' is set to 'None'.

Quantity	Posting	Print	Use print management destination	Check credit limit
Ordered quantity	Yes	After	Yes	None

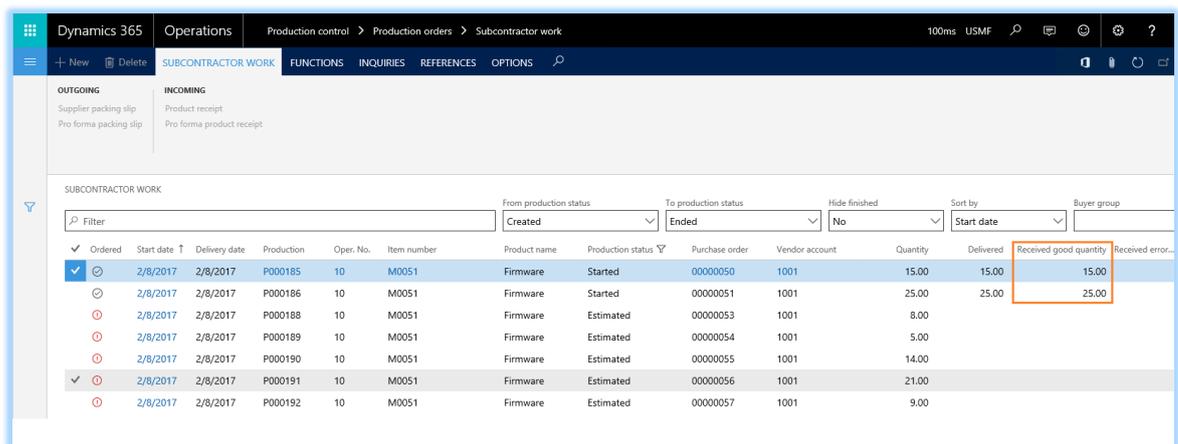
Overview

Update	Purchase order	Name
Supplier packing slip	00000064	Fabrikam Supplier



During the posting process of the service, the referenced operation is also being updated with the quantity and may hence be applied in the monitoring with respect to the operations. The standard initialization “ordered quantity” initializes the entire service and sets the return delivery of the provided materials to 0.

The field “good quantity received” in the form “subcontractor work” displays the already delivered quantity.



The (Return) delivery address can be defined individually in the purchase order. For this purpose, the desired alternative address must be set up in the Organization administration / Settings / Organization / Legal entity. The address can be selected in the order under the tab “Address” per button “Setting”.

6.2.4 Committee in the receipt of performance

The committee in the external production can be “chargeable” or “non-chargeable”.

- If a sub-contractor carries out work and recognizes committee without being involved after he finished his work, the committee is usually chargeable (the sub-contractor has done his work correctly).
- If a sub-contractor creates committee during his work then the committee is usually not chargeable.

At the time of the product receipt (service) this decision has to be made by activating the relevant checkbox. If needed an error code can be entered in the “Error code” field, which has been recorded in the master table for selection.

Update, print, edit and inquire regarding packing slip.

Settings

Select Arrange Printer setup View charges

PARAMETERS

Quantity Ordered quantity

Posting Yes [checked] Late selection No

PRINT OPTIONS

Print After Print supplier packing slip Yes [checked]

Use print management destination Yes [checked] Print shelf labels No Print product labels No

SETUP

Check credit limit None

SUMMARY PURCHASE

Summary update for None

Overview

+ Add Remove View accounting Totals Sales tax

Update	Purchase order	Name
[checked]	Supplier packing slip	00000061 Acme Office Supplies

Lines

Delete Purchase order line View charges Inventory Update line View accounting

Warehouse	CW update	Quantity	Unit price	Vendor batch date	Line net amount	Vendor expiry date	Close for receipt	B...	Quality order status	Net weight
11		17.00	1.00		17.00		[checked]			

6.2.5 Invoice Posting

The posting of the invoice is entered in the purchase order analogous to a normal purchase order.

6.2.6 Posting of an internal unscheduled additional expense (value reduction of external production)

When it becomes necessary to post additional unscheduled expenses while the external service (costs) shall be reduced, (e.g. error on part of the external producer), it's possible to enter a respective position for that in the below form:

Path: Production Control → Production order → Subcontractor Work → Functions

Dynamics 365 Operations

+ New Delete SUBCONTRACTOR WORK FUNCTIONS INQUIRIES REFERENCES OPTIONS

PRODUCTION	PURCHASE
Start production	Confirm purchase order Charge cost on Purchase New purchase order Split purchase order

Example of an entry

Charge cost on Purchase

Parameters

Charge cost on purchase order 00000061 to vendor 1001, Acme Office Supplies.

Item number

Text

Quantity

This will be entered as negative purchase line and, in parallel, as BOM line and will be posted on a quantity basis. Finally, invoice of the “external producer” has to be posted.

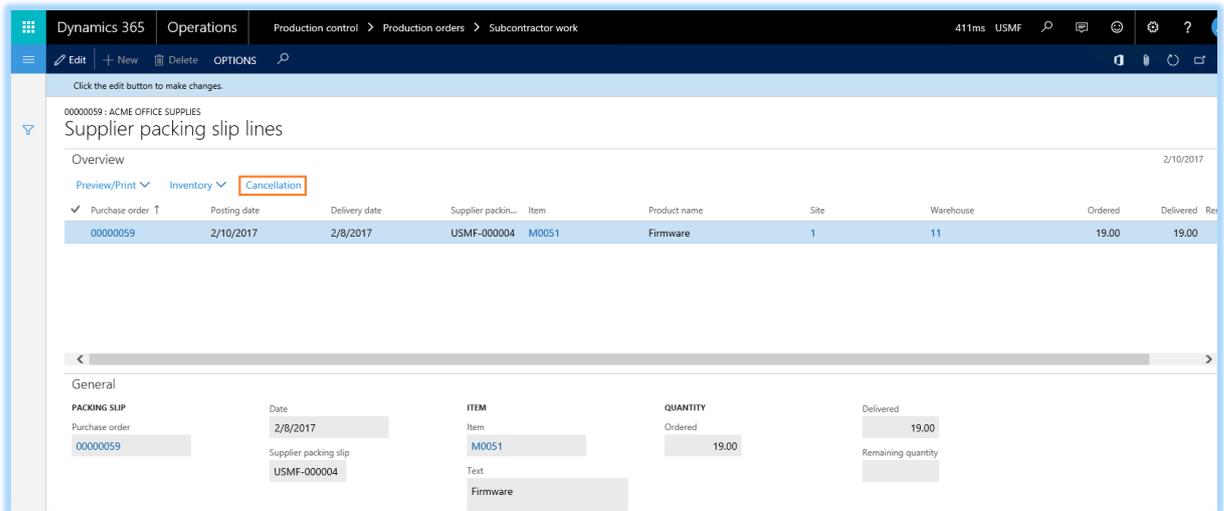
Important: The amount in terms of value for this process must not be adjusted with the invoice posting in the order, as this one is not effective for the production posting (posting in the purchase marks a sale, posting in the BOM list is a purchase → Sales price depends on the purchase price and thus on the BOM posting)

6.2.7 Cancellations

If an order has to be cancelled, it’s necessary to always post or cancel the order correctly at first, as this one is respectively referenced in the production order. Important: Existing postings of packing slips are also being reset in the BOM (release quantity) and operations with the status reset (< Started) of the production order!

The cancellation of the subcontractor-delivery note is done by means of the *Subcontractor form / Queries / Supplier packing slip* → *Cancelation*

Path: Production Control → Production order → Subcontractor Work → Inquiries



6.2.8 Exceptions

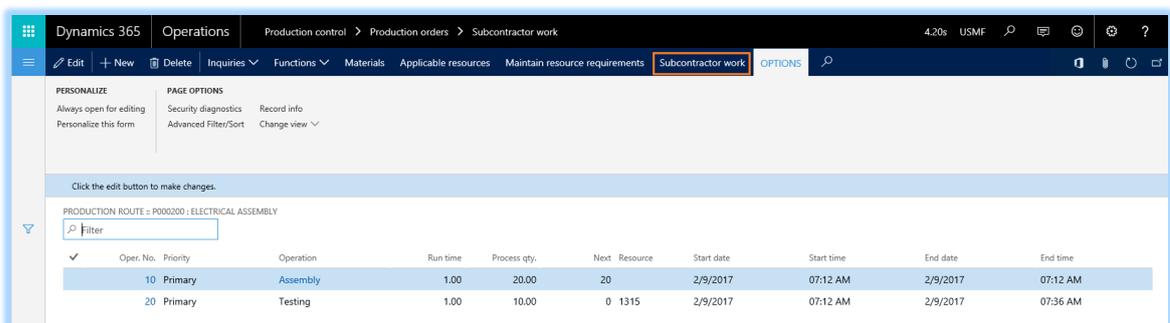
Important: When a production order is being set to started, the checkbox “End-mark picking list” should not be checked because the service is no longer referenced as order with the posting of the picking list (Quantity is set to Zero). Also, the provided material items are being posted with the remaining quantity.

7. Additional features of Avanade External Production module

7.1 Button “Subcontractor work” on the Production route

Another improvement for the daily work flow is the option to switch in the production route schedule directly to the respective Subcontractor form with the button “Subcontractor work” in order to directly query the current information on the subcontractor work.

Path: Production Control → Production order → Subcontractor work → Reference → Production order → Route



7.2 Over-delivery by the external supplier

In the external production, it is possible that the external supplier delivers excess quantity

The new quantity has to be entered on the Subcontractor work form Register *Order* in the field “Current delivery”

The screenshot shows the Dynamics 365 interface for Subcontractor Work. The main form is for Purchase Order P000186. In the 'QUANTITY' section, the 'Delivered' field is set to 25.00 and is highlighted with a red box. Other fields in this section include 'Unit' (ea), 'Quantity' (25.00), and 'Receive now' (0.00). The 'PRICE' section shows 'Unit price' (1.00) and 'Net amount' (25.00). The 'DELIVERY' section shows 'Start date' (2/8/2017) and 'Delivery date' (2/8/2017).

Afterwards, this quantity can be delivered with the setting “Current delivery” in the delivery note update. In case of a possible “excess delivery”, the order quantity will be adapted according to the production parameter confirm adjustment of order quantity with or without callback.

7.3 Split of the subcontractor work

In some circumstances, it may be necessary that the order for the subcontractor work has to be split into more parts. Select in the Subcontractor work form “*Functions / Split purchase order*”:

Path: *Production Control* → *Production order* → *Subcontractor Work* → *Functions*

The screenshot shows the Dynamics 365 interface for Subcontractor Work with the 'FUNCTIONS' tab selected. The 'Split purchase order' button is highlighted with a red box. Below the form, a table displays a list of production orders. The table has columns for 'Ordered', 'Start date', 'Delivery date', 'Production', 'Oper. No.', 'Item number', 'Product name', 'Production status', 'Purchase order', 'Vendor account', 'Quantity', 'Delivered', 'Received good quantity', and 'Received error...'. The second row is highlighted in blue, showing a production order for 'Firmware' with a quantity of 25.00 and a status of 'Started'.

Ordered	Start date	Delivery date	Production	Oper. No.	Item number	Product name	Production status	Purchase order	Vendor account	Quantity	Delivered	Received good quantity	Received error...
✓	2/8/2017	2/8/2017	P000185	10	M0051	Firmware	Started	00000050	1001	15.00	15.00	15.00	
✓	2/8/2017	2/8/2017	P000186	10	M0051	Firmware	Started	00000051	1001	25.00	25.00	25.00	
○	2/8/2017	2/8/2017	P000188	10	M0051	Firmware	Estimated	00000053	1001	8.00			
○	2/8/2017	2/8/2017	P000189	10	M0051	Firmware	Estimated	00000054	1001	5.00			

In this process, the present order is being reduced by the entered quantity and a new order (with a new ID) is created for the entered quantity. An alternate delivery date can be specified as well:

Split purchase order

Production	Item number	Quantity	ea
P000190	D0012	14.00	

CURRENT PURCHASE ORDER

Purchase order	Item number	Current quantity	ea
00000055	M0051	14.00	
Vendor account	Delivery date	New quantity	ea
1001	2/8/2017	8.00	

NEW PURCHASE ORDER

Vendor account
1001

Item number
M0051

Delivery date
2/8/2017

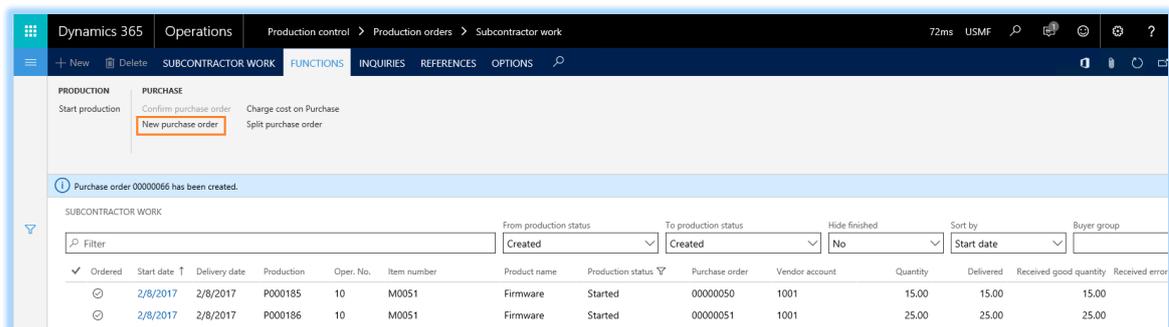
Quantity
6.00 ea

7.4 Management of “spontaneous subcontracting” with decreasing of load on resources

In the control of production processes, it can be very important to outsource production processes to external producers in a fast way and without much time & material investment.

For this purpose, it's possible to create a new order for external services in the Subcontractor form under Function “New purchase order”

Path: Production Control → Production order → Subcontractor Work → Functions



If the production parameter Spontaneous purchase order reduces work center load is also activated, the initially planned resource will be reduced by the value stated in the field *Reduction on work center load*.

Note: For an actual capacity reservation, the production order has to be scheduled again.

The calculation is made as follows:

- The reduction is effected by means of the “maximum percentage rate of capacity” (load) in the operation.
- If “Hours” are ordered in the unit (to be defined under (*Organization administration* → *Setup* → *Units* → *Units* → *Hours*), the effort is reduced by these number of hours in the relevant operation resp. the percentage value is calculated on this basis.
- If the order for external services is made in the unit of the items to be produced, the percentage reduction is calculated by means of the estimated „Time / Quantity“ in the operation.
- If the order is made in an undefined unit relationship (fixed unit defined in hours → General conversion into order unit), a conversion won’t be possible. The reduction can be entered manually with the creation of the “New purchase order”.

7.5 Settlement of service Items and materials provided material on an purchase order position

The Avanade External Production module allows for the definition of an “external material provided” together with the service items in one “Settlement”.

This requires the following settings resp. entries.

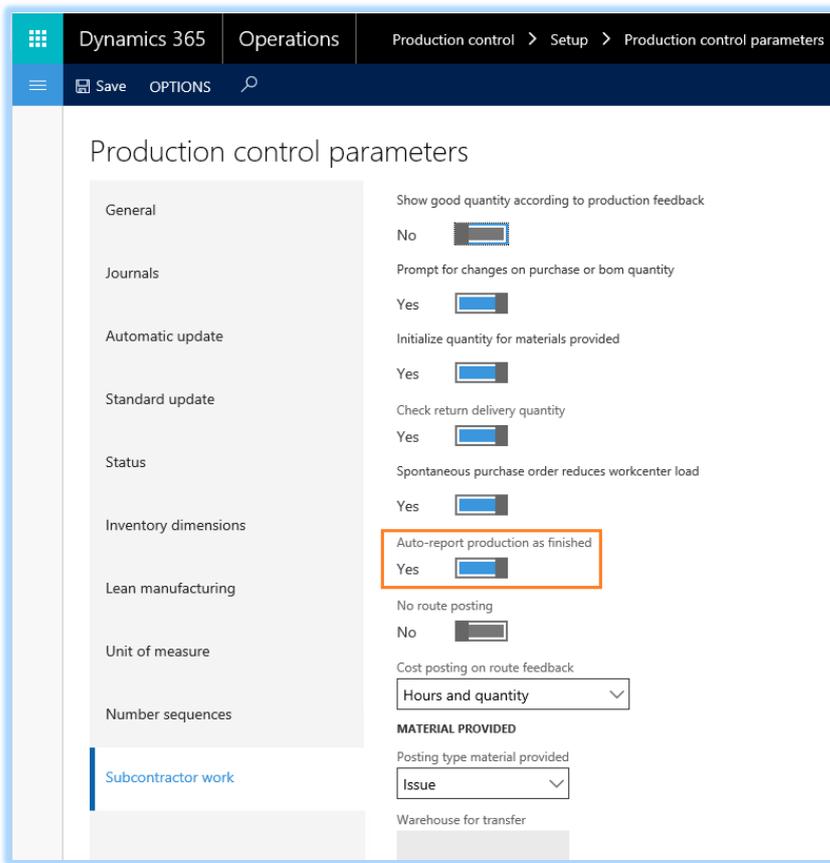
- Set up the provided material items of the item type “Service”.
- Mark this new items in the BOM of the parent service items as provided material.
- Define the BOM line as Vendor and enter the same vendor that is stated for the external production.
- That way, the service order for the external production can be complemented with the external material provided so that the purchase invoices are settled per each Purchase line.

7.6 Report as finished in production upon posting of item arrival

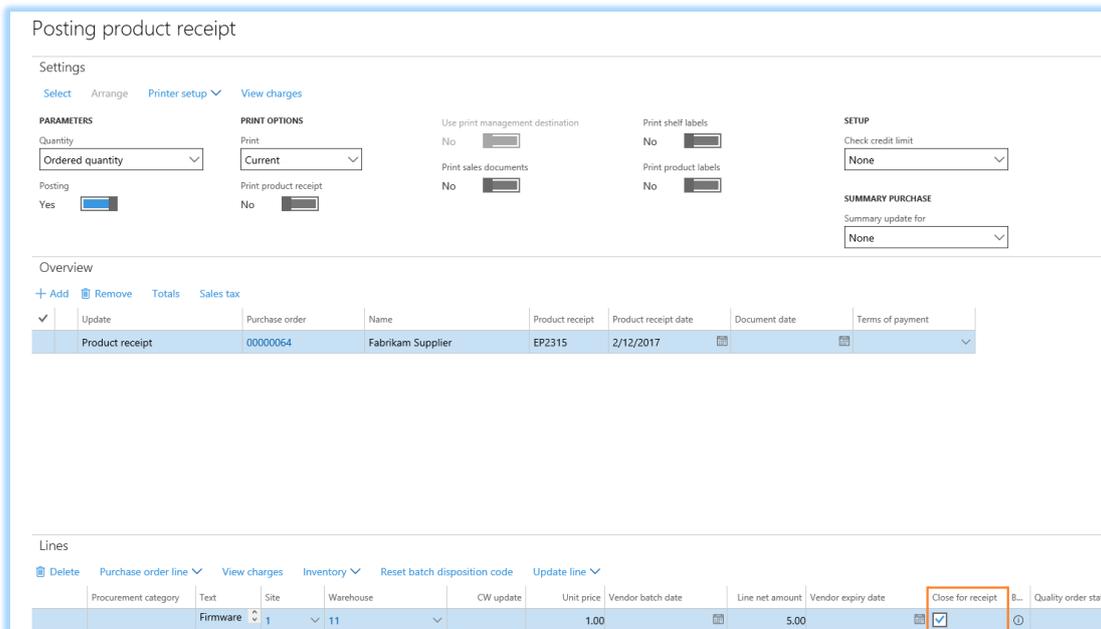
The Avanade External Production module allows for the simultaneous completion notification of the production order and the item arrival.

If the flag is activated in the field *Auto-report production as finished* under

Path: **Production Control** → **Setup** → **Production control parameters** → **Subcontractor work**



- And provided, the field “close” is activated in the packing slip update, the production will also be marked with the flag “Finished”.



Important: The report as finished of the production is only possible, if the operation which has been assigned to the service, is indicated as the last one.

7.7 Display of start and delivery date on the “Subcontractor Work”

The new fields “Start date” and “Delivery date” show the schedules for the activities. In the application of “Schedule to end of operation” the schedules are configured in such way that they indicate the start and end of the operation. If the schedule is set to the start of the operation, the end date of the order will be the start date, while the start date for the activity corresponds with the start date less the replacement time for the service items.

Path: Product Information Management → Bill of materials and formula → BOM

The screenshot shows the Dynamics 365 interface for configuring a Bill of Materials (BOM) for 'Electrical Assembly' (000110). The left sidebar lists BOM lines 000111 through 000120. The main area shows the configuration for line 000111, which is 'Kit - Power Supplies'. The 'Line details' section is expanded to show the 'SUBCONTRACTOR' tab. In this tab, the 'END' checkbox under the 'OPERATION' section is checked, indicating that the schedule is set to the end of the operation. Other fields include 'Vendor account' (US-104), 'Material provided' (M0050), and 'Line type' (Item).

Path: Production Control → Production order → Subcontractor Work

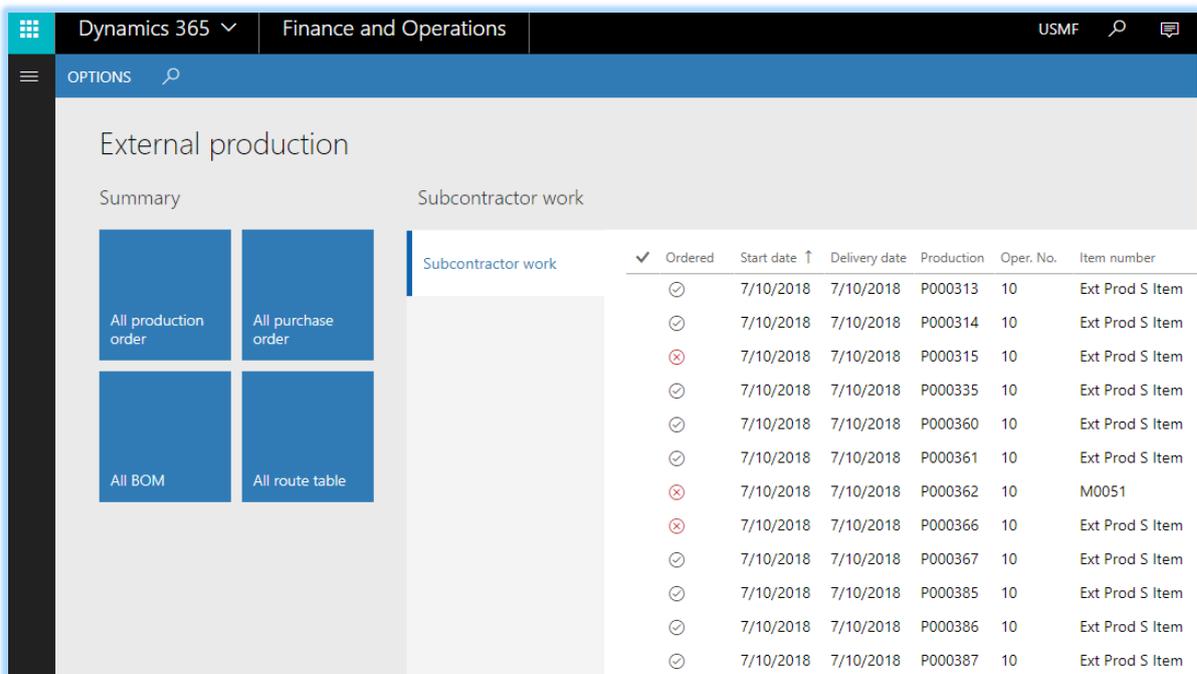
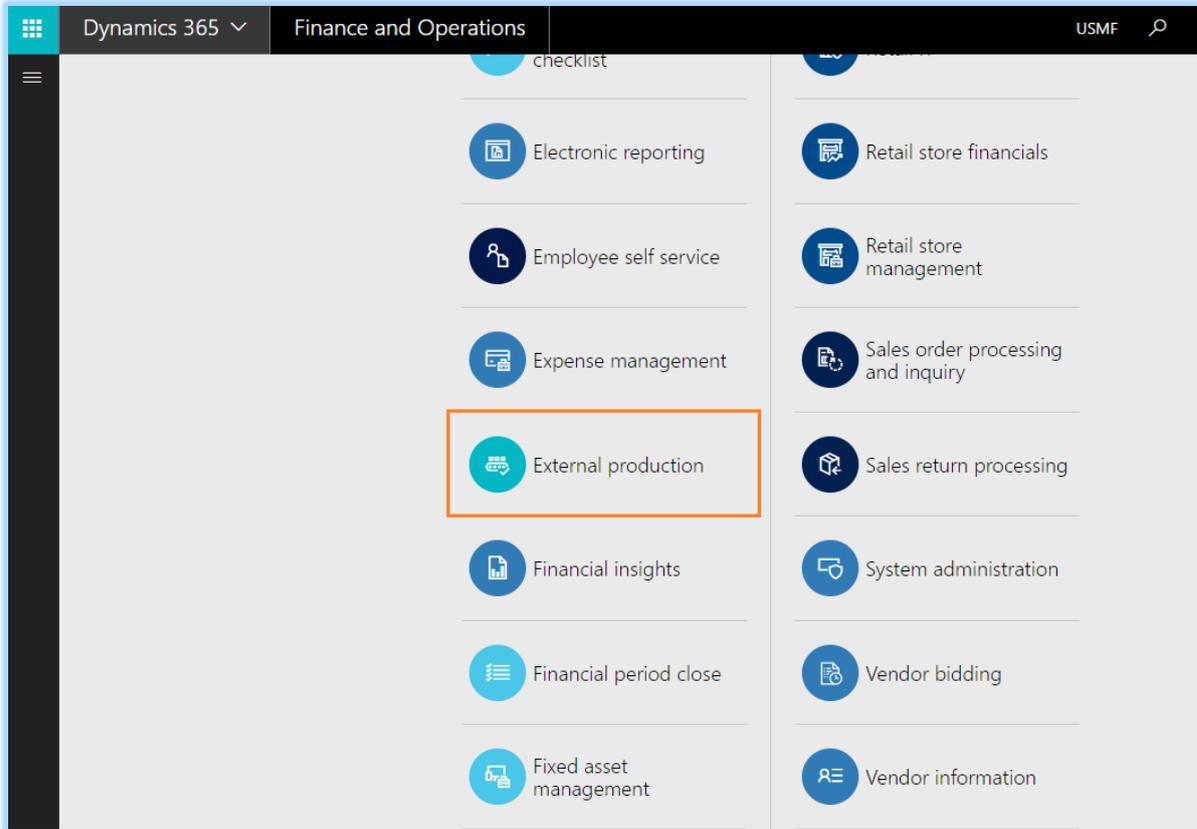
The screenshot shows the Dynamics 365 interface for the 'Subcontractor Work' overview. The table displays a list of production orders with columns for 'Ordered', 'Start date', 'Delivery date', 'Production', 'Oper. No.', 'Item number', 'Product name', 'Production status', 'Purchase order', 'Vendor account', 'Quantity', 'Delivered', 'Received good quantity', and 'Received error...'. The 'Start date' and 'Delivery date' columns are highlighted with a red box, showing dates of 2/8/2017 for all entries. The 'Production status' column shows various statuses such as 'Started', 'Estimated', and 'Firmware'.

Ordered	Start date	Delivery date	Production	Oper. No.	Item number	Product name	Production status	Purchase order	Vendor account	Quantity	Delivered	Received good quantity	Received error...
✓	2/8/2017	2/8/2017	P000185	10	M0051	Firmware	Started	00000050	1001	15.00	15.00	15.00	
○	2/8/2017	2/8/2017	P000186	10	M0051	Firmware	Started	00000051	1001	25.00	25.00	25.00	
○	2/8/2017	2/8/2017	P000188	10	M0051	Firmware	Estimated	00000053	1001	8.00			
○	2/8/2017	2/8/2017	P000189	10	M0051	Firmware	Estimated	00000054	1001	5.00			
○	2/8/2017	2/8/2017	P000190	10	M0051	Firmware	Estimated	00000066	1001	6.00			
○	2/8/2017	2/8/2017	P000190	10	M0051	Firmware	Estimated	00000055	1001	8.00			
○	2/8/2017	2/8/2017	P000191	10	M0051	Firmware	Estimated	00000056	1001	21.00			
○	2/8/2017	2/8/2017	P000192	10	M0051	Firmware	Estimated	00000057	1001	9.00			
○	2/8/2017	2/8/2017	P000193	10	M0051	Firmware	Started	00000058	1001	13.00			
○	2/8/2017	2/8/2017	P000194	10	M0051	Firmware	Started	00000059	1001	19.00	19.00		

If the field “No posting of operations” is not activated in the production parameters, the end date of the order less the replacement time for the service items will be calculated as start of the activity in the subcontractor overview.

7.8 WorkSpace for Avanade external production

Avanade External Production workspace provides the 360° cockpit view of the underlying business functionalities throughout Dynamics 365 for Finance & Operations business application from the areas of production control, accounts payable and product information management module.



8. Installation Instruction

8.1 License Requirements

The following Microsoft D365 AX-Module licenses are required:

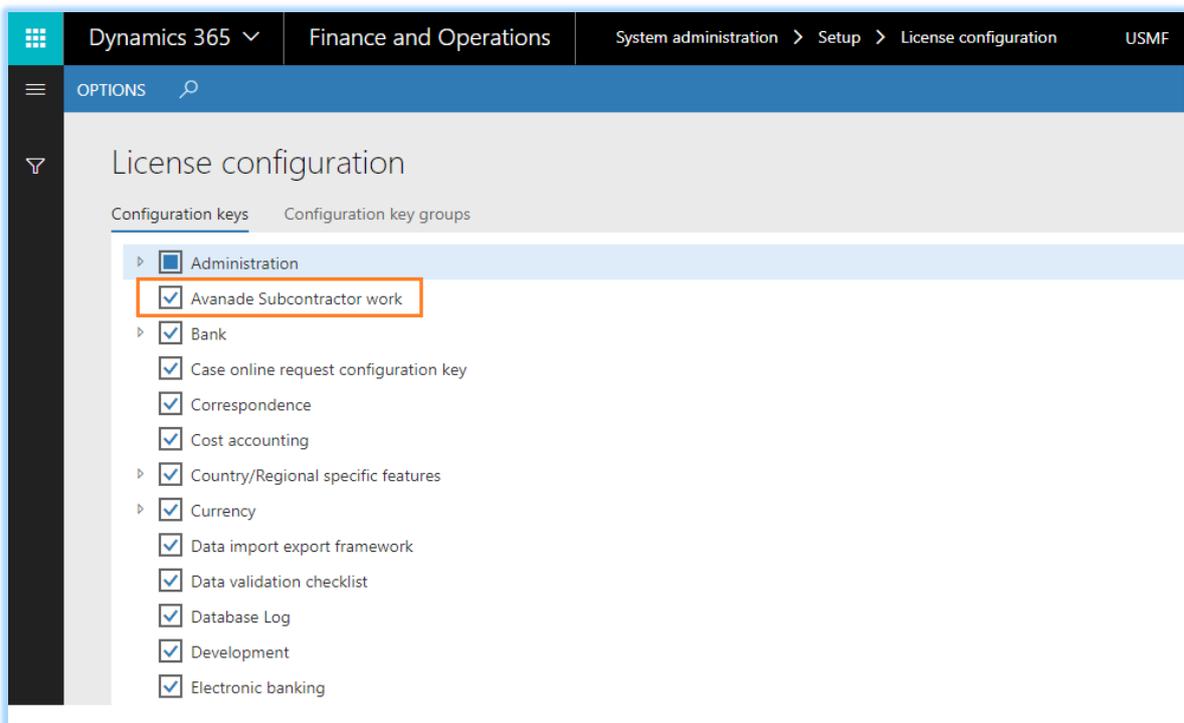
- Production

The license code for the Avanade “Subcontractor work” module has to be loaded from a license file.

Configuration

Model file and License file must be installed for accessing this asset and its functionalities

Path: *System administration* → *setup* → *License configuration*



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