Valvetech AS

New ERP Solution

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TPK4165 ERP and PLM systems

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Introduction

Valvetech ASA is a mechanical engineering company centered in Ålesund, Norway. The company focus on creating new technology for maritime operations. Every product they create is custom engineered for each individual buyer. Some of the standard components they produce are supplied from stock, while their custom design products are engineered to order with a typical delivery time of 3-6 months.

ValveTech wants a new ERP-solution to meet the requirements of the expected growth-related challenges for the upcoming years. Currently, they use several different in-house systems for purchasing and purchase order management, ordering, inventory, invoices, accounting, product structure, production, and shipment. With our solution, we aim to replace these self-developed systems.

Conceptual description of software solution

Microsoft Dynamics AX (for readers convince herby; MSD AX) is an enterprise resource planning software with genes tracing back to the MSD family. MSD AX is a flexible and adaptable ICT software solution for mid – to large scale business ventures. MSD AX among all other valued software solutions has an interdisciplinary community primarily consisting of Dynamics Partners, MS MVPs, end-users, and dedicated organizations like for instance AXUG and DUG. The solution is built up by different modules who compose a core of functionality for the system. However, this core is able to extend its capabilities to a powerful ERP – and business management system, fitting the particular organization's needs.

Valvetech ASA requires a fully functional ERP system supporting all processes included in SnP, production, finance, and all logistics needs. As for purchasing inquiries, the requirements are a system that is able to communicate with all parties involved and provides an efficient and comfortable way to handle transactions.

For instance; their current purchasing model includes the usage of multiple systems and analog communication. Our aim is to provide a single software solution that groups all the processes and automatically notify all departments when a change has been made. The key processes included in Valvetech's purchasing is; mapping of purchase requirements, sending purchase orders, receive delivery confirmation, receive goods, register invoices and pay the vendors. With

their current solution, these processes are done by different departments on multiple systems with little to no dialogue between departments as the purchase order moves throughout the phases.

Our solution brings these processes into MSD AX. There will be no need to use spreadsheets for essentials, as all necessary information will be stored in MSD AXs database(s). Whenever changes are made, all departments will be notified to ensure clear communication throughout the chain of events.

Implementation of the ERP system

Naturally, it is a cost related to the implementation of a new ERP system, of both time and resources respectively. However, it is possible to integrate the existing Microsoft Access Application solutions in Microsoft Dynamics AX through a process of for instance an ODBC data source connection to the SQL server and MSD AX database. That if cost is concerned, and there is no wish for a “ground-up” implementation.

Applying MSD AX to the miscellaneous departments would significantly improve internal communication. The effects of introducing MSD AX may as well be contributing to a reduction of time consumption related to manual labor and improve workflow. Hence, the need for full time employees is reduced and or reorganized given the magnitude of the effect.

Indeed, implementing a signature solution throughout the company offers plentiful of pros., Cons must also be considered for every single business case, like the effect of over-complicating the matters at hand, and naturally the initial problems above. The scale of implementation is highly dependent on the specific needs of the company, and it’s growth potential.

1 Purchase

1.1 Valvetech’s current situation

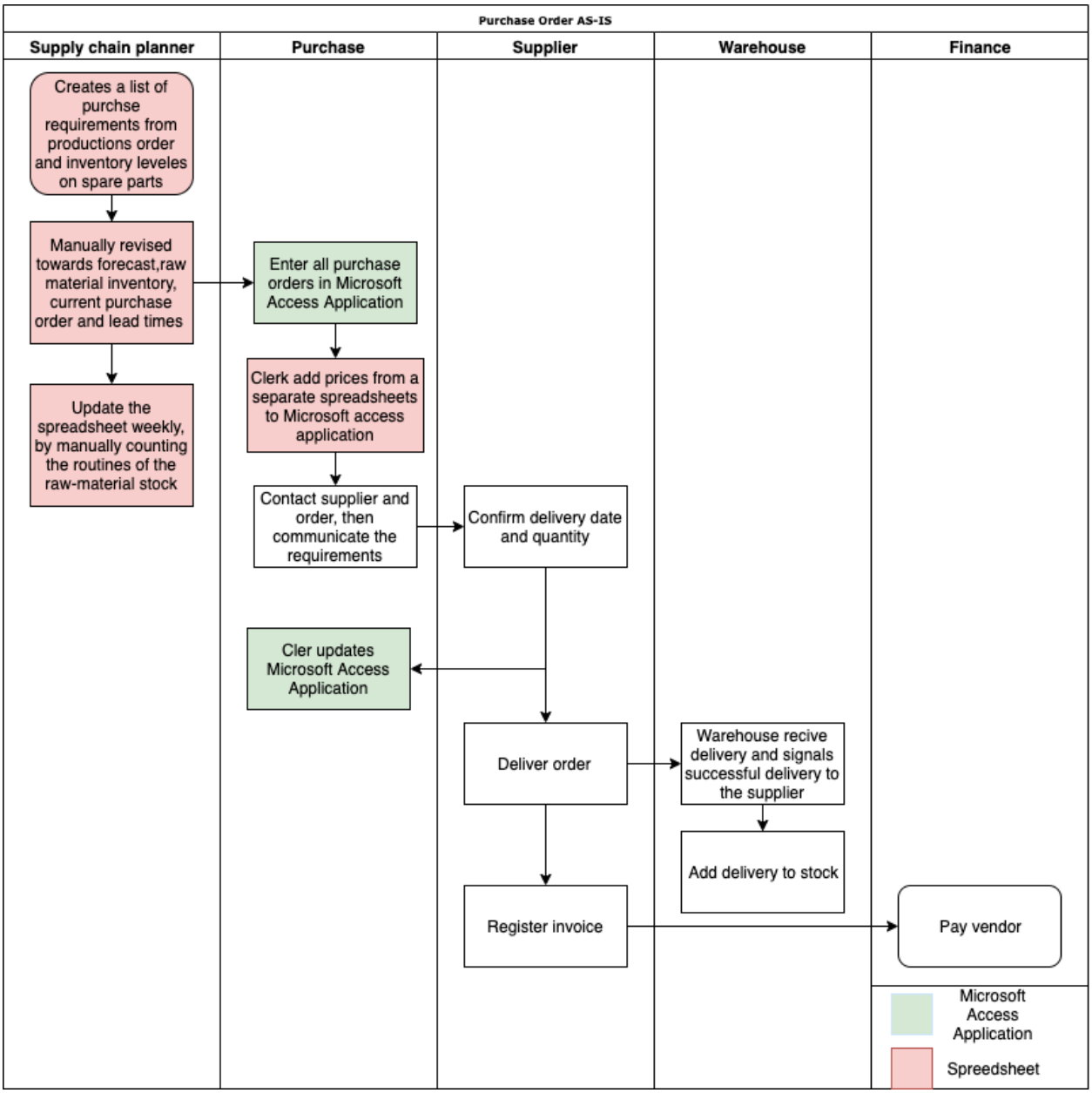

Figure 1.1 Purchase order As-Is

The supply chain planner is doing manual tasks in a spreadsheet. First, he creates a list of purchase requirements from production order and the inventory level on spare parts. Before he sends the purchase requirements to the purchasing department he compares the list toward forecast, raw materials inventory, current purchase order and lead times. Then the purchasing department can enter all the purchase orders into Microsoft access application (hereby; MS AA). The supply chain planner will every week update the spreadsheet by manually counting the routine of the raw-materials stock. After the purchasing department has entered the purchase order into MS AA, a clerk from the department will manually write in the prices from a separate spreadsheet into the MS AA. The purchase department is now ready to contact the supplier by phone, or by sending the order as a PDF by email. Then the supplier needs to confirm delivery date and quantity, and when it's confirmed the supplier sends the confirmation back to the purchasing department. The purchase department can now update MS AA with the delivery date and quantity. Then the supplier delivers the goods to the warehouse department and registers the invoice and sends it to the finance department. The warehouse department signalizes successful delivery and put the goods in stock. The finance department will pay the vendor without checking with the warehouse department for what's received.

Challenges with the current process

- The supply chain planner needs to manually create a list from the production orders and inventory levels of spare parts.
- The supply chain planner must manually control the purchase requirements towards forecast, raw material inventory, current purchase orders and lead time.
- The supply chain planner needs to weekly manually update the spreadsheet by manually counting the routine of the raw-material stock.
- Supply chain planner sends the list of purchase requirements to purchase department and a clerk need to enter all the purchase order into Microsoft Access Application.
- A clerk from purchase department must manually add all prices into MS AA from a separate spreadsheet.

- A Clerk from the purchasing department must manually update the delivery date and quantity after the supplier has confirmed.
- The finance department doesn't know anything about the received goods.

1.2 Recommended solution

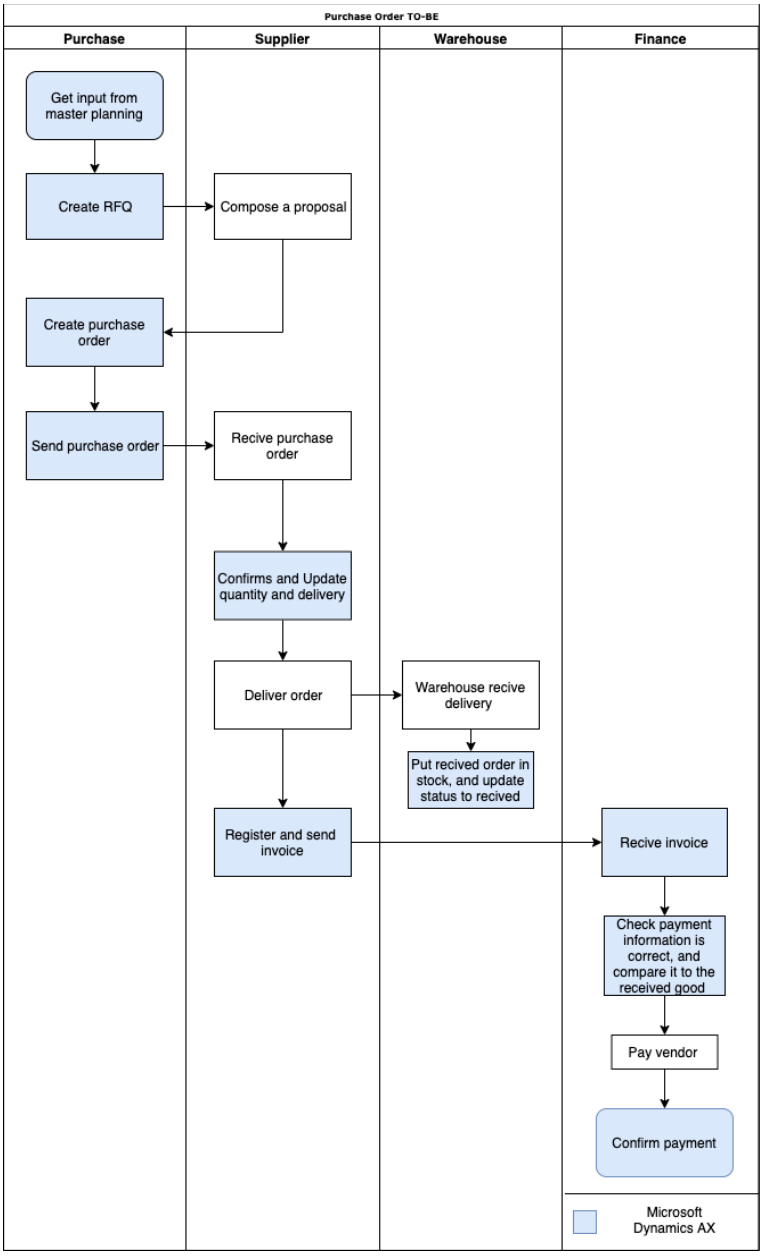

Figure 1.2 Purchase order To-Be

The purchase process retrieves inputs from the master planning and creates an RFQ (Request for quotations) per vendor. The Vendor will then come up with a proposal and the purchasing department receives and register the offers. The purchase department confirms the offer. When an offer is confirmed the purchasing department creates a purchase order and sends it to the supplier. The supplier will then confirm the delivery date and quantity, which will be updated in MSD AX automatically. After the warehouse has received the goods, they put it in stock and update the order status. The supplier sends the invoice to the finance department, (in MSD AX) and the finance department can now check the payment information and see that everything is correct. Then pay the vendor and confirm the payment in MSD AX.

Why our solution is better for Valvetech AS

- The input from production orders and inventory levels of spare parts are now in master planning.
- The purchase department can create an RFQ, then Valvetech can get an offer from the vendor, then choose what’s best for them.
- The purchase department can send a purchase order to the supplier in MSD AX instead of a phone er e-mail.
- The supplier can confirm the delivery date and quantity in MSD AX and it automatically updates the status.
- Supplier can register and send invoices to the Finance department
- The finance department can now compare the invoice to the goods warehouse received, so the payment will be correct.
- If the invoice is incorrect finance department can contact the supplier for and updated version.

1.3 Functional description of our recommended solution

To create a new purchase order, go to “Procurement and sourcing → Common → All purchase orders” and press “Purchase order” in the top-left corner. Insert vendor and press ok.

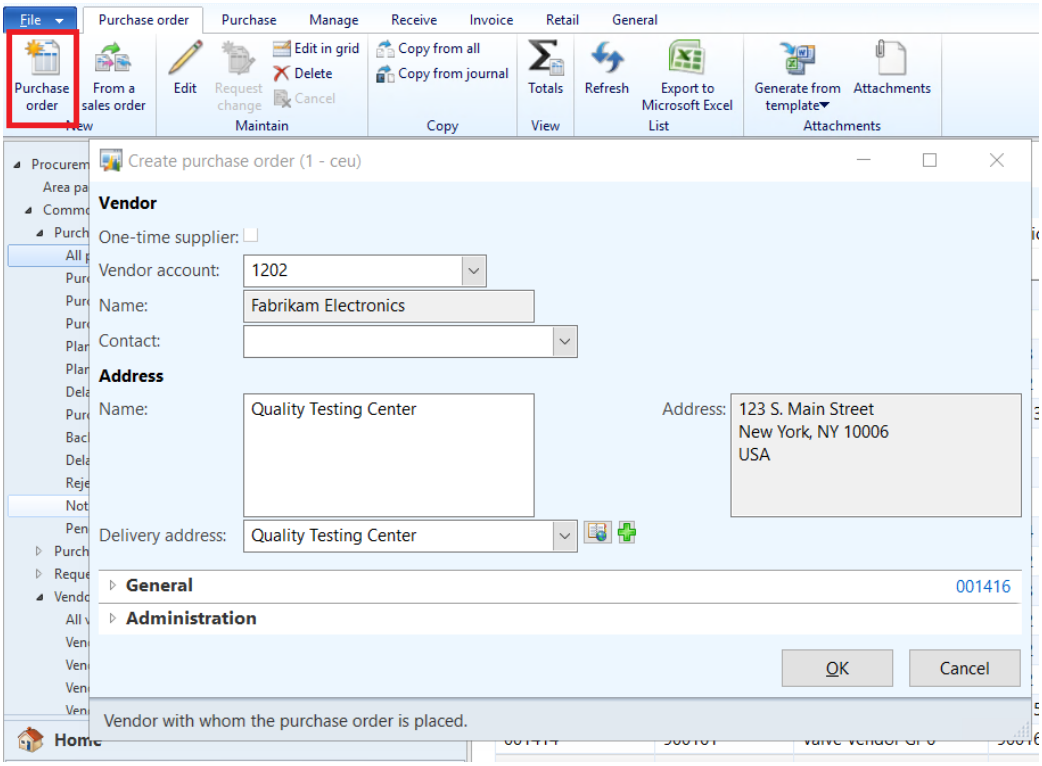

Figure 1.3 Create new purchase order

On the next screen, add necessary purchase order lines as shown in the picture below:

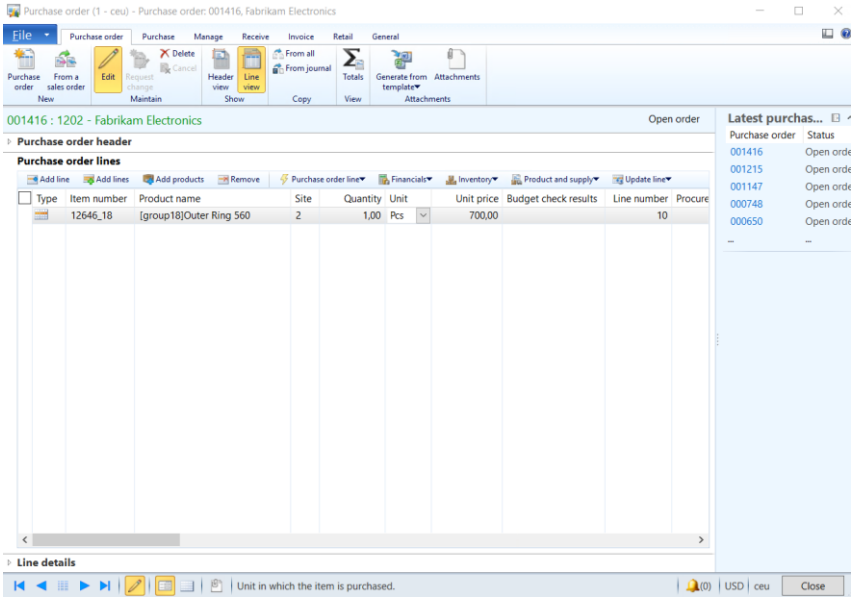

Figure 1.4 Add purchase order lines

To create a request for a proposal, go to “Procurement and sourcing → Common → Request for quotation → All requests for quotations” and press “Request for quotation” in the top-left corner. Insert necessary information and hit “ok”.

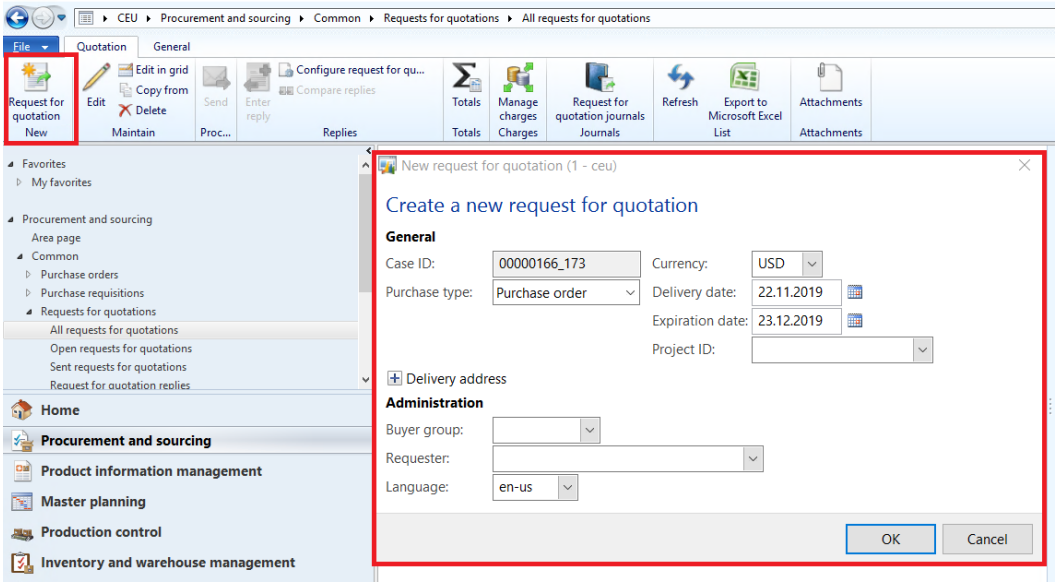

Figure 1.5 Create a request for quotation

2 Sales process

2.1 Sales - New Products

2.1.1 Valvetech’s current situation

The diagram below illustrates Valvetech’s current sales process to handle the sales of new products:

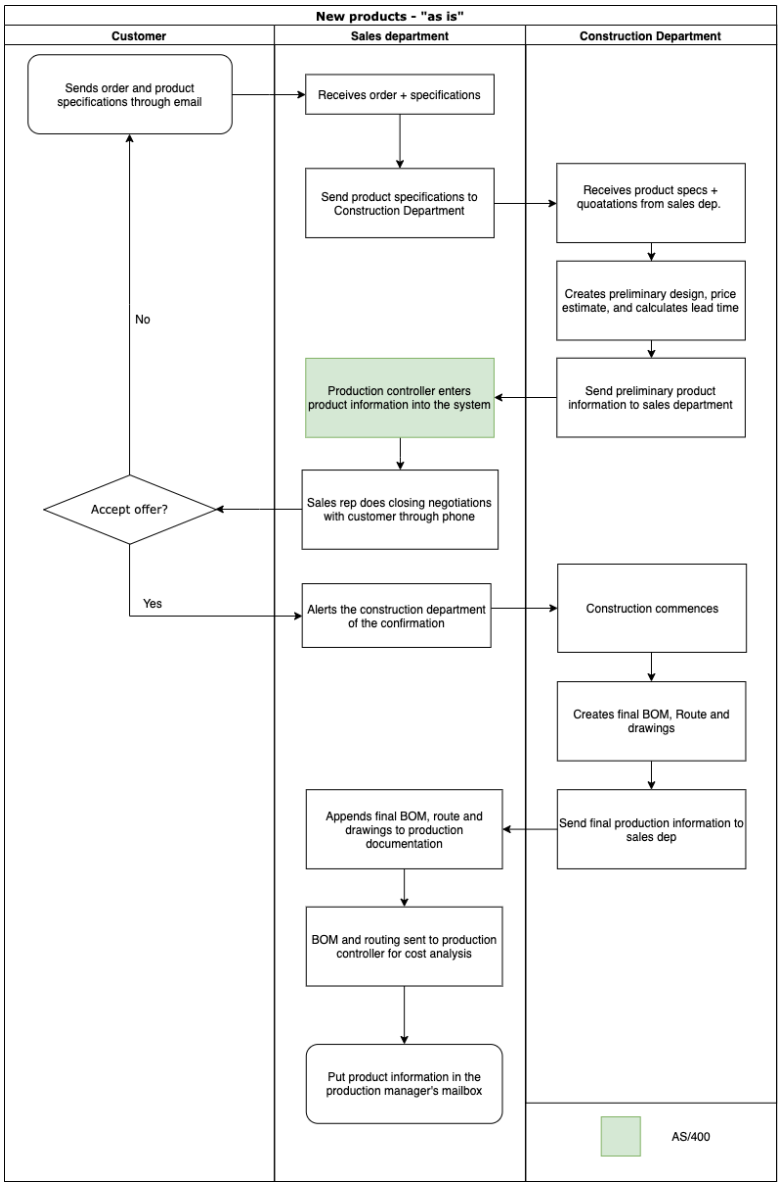

Figure 2.1.1 Sales - New product As-Is

The process starts off with the customer sending their order accompanied by the product specification through email. Valvetech’s sales department receives the order

and specifications and forwards these to the construction department. From there the construction department creates the preliminary design of the product as well as sets a price estimate and calculates expected lead-time. This information is sent back to the sales department which then enters it into AS/400. A sales representative will then call the customer and do final negotiations with the customer. If the offer is rejected, further specifications are sent by the customer and new designs, price estimates and lead-time are made by the construction department. During negotiations, discounts may be made on item(s) without knowledge of whether its discounted sales price covers the production cost or not. It usually takes about 1-4 weeks until the customer gets a confirmation of the order and its final price quote.

When the customer accepts the offer, the sales department will alert the construction department which will then start the construction. Once it is done, the construction department will determine final drawings, BOM and route and send these to the sales department. The sales department will print out and append this information onto the product documentation. Finally, the BOM and routing are sent to the production controller for cost analysis, and the product information is put in the outgoing mailbox of the production manager.

Challenges with the current sales order process:

- A lot of manual transfer of product specifications through email or phone.
- Impossible to store information about new constructions, and access documentation on previously made products.
- Prices are set from a standardized list, and discounts are made on parts without knowing if it even covers construction costs. This means that Valvetech can potentially lose money from selling new products.

2.1.2 Recommended solution:

The diagram below illustrates our recommended solution as to how Valvetech should handle sales of new products:

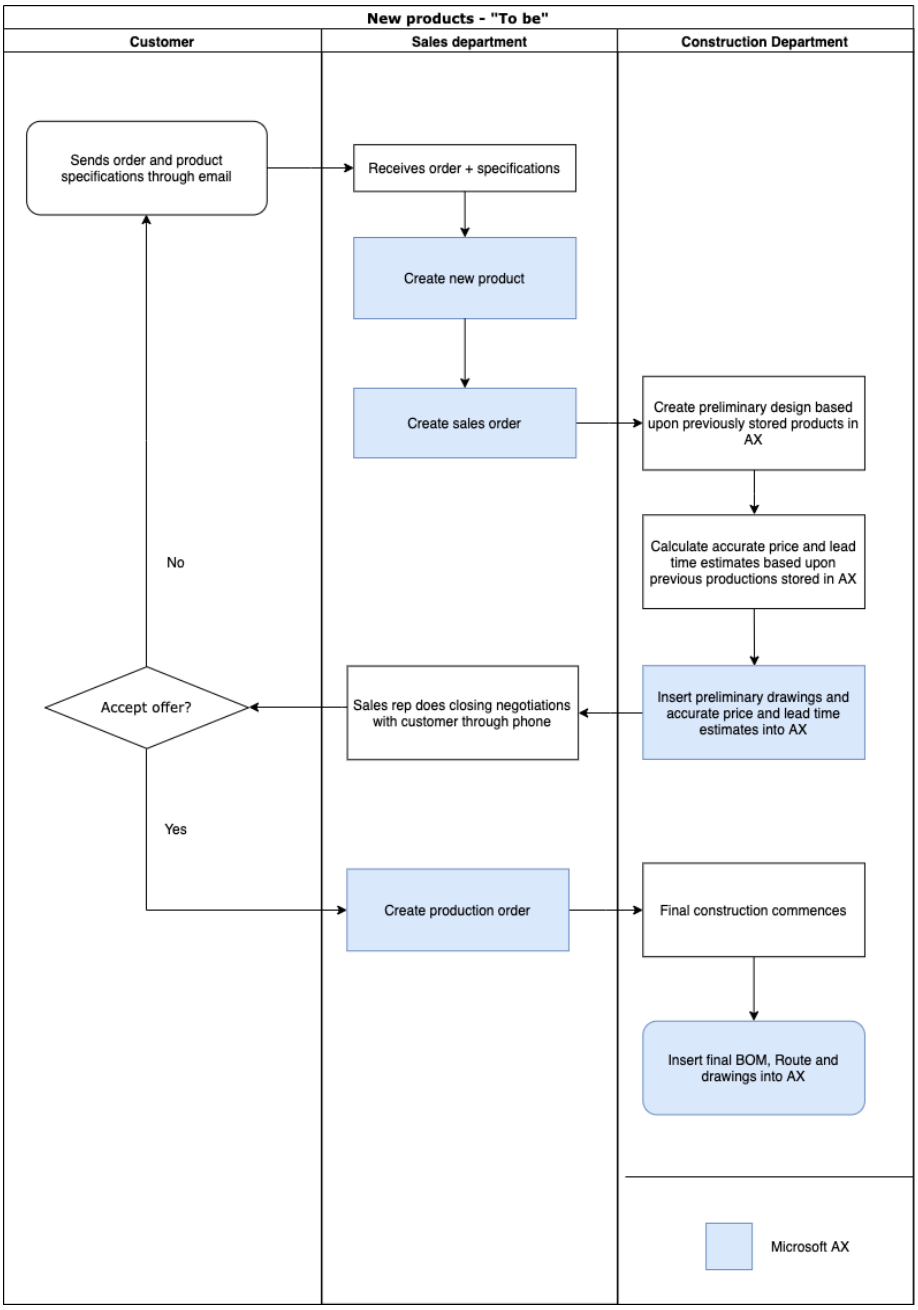

Figure 2.1.2 Sales - New product To-Be

The sales process starts off the same way with the customer sending the order and product specifications through email. This information is received by the sales department which then creates a sales order in MSD AX. The construction department has access to the sales order and will create a preliminary design based upon previously created products that are stored in MSD AX. Accurate price and lead time estimates are then calculated also based upon previously stored products in MSD AX. The sales department will then do final negotiations with the customer. When the customer accepts the offer, the sales department will create a production order in MSD AX. The construction department will then start detailed production, and once it is done they will insert the final BOM, route, and drawings into MSD AX. The production manager can then access the final production order in MSD AX.

Why our solution is better for Valvetech AS:

- The biggest benefit of using MSD AX as a tool in the sales process of new products is the ability to access previously stored product information. This allows Valvetech to do much more accurate price and lead time estimates. It also saves the construction department a lot of time in creating preliminary designs.
- The ability to access previously made products will also reduce the time it takes from an order is received until the customer gets the final confirmation and price quote. This is because the construction department will do a better job creating preliminary designs while at the same time spend less time.
- When the sales representative does closing negotiations, he or she will be able to look up the exact production cost of each item in the production order. This eliminates the risk of giving a discount that doesn’t cover production costs.
- Our solution will eliminate most of the manual transfer. As soon as a sales order/production order is created or edited, all departments will be notified and able to access them. In the long run, this makes for a lot of saved time.

2.1.3 Functional description of our recommended solution:

To create a new product in MSD AX go to Product information management → Common → Released products → press the New Product button. From there you type in the product name, item number and unit measurement and then press the “OK” button.

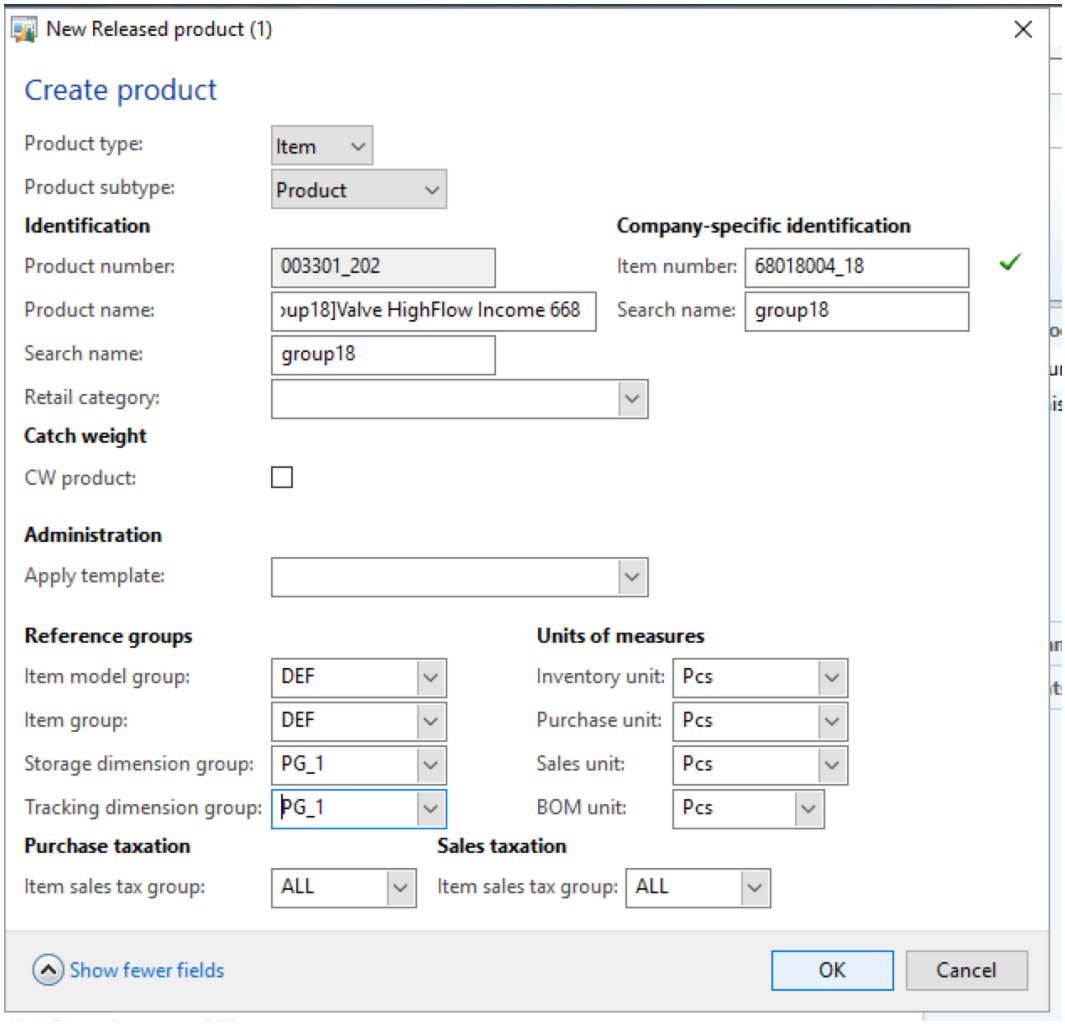

Figure 2.1.3 Create new product

‘Once a new product is saved you are able to create a bill of materials and a route for that product. This is done by clicking on your new product in the “Released Products” tab, then go to the “Engineer” tab on top and pressing either “Lines” or “Route”.

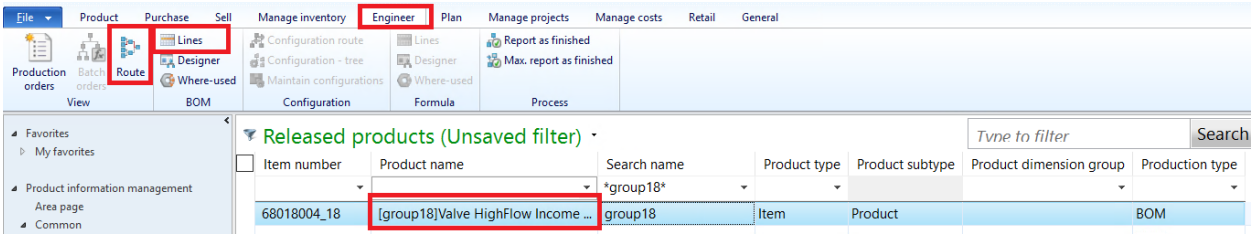

Figure 2.1.4 Create Bom and Route

To create a BOM you click “Lines” in the “Engineer” tab. From there you can press “Create BOM”, and insert every necessary component for the given product.

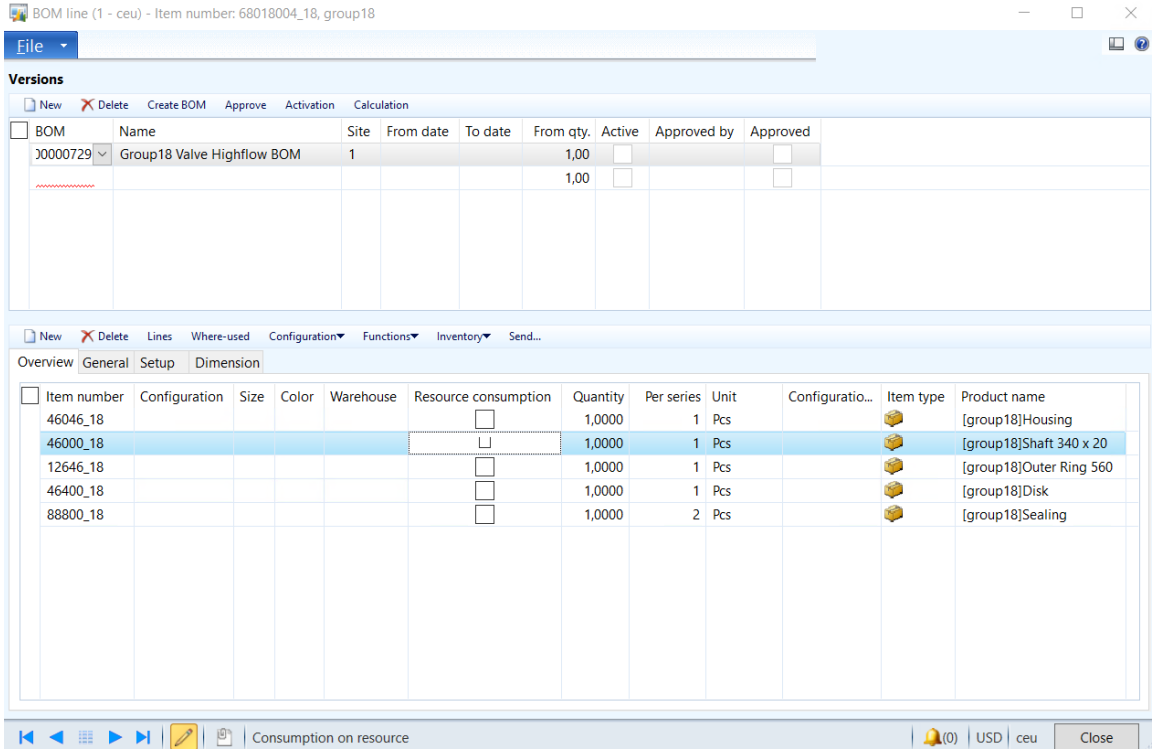

Figure 2.1.5 Bom

To create a Route you press “Route” in the “Engineer” tab of your given product. From there you press “Create Route” to create a new Route. Operations are added by pressing the highlighted “New”.

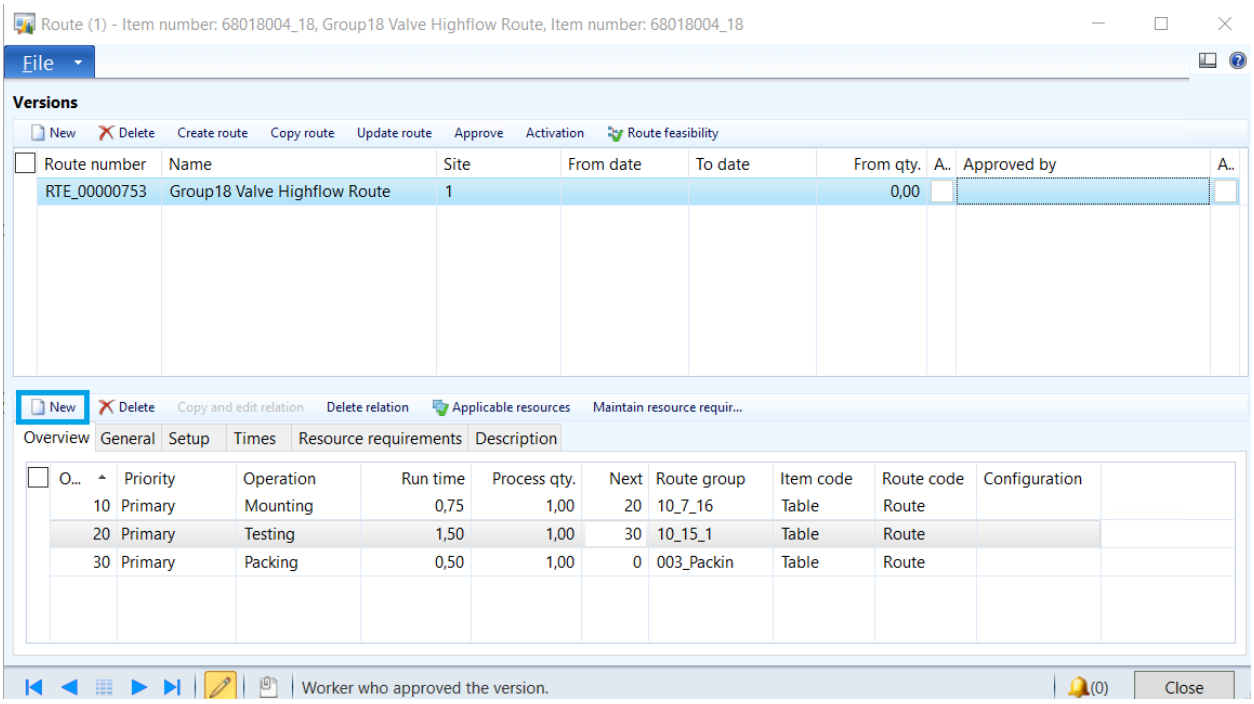

Figure 2.1.6 Route

2.2 Sales - Standard product

2.2.1 Valvetech's current situation

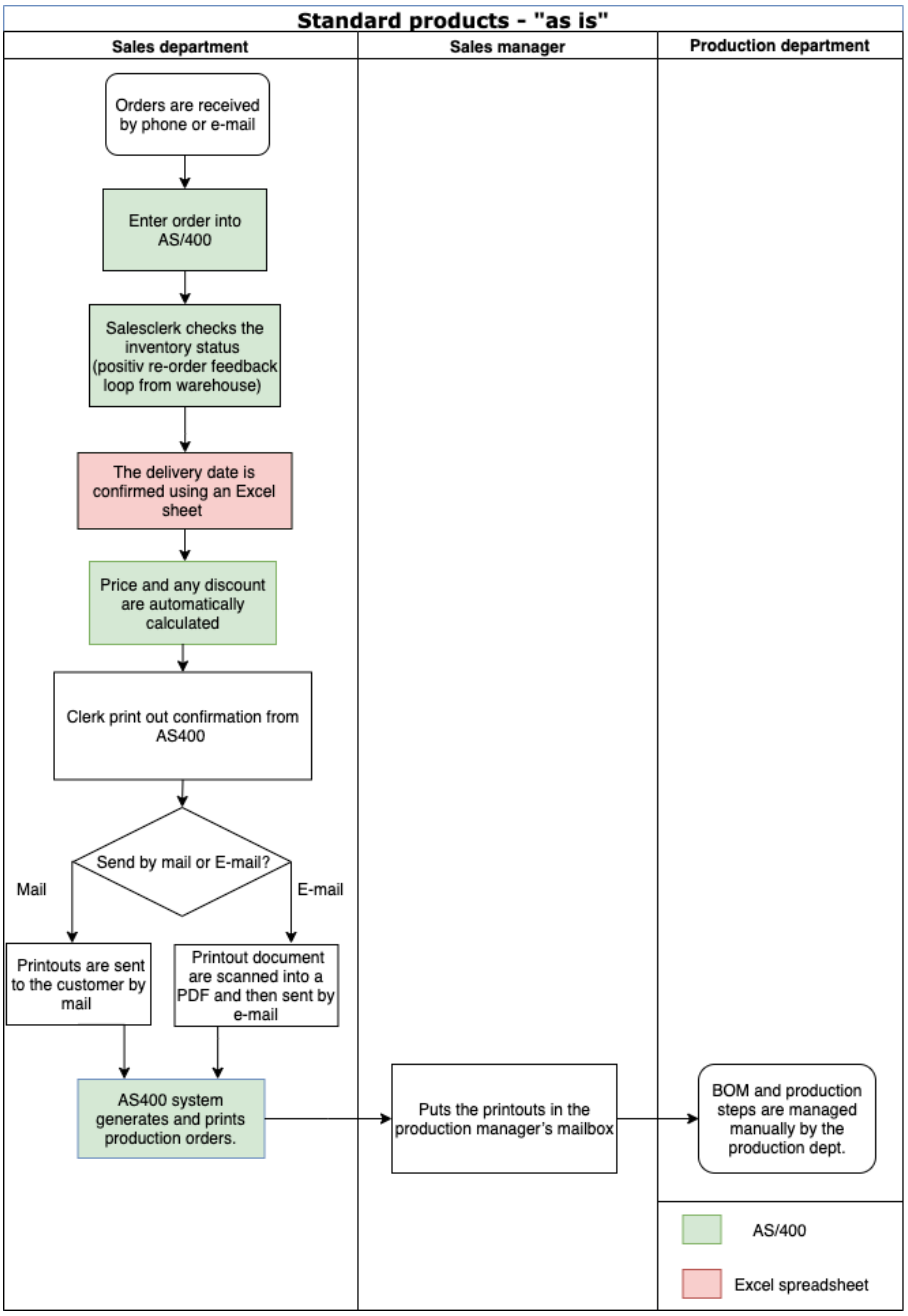

Figure 2.2.1 Sales- Standard products As-Is

Orders on standard products are received either through phone or email and entered into AS400 by the sales department. A positive re-order feedback loop is present on the standard products so that when the stock is running short, the necessary components are “automatically” purchased. Delivery dates are confirmed using an excel sheet and price and discounts are automatically calculated. Confirmation of purchase is sent to the customer either by physical mail or email which prompts the AS400 system to generate production orders. BOM and production steps are manually managed by the production department.

Challenges with the current process

- Manual transfer of production orders to production manager
- Manual transfer of order confirmation to the customer
- Several systems in use in the same process: AS/400 and excel spreadsheets.

2.2.2 Recommended solution

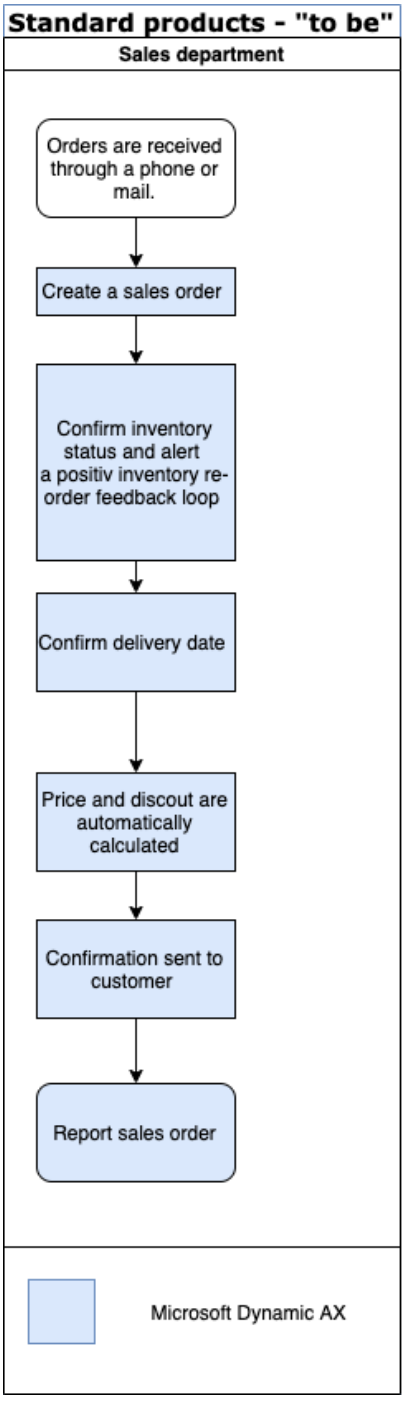

Figure 2.2.2 Sales order- Standard product To-Be

When a customer place an order the sales department creates a sales order and confirms available inventory in AX. Then the delivery date is confirmed and the price is automatically

calculated. The sales department sends purchase confirmation from MSD AX. Finally, they report the sales order so that master planning processes can commence.

Why our solution is better for Valvetech AS

- Everything is done in one single system: MSD AX
- All manual transfer eliminated, including production orders to production manager and order confirmation to the customer.

2.2.3 Functional description of our recommended solution

To create a new sales order go to “Sales and marketing → Sales orders → All sales orders” and press a new Sales Order. From there you can insert all necessary information as shown below:

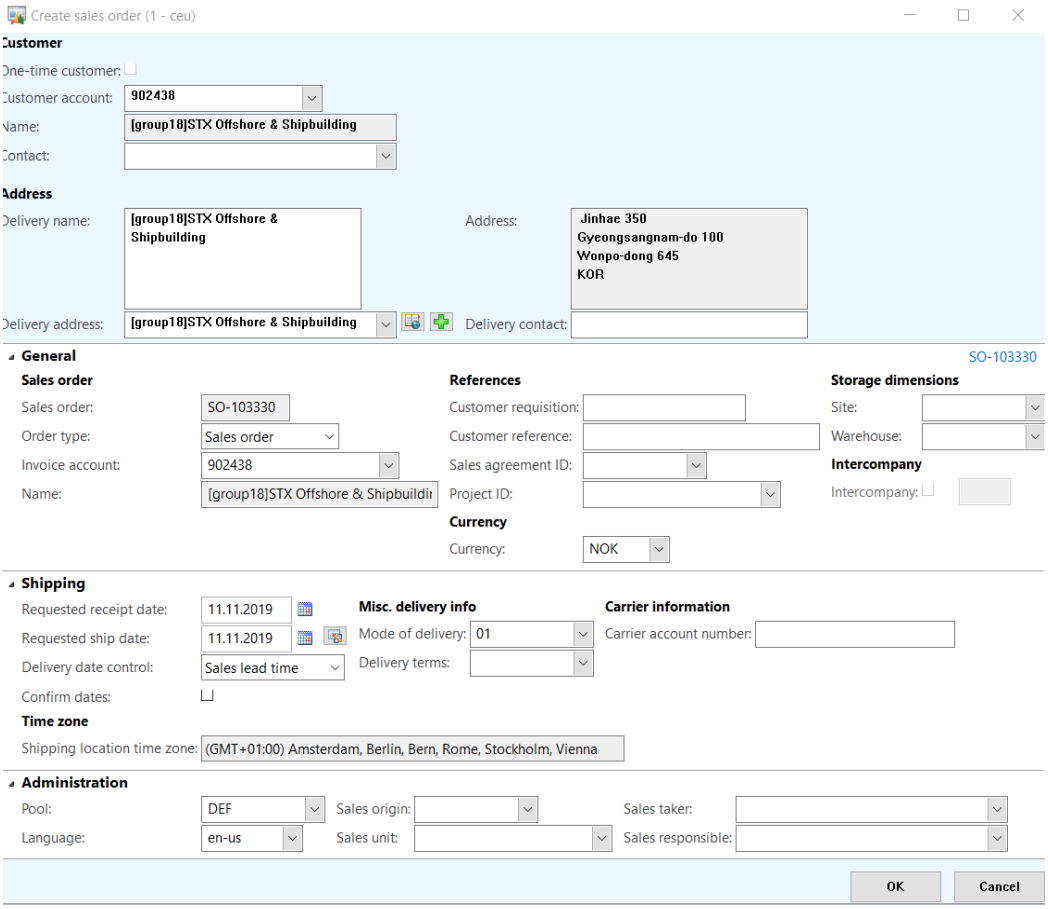

Figure 2.2.3 Create a sales order

After you press okay you’ll be led to the screen below where you can add sales order lines:

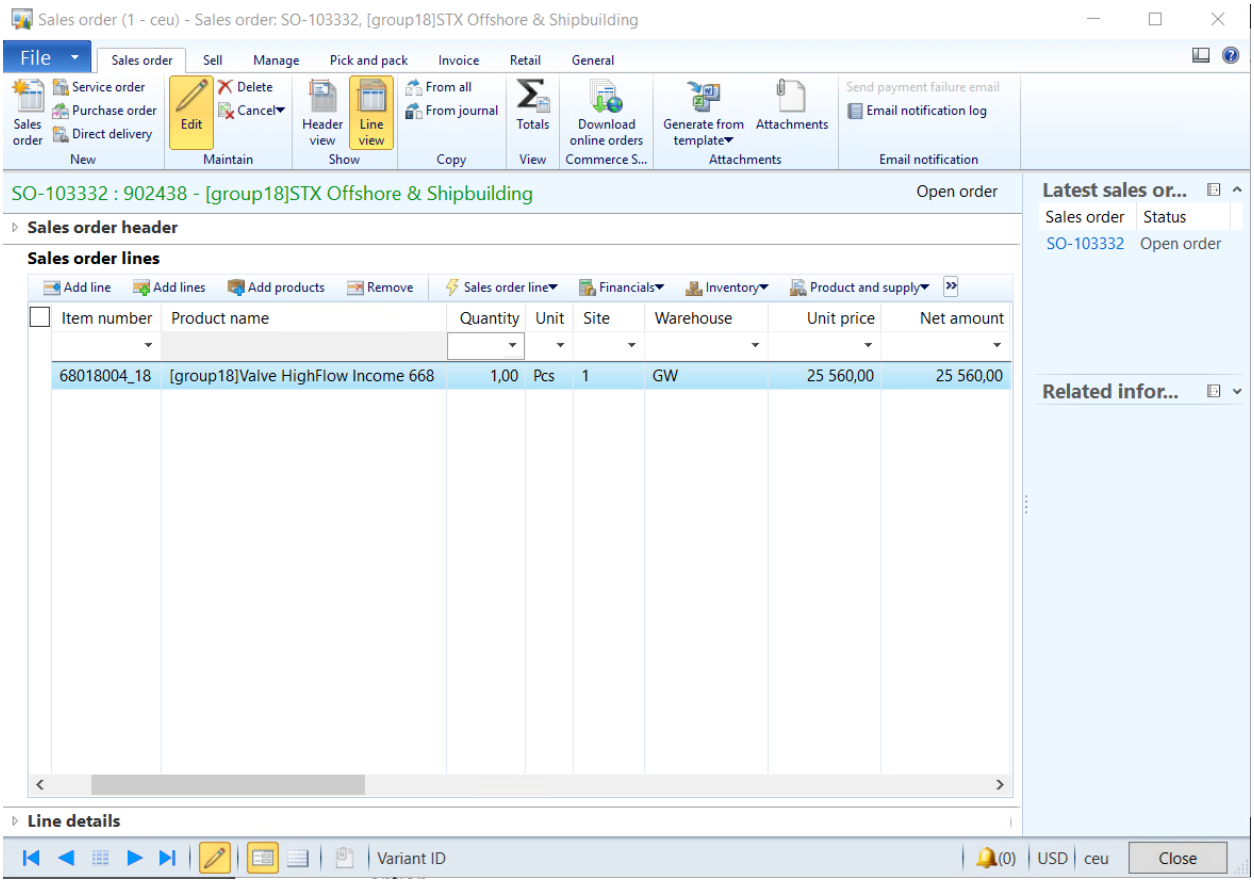

Figure 2.2.4 add sales order lines

2.3 Sales - Spare product

2.3.1 Valvetech's current situation

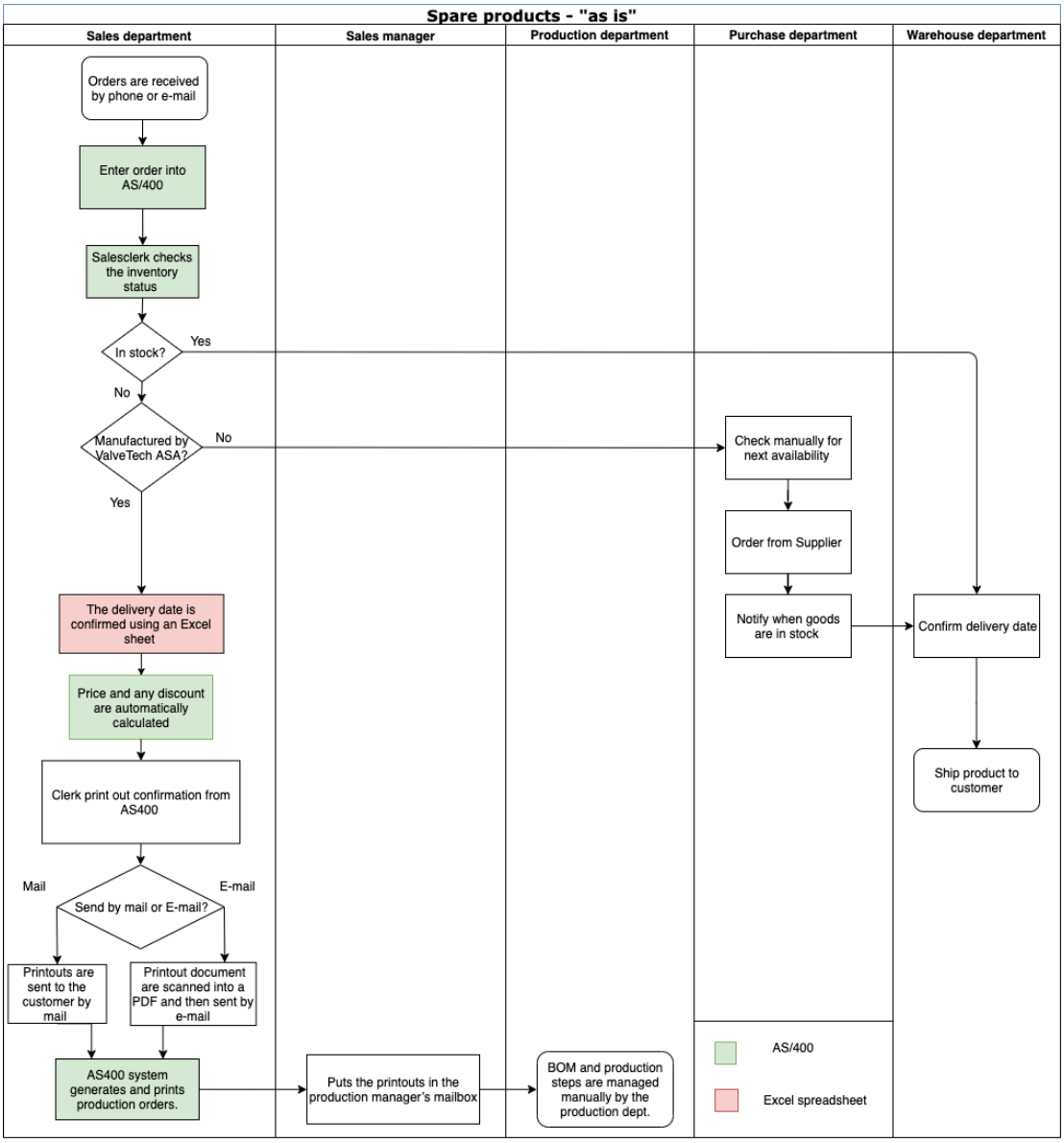

Figure 2.3.1 Sales order - spare product As-Is

The Sales order of a spare product is carried out in the same manner as standard products. A Customer can require a spare part that are manufactured by Valvetech ASA or purchased. If a purchased spare part is required by the customer, the sales department needs to check

manually with the purchasing department when the product is available. If the product is manufactured by Valvetech it will follow the same stream as in standard products. A Clerk in the sales department will print out the confirmation from AS400, then send it by mail or email. If the confirmation will be sent by email, the printout will be scanned into a PDF format and then sent by email.

Challenges with the current process

- The sales department must manually check with the purchasing department for the next availability of the product.
- Sales department and purchase department has different ordering systems.
- The confirmation must be printed out and then scanned in to be a PDF- format.
- Sales manager must send the printouts to the production manager every evening.

2.3.2 Recommended solution

The diagram below illustrates our recommended solution:

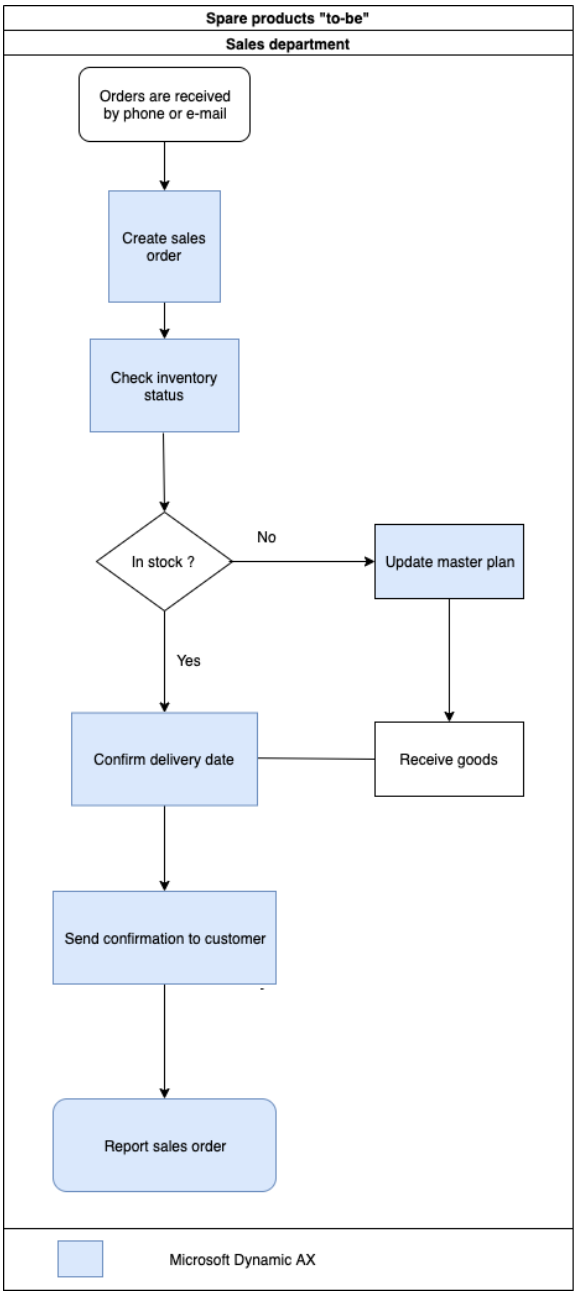

Figure 2.3.2 Sales order- Spare products to-be

In this solution sales department doesn’t need to communicate with the other departments.

If the stock is empty it is reported to the masterplan and updated. Then purchase department and production department can get the information from the master plan.

Why our solution is better for Valvetech AS

- Every department has access to the database so they don't need to manually check with other departments.
- Sales manager doesn’t need to send the printouts to production manager every evening

2.3.3 Functional description of our recommended solution

To confirm the sales order, enter your sales order and in the “Sell” tab press “Sales order Confirmation. To confirm delivery date press the “Confirmed delivery dates” in the same tab .

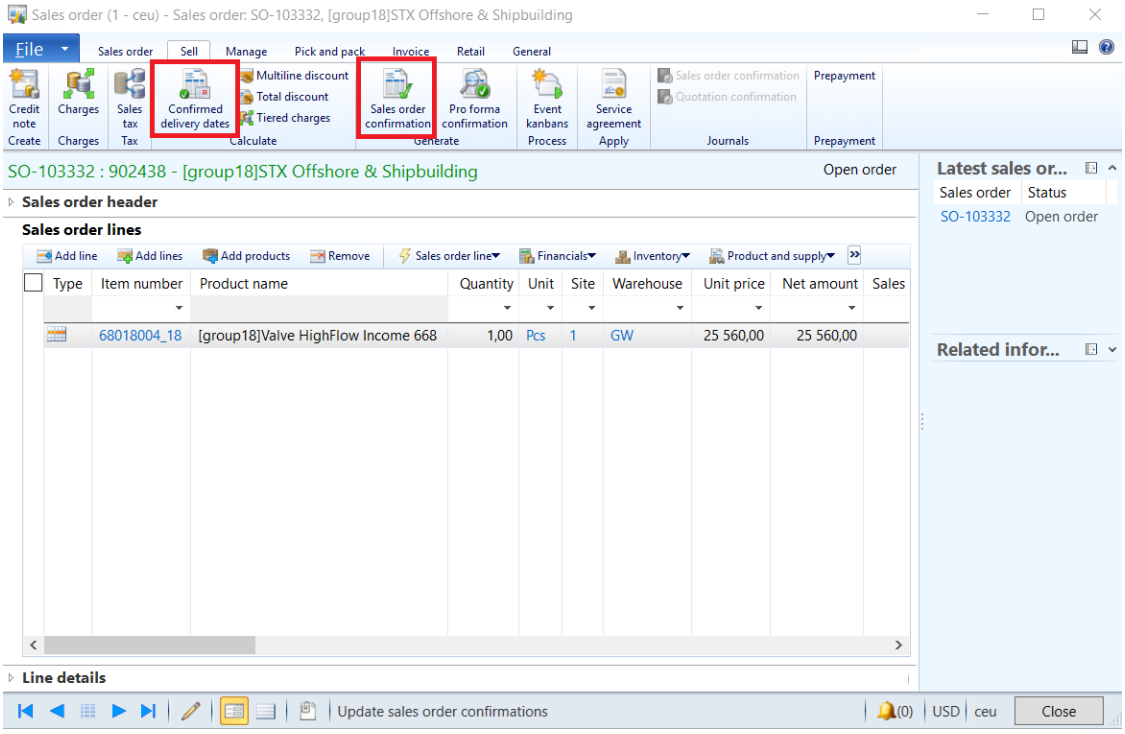

Figure 2.3.3 Confirm sales order and date

When a customer requests a purchased product, it can be delivered directly. To do this select your sales order and then press “direct delivery “in the left corner.

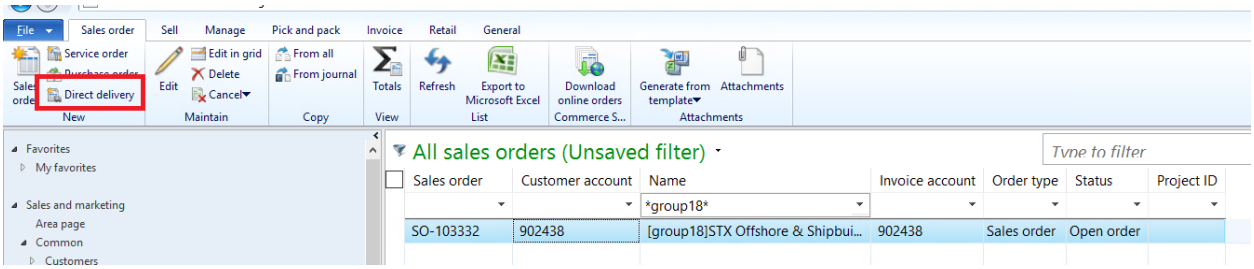

Figure 2.3.4 Direct delivery

3 Production

3.1 Valvetech’s current situation:

The diagram below illustrates Valvetech’s current production process

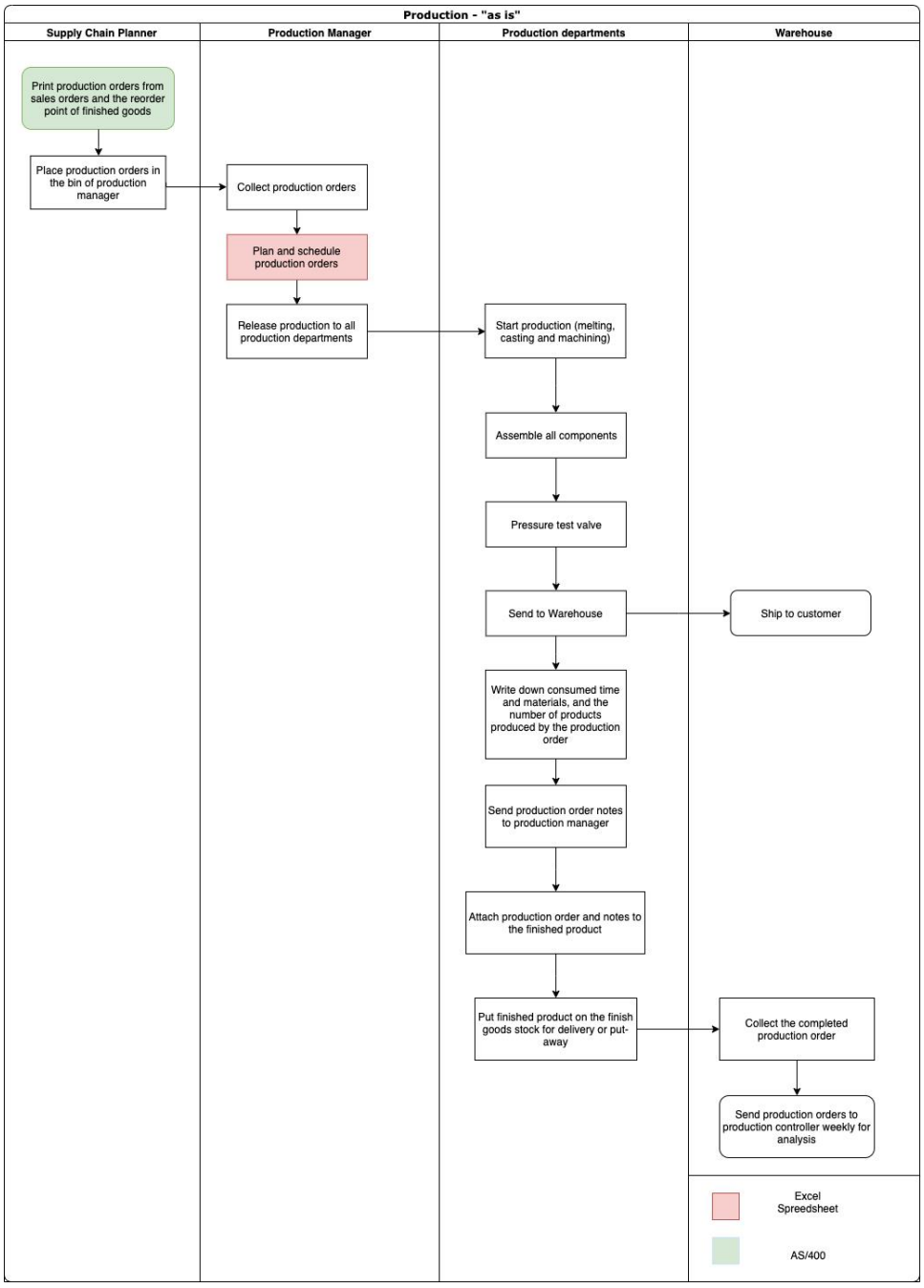

Figure 3.1 Production as-is

The production process starts off with the supply chain manager printing the production orders and then placing them on the shelf of the production manager. Valvetech's production orders originate either from the reorder point on standard products in inventory or from sales orders on new and standard products that are not in stock. When the production manager has collected the orders, he will plan and schedule the orders to meet the delivery schedule using a manual planning system in an MS Excel spreadsheet. Operator will then release the production orders to the production department.

The production department will start off by purchasing the necessary components for the production orders. Only the machine housing is cast and machined at Valvetech. When all necessary products arrive, they will start the production by melting and casting alloys and then machine the valve housing. All components are then assembled and the valve is pressure tested. When the test is done, the valve is shipped to the customer by the warehouse.

Production workers will then write down the consumed time and materials, and also the number of products produced by the production order. These notes are sent to the production manager which attaches them to the finished product alongside the production order. The finished product is then put on the finished goods stock and the finished production order is collected by the warehouse and sent weekly to the production controller for analysis.

Challenges with the current production order process:

- A lot of manual transfer of production orders and notes between departments.
- The production department has to do an analysis of every production order to see what components have to be purchased because the production order does not include a bill of materials.
- The production process of a given product is not stored in any system, which means that the production department has to do a pre-production analysis on what steps to take during the cast, melting, machining, and assembly for every new production order.

3.2 Recommended solution:

The diagram below illustrates our recommended solution to how Valvetech should do the production process:

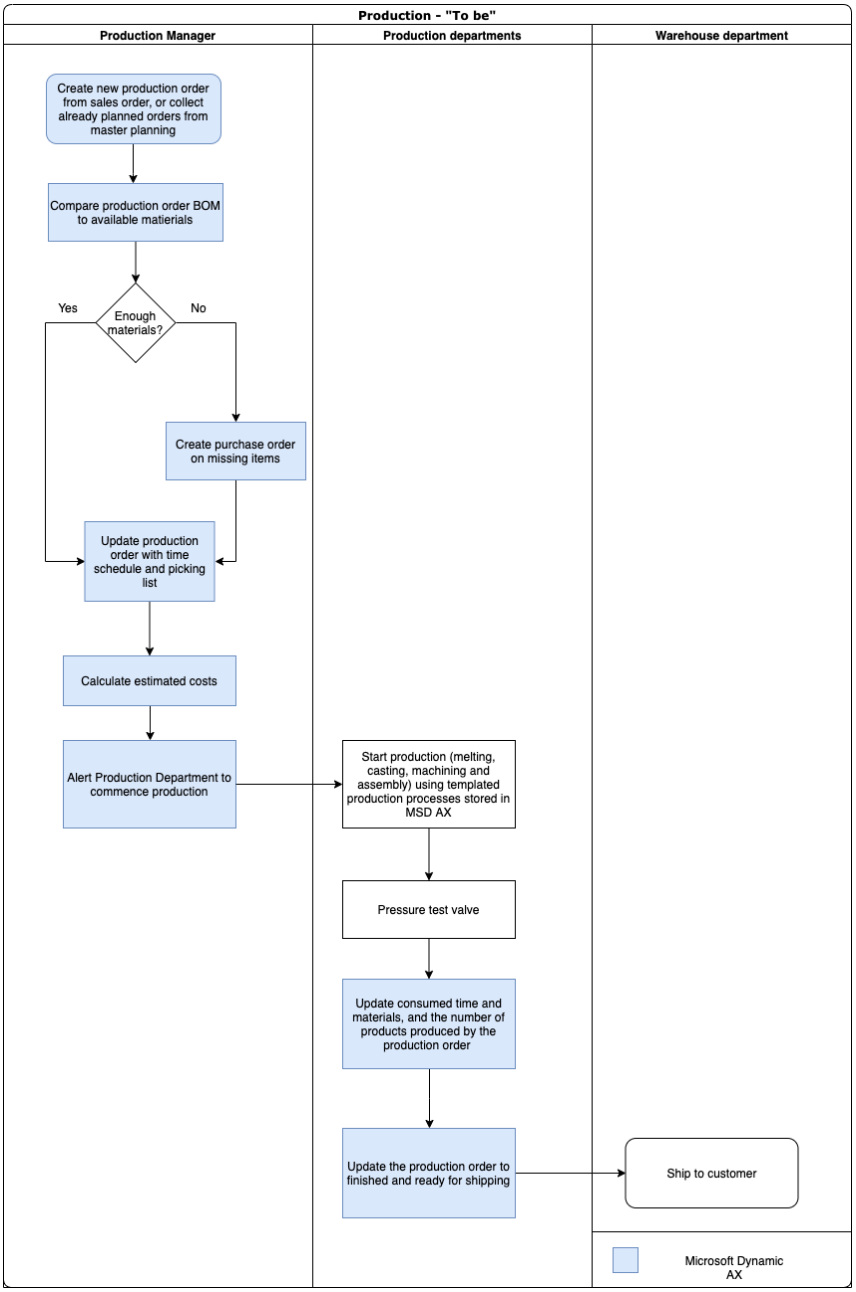

Figure 3.2 Production to-be

Our solution starts off with the production manager viewing production orders that are already created in MSD AX. He will then check the BOM of the production orders against the available materials, and create purchase orders on components that are needed. Once this is done, the production manager will update the production order with the correct picking list and time schedule. He will then alert the production department to start production.

The production department will follow a templated production process that is stored in MSD AX if it exists. They will do the melting, casting, machining and assembly and then pressure test the valve. Once the production is done, the production department will update MSD AX with the consumed time and materials, and the number of products produced by the production order. Finally, they will update the production order to finished and ready for shipping. The warehouse will then ship the product to the customer.

Why our solution is better for Valvetech AS:

- Most manual transfers eliminated. The right departments are notified when production orders are modified.
- Production orders contain a bill of materials that are easily compared against available materials in order to create purchase orders on missing components
- Templated production processes are stored in MSD AX and can be reused in multiple production processes. Consumed time is also stored in MSD AX which will give better production time estimates in later productions.

3.3 Functional description of our recommended solution:

There are two ways of creating a production order: either from scratch without a sales order or from an existing sales order. To create a production order without a sales order, go to Production control → Common → All production orders, and press the New Production order in the top right corner. To create a production order from an already existing sales order, you first have to find your sales order by going to Sales and Marketing → Common → Sales orders → All sales orders. With your sales order selected press “Product and supply” and under the “New” tab click “Production order”.

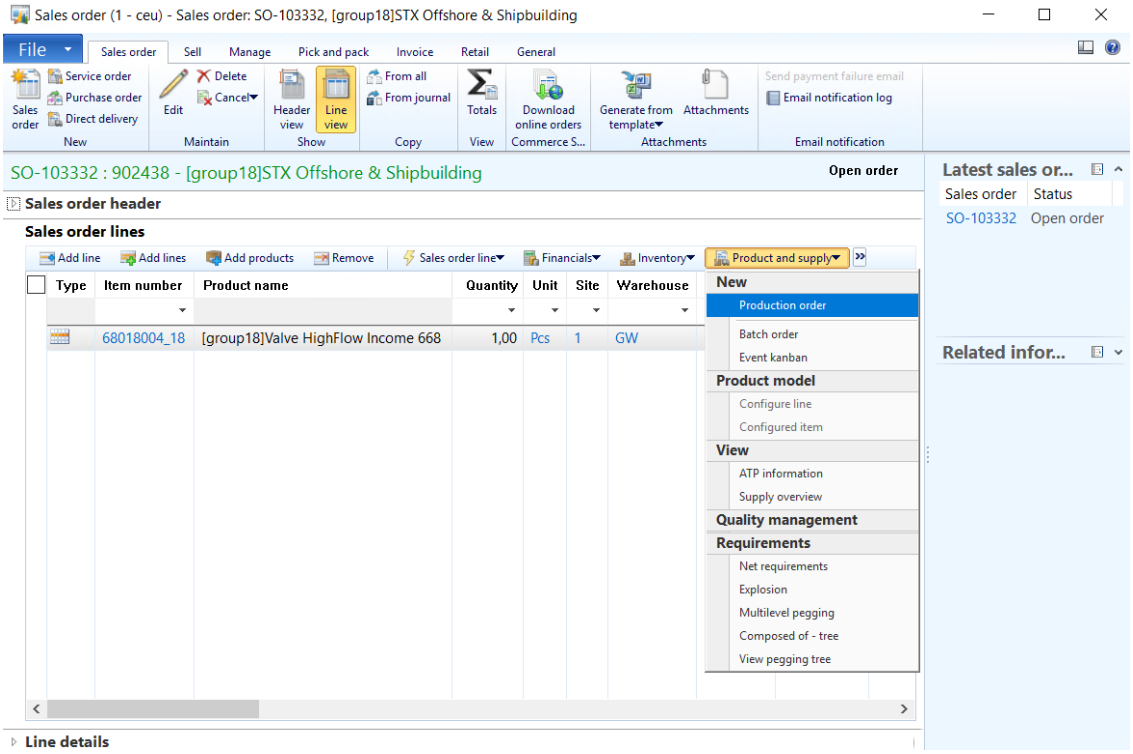

Figure 3.3 Production order from sales order

When creating a new production order, make sure to choose the right BOM and Route number in the “BOM/route” tab. Then press “Create” to create your production order.

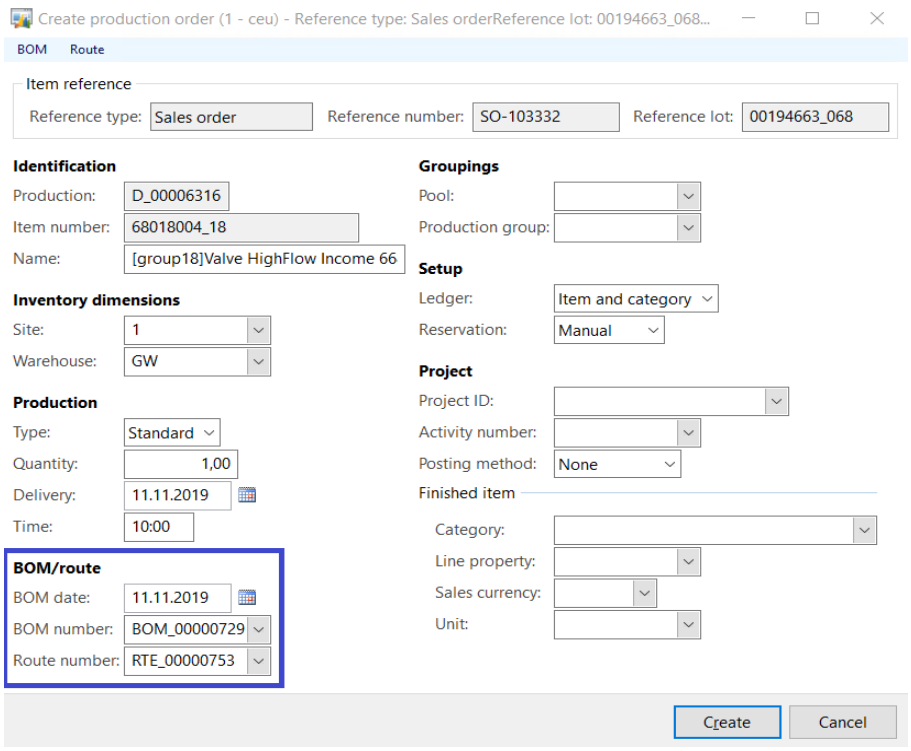

Figure 3.4 Create production order

To schedule your production order, enter your production order and in the “Schedule” tab press “Schedule operations” or “Schedule jobs”.

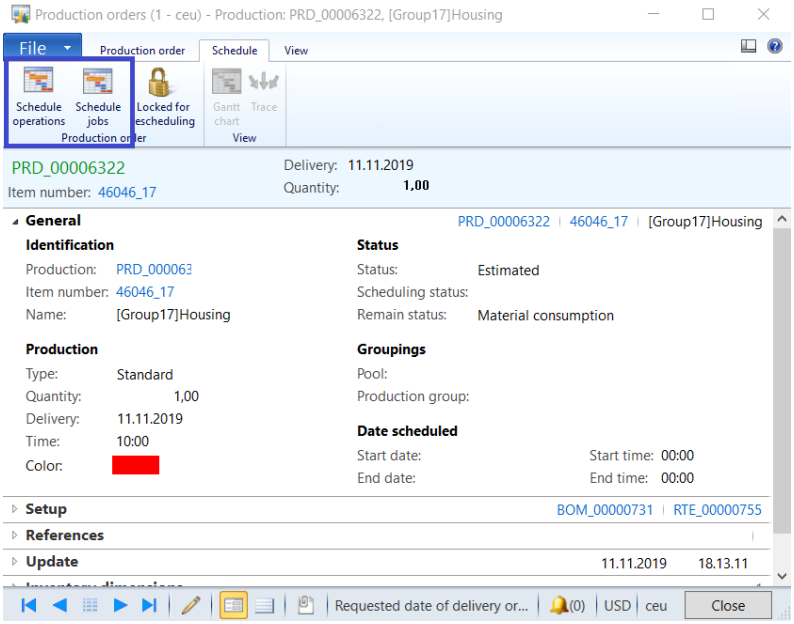

Figure 3.5 Schedule operation and jobs

4 Outbound logistics

4.1 Valvetech’s current situation:

The diagram below illustrates Valvetech’s current outbound logistics process:

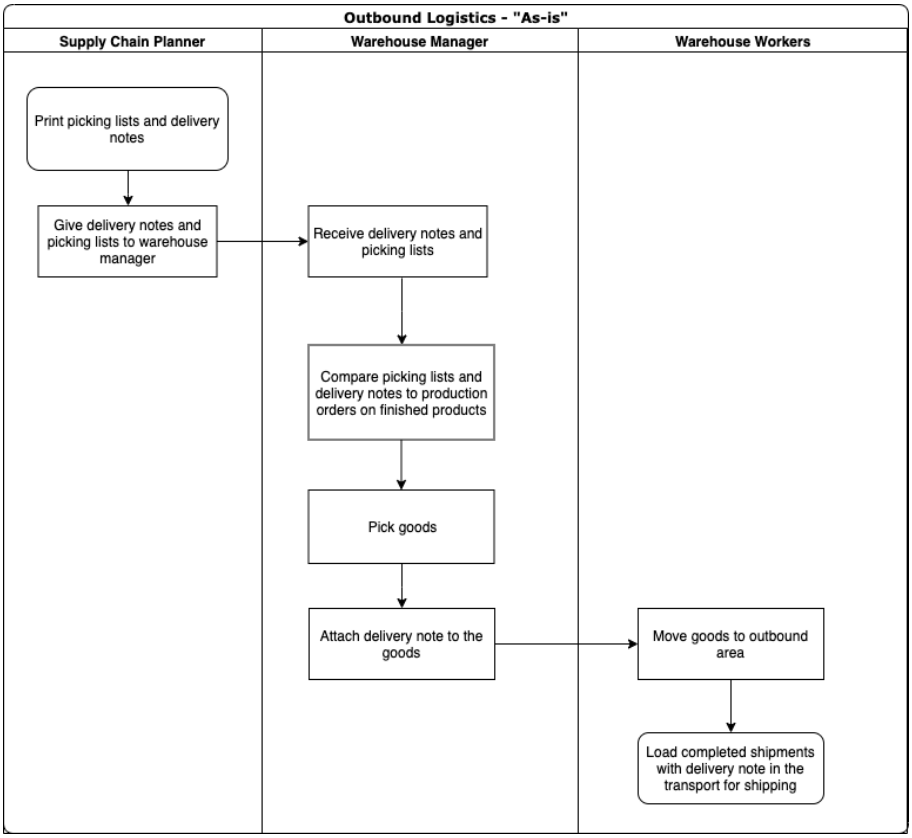

Figure 4.1 Outbound logistics as-is

The outbound logistics process starts off with the supply chain planner printing picking lists and delivery notes and handing them over to the warehouse manager. The warehouse manager will compare the picking lists and delivery notes to the production orders on finished products and then pick the necessary goods. Afterward, he will attach delivery notes to the goods and then the warehouse workers will move the goods to the outbound area, ready for shipping. When the transport arrives at the warehouse workers will load completed shipments with delivery notes onto the transport.

Challenges with the current outbound logistics process:

- Unnecessary manual transfer of pickings lists and delivery notes between the supply chain manager and the warehouse manager.
- Manual comparing of picking lists to products in the finished goods warehouse. This makes for a big waste of time and a possibility of human error.

4.2 Recommended solution:

The diagram below illustrates our recommended solution to how Valvetech should do the production process:

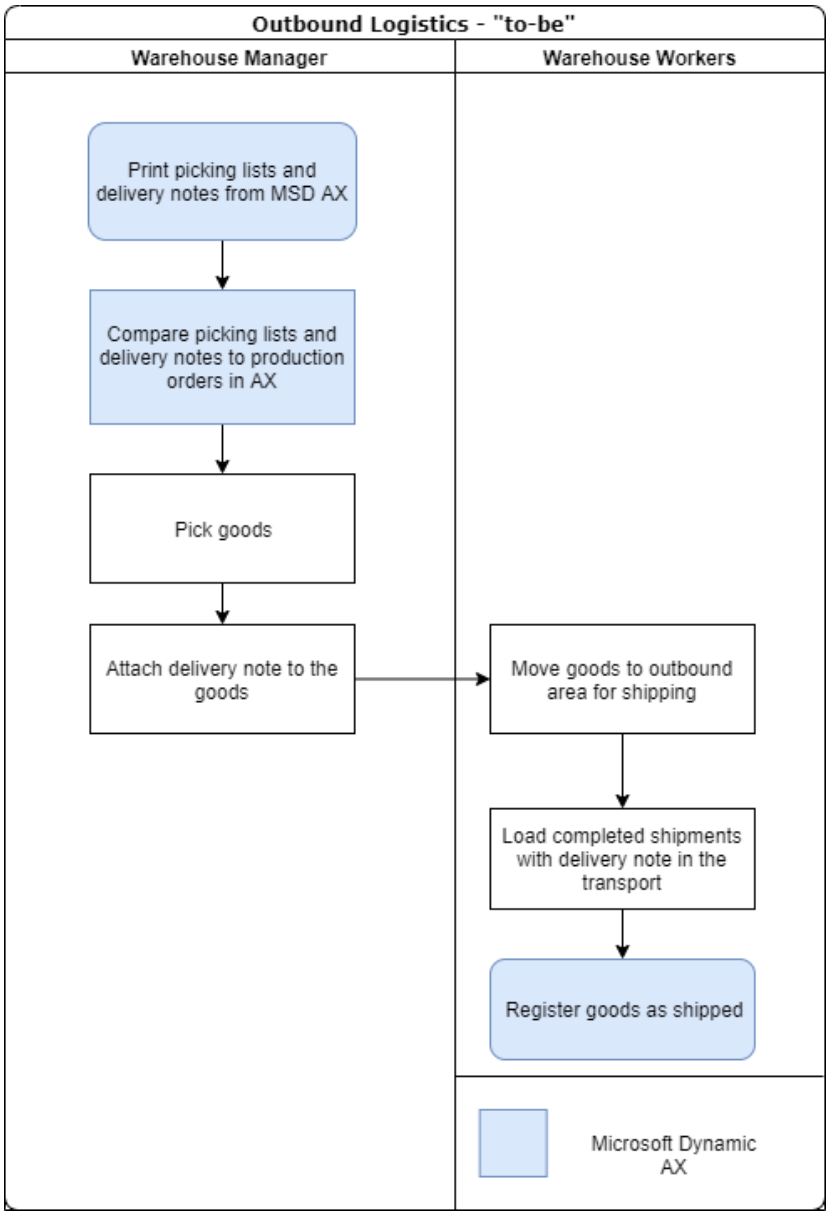

Figure 4.2 Outbound logistics to-be

Our proposed solution starts off with the warehouse manager printing the pickings lists and delivery notes fra MSD AX. He will compare these to production order that is also stored in AX.

Afterward, he will pick the necessary goods and attach the delivery notes to the goods. The warehouse workers will then move the goods to the outbound area for shipping, and when the transport arrives they will load the truck with completed products with delivery notes attached.

Why our solution is better for Valvetech AS:

- There is no longer a need for a supply chain manager to print picking lists and delivery notes because these can be found in AX and accessed directly by the warehouse manager.
- Picking lists and delivery notes will be compared against production orders on finished products directly from AX. That means that the production manager doesn't have to manually compare these to the products in the finished goods warehouse. This will remove the possibility of human error.

4.3 Functional description of our recommended solution:

To print a picking list in AX, you need to select your sales order by going to Sales and Marketing → Common → All sales orders. Inside your sales order, you need to enter the “Pick and Pack” tab and then select “Picking list”. From there, make sure to check the “print picking list” option in order to print the picking list to the screen.

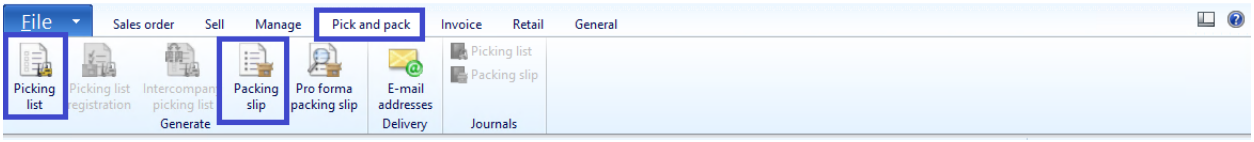

Figure 4.3 Pick and pack

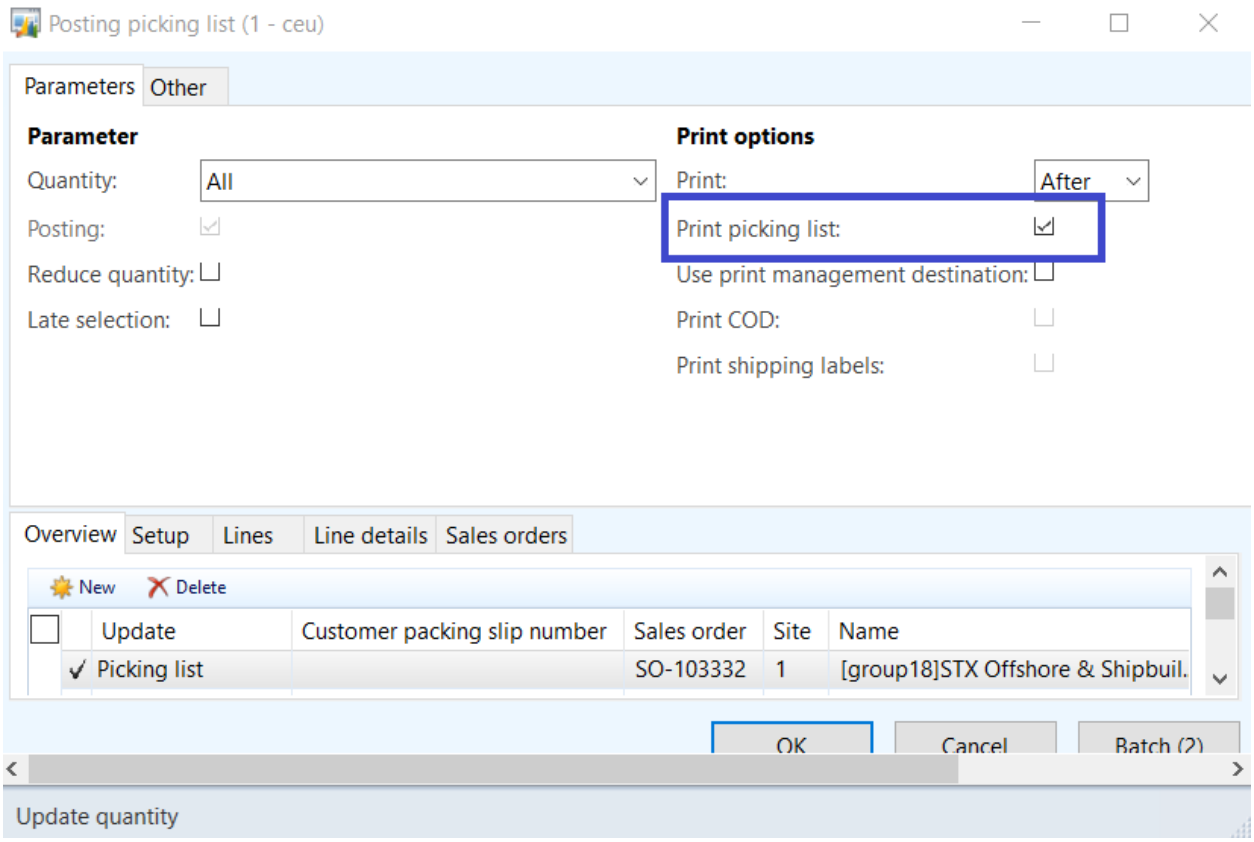

Figure 4.4 Print picking list

The receipt will look something like this:

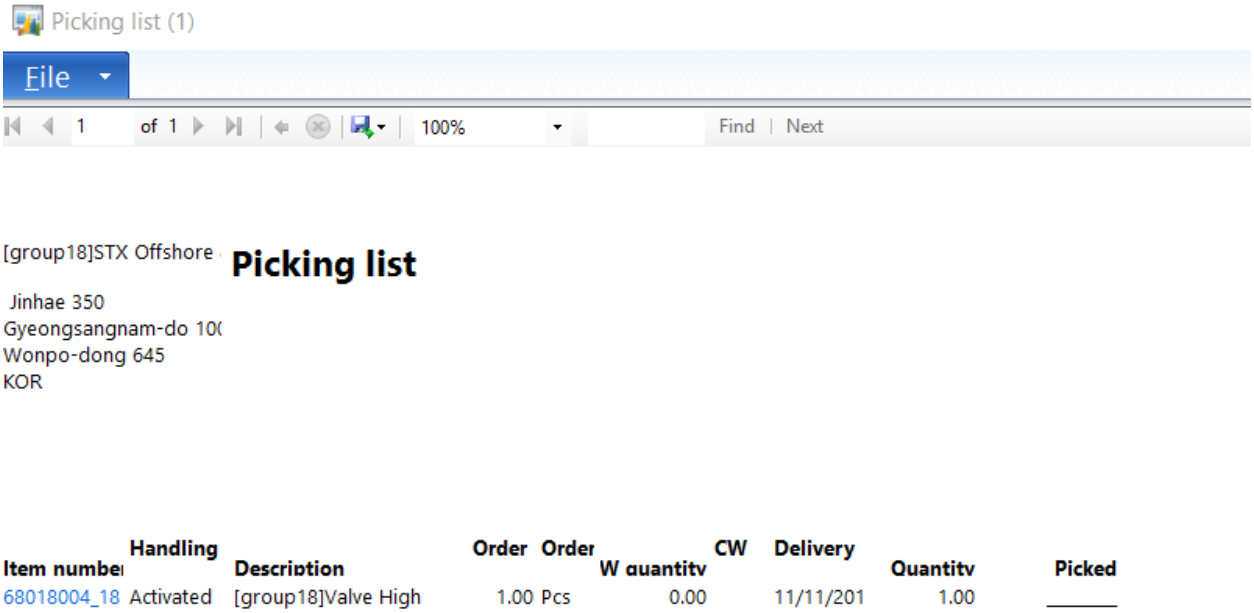

Figure 4.5 Printed picking list

In the same way, you can print the packing slip by entering “Packing slip” in the “Pick and Pack” tab of your sales order. Once again, make sure to check the “Print packing list” option:

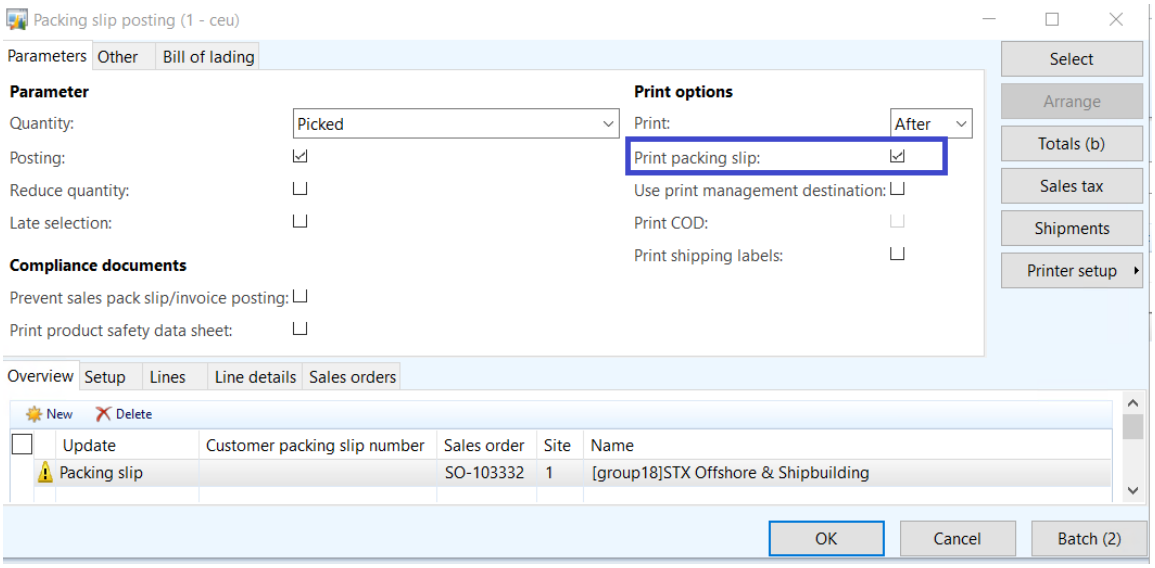

Figure 4.6 Print packing slip

5 Cost Calculation

5.1 Valvetech's current situation

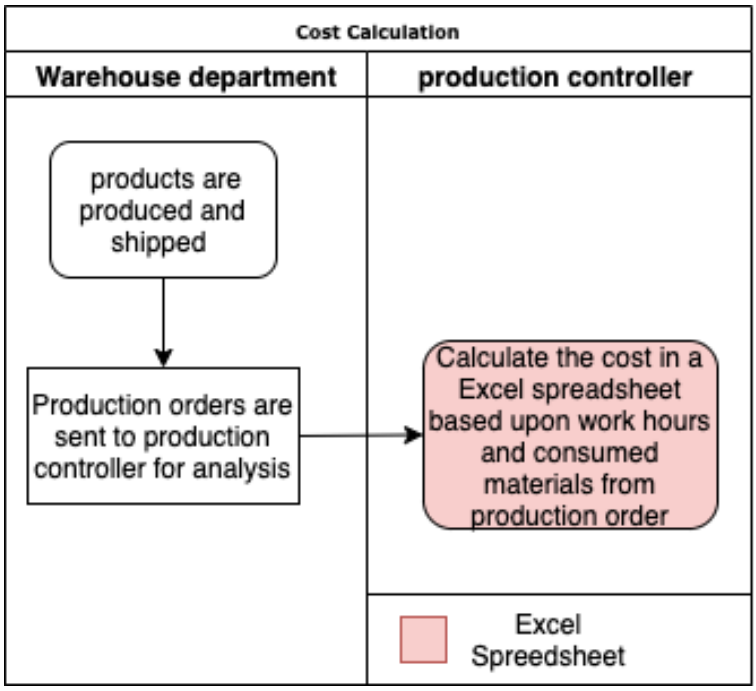

Figure 5.1 Cost calculation as-is

In today's solution, all cost calculations are performed after the products are produced and shipped. This is because AS400 does not hold costing information. The warehouse department will send production orders to the production controller for weekly analysis. The calculation is done using an excel spreadsheet and is based upon the work hours and materials consumed during production.

Challenges with the current process

The main challenge with the current solution is that the cost calculations are performed after products are produced. This means that Valvetech has no idea of what a product is going to cost prior to starting the production. This again means that the sales department will run into the risk of giving too much of a discount on a product so that the sales price doesn't cover the production price.

5.2 Recommended solution

The diagram below illustrates our recommended solution for doing cost calculations:

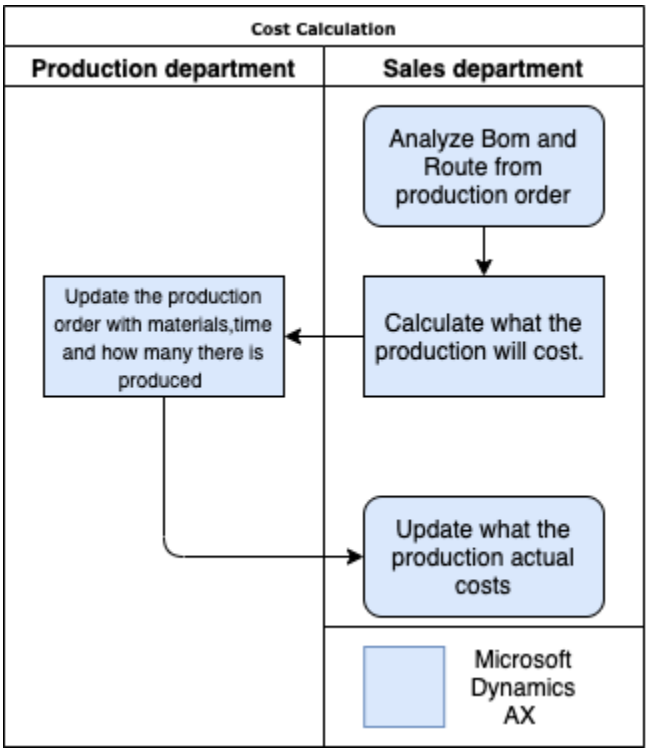

Figure 5.2 Cost calculation to-be

In our solution, the cost calculation starts prior to starting the production. Estimated costs are made by analyzing the BOM and route for the given production order. Once the production is done, and the production order is updated with the actual hours and consumed materials, the production controller updates the production order with the actual cost.

Why our solution is better for Valvetech AS

Our cost calculation starts prior to production, which eliminates the risk of offering a discounted price that doesn't correlate with the necessary profit margin. In addition, our solution makes for very little manual labor as MSD AX does cost calculations automatically as long as it's provided with the necessary cost information on products and operations.

5.3 Functional description of our recommended solution

For AX to be able to automatically estimate costs, each product and operation in the BOM needs to be set with the right purchase/production cost. To set costs on products, enter your product (Product information management → Common → products → Released products) and change the “price” in the “Purchase” and “Manage cost” tab to the right price:

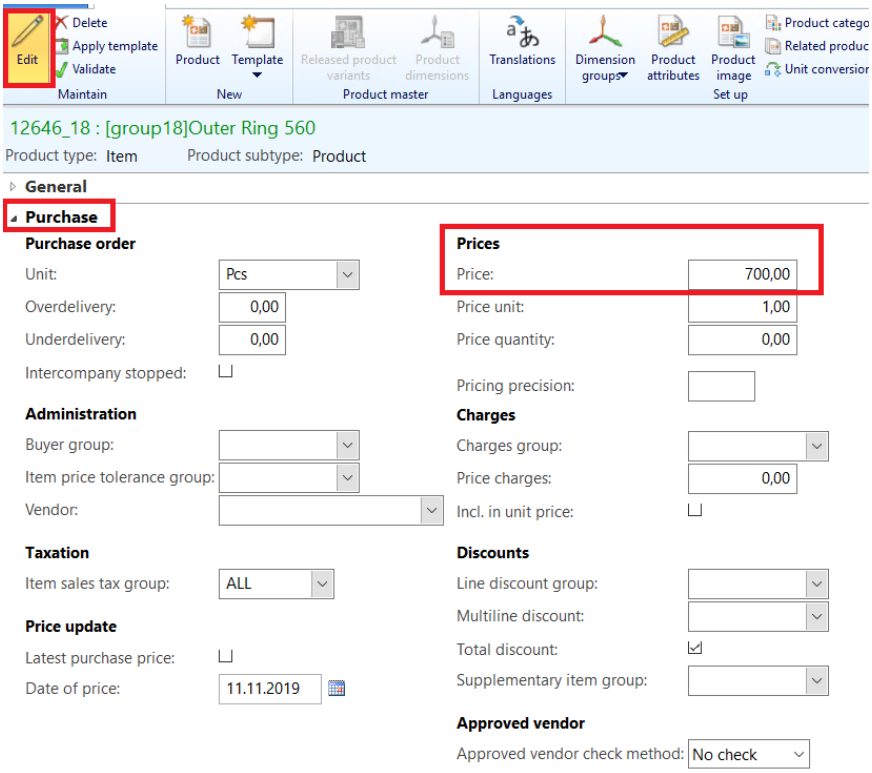

Figure 5.3 Edit purchase price

Once that is done, AX can estimate the cost of production by pressing your production order, and in the “production order” tab press “Estimate”:

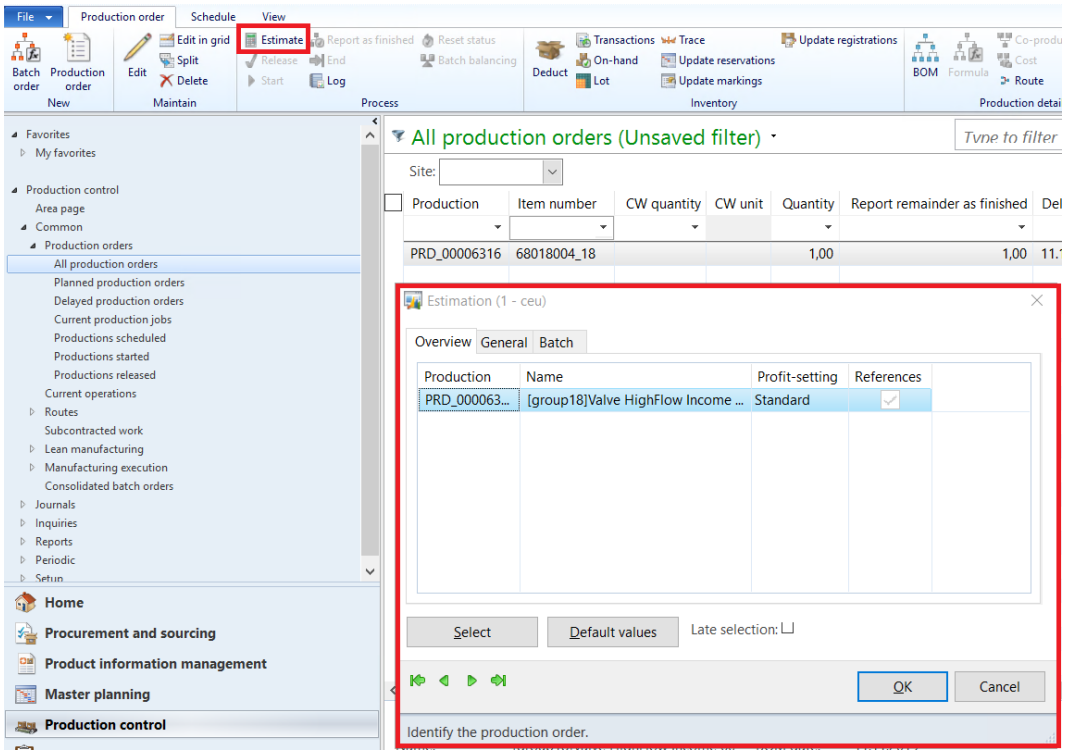

Figure 5.4 Estimate production order

After production is complete, and actual product consumption and work hours are updated in MSD AX, the actual overview costing can be viewed alongside the overview estimation by entering your production order and going to View → Price Calculation:

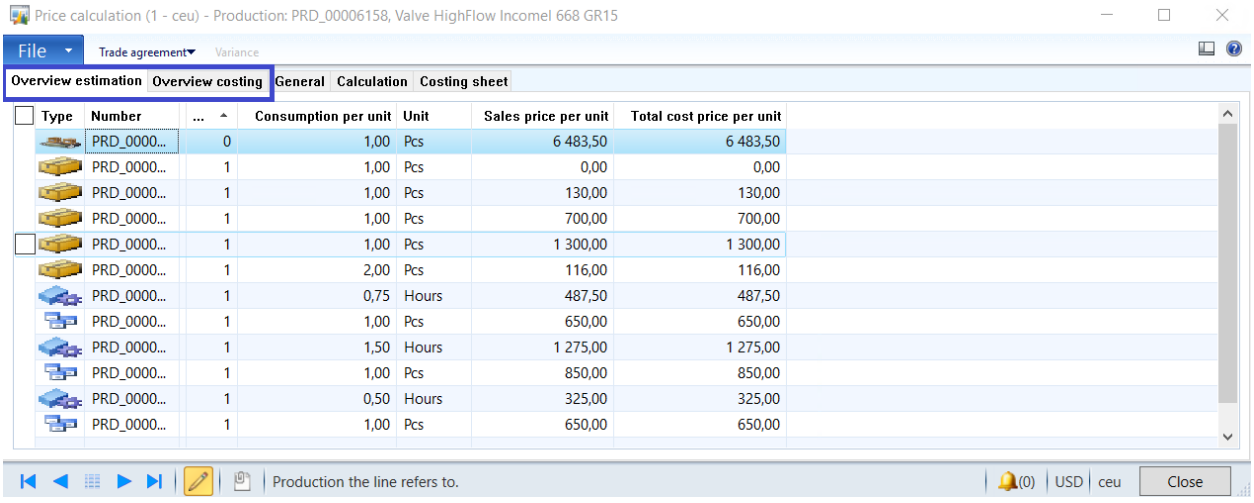

Figure 5.5 View estimation and actual costing of production order

6 Master planning

6.1 Valvetech's current situation

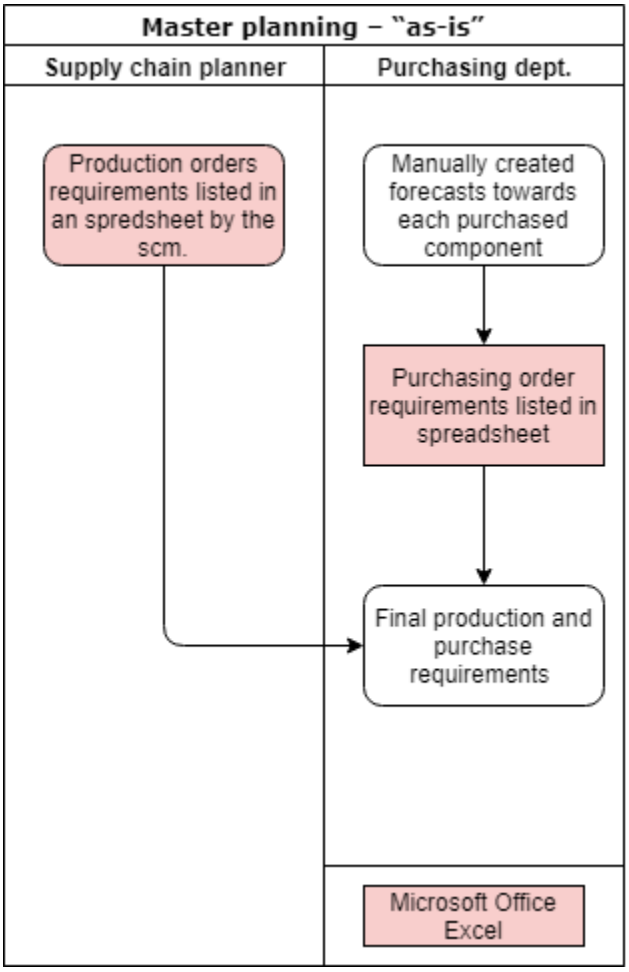

Figure 6.1 Master Planning as-is

Explanation and challenges with the current solution:

The current master planning system contains of multiple spreadsheets as seen above. Poor communication between the different departments results in challenges concerning overstocking or shortage of different components. The forecast neglect both the sales

department, inventory and it's dynamics. While the current system might be easy to operate and implementation wise; cheap, it has failed to achieve a stable system where over-/ understocking occurs on a seemingly regular basis.

Considering the failures, the lack of modern planning systems and software solutions is obvious.

6.2 Recommended solution

We have deemed it necessary to totally reconfigure the workflow architecture of this important part process and recommend the following solution.

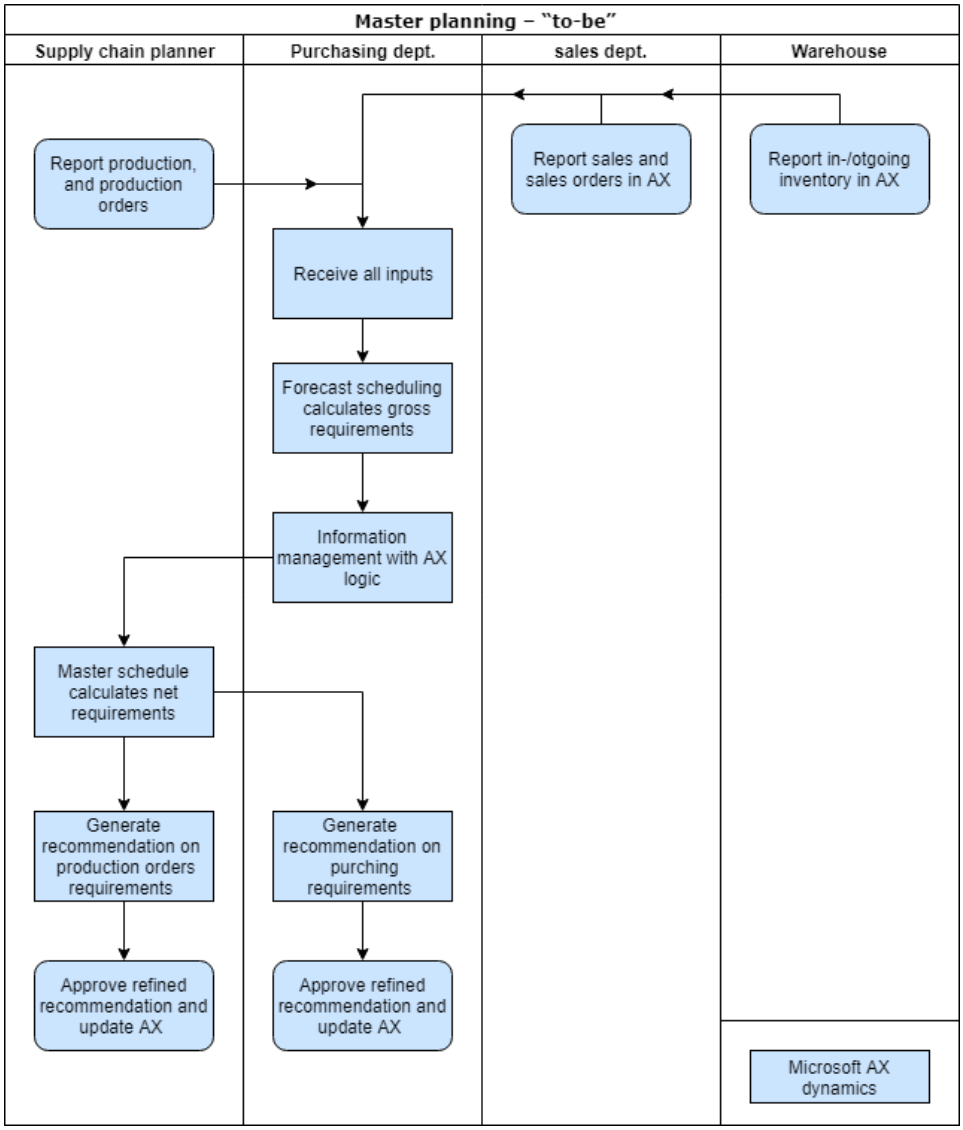

Figure 6.2 Master Planning to-be

This new approach to a dynamic master plan will improve the process considerably. Our new suggestion is based on the concept of information flow through MSD AX to allow for sufficient calculations on the requirements. Data received from sales, supply chain planner and warehouse will continuously be saved in the database, thus the gross and net requirements will be genuinely more accurate.

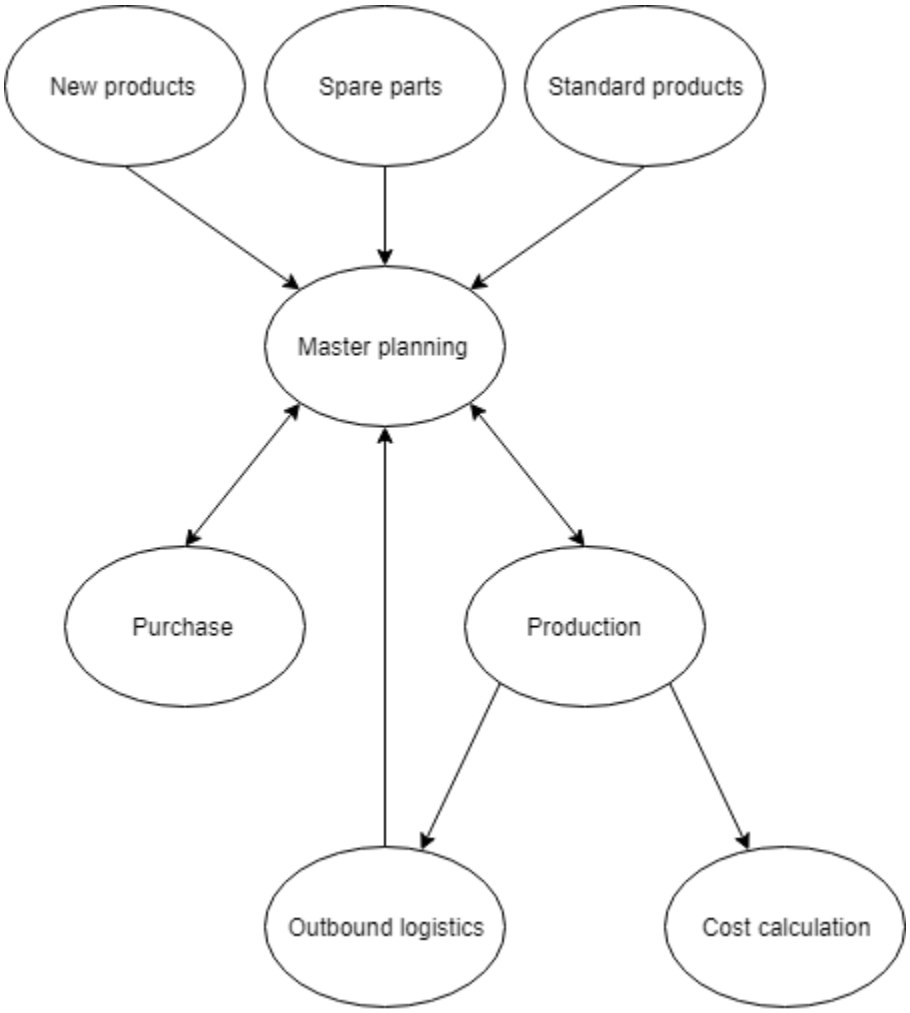

Figure 6.3 Master planning description

This map shows a brief overview over how our new system transmits information with itself. The masterplan has taken a natural position in the centre of communication. The arrows represent the direction of information flow, and the spheres the different recognizable processes. This flow

offers the production and purchase dept the opportunity to be more efficient following the “economies of size” principle.

Why our solution is better for Valvetech AS

Our system will benefit Valvetech significantly by giving them a solution they can have confidence in. The calculations will be more accurate, lean, and we believe Valvetech also will value the promptitude we can offer. We have considered the fact that the current solution has neglected the input values from the other departments and thus; the results have been troublesome with i.a. poor timeliness on the deliveries.

This process considers multiple inputs and will permit Valvetech to purchase larger quantities from the vendors, to conserve spending on parts and materials. The master plan operates on a positive feedback loop principle in symbiose with the other departments where the response from the master plan initialize other parts of the solution such as production and purchase department.

6.3 Functional description of our recommended solution

To create a master plan go to “Master planning module → Setup → Plans → Master plans. From there press new in the top-left corner to create a new master plan. From there you will be shown the image below where you can choose time fences and general setup for your master plan:

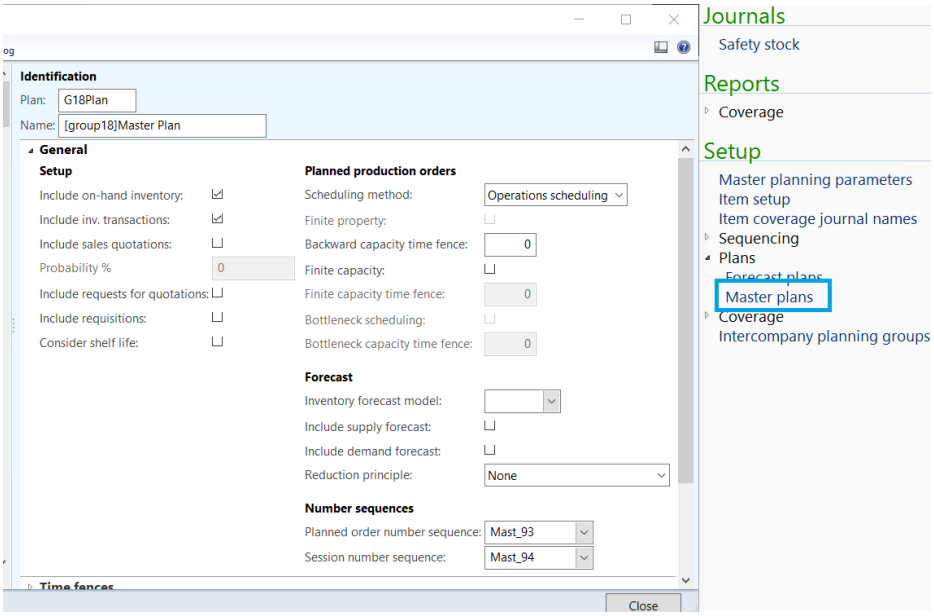

Figure 6.4 Create master plans

To schedule your master plan, go to “Master planning → periodic → master scheduling and you’ll be shown the window below:

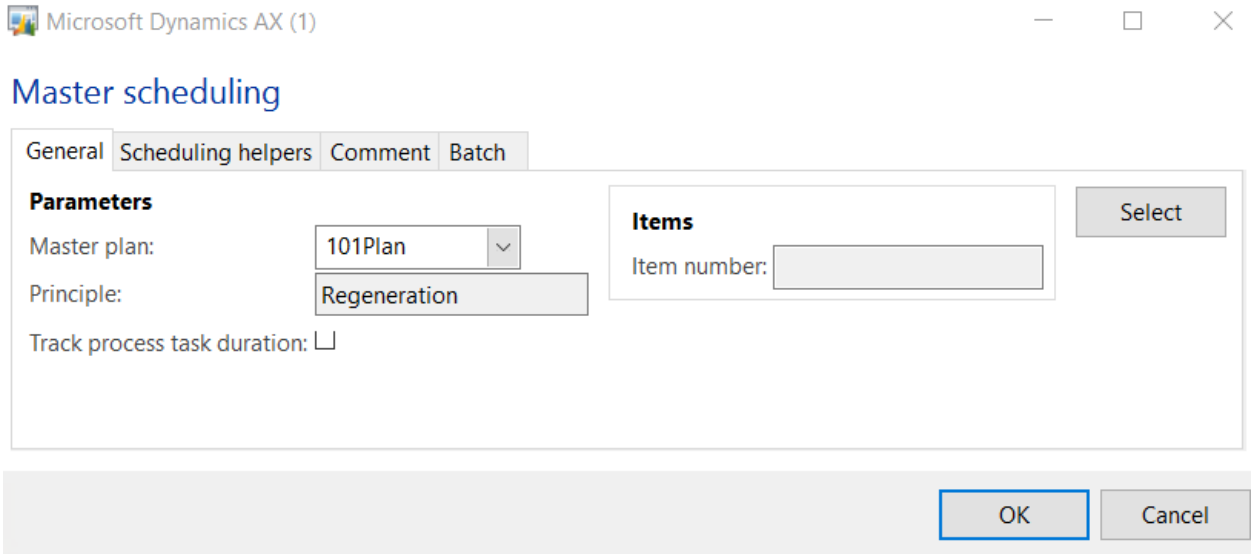

Figure 6.5 Master scheduling

To schedule forecast go to “Master planning → periodic → schedule forecast and you’ll be shown the window below:

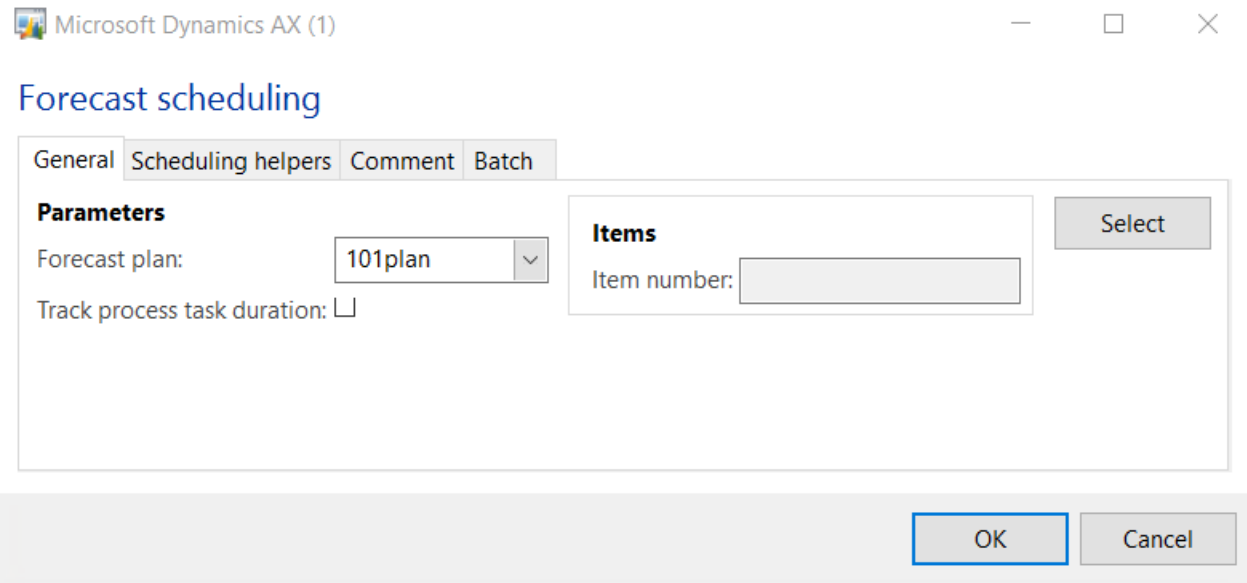

Figure 6.6 Forecast Scheduling

Conclusion

In this report, we’ve analyzed Valvetech’s current system for handling sales, production, master planning, purchasing, cost calculation, and outbound logistics. The main challenges we’ve found in their current system are as follows:

- Plenty of manual transfer of important documents such as production, purchasing, and sales orders, and requirements.
- Risk of human error due to manual labour that could be avoided by automation. It’s important that processes such as cost calculation and estimation is accurate, in order to ensure that the desired profit margin is maintained.
- Little to no communication between the systems. At present, Valvetech is using a wide variety of systems including, but not limited to, Excel spreadsheet, AS400 and Microsoft Access Application. These systems do not integrate with one another, and a Valvetech employee must access several systems in order to gather all relevant information about a process.

- No single platform that every department can access. Every department in Valvetech are using their own systems and other departments have no way of accessing important documents in these systems. Nor will they be notified when changes are made to orders that concern them.
- Cost information on products to be purchased and cost estimation on production products are not stored in any of Valvetech's current systems. This makes for inaccurate BOM's on new products and thus no way of giving discounts on a product without the risk of giving an unfavorable price.
- No way of storing previously created products for use in new productions.
- Production orders do not contain a route or bill of materials (BOM). This means that the production department must manually do an analysis to figure out what components are required and actions that need to be done.

To combat these challenges, we recommend that Valvetech implement a new ERP system, namely MSD AX. The main benefits of switching to MSD AX are:

- Elimination of manual transfer by providing a system that every department can access to view orders, and information that is relevant to them.
- The risk of human error considerably reduced as MSD AX automatically completes calculation processes such as cost estimation.
- A fully integrated approach that automatically updates relevant orders when changes are made.
- Cost estimations are done prior to production, which greatly reduces the risk of giving a discounted price that doesn't cover production costs.
- Templated production processes are stored in MSD AX and can be reused in later productions. Consumed time is also stored in MSD AX which will result in better production time estimates.
- Bill of materials and routes are included in every production order, so the production department always knows exactly what products are required and what operations are needed.

Taking into consideration the effects, the key takeaways are to enable collaboration throughout different departments and multiple projects. Our system also gives the board and owners the possibility to reduce or reorganize full-time employees, hence improving the bottom line. We know overview is key for the board and managers, therefore we wish to offer the opportunity to watch that projects are on track and teams are fully allocated. After the implementation, Valvetech AS will have the opportunity to visualize the next project timeline and deliver on the project scope with confidence.

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