



Business  
Software  
for People

cc | discrete manufacturing

QUALITY CONSTRUCTION

DYNAMIC BILL OF MATERIALS

CALCULATION SCHEMES

DOCUMENT BILL OF MATERIAL

PROTOTYPES

CHECKLIST SYSTEM

DOCUMENTS BOMS

SUPPLY MATERIAL FOR OUTSOURCED PRODUCTION

**Microsoft Partner**  
Gold Enterprise Resource Planning

# cc|discrete manufacturing

Industry Solution for the Discrete Industry Based on Microsoft Dynamics NAV

## CONTENT

Built on Microsoft Dynamics® NAV, cc|discrete manufacturing, developed by COSMO CONSULT, is the industry solution that integrates all operational procedures of production planning and control into the business processes of companies in countless industrial sectors such as, mechanical and plant engineering, special vehicle construction, lift manufacturing, as well as, equipment and apparatus engineering.

cc|discrete manufacturing relies on a unique, integrated information system guaranteeing consistent and transparent management of all business data at all times. This is achieved through industry specific functionalities such as, real-time calculations or the product configuration using dynamic bills of material (BOMs). This allows a quick realization of important company objectives in terms of process transparency and stability, optimization of results in production planning, and the reduction of lead times. (SEE FIGURE 1)

## A HIGH-QUALITY PRODUCT PROVIDES THE BASIS FOR SUCCESS

A special challenge for discrete and configure to order manufacturing is the preparation and tracking of quotations. Technical and calculative components have to interlock in order to describe all services included in the delivery and accurately and simultaneously guarantee the successful completion of an order. The reliability of cost and budget control plays a crucial role in this respect.

## QUICK AND ACCURATE STATEMENTS WITH THE CHECKLIST

Checklists, also known as Q&A spreadsheets, process customers' specific configuration requirements as part of the quoting process and simultaneously ensures the quality control of data. Technical verification processes and checklists prepared according to rules and logical formulas are used to examine collected data and determine whether any details

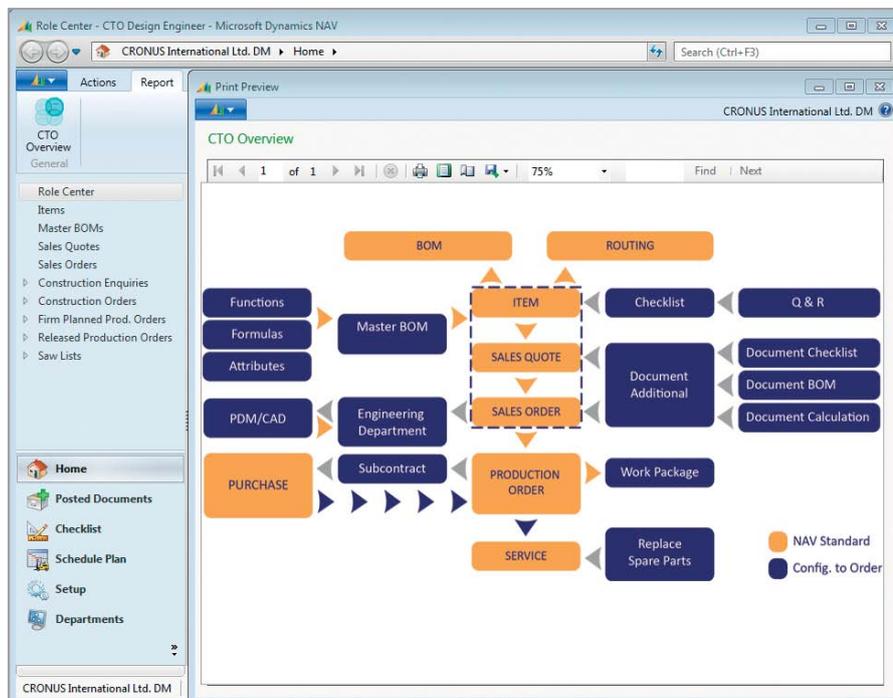


FIGURE 1 | CC|INDUSTRY SOLUTION - DISCRETE MANUFACTURING OVERVIEW

are missing. For example, incorrect product configurations will be immediately recognized. The answers and results from these checklists will be consulted during the generation of quote- and/or order-related BOMs. This automatically generated BOM is therefore called dynamic BOM.

In conjunction with the details in a quotation, a dynamic bill of material can be used to prepare calculations for an individual offer. Surcharges, discounts as well as price increases and reductions can also be taken into account here. (SEE FIGURE 2)

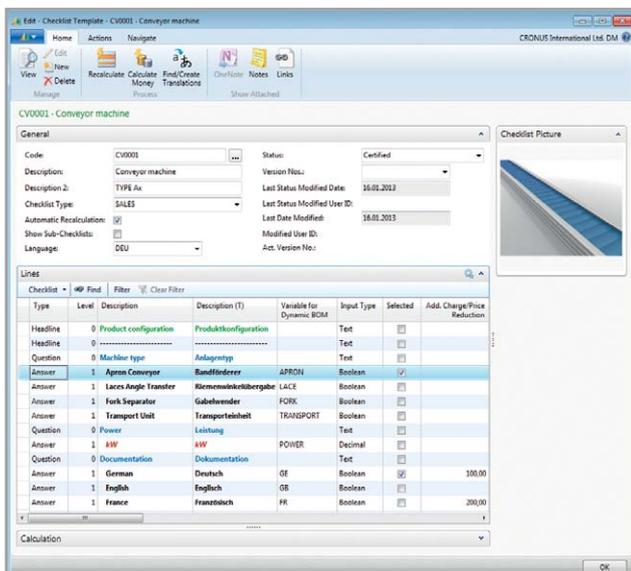


FIGURE 2 | CHECKLIST TEMPLATE

### CONSTRUCTION AND TECHNICAL ASSESSMENT

Many ERP systems lack construction and technical departments. By contrast, cc|discrete manufacturing easily allows the construction tasks and detailed technical descriptions of implementation often required here. This information will also minimize lead times in the manufacturing process.

#### Tree Structures for Document Bills of Material

A construction order is based on the information in a sales order. The structure of the data allows for the

separation of different assembly groups that can subsequently be viewed separately or in combination with other stages of the construction process.

#### Planning Ahead – Avoid Delays

Construction tasks are incorporated into the lead time. Since there are some assembly groups and components that have longer delivery times, they can be ordered in advance to avoid delays.

#### Manufacturing During Construction

Individual assembly groups can be reviewed and modified in the construction module. However, it is not mandatory to fully check the whole order before the manufacturing department receives its first partial assignment.

Once an assembly group is approved, a separate manufacturing assignment can be generated. This permits individual components to be produced in advance. After general approval, the manufacturing order for the assembly of individual groups can be created. Subsequent changes resulting from customer requests are possible and are displayed transparently by the system; even when some assembly groups are being manufactured.

### MANUFACTURING AND PURCHASE WITH NUMEROUS AUXILIARY FUNCTIONS

The manufacturing and purchase departments operate in close concert. To ensure punctual delivery, it is important to know which materials are needed when. Beyond the scope of Microsoft Dynamics NAV, cc|discrete manufacturing offers additional functions that facilitate work in both departments and improve the content of information.

#### Subcontracting with Supply of Material

Order specific batch production may warrant multi-staged assignments that need to be realized simul-



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taneously at multiple locations. Individual operations are often outsourced in such situations, subcontractors and specialists assigned to such tasks must be considered in production plans. The cc|discrete manufacturing module offers the necessary functions that display the supply of materials, monitor the external production, and check incoming invoices.

### Multiple Production Processes, Equal Procedures

In some cases, the same procedure can appear at several stages of one related or multiple unrelated production processes. To increase effectiveness, these procedures can be combined into work packages before being executed. Time and materials that are being consumed can be considered proportionally, which guarantees the accurate allocation of costs.

### Same Basic Material, Same Finished Material

The material(s) to be processed is another variable derived from the multitude of different production orders. Whether for inspections or optimized processing, it is possible to determine precisely those procedural stages of the whole process that use a specific material (for example V2A or V4A).

### CC|DISCRETE MANUFACTURING ALLOWS YOU TO KEEP TRACK

It's a familiar problem: a system provides decent functions facilitating day-to-day operations, increase quality and yield the desired analyses, but after the course of time the collected data becomes complex and confusing; perhaps superfluous. cc|discrete manufacturing provides a number of handy features for solving this issue.

### Item Description Catalogue

Often, a new item is created unnecessarily because the existing one was not immediately found. Sometimes a different spelling or case sensitivity of an item prevented the user from successfully finding it, de-

spite the fact that it already exists. An evaluation will be difficult in this scenario. The clear structure of the item description catalogue, however, will ensure that duplicate data will not be created and that existing items can be found quickly.

### Master Bills of Material for Complete Product Groups

Because order specific manufacturing warrants a different process for each final product, the complete master data for each order needs to be collected. cc|discrete manufacturing bypasses the need for doing so. The customer can select which product groups' master data is to be collected. For the required items, a Master BOM is generated with rules and formulae that preclude technical impossibilities. On entry of quotation and/or order information, a Master BOM is automatically and dynamically generated for the product.

### Prototypes: Learning From Experience

A prototype can be used from a very early stage in a quotation or order. The system's logic is in charge of most of the master data administration and simultaneously ensures that no more data than necessary is being used.

The system makes use of prototypes to check whether you previously manufactured a product with the same features (e.g. width, length, material type). If the search proves fruitless, the required master data is automatically captured. However, if the system finds a matching product in the history data, the BOM that was manufactured and the routings across all of the manufacturing stages will be consulted again for the construction process. As a result, you obtain all the necessary information and benefit from legacy data at the same time.

### Discontinued Items

There is data that should no longer be used because of technical changes or legal obligations but con-





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tinues to appear in BOMs and ongoing orders. The function "discontinued items" offers a controlled display of this modification process and guarantees a target insertion/removal of items and assembly groups into/out of the production process. The saved data intended for the BOMs or for service procedures is retained.

## MAXIMUM FLEXIBILITY

Because nothing is more permanent than change, flexible data and processes are crucial to enterprise solutions today.

## A Rough Schedule

The large volume of information and details which occur during production make it difficult to track. What is needed here is a rough schedule or milestone plan that provides an orientation for weekly meetings. cc|discrete manufacturing allows you to prepare this type of time schedule without having to work out the details. You can also use this schedule for reference during meetings with your customers. Since several milestones may be connected, the schedule provides a temporal sequence and a duration overview without already requiring BOMs or work plans. This schedule can be stored early on in the quote and serve as a

communication device or guideline for employees. (SEE FIGURE 3)

## Order Network

What has been drafted in the rough schedule can be traced as detailed information across all levels of the order network. This is where all information converges, ranging from the order through the construction process right up to the manufacturing of the product and, of course, the ensuing purchase orders. Should a scheduling or material procurement problem arise, these can be quickly recognized in the order network. (SEE FIGURE 4)

## SERVICE: A COMPLETED ORDER IS ONLY THE BEGINNING

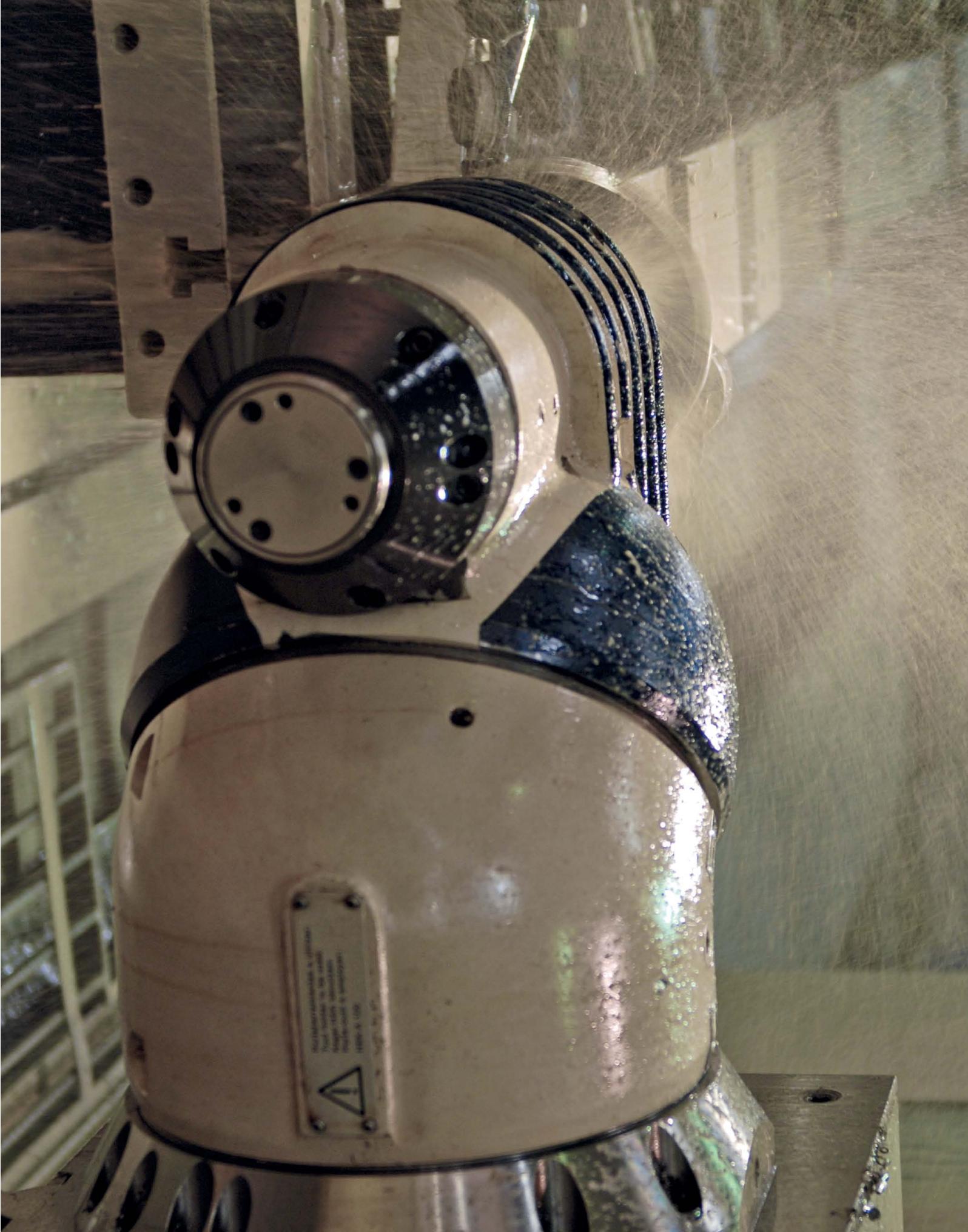
Document Type	Document No.	Process Code	Description	Duration	Person Responsible	Planned Starting Date	Planned Ending Date	Completion %	Actual-Start Date	Actual-End Date
Order	1001	10	Order from Customer	1W	AH	15.06.2012	22.06.2012	100%	15.06.2012	22.06.2012
Order	1001	20	Construction Mechanic	ZW	BD	22.06.2012	06.07.2012	100%	22.06.2012	06.07.2012
Order	1001	30	Construction Electric	SD	BD	06.07.2012	11.07.2012	100%	06.07.2012	11.07.2012
Order	1001	40	Production	ZSD	JR	11.07.2012	05.08.2012	100%	11.07.2012	05.08.2012
Order	1001	50	Installation complete	IM	JR	05.08.2012	05.09.2012	100%	05.08.2012	05.09.2012
Order	1001	60	Transport	4D	JR	05.09.2012	05.09.2012	100%	05.09.2012	05.09.2012
Order	1001	70	Inspection date	SD	LM	09.09.2012	14.09.2012	100%	09.09.2012	14.09.2012
Order	1002	10	Order from Customer	1W	AH	07.01.2013	14.01.2013	100%	07.01.2013	14.01.2013
Order	1002	20	Construction Mechanic	ZW	BD	14.01.2013	28.01.2013	100%	14.01.2013	29.01.2013
Order	1002	30	Construction Electric	SD	BD	28.01.2013	02.02.2013	50%		30.01.2013
Order	1002	40	Production	ZSD	JR	02.02.2013	27.02.2013	30%		30.01.2013
Order	1002	50	Installation complete	IM	JR	27.02.2013	27.03.2013	30%		01.02.2013
Order	1002	60	Transport	4D	JR	27.03.2013	31.03.2013	0%		
Order	1002	70	Inspection date	SD	LM	31.03.2013	05.04.2013	0%		
Order	1003	10	Order from Customer	1W	AH	15.03.2013	22.03.2013	30%		12.03.2013
Order	1003	20	Construction Mechanic	ZW	BD	22.03.2013	05.04.2013	20%		18.03.2013
Order	1003	30	Construction Electric	SD	BD	05.04.2013	10.04.2013	40%		18.03.2013
Order	1003	40	Production	ZSD	JR	10.04.2013	05.05.2013	0%		
Order	1003	50	Installation complete	IM	JR	05.05.2013	05.05.2013	0%		
Order	1003	60	Transport	4D	JR	05.06.2013	09.06.2013	0%		
Order	1003	70	Inspection date	SD	LM	09.06.2013	14.06.2013	0%		

FIGURE 3 | DOCUMENT SCHEDULE PLAN

Name	No.	Description	Quantity	Shipment Date	Expected Receipt Date
Customer 10000			8		
Order 1001					23.01.2014
Order 1002					23.01.2014
Order 1003					23.01.2014
Order 1004					23.01.2014
Order line, Order 1004	M1000	Conveyor machine complete	1	06.08.2014	05.08.2014
Checklist, C100003, SALES		Conveyor machine		16.01.2013	17.01.2013
Doc. BOM, DB00000	M1056	Apron conveyor			
Construction Order, C000000	M1000	Conveyor machine complete	1	05.08.2014	
Prod. Order Line Released 101004	M1000	Conveyor machine complete	1	05.08.2014	04.08.2014
Purch. Rcpt. Header, 107029	107029	Order 106024		23.01.2014	23.01.2014
Order 101016					
Order 104001					15.01.2014
Order line, Order 104001	LS-MAN-10	Manual for Loudspeakers	4	16.01.2014	15.01.2014
Order 104006					15.01.2014
Order 104011					15.01.2014
Customer 20000			4		

FIGURE 4 | ORDER NETWORK

Product service is just as much a part of daily contract manufacturing as is the administration of the manufacturing facilities. A comprehensive service module is already a standard feature of Microsoft Dynamics NAV, however, it is the expansion included in cc|discrete manufacturing that makes it really interesting. (SEE FIGURE 5)



Replaced	Level	Position	Type	No.	Description	Exp. Quantity	Exp. Unit of Measure	Spare Part	Wear Part
No	1		Account(G/L)	2910	Cash	5,00			
No	1		Work Center	101	Technical engineering (CAD)	1,00	MINUTES		
No	1		Work Center	100	electrical engineering TB (CAD)	1,00	MINUTES		
No	1	0400	Item	M1056	Apron conveyor	1,00	PCS		
No	2	0010	Item	M1057	Hydraulic (Conveyor)	1,00	PCS		
No	3		Work Center	200	stock withdrawal	1,00	MINUTES		
No	3	0110	Item	M7014	Hydraulic Ventile Type 70/B	1,00	PCS		
No	3	0130	Item	M7016	Hydraulic drive-3000 Upm	1,00	PCS		
No	3	0140	Item	M7017	Screw M10	10,00	PCS		
No	3	0150	Item	M7019	Screw M12	10,00	PCS		

FIGURE 5 | SERVICE BILL OF MATERIAL

### Service Contracts, Service Orders and Item Worksheets

cc|discrete manufacturing permits a complete organization of work procedures ranging from service contracts with planned and unplanned service orders right up to resource planning. Naturally, the periodical service bills are also included in the software, as is every material movement or material storage for the service staff.

### THE PRODUCT AS SERVICE ITEM

The information for a specific product that was documented during the manufacturing process is automatically copied into the service area and provided as the beginning of the "service lifetime." The manufacturing structure that exists at the time of delivery serves as service BOM. Here you find every single screw and every piece which was once used in the original manufacturing process.

### Repair and Exchange Items

Spare parts need to be replaced or the unit has to undergo routine maintenance or repair procedures. Work certificates indicating replaced parts are created on the basis of service orders.

The service items provide information far into the future to find out which parts originally made the unit and which have been replaced, including the date of repair procedure.



## RESELLER PROFILE

Naviona is a Microsoft partner and Dynamics NAV reseller with a long history of implementing and supporting the manufacturing verticals from COSMO Consult. As the premier reseller we have become the go-to partner for advanced manufacturing implementations based on Dynamics NAV in the US.

Naviona is the 'Navy SEALs of Dynamics NAV'; we are experienced, well trained and we get the job done. Our customer base is primarily manufacturing and distribution companies where finance, operations and inventory management are in focus.

The services provided includes everything from project management to development, we do full Dynamics NAV implementations, optimizations of business processes and ongoing support. We are also available if you just want a second opinion about something related to Dynamics NAV.

Our team is located across the US, from Tampa in the southeast to San Diego in the west. Feel free to contact us for more information or to request a demo.

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