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eBECS Manufacturing Accelerator for Microsoft Dynamics

Overview

Manufacturers know that to survive in the current customer-focused environment they must change the way they do business by enabling a more customer-centric approach. In order to achieve this, manufacturers need to be transparent and engage customers throughout the product life-cycle. Manufacturers also need to offer more flexibility around product configurations, higher quantity, lower prices, faster delivery and quick turn-around of customer enquiries.

To increase profitability and improve customer satisfaction it is necessary to optimise the internal processes that will reduce manual work, improve visibility, increase efficiency, add flexibility and reduce unnecessary costs.

The eBECS Manufacturing Accelerator for Microsoft Dynamics has been designed to complement the existing standard manufacturing functionality by adding the capability to: manufacture or prototype to bespoke customer requirements using an item configurator; use shop floor control functionality to accurately record the progress of production orders; use the quality assurance module to assess and report on the quality of manufactured items or components; and benefit from tools that add additional controls and visibility across the shop floor environment.

Shop Floor Control

Whilst many organisations effectively use systems to plan their production processes, full efficiency of the manufacturing processes cannot be achieved as visibility of production orders can be lost. Workers on the shop floor traditionally have little interaction with the systems and therefore the time spent on individual jobs, wastage and re-work is often not accurately recorded, making it difficult to accurately gauge profit margins.

Shop floor control is used to prioritise, track and report against production orders and schedules. This includes the procedures used to evaluate current resource status, and the update of labour, machine hours, and other associated information as required to support the overall planning, scheduling and costing systems.

The shop floor control options allow shop floor terminals to run either within Microsoft Dynamics or by utilising separate terminals specifically for the reporting of shop floor activities. Dedicated terminals provide a simple, easy to use interface for the shop floor operatives that requires minimal input.

The shop floor terminal screen provides a prioritised overview both of active and pending production order operations. From this, the operator can start and finish production order operations with all related information easily available. Output quantities, additional material requirements and scrappage can be quickly entered. The shop floor terminal can also link in with the quality assurance module if specific quality assurance tests are required at the end of a particular manufacturing operation.

The use of the shop floor terminal improves visibility of the status of production orders across the whole manufacturing process allowing planners to accurately gauge the status of production orders and react rapidly to issues that may occur, such as time overruns or machine breakdowns.

Accurate time recording against production order work centres and machine centres, plus more accurate reporting of output and scrappage (with related reasons), allows organisations to more precisely cost their manufacturing processes and report cost variances.



Quality Assurance

Quality control is a core part of supply chain processes for companies procuring goods or producing goods in manufacturing, assemble-to-order or assemble-to-stock scenarios.

A quality assurance policy allows organisations to determine which goods will be tested and which tests will be carried out, including the acceptance criteria. Policies can be assigned to ranges of products and also assigned at product variant or production location levels. This allows full flexibility in the testing to be undertaken and respects specific regional or product requirements. Each policy can contain as many test cases as required, with the use of either individual test cases to capture a defined option, date and value, or free-form entry. Standard testing measures may be defined to ensure consistency across policies and to make the creation of quality assurance test policies easier. Quality assurance tests are automatically generated when an applicable inventory movement (such as a purchase receipt or production output) is undertaken in the system and based on the quality assurance workflow and policies defined.



Each item to be tested within a test becomes its own test instance and results can quickly be entered into a simple grid view allowing tests to be structured on a per item or per test case basis. For each test result a picture or free-form notes may be entered. If using the quality assurance module on a camera-enabled device using the Microsoft Dynamics tablet client, pictures may be automatically taken and stored from within the QA module. Test sheets may also be generated for test instances so tests can be carried out away from the system and the results recorded. A signature may also be captured to document the tester and for use in the production of test certificates.

The quality assurance module fully integrates with the workflow functionality that is standard within Microsoft Dynamics, allowing full flexibility in how the quality assurance is handled within your organisation. The workflow also allows actions to be defined in the event of quality assurance failures being reported. Examples of such actions could be:

- Create a purchase return order
- Create a transfer order to move inventory to quarantine
- Automatically move inventory to quarantine
- Write-off inventory
- Send for re-test when failures detected in a sample test
- Block serial or lot numbers
- Notify users.

There are also a number of pre-defined workflow templates provided for the quality assurance module for common document types purchase receipts, production output, assembly output, sales returns, transfer receipts and production routing operation output.

Item Configurator

Many organisations have the requirement to offer customers made-to-order products. By allowing workflows to be defined for item configurations, organisations have full flexibility in designing how the item configurator will operate, allowing it to cope with a range of different product scenarios such as:

- Prototypes
- One-off customer samples
- Manufacture-to-order customised products
- Highly-configurable products

From sales documents users will be prompted with the item configurator wizard when entering an item that can be configured. The wizard takes the user through a series of steps based on a pre-defined worksheet. Steps can be questions, product option choices, optional extras, related services, measurements or item personalisation information.

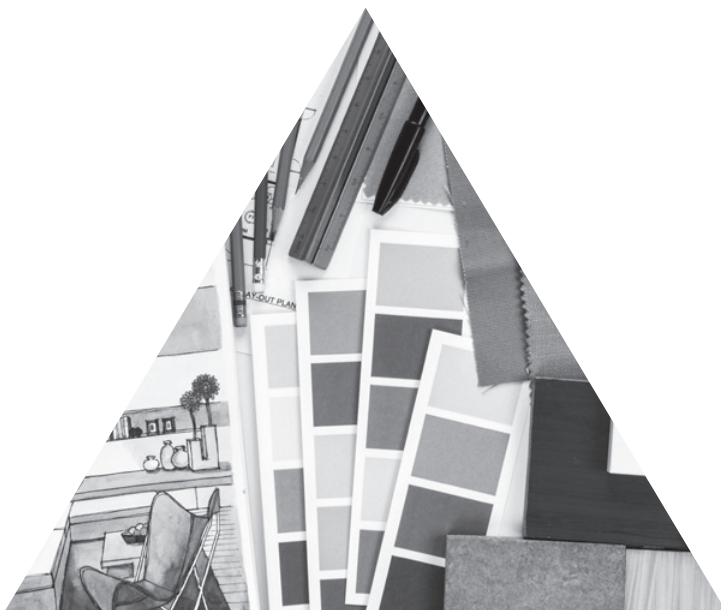
At each step a history of previous selections is made and users are able to step backwards through the history to amend previous choices. Images may be displayed to clarify information, show product images, material samples or personalisation samples.

The item configurator allows dynamic pricing to be displayed at each step of the item configuration. As each change or selection is made the running total is dynamically updated. Where product options or service choices are displayed, the difference in price in selecting that option is shown allowing employees to convey the costs of all choices made.

Calculations can be embedded into the item configurator workflows allowing material requirements to be calculated. For example, pricing for made to measure curtains can be dynamically calculated on a material cost per square metre based on the material requirements and a set of entered measurements.

The item configurator can support both assembly orders and production orders (including routings).

From a completed production order a configured item can be used to create a standard item with a bill of materials and routing or to update the components and routing against an existing manufactured item. This allows the item configurator to be used to configure products to a customer's specific specifications and then save the resultant design to a standard item to facilitate repeat orders.



Engineering Change Management

Changes to the manufacturing process for a product can be caused by many factors, such as scarcity or supersession of a component, standardisation of component items, safety issues or quality improvements, legislative changes, cost savings, changes in customer specifications, the introduction of new machines or working practices, or the use of alternative suppliers or sub-contractors. In order to maintain both quality of products and efficiency on the shop floor whilst product designs are continually evolving, it is important for manufacturers to adopt engineering change control processes.

Approval workflows on production bill of materials, production bill of materials versions, routing and routing versions allow engineering change control to be adopted across the manufacturing process. Each new version of a bill of material or routing can be made to undergo an authorisation process or to notify interested parties via integration with standard workflows. Each individual or team in the authorisation process is able to comment on the proposed changes and accept or reject the proposed changes. Full history of the change control authorisation is retained against the production bill of material or routing. Approval workflows for change control can be easily created using standard templates or the solution allows custom change control workflows to be created for those organisations requiring either more flexibility or having more complex change control procedures.

Production bill of materials have been enhanced by allowing pictures to be stored against each sub-assembly or component allowing visual checks that the correct components are utilised or providing the ability to display technical diagrams against a component. Improved visibility and comparison of production bill of materials versions make it easier to incrementally improve products and to compare each revision to the original base bill of materials as well as previous revisions.



Planning, Capacity and Shop Floor Management

In order to achieve optimum manufacturing processes, organisations need to ensure they have clear views of capacity and material constraints and the status of production orders, and ensure machines are in optimal working order.

In order to improve capacity views, visual capacity loading and enhanced matrix views have been added to machine centres, work centres and work centre groups. These views allow planners to view potential capacity issues at a glance and make it easier to make decisions on reallocating machines, resources or rescheduling production orders. A production load overview provides production planners with a single view showing capacities and utilisation across all their resources with definable Key Performance Indicators (KPIs) helping to highlight where issues could arise.

New dashboards allow planners to easily track the status of open production orders with visual representation of the production routing. With these new dashboards, planners can simply view production orders by metrics such as production orders, customer, item or item family. A production shortage dashboard allows planners to quickly see where material shortages could impact production and view by component, item, item family, production order or customer. By utilising these dashboards, planners have better advanced visibility of potential issues and can prioritise the most important production orders in the event of material or capacity constraints.

Downtime of machines due to unplanned maintenance can have a significant impact on shop floor capacity and production lead times. In order to maintain machines across the shop floor, machines and equipment may be linked to fixed assets. This link allows acquisition, depreciation and maintenance history information to be directly related to machines. Furthermore, by utilising the service management model, internal service orders may be raised for the internal repair or preventative maintenance of machines or to arrange the work to be carried out by a third-party.





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