

PRODUCT BUILDER IN MICROSOFT DYNAMICS AX

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Annotation. This paper represents the approach of the organization of the control system of the automated technological complex with the “Product Configurator” as a key element in ERP-system Microsoft Dynamics Ax. A structural diagram of information flows in the ERP-system is presented. The configuration process is described in detail. A structural diagram of the configuration process is developed and presented.

Keywords. Product Builder, ERP-system, intelligent production, modeling variables, configuration, item, bills of material, production route.

In order to maintain the position in the market, produce high-quality products and at the same time be stable in profit, any modern industrial enterprise should pay attention to the optimization and automation of the technological process, the particular task of which is to implement the possibility of flexible adjustment of equipment and technological process according to the requirements of the client, ideally, without human intervention.

This paper considers the “Product Builder” as a key element of the proposed architecture of the IT ecosystem of a modern manufacturing enterprise, where the ERP-system is the link between external, relative to the enterprise, data sources, and the executing equipment of the production workshop (figure 1).

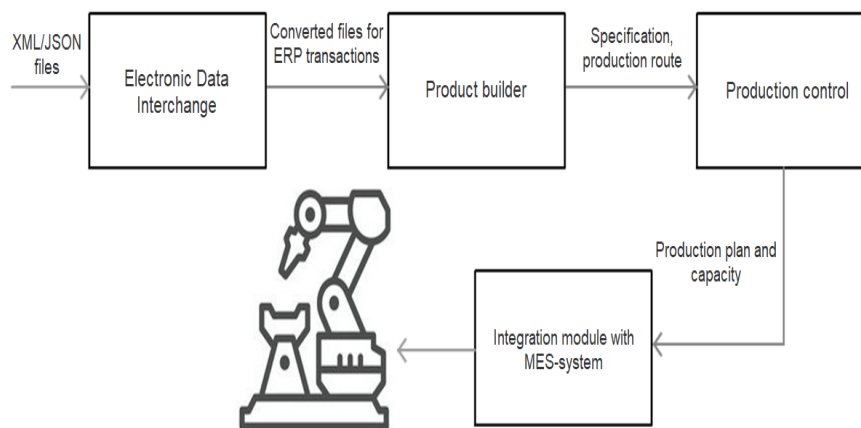


Figure 1 – Block diagram of the movement of information flows in the ERP-system

The Product Builder allows to dynamically configure BOMs and create production routes based on the sales order, purchase order, production order, and a number of modeling variables that are predefined for each item.

The Product Builder module’s key processes are as follows:

- Identification and creation of modeling-enabled items, together with the modeling variables and variable groups that are required to create product models for these items;
- Creation of user profiles, default routes, and default values that can be used in the product models;
- Creation of product models (including calculation variables) that determine the properties of the finished products;

- Automatic creation of standard bills of materials (BOMs) and standard routes of production for each configured item, in a process that is fully controlled by each product model’s modeling tree;

- Sales-price calculation by using either the price combinations that are defined in the “Product Builder” module or the standard BOM calculation;

- Calculation of the delivery date by using the “Master planning” module.

The configuration process includes the following steps (figure 2):

- The first step is the conceptual design of the model (design model defining elements of the model, their types, rules, etc.), after the conceptual design of the model is done the configuration experience can be launched.

- After the configuration process has begun, the work will take place with specific values of the variables, which may be correct or incorrect (Runtime model).

- When changing the values of the variables, the system invokes Configuration backend after each change to validate that model is not in contradiction against the constraints. In case contradiction is detected and one or more constraints are not satisfied the system will immediately notify, so the appropriate correction can be made to variable values before proceed further in the configuration process.

- Once the certain state of the model is validated appropriate values of variables will be “fixed” which will provide a starting point for the next step/change.

- When all necessary variables values are specified and the configuration cost (Sales price) and delivery date should be shown the system will solve the model which will propagate depending on values, validate used calculations, and make sure that the solution found is feasible.

- In the last step when the model is solved system will save the configuration in order to generate associated with source document BOM and Route. Then hand-off to Manufacturing will happen manually (Create Production order from Quote/Sales order) or automatically (MRP run).

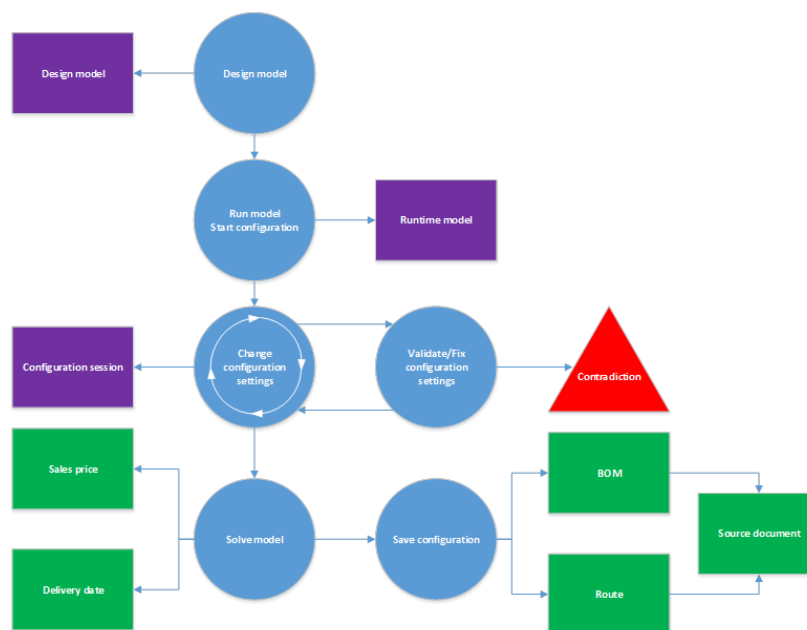


Figure 2 – Diagram of the configuration process

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Based on the configuration and predefined model variables, the Product Builder automatically generates standard BOMs and routes in the system for the production of each item. This simplifies the process of passing the production order and improves the relationship between sales and production.

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КОНФИГУРАТОР ПРОДУКЦИИ В MICROSOFT DYNAMICS AX

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Аннотация. В данной работе представлен подход организации системы управления автоматизированным технологическим комплексом с ключевым элементом “Конфигуратор продукции” в ERP-системе Microsoft Dynamics Ax. Представлена структурная схема информационных потоков в ERP-системе. Подробно описан процесс конфигурирования. Разработана и представлена структурная схема процесса конфигурирования.

Ключевые слова. Конфигуратор продукции, ERP-система, умное производство, переменные моделирования, конфигурация, номенклатура, спецификация, производственный маршрут.