

# Sales-oriented product models for SAP

WHITE PAPER

April 2009

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## Abstract

*This white paper explains how to support sales organizations with a sales configurator based on an existing SAP implementation. It is assumed that the Variant Configurator in SAP is already used or planned to be used. The sales configurators are planned to be based on Configit's technology as used in the application Configit Quote or as a customized application built using Configit Runtime.*

*We propose different solutions and make recommendations on what solution to use in four different scenarios.*

## Background

The target company considered is a company within discrete manufacturing where SAP ERP has already been implemented. The company is already using the SAP Variant Configurator (the module LO-VC in SAP also often referred to as SAP-VC) or is planning to use SAP-VC for defining configurable product for manufacturing and sales.

A typical process is that an order is, more or less manually, transferred from the sales organization to an order entry function in back office. Back office creates the order using SAP transaction VA01 or similar and enters configurations using the SAP transaction CU50. The company might have implemented change management and approval procedures within SAP. We are looking at a situation where the SAP processes are preserved but the quote generation and order entry is improved by having an "outside-SAP" application for generating quotes and orders and uploading them to SAP. The overall picture is illustrated in Figure 1.

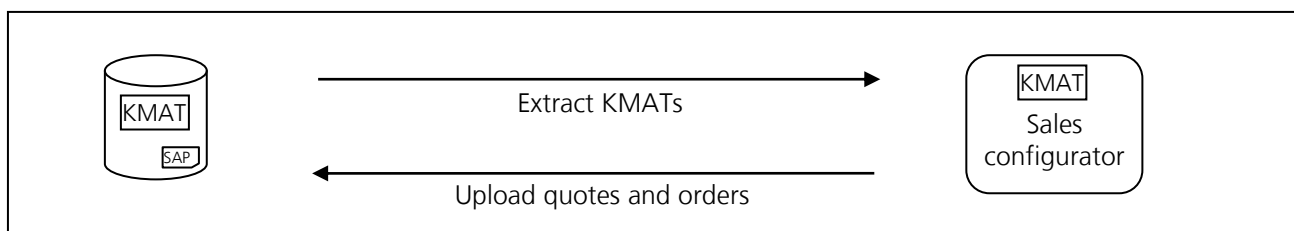


Figure 1. The overall picture using Configit's technology. Data is maintained in SAP and extracted to be used in the sales configurator. Quotes and orders can be created in the sales configurator and uploaded to SAP. The sales configurator can be either Configit Quote or a custom application built with Configit Runtime.

## Scenarios

We will classify the situation into three main scenarios defined according to the existing definitions of configurable materials (KMATs) for the company's configurable products. We consider one configurable product as defining the situation. Of course, the picture might be different for different products. For instance, there might not yet be a defined KMAT for one configurable product whereas another product might have been fully defined as a KMAT with characteristics, dependencies, procedures etc. We will discuss the mixed scenarios and how to deal with them at the end of the document.

The four different main scenarios for a configurable product are as follows:

### Scenario 1: Existing KMAT, fully maintained in SAP

In the first scenario, there exists a KMAT in SAP for the configurable product. It is defined and maintained fully inside SAP-VC without any external sources. There are two variations of this scenario to consider. They might be overlapping, and if this is the situation, it should be considered as variation **b**.

#### a. [Too rich KMAT]

The KMAT contains all sales relevant characteristics but contains many details which are only relevant for manufacturing. Additionally, it may further have a definition of the user interface (using characteristic



groups in the configuration profile) which is not suitable for sales. Only a subset of the characteristics should be shown in the sales configurator and organized differently than in the existing KMAT and configuration profile.

**b. [Too weak KMAT]**

The KMAT is missing relevant characteristics for sales and perhaps also missing constraints and default assignments more appropriate for sales. The characteristic groups defined in the existing configuration profiles are not right for sales and it does not include the missing characteristics.

## Scenario 2: Existing KMAT, partially maintained outside SAP

In the second scenario, there exists a KMAT in SAP for the configurable product but an important part of the maintenance takes place outside SAP in external tables such as Excel sheets. The external data is then by some custom mechanism – perhaps partially manual – uploaded to SAP-VC. As above, the resulting KMAT could be either too rich (a) or too weak (b), but the suggested solution will in both cases be the same so we do not make the distinction here.

## Scenario 3: No KMAT yet

In the third scenario there is no product model for the material in SAP yet. It has been decided that configurable materials should be defined and quoted in SAP but it has not necessarily been decided that maintenance should be done fully within SAP-VC

## Scenario 4: KMAT creation and maintenance too time consuming

This fourth scenario covers situations where the creation and maintenance of models in terms of dependencies, classes, procedures and reference tables is too time consuming and becomes a bottleneck that delays the introduction of new products and requires special skills that are hard to find within the organization. This scenario can occur in all three contexts described in the scenarios above, i.e.:

1. KMATS exists on the system but the ongoing maintenance burden becomes unmanageable as models grow over time and it becomes too difficult to keep up with demands for new and updated KMATS.
2. The use of external rules from general applications such as Excel, Access or other applications does not provide sufficient product modeling support and it becomes too difficult to use non-dedicated tools to build and maintain product models and to align these models with KMATS in SAP.
3. The need to consistently implement a significant number of product models in SAP cannot be met because of lack of expertise and modeling resources.

The four scenarios are illustrated in Figure 2.

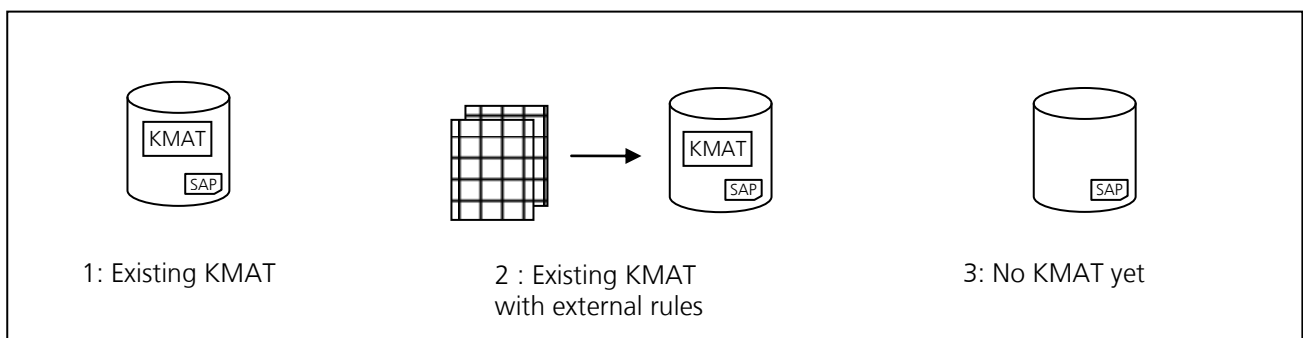


Figure 2. The four main scenarios. 1: A KMAT already exists. 2: A KMAT exists and it is partially based on external data. 3: There is no existing KMAT. Scenario 4 can occur in any of the three situations.



We are now going to consider different approaches that will allow a sales configurator to be based on sales-oriented product models for configurable materials.

## Solution approaches

The proposed solutions have the common feature that the KMAT in SAP-VC will define the validity and completeness of configurations. In some situations the KMAT will be supplemented by an external, sales-oriented product model using a new construction called *SMAT* for *sales material*. The SMAT might contain additional sales specific characteristics and constraints and the SMAT will be linked to an underlying KMAT for the material.

KMATs reside in SAP but some of the required data might be maintained outside SAP in custom tables or in the tool Configit Product Modeler.

The five approaches are as follows:

**A. [New KMAT]**

The existing KMAT is altered, a new profile is added to the existing KMAT, or a new KMAT is created with the necessary sales-oriented characteristics and constraints. The characteristics groups should be made so that they match what is needed in the sales configurator. The new KMAT is extracted and used in the sales configurator as shown in Figure 1.

**B. [Annotate]**

Annotations to existing KMATs are listed in one or more separate files. The annotations can be information that will hide certain characteristics, provide new default assignments, and alter or add characteristics groups. Annotations can also include alternative names and translations for values and characteristics as they are to be presented in the user interface. In SAP there is further an option of associating organizational areas to classes and the characteristics in classes so that, for instance, characteristics can be marked as being relevant only for other areas than sales. If this option is used, the information can be pulled out and used in the annotation step.

The result of making an annotation is a modified KMAT. The annotations are added to a KMAT during extraction by Configit Server, which is responsible for extraction of data from SAP and the distribution of data to the sales configurators. The flow is shown in Figure 3.

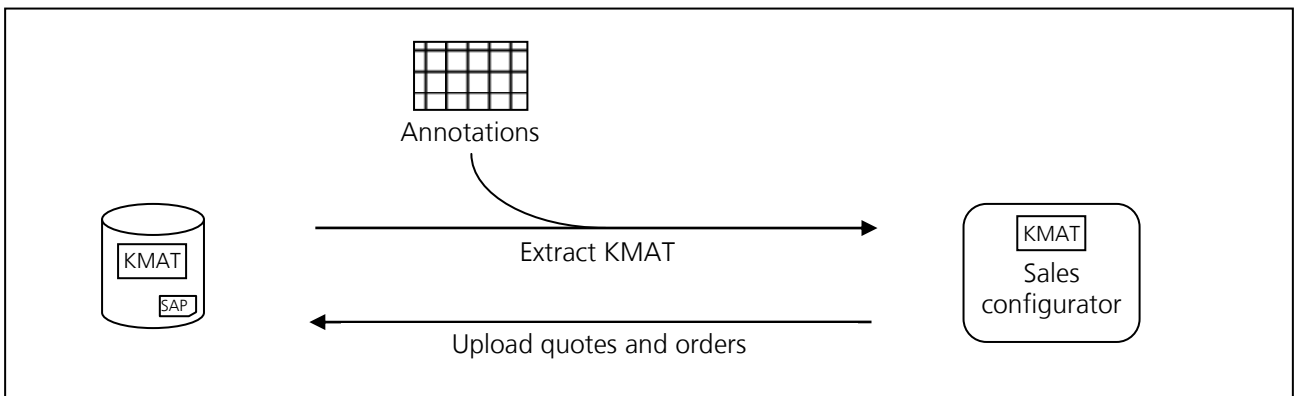


Figure 3. Approach B. Annotations to the extracted KMAT are added during distillation. The annotation contains information relating to the user interface about the layout. This can be information relating to hiding certain characteristics and grouping them differently than in SAP-VC



C. [Make SMAT]

A separate sales material, SMAT, is developed based on the structure of an existing KMAT as defined by the KMATs classification. The SMAT is developed in the tool Configit Product Modeler. The starting point is an import of the characteristics, values and other structural information for a specific KMAT. This import into the Configit Product Modeler is made by an automatic extract from SAP (using an SAP user with the necessary (read-only) access rights).

The SMAT is then developed as a new product model that can reuse characteristics and values from the imported KMAT. New characteristics can be added freely and new sales-oriented constraints can be defined. The constraints can be on new characteristics, on existing characteristics, or a mixture of new and existing. The KMAT and the SMAT with all dependencies are both present in the sales configurator. The SMAT is purely declarative and offers complete user guidance. On every user selection the SMAT and KMAT is synchronized so that if the user makes a choice which makes the KMAT invalid, this is shown in the user interface. A quote will then only be valid in the sales configurator if it is accepted by both the SMAT and KMAT. There is therefore no risk of accepting a quote that will later be rejected by SAP-VC. The SMAT might limit the options available in the sales configurator, compared to the options available if entered directly in SAP. This means that it is possible to make sales-related decisions on what a particular sales force should be able to quote. The flow is shown in Figure 5.

It is possible to upload the SMAT to SAP-VC so that orders can be validated also inside SAP. But it is not necessary in order to get the sales configurator working as needed.

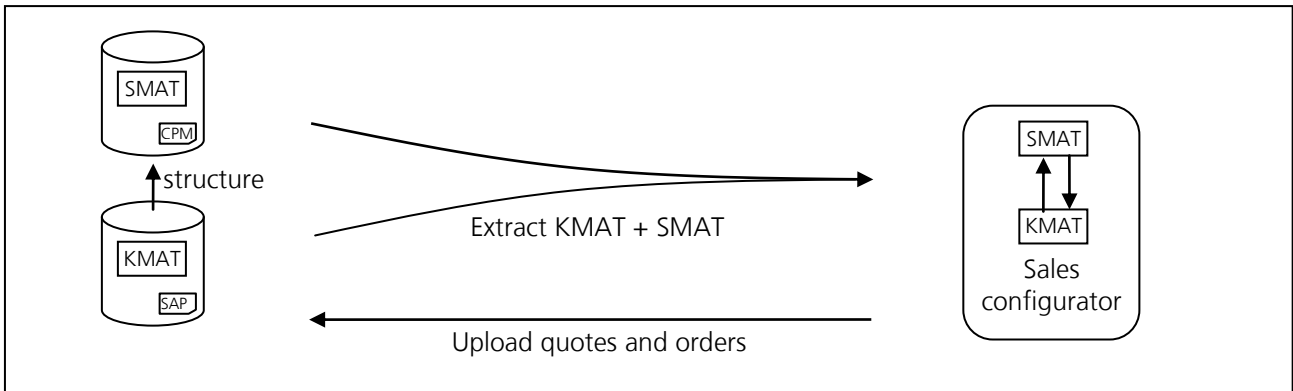


Figure 5. Approach C. The KMAT structure (characteristics, values etc.) is imported into Configit Product Modeler (CPM) as a basis for developing a sales-oriented model, an SMAT. The SMAT is then developed independently in CPM. At runtime both the SMAT and the KMAT are executed. No configuration will be determined valid and complete unless determined so by both.

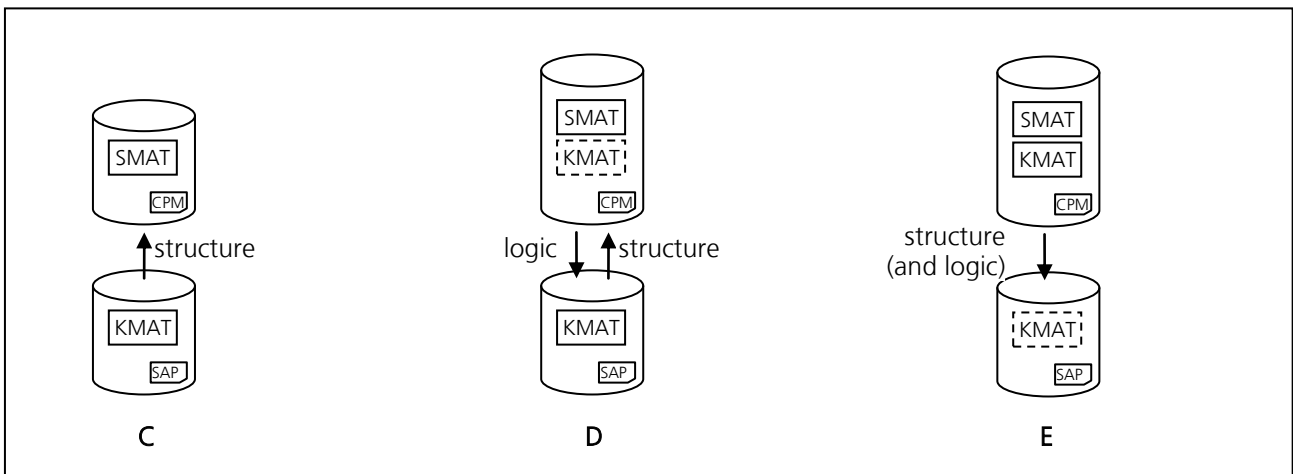


Figure 4. Illustration of the data flow in approach C, D, and E. See main text for details.



**D. [SMAT and KMAT logic upload]**

As in approach C a separate SMAT is developed in Configit Product Modeler (abbreviated CPM) based on the KMAT structure from SAP-VC. Furthermore, part (or all) of the logic for the KMAT is added in CPM. This is then uploaded as dependencies to SAP-VC which is still the master of the KMAT data. CPM is the master of the SMAT data. This is somewhat similar to having custom external tables of data being uploaded to SAP-VC except that there are much more powerful modeling capabilities in CPM than in custom external tables. The flow is illustrated in Figure 4 (D).

**E. [KMAT structure + logic upload]**

In approach E, Configit Product Modeler is the master for the KMAT data as well as the SMAT data. The KMAT can be uploaded to SAP so that configurations can be validated in SAP using the variant configurator with, for instance, transaction CU50. This is illustrated in Figure 4 (E). If the KMAT from the start is made sales-oriented, it might not be necessary to create the SMAT. It is also not strictly necessary to upload the logic as dependencies. If all configurations are made through the sales configurator, they will all be determined valid against both the KMAT and the SMAT by the sales configurator before entering SAP. It is only necessary to upload the logic to SAP if configurations have to be checked directly in SAP.

Approach C, D, and E all involve Configit Product Modeler (CPM). CPM is a standard tool for making product models for variants. For the present purpose, CPM is equipped with various import and export scripts that facilitate the synchronization with SAP.

## Recommended solutions

We now revisit each of the scenarios and suggest what approach to use in each of them. The recommendations are summarized in Table 6.

<i>Scenarios</i>					
1a: Existing KMAT, too rich		++	+		
1b: Existing KMAT, too weak	+		++		
2: KMAT with external rules			+	++	
3: No KMAT yet	(+)			+	++
4: KMATs too difficult to create and maintain				+	++
<i>Approach</i>	A: New KMAT	B: Annotate	C: Make SMAT	D: SMAT + KMAT logic upload	E: KMAT structure + logic upload
<i>Tool</i>	SAP-VC	Configit Server	Configit Product Modeler		

Table 6. Summary of recommended solutions: “++” means preferred solution, “+” means a reasonable alternative, “(+)” means another less attractive alternative. See further details in main text.



For scenario **1a** the recommendation is to use annotations (approach **B**). The KMAT is very close to what is needed in sales and the most efficient way of obtaining the wanted effect is to define and maintain the modifications in a separate collection of files. As an alternative, an SMAT can be defined with the same effect (approach **C**). With the SMAT there is the further advantage that it is easy to later add more sales-oriented characteristics and constraints.

For scenario **1b** the recommendation is to create an SMAT (approach **C**). An alternative is to define a new or altered KMAT with the sales specific features (approach **A**). If it is preferred to keep everything in SAP-VC, this is the option to select. However, better user guidance and more flexible constraint formulations are available if an SMAT is created.

For scenario **2**, where part of the KMAT comes from external sources, the recommendation is to create in CPM not only an SMAT but also the part of the logic that already comes from other external sources (approach **D**). An alternative is to keep the external sources in place and only create an SMAT (approach **C**). If the KMAT is in fact rich enough to contain what is needed for sales, but have too many details (as in scenario 1a), it would be possible to keep the external sources and use annotations instead (scenario **B**) but data would then reside in three different systems: SAP-VC, external data sources for part of the KMAT logic, and the annotations.

For scenario **3**, the recommendation is to construct the KMAT externally in CPM and then upload the resulting KMAT structure and logic to SAP-VC (approach **E**). This is preferred because the modeling environment in CPM is more powerful than the existing SAP-VC environment. However, due to this expressiveness, user guidance will be best in the sales configurator and not necessarily very good in SAP transaction CU50 due to some constructions not being well-supported in SAP-VC. Alternatively, a full KMAT could be constructed from scratch (approach **A**). This is typically quite involved. Another and better alternative is to define the KMAT structure in SAP-VC and then add the logic in CPM (approach **D**).

For scenario **4**, the recommendation is to construct the KMAT externally in CPM and then upload the resulting KMAT structure and logic to SAP-VC (approach **E**). This is preferred because the modeling environment in CPM is more powerful than the existing SAP-VC environment and provides the modeling support that is missing in general tools such as Excel and Access. To mitigate potential performance problem in CU50 this approach could adopt CU50-compliant modeling patterns in CPM.

For mixed scenarios, where some KMATs might be non-existent and others are fully defined, the recommendation is as follows: Choose consistently to use approach **B**, **C**, **D** or **E**. If the right choice for just one of the KMATs is approach **C**, **D** or **E**, then use **C**, **D** and **E** for all of them in order to limit the number of external tools and data sources. In approach **C**, **D**, and **E** only the external tool Configit Product Modeler is used, whereas in approach **B** custom external files are used.

## Further information

Further information about Configit Quote, Configit Server, and Configit Product Modeler can be found on Configit's website [www.configit.com](http://www.configit.com). Further information about SAP-VC (also called LO-VC because VC is part of the LO module) can be found on SAP's online help portal on [help.sap.com](http://help.sap.com) (search for LO-VC) and on the portal [www.configuration-workgroup.com](http://www.configuration-workgroup.com) for the interest group CWG (Configuration Workgroup).



## Terms and abbreviations

This section contains a summary of terms and abbreviations used throughout the document.

### Abbreviations

CPM:	Configit Product Modeler
CWG:	Configuration Workgroup
KMAT:	Configurable material (in SAP)
SMAT:	Sales material (the term is new and occurs for the first time in this document)
SAP-VC:	SAP Variant Configurator
SAP-LO-VC:	SAP Variant Configurator (emphasizing that it is part of the logistics module LO)

### Terms

Configit Product Modeler:	A tool for defining product models (developed by Configit).
Configit Quote:	An application for generating SAP quotes and orders outside SAP (developed by Configit).
Configit Server:	An application performing distribution of product models, configurations, quotes, orders, and more (developed by Configit).
Configit Runtime:	A programming interface used to construct custom sales configurators (developed by Configit).



### About Configit A/S

Configit is a Copenhagen-based independent software vendor that offers third generation configuration solutions to companies with product configuration needs. The configurators are used in product development, as sales configurators, and for maintenance, service and overhaul of complex products. Configit is a SAP-certified software solution partner.

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