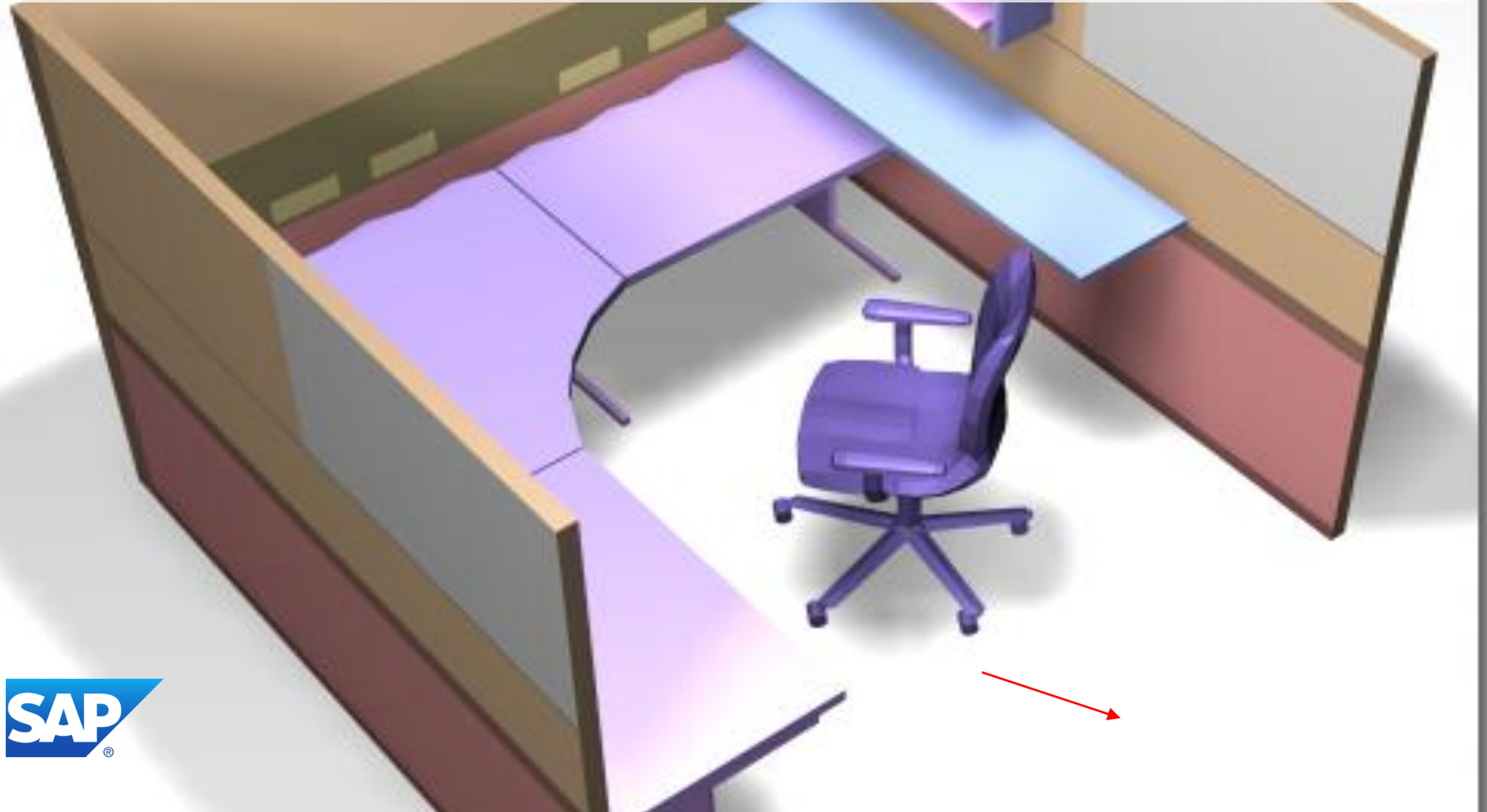


Product and Variant Configuration at SAP

Albert Haag, SAP AG
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What is Product Configuration?

A product is something a business offers for sale; this includes:

Material products

Services

Financial packages

Compound solutions of materials, services, and financing



A configurable product is one that requires an individual specification

Simple configurable products have one specifiable component

Multi-level configurable products may have more than one specifiable component

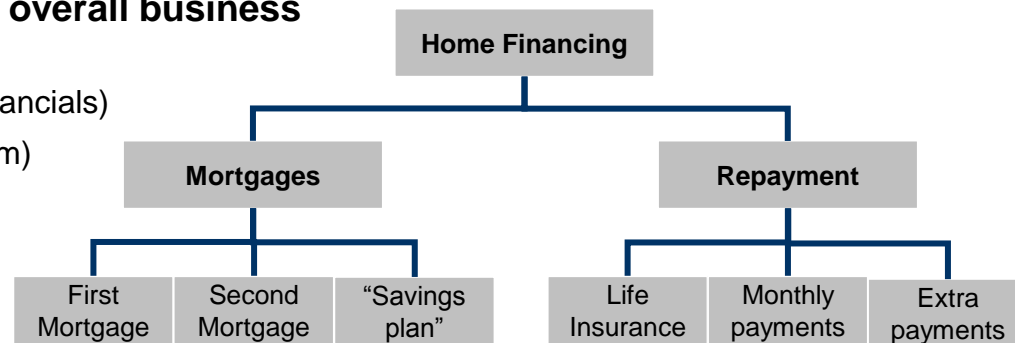
Product configuration is a business step in an overall business process such as

sales or delivery (SAP VC: interfaces with logistics and financials)

Customizing a product instance (airplane, operating system)

Related Terms

- *Mass Customization (partly Synonymous)*
- *Guided Selling/ Recommender Systems*

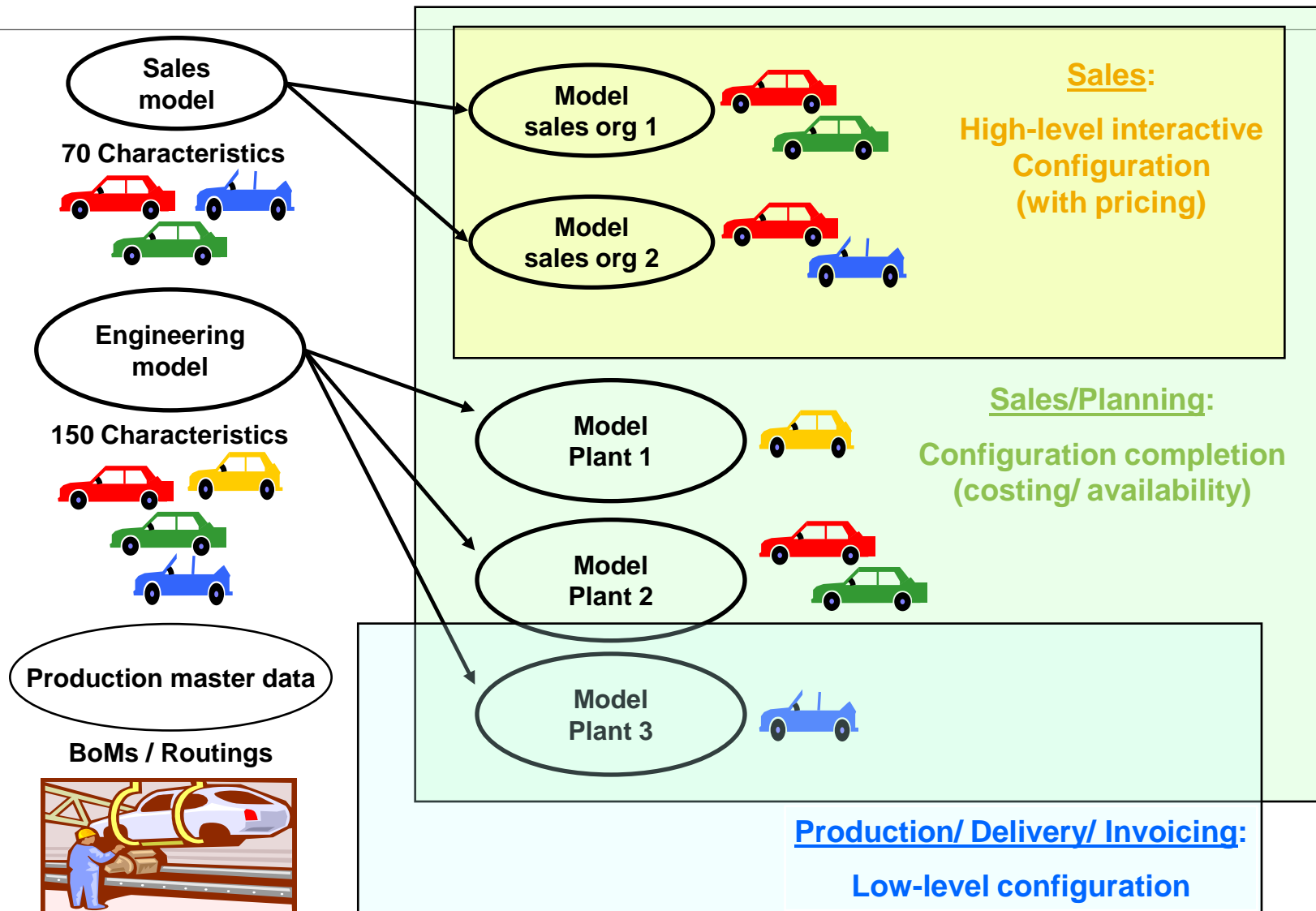


Product configuration has a considerable span:

Products that can be completely formally configured

Products that need (creative) Engineering/ Design

An Example: Make-to-Order Business Process



Product Configuration – Problem Dimensions

Underlying business process

- Sales/quotation
 - for products
 - for solutions
- Instance configuration
 - Software system configuration such as SAP ByD system
 - Airplane cabin layout

Required type and depth of business integration

- Assembly/ delivery of finished product/ solution in-house
- Supply of components only

Configuration problem solving techniques employed

- Extended CSP
- Preference/ default reasoning

Intended user interaction mode

- Provide decision support for interactive user (explanations/ what-if/ conflicting choices)
- Calculate proposed solutions non-interactively

Observations About Sales Configuration in General

- ✓ Accompanying pricing, costing and availability calculations essential
- ✓ Usually a multi-criteria optimization problem
- ✓ Often encompasses a two-person game between
 - ✓ The vendor of the product/ solution (this is the owner of the configurator and business process)
 - ✓ The buyer (configuration needs to be “fun” for buyer)
- ✓ Is not a business process in itself – manifests itself as one or more business process steps
 - ✓ High-level configuration step (interactive)
 - ✓ One or more “completion” steps (non-interactive)
 - ✓ One or more low-level fulfillment steps (non-interactive – BoM explosions; routings)
- ✓ The vendor (owner of the business process) will require from the deployed configurator:
 - ✓ Empowerment over content and UI changes
 - ✓ Cost-effectivity when maintaining it
 - ✓ Enterprise wide consistency
- ✓ The vendor may specify procedural behavior (bad choice!)
- ✓ User choices need to be respected (even when model changes)
 - ✓ Configuration repository must contain minimal notion of “author” for a property (“justification”)

Details: Sales of Configurable Products Process

Standard categorization of business processes associated with sales of configurable materials

- Assemble to Order (ATO) – in-house or at customer site
- Make-to-Order (Specification) (MTO/ MTS)
- Engineer-to-Order

Sale of service products (same basic model as for materials; different integration issues)

- Utilities – contracts (mix of legal and technical attributes)
- Telco – mix of hardware and contracts

Sale of solutions

- Simultaneous configuration of a potentially large set of individually configurable materials and services
- Apply global constraints across this set

Outlook: collaborative configuration of solutions

Details: Business Integration Problem

Collaboration between sales, logistics, and engineering may be required in master data/ model maintenance

Configuration results must be intelligible/ available down-process

- Base low-level decisions on configuration results
- Include/ produce product documentation at

Configuration result may need to be changed/ adapted down-process

Forecasting also in conjunction with configurable products

SAP Product Configurator Overview

SAP ERP Variant Configurator

- Provides high-level configuration in SAP ERP (R3)
- Since 1994
- ~ 2000 customers (companies not users)

SAP IPC (Internet Pricing and Configuration)

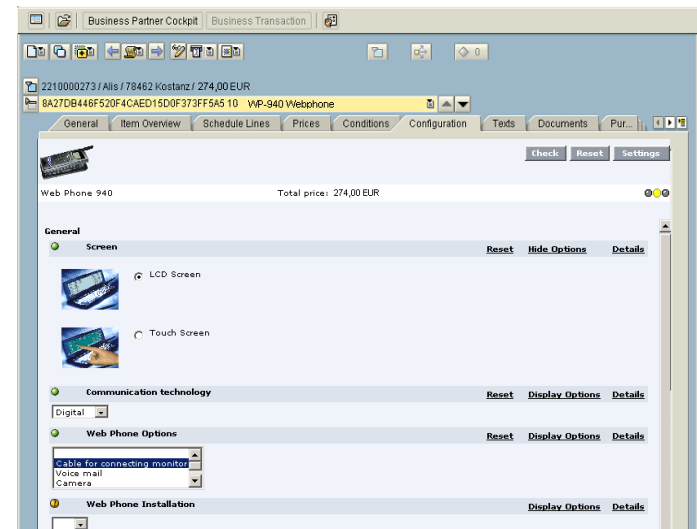
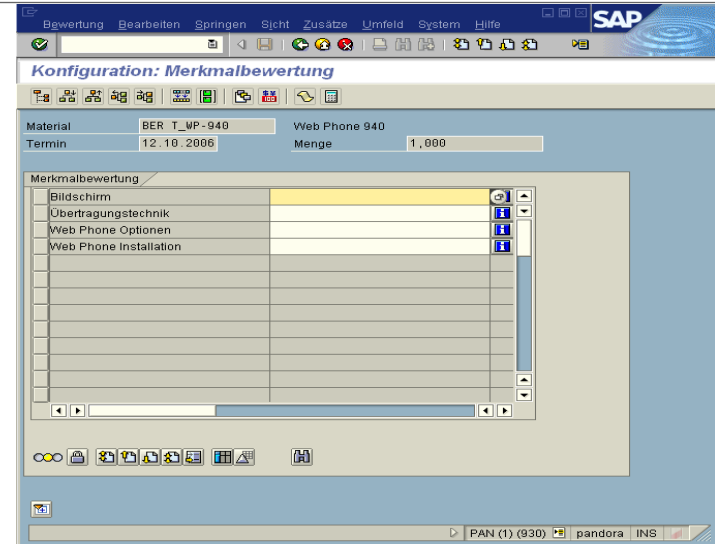
- Provides high-level configuration in SAP CRM
- Since 2000
- Implemented in Java
- 300+ customers (companies not users)
- Emulates SAP VC as much as possible

SAP Solution Configurator

- Based on IPC engine with “advanced” features
- Offered on project basis since 1998
- Standard offering recently announced

SAP ByD Product Requirement Specification

SAP ByD Scope Selection



SAP Variant Configurator Usage: a UNIX Server

Automate logistics planning and execution

- Many orders/ day: High throughput
- Ensure that only valid orders are accepted into back-end ERP system
- Create bills-of-material and routings
- Enable fuller utilization of production capabilities

Challenges

Potentially high project cost

Integration is the central aspect

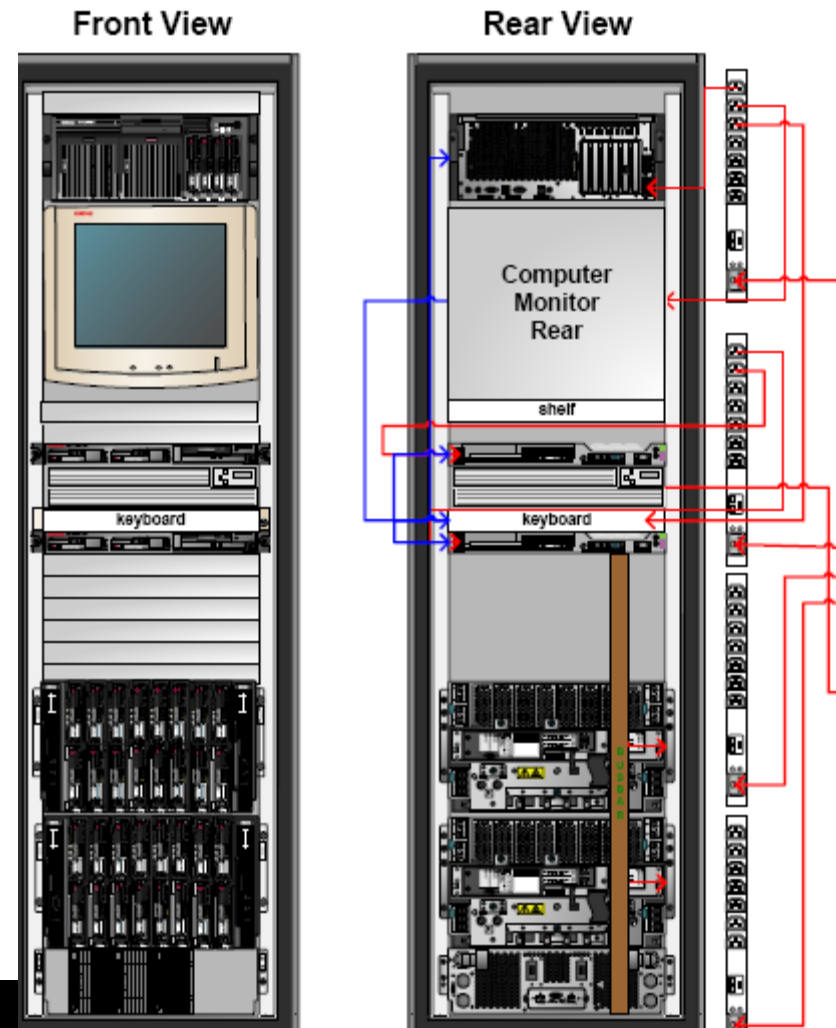
Remarks:

Successful implementation of SAP ERP Variant Configurator (1995 – present)

- *Covers “manufacturing Completion” step*
- *Subsequent low-level step also in ERP*

Sales configuration started with SAP IPC but remains non-standard solution

Computer (Server)



SAP Solution Configurator Usage: Office furniture

“Enabling” the selling of modular furniture solutions

- Without being able to sell the solution to customers plant that produces components not utilizable
- Requires integration of configurator, CAD, and ERP



Remark: Originally based on early project with SAP IPC; current solution has evolved

SAP IPC Usage: Selling a car

“Sales-Channel Internet”:

- Many orders/ day: High throughput

Channel enabling

- Consistent orders from dealers
- Direct end-customer orders through internet

Also: Automate logistics planning and execution

Additional challenges :

Ensure sales configuration translates into manufacturing configuration consistently

Provide adequate user guidance and explanations

Remarks:

Approach deemed adequate if offers same possibilities as visit to dealer

Over-simplified if better configuration could be obtained through dealer



German Renault web site (2007):

- Not using SAP
- User could not visit inconsistent states
- Current appearance simpler

High-Level Scope Selection

Profiling of the Solution Scope

Select countries and type of business

The screenshot shows the 'Edit Project Scope' dialog with Step 1 selected. The dialog is titled 'Edit Project Scope' and has a progress bar with steps 1 through 6. Step 1 is 'Country and Type of Business'. Below the progress bar, there are buttons for 'Previous', 'Next', 'Finish', 'Cancel', and 'Save Draft'. The main content area has a heading 'Country and Type of Business' and a sub-heading 'Country'. Below this, there is a text box with the following text: 'Review the countries where you will implement the solution. Your solution will include specific options for these countries, such as language and financial settings.' To the right of this text box is a table with two columns: 'Country' and 'Type of Business'. The table has three rows: 'Germany', 'United Kingdom', and 'China'. The 'Country' column is currently selected. Below the table, there is a text box with the following text: 'You can modify the selection above: Edit Countries'. To the right of this text box is a text box with the following text: 'You can modify the selection above: Edit Types of Business'.

Usage

To begin with the definition of the solution scope, users must first select required countries and a type of business as well as the implementation focus

Based on this information, Business ByDesign compiles the relevant set of business functionality, based on which users can define their detail-level solution scope

Decide on implementation focus

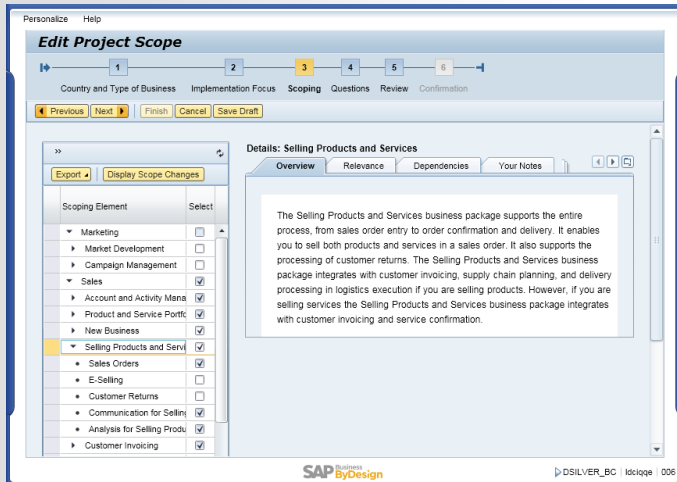
The screenshot shows the 'Edit Project Scope' dialog with Step 2 selected. The dialog is titled 'Edit Project Scope' and has a progress bar with steps 1 through 6. Step 2 is 'Implementation Focus'. Below the progress bar, there are buttons for 'Previous', 'Next', 'Finish', 'Cancel', and 'Save Draft'. The main content area has a heading 'Implementation Focus' and a sub-heading 'Select Implementation Focus'. Below this, there is a text box with the following text: 'You may prefer to take a phased approach instead of implementing the whole SAP Business ByDesign solution at once. To do this, you simply specify the focus of your current implementation project. If you select a limited focus now, you can extend it later to cover the whole solution. Note that the implementation focus you select may restrict your choices in subsequent steps.' To the right of this text box is a table with two columns: 'Implementation Focus' and 'Selected'. The table has four rows: 'Complete Solution', 'Buy, Sell, Administrate', 'Manage and Control Projects', and 'Manage and Control Projects'. The 'Complete Solution' row is currently selected. Below the table, there is a text box with the following text: 'The implementation focus Complete Solution enables you to explore and implement capabilities from the whole SAP Business ByDesign solution. It can be selected during the initial setup or when making changes later in the solution life cycle.'

Relevant elements

- Countries
- Type of Business
(e.g. Services, Manufacturing)
- Implementation Focus
(Use complete solution or partial usage e.g. CRM only)

Detailed Solution Scope Review and Refine the Solution Scope

Review Business Packages and Topics



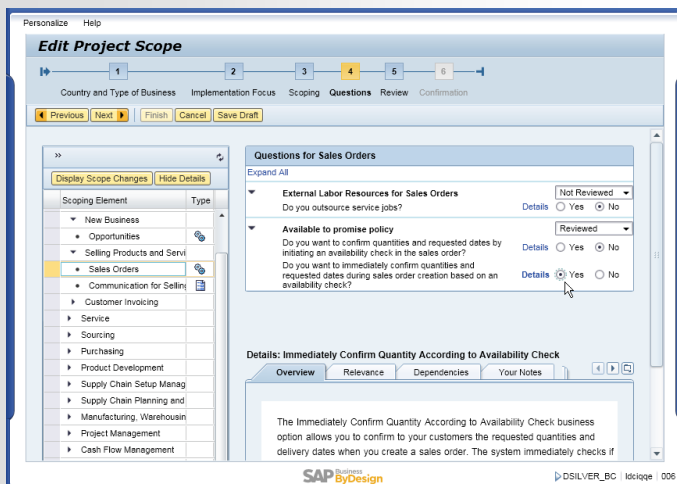
Usage

As first step, the user reviews the Business Packages and Topics that were preselected through High-Level Scope Definition

In a second step, the user reviews the recommended Business Options for the selected solution scope

Once finished, the detailed solution scope becomes the basis for the contract as well as for a trial solution

Answer the Question Catalog (Business Options)



Relevant elements

- **Business Packages**
(e.g. *"Selling Products and Services"*)
- **Business Topics**
(e.g. *"Sales Order"*, *"Customer Returns"*)
- **Business Options**
(e.g. *"Approval for Customer Returns"*)
- **Constraint Rules, Recommended Defaults**
(e.g. *"Sales Order" requires "Sales Invoicing"*)

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Further information:

<http://www.sap.com>

<http://help.sap.com/>



Thank You!

Contact information:

Albert Haag
Development Architect
albert.haag@sap.com

Appendix