

SAP's PDM Strategy



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SAP's PDM Strategy

SAP's strategy for PDM is to support two main scenarios:

- ❑ Connection between the R/3 System and third-party PDM systems
- ❑ Implementation of SAP's own PDM solution in the R/3 System

The development of the standard interface to PDM systems will continue to benefit from our many years of experience in the integration of external systems in SAP environments. SAP will continue to work closely with its partners to improve the functionality of the interface, and to implement support for other PDM systems. The certification of interfaces remains an important milestone in cooperation with SAP's partners.

At the same time, SAP offers its own PDM functions in conjunction with other R/3 application components, to provide a single-source integrated solution. SAP's PDM solution reflects the expertise gathered from the implementation of business processes for entire companies, especially in the interdependencies between engineering and production.

Earlier releases of the R/3 System already supported important PDM functions such as document management, engineering change management, classification system, CAD integration, project system, and product configuration. In release 3.0, the engineering side of these functions was considerably enhanced, and interfaces between functions were improved. Combined with other important PDM modules, such as workflow and the product structure browser, these functions now form a complete PDM solution that is fully integrated in the R/3 environment. In release 4.0, SAP's PDM functions will be available as a standalone solution.

Integration of third-party PDM systems

PDM functions as a standalone solution

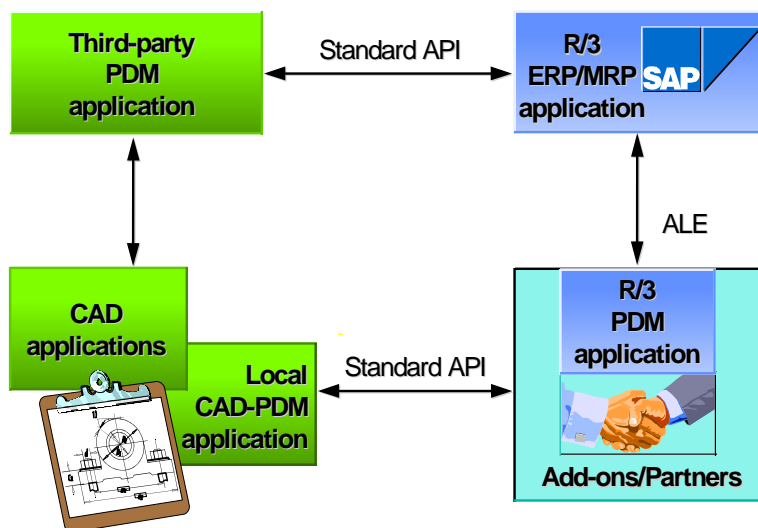


Fig. 1: SAP's PDM Strategy

Document Management System

Modern companies are finding it increasingly important to manage a wide range of technical, commercial, and administrative documents in a consistent way. Employees who have the required authorization need to access the most diverse types of document at all times, and they need access to the current version.

The R/3 document management system offers a solution to this complex problem that can be applied throughout your company.

Authorization checks for accessing original documents

To uniquely identify a document in the R/3 System, you create a document info record containing administrative information and information on the original document (created with an external application). The document info record supports flexible status management options, integrated with R/3 Business Workflow, allowing you to record the various release procedures in your company. The document info record is also used to process authorization checks for accessing original documents, and it provides the link to external frontend applications.

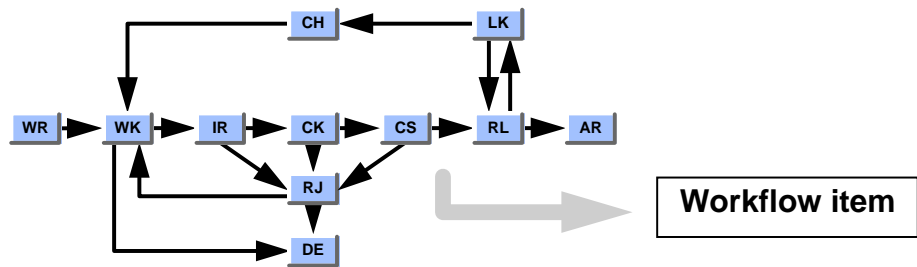


Fig. 2: Document status management with workflow

Document info records are structured so as to allow you to manage several parts and versions of a document. This means that you can structure your data efficiently and there are no gaps in your records of change statuses.

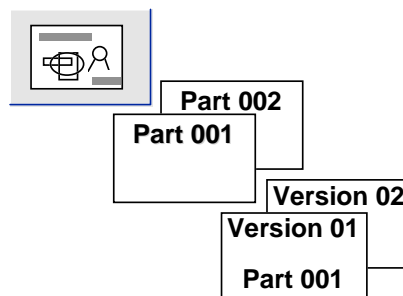


Fig. 3: Document version management

Link to engineering change management

An important feature of the document management system is that it is fully integrated in the R/3 environment. This means that the document management system is connected to the R/3 engineering change management functionality. You can use the R/3 classification system to classify document info

records, and use the BOM management functionality to link documents together in a document structure, thereby setting up a kind of document hierarchy.

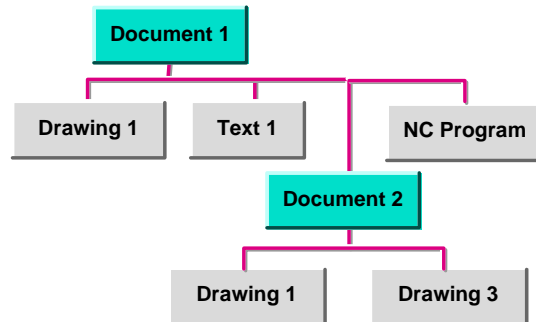


Fig. 4: Document structure

Full integration in the R/3 System also gives you the option of linking original documents to various objects in the R/3 System. This makes this information available in the structures of the productive system. For example, a designer can create a manufacturing specification for a new part as a Microsoft Word document, and create a document info record in the R/3 System for this document. For work scheduling purposes, you can link the document info record to the relevant routing as a production resource/tool. You can then display the current version of the manufacturing specification when you need it on the shop floor.

Linking original documents to R/3 objects

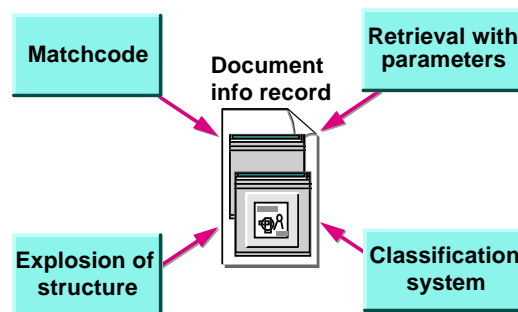


Fig. 5: Document retrieval

Wherever you are in the logistics process chain in the R/3 System, you can find documents via classification data, search parameters, the document hierarchy, or the matchcode functionality. Access to relevant documents is an important aspect of the overall solution for a company.

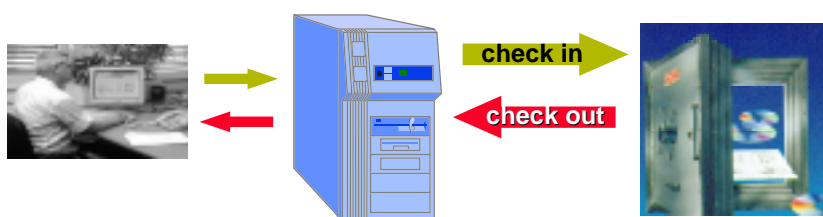


Fig. 6: Data vault



The R/3 document management system also supports access to external optical archiving systems via the ArchiveLink interface. The check-in and check-out procedure allows you to check whether a user has the authorization to access a document.

Engineering Change Management

Engineering change management is used to control and document related changes to master records, ensuring a regulated flow of changes to the structures used in production.

Full integration in the logistics process chain

One of the most important features of R/3 engineering change management is full integration in the logistics process chain of a company. Engineering change management ensures that planned changes to master data are made automatically at a defined point in time in the productive functions of Sales and Distribution, demand management and MRP, production control, product costing, Quality Management, and Materials Management. R/3 engineering change management supports changes to the following types of object, among others: BOMs, routings and other task lists, documents, materials, and objects in the classification system (for example: characteristics, classification data, and object dependencies). You can also assign a revision level to the most important change statuses of documents and materials.

Engineering change requests and orders

To uniquely define and control a change in the R/3 System, you create a change master record. We also make a distinction between engineering change requests (ECRs) and engineering change orders (ECOs), according to the status of a change master record. This distinction allows you to model the approval and release procedures in your company, with the support of SAP Business Workflow if required.

You can create an ECR as a purely descriptive record, without reference to the objects affected by a change. However, if you already know which objects are affected, you can enter them in the ECR. Once the ECR has been checked and approved, its status is set to 'released for changes'. In other words, the ECR is converted to an ECO. You can only make changes to the relevant objects once this conversion has taken place.

You can use the R/3 classification system to classify change master records. This allows you to structure your changes and to find them again at a later date.

SAP Business Workflow

SAP Business Workflow is a high-performance, cross-application tool for modeling and optimizing business processes throughout a company.

The worklist to be completed by a user is displayed and managed in the user's inbox in the integrated mail system. The integrated inbox also contains

SAP office documents to be processed (for example: e-mail, internet mail, or faxes). The individual activities in the work list (work items) can be processed directly from this list. You just double-click on the item to automatically start the relevant application and load the data required.

The work process (sequence of work items) is triggered automatically by certain predefined events, such as a change to the status of an object (document info record, change master record, production order, and so on). The address to which individual work items are sent is determined from either a company-specific Human Resources (HR) organization model or a predefined distribution list.

Depending on the business area, there are different predefined workflow templates that you can adapt to suit your company's needs. SAP Business Workflow enables you to define your own company-specific workflow processes.

Predefined workflow templates

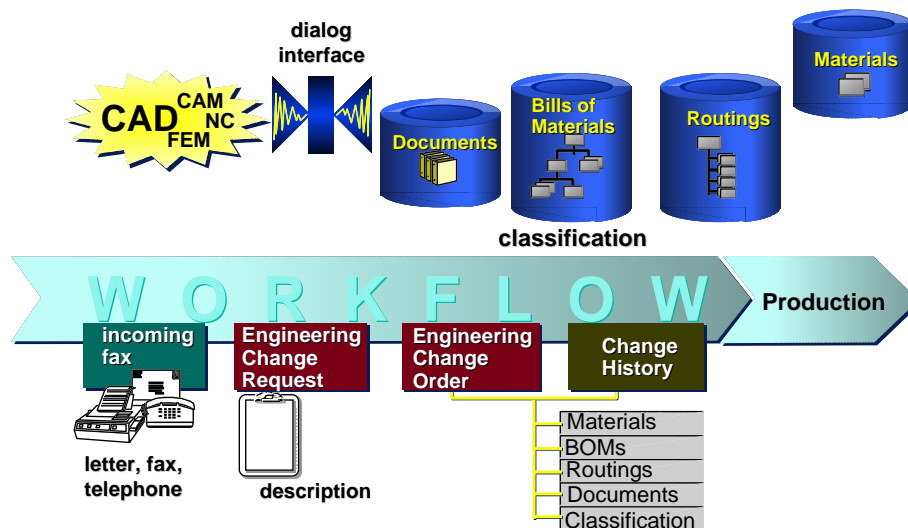


Fig. 7: Engineering Change Management

The R/3 PDM environment contains a workflow template that supports the engineering change management process.

Once an authorized person has created an ECR and the persons responsible (for example, from the configuration management department) have determined which objects are affected by the change, the specialist departments are informed via workflow.

The specialist departments check the technical details of the change to find out whether the change is possible. The information from all the specialist departments then goes back to the persons responsible in the configuration management department. Once the last parallel check has been completed, or once a specific deadline has been reached, the persons responsible from the configuration management department are informed via workflow. This department makes the final check on the change and makes a draft decision on whether the change can be released.



If the change is approved by a review board, the ECR is converted to an ECO. The specialist departments are then required to make the change via workflow. Once the change is complete, the persons responsible from the configuration management department are informed via workflow, so that the change can be released for subsequent application areas, such as MRP and the shop floor.

Material Master

The material master record is a data object that is central to the R/3 System. It is used to represent finished products, semi-finished products, raw materials, operating supplies, and production resources/tools, among other materials.

Different views on a material master record

In a material master record, you can store general data that is valid throughout the company, such as the material number, descriptions in multiple languages, weight, basic material, classification data, and so on. This data is often defined in the design or standards department. You can also store data that is relevant to specific departments, such as sales and distribution, MRP, and work scheduling. The different views on a material master record allow you to make this distinction. You can define the number of views and the scope of information on each view for your company in the customizing functions for the R/3 System.

Often, a material will have a limited life cycle in a company, and certain material data is only required in certain departments. For this reason, the R/3 System allows you to set the status of a material master record so that you cannot perform certain business transactions, or so that you see a warning message when you try to perform certain business transactions. For example, a specific material must not be used in new designs.

If the R/3 document management system is active, and one or more design drawings or other documents are linked to a material master record, you can display original documents while you are processing the material master record. This information is available throughout the company.

Classification

The classification system is a system-wide function that allows you to classify all types of object in the R/3 System. For example, it can be used to classify materials, production resources/tools, documents, inspection characteristics, customers, and vendors. The classification system allows you to structure data according to the criteria you define. For example, designers can use the classification system to find similar parts, which reduces duplication of parts in the company.

Characteristics are used to describe the features of an object. Objects are grouped together in classes (with characteristics) according to shared or similar features. To define the features of an object in the R/3 System, you

assign values to the characteristics. For example, you classify a material in a class for 'Bolts', which has the characteristics 'Thread type' and 'Length', by assigning the values 'metric' and '30 mm' to the respective characteristics.

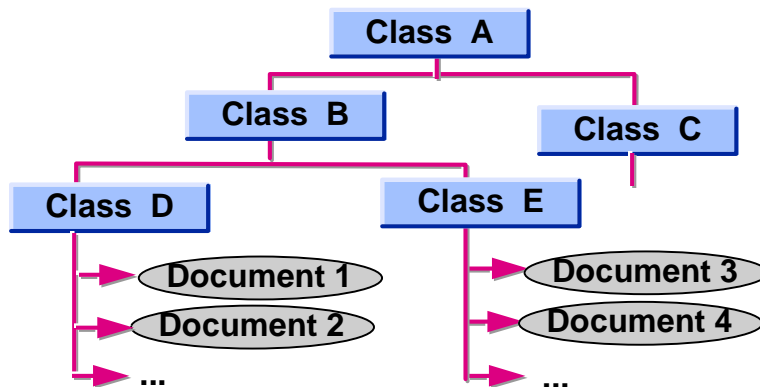


Fig. 8: Classification

The classification system provides efficient support throughout the process chain, allowing you to maintain classes and characteristics, classify objects, and find objects. For example, you can define characteristics as required or optional, or define default characteristic values for single-value and multiple-value characteristics, reducing the workload for classifying and finding objects. You can also link classes together to define class hierarchies and networks, either with or without inherited characteristics, making it easier for you to structure your data and therefore to find the object you are looking for.

For example, a class for 'extras' can contain two classes, one for 'printers' and one for 'monitors'. The class for 'printers' also contains two classes, one for 'inkjet' and one for 'laser' printers. These last two classes are used for classifying materials.

The classification system supports data transfer from external data carriers in DIN 4001 format.

Bills of Material

In the R/3 System, you can use the full range of BOM functionality for different objects, to maintain material BOMs, document structures, equipment BOMs, and functional location BOMs.

You can use material BOM data in a wide range of internal areas in a company. In the R/3 System, we make a distinction between the following BOM usages: engineering/design, production, costing, sales and distribution, and

Defining class hierarchies and class networks

Engineering/design and production BOM

plant maintenance. You can use completely separate BOMs for these different usages. This means that each area in the company has its own specific BOM.

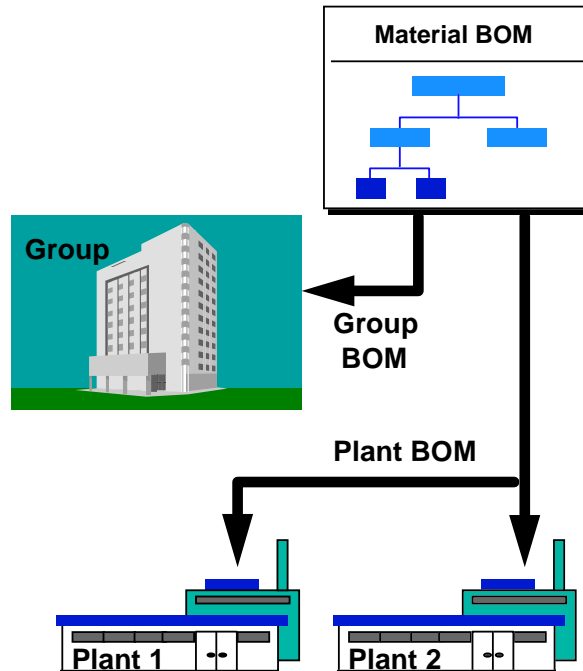


Fig. 9: Material BOM Areas of Validity

Another way of distinguishing between these different usages is to use different views on one BOM. To do this, you define individual items in a BOM as relevant to engineering/design, production, and so on.

Validity of BOMs

A BOM is valid in a specific physical area over a specific time period. We make a distinction between group BOMs and plant BOMs. This distinction can be used to resolve the issue of defining a BOM for the usage engineering/design or production. To ensure that the design BOM is the same throughout the company, it is created as a group BOM and maintained by the design department. However, the production BOM is the responsibility of the plant in which the product is manufactured, and may vary from one plant to the next, so you can only define a production BOM for a specific plant.

You can run essential reporting functions for BOMs at all times, such as level-by-level, multi-level, and summarized BOM explosions, or single-level and multi-level where-used lists. Another effective tool for working with BOMs is the single-level and multi-level BOM comparison function. This allows you to find the differences between two BOMs, such as the engineering/design BOM and the production BOM, or the differences between two different change statuses of a BOM.

CAD Integration

The R/3 System supports a standardized dialog interface - an important module for integrating engineering and design processes in the logistics process chain of a company. This interface is not just for integrating CAD systems - you can use it to connect all kinds of engineering applications to your R/3 System.

Connecting all kinds of engineering applications

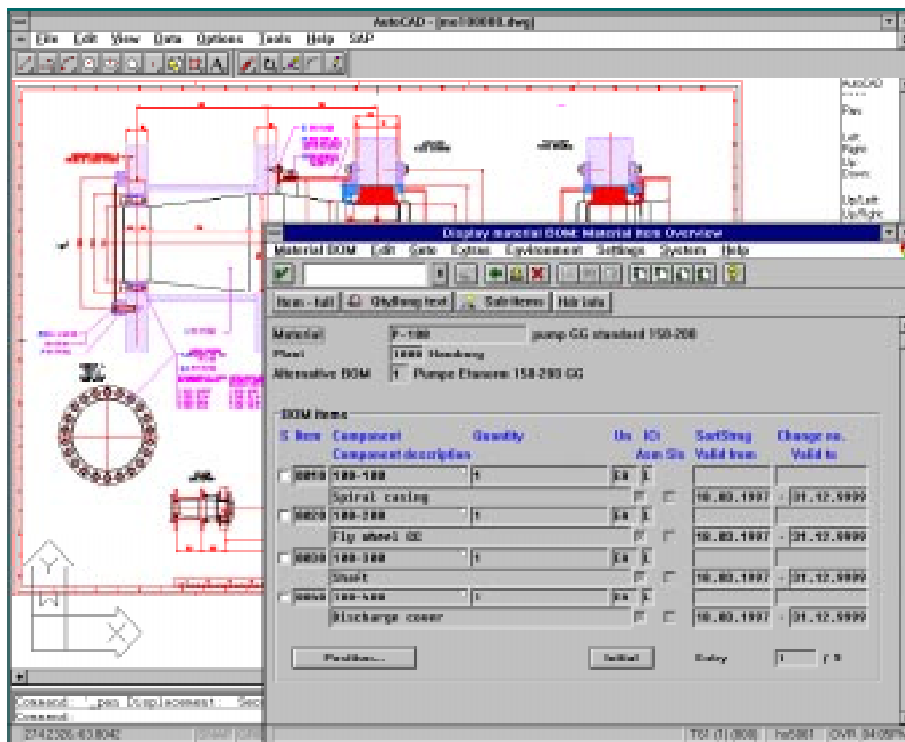


Fig. 10: CAD Integration

Many API functions give you the option of inserting R/3 screens in dialogs. This means that, when you develop a CAD integration solution, you can decide on a function by function basis whether an engineer will work with R/3 screens in the external system, or whether the CAD system will have its own screens for entering R/3 data. Whichever option you decide on, the R/3 functions for material master records, BOMs, document management, classification, and workflow are directly integrated in the CAD application. The full integration of the R/3 document management system means that an engineer can use functions for finding, checking in, and checking out drawings with a few clicks of the mouse button.

Application Programming Interface (API)

The API functionality allows you to extend the standard set of functions supported in the CAD interface easily.



Project System

Modern PDM systems provide a project system for defining and controlling large product development projects. A project system makes it easier for you to have an overview of the complex tasks that arise when you work on limited-period cost and capacity-intensive projects.

Work breakdown structures and networks

You can structure a project in the R/3 Project System in a way that is clear and easy to understand, by using work breakdown structures and networks. A work breakdown structure (structural plan) defines the structures for organizing and controlling the project, and splits the project into a hierarchy of individual elements. A network (procedural plan) arranges the elements in a time sequence. For example, the network defines which events are dependent on each other, which additional activities are required, and which activities need to be more detailed. To minimize the workload in your productive system, you can create standard work breakdown structures and networks to copy from when you create a structure for managing a new project.

At any point in the project, you can use the project information system, project planning boards, earned value analyses, cash budget management, workflow processes with milestones, and so on, to check and get an overview of resources, capacities, and budget.

Product Configuration

Configuration on multiple levels

There is an undeniable trend in today's modern industries toward products with a large number of variants. One of the most important requirements of product configuration is full integration in the logistics process chain of a company. In addition, it is often necessary to configure a complex product on multiple levels. This means that characteristic values are assigned at different levels of the product structure - not just at the top level, but at component level, too, for example.

The variant configuration functionality in R/3 offers a complete solution that covers all of these issues. The R/3 System supports multi-level configuration of BOMs, routings, and Project System structures (networks and work breakdown structures), and is integrated with Sales and Distribution, MRP, Production Planning, purchasing, and Service Management.

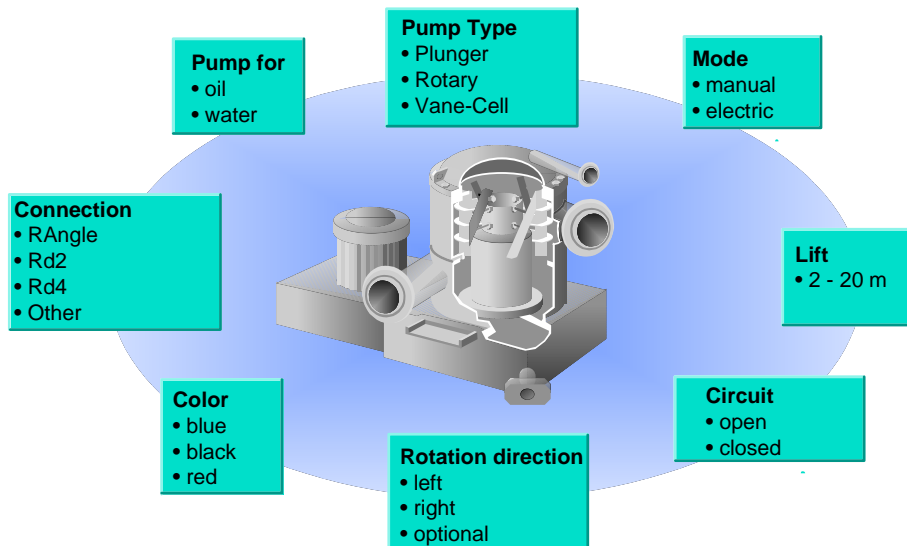


Fig. 11: Product Configuration

Variant configuration in R/3 is based mainly on classification system functions and the object dependencies that are allocated to a configurable object. For example, BOM items in a configurable product can be selected automatically from a super bill according to characteristic values and selection criteria (the object dependencies in the BOM). You also have the option of grouping together 'alternative' materials in a class, then using this class as an item in a BOM - a class item. The relevant BOM item can then be selected automatically - you assign characteristic values, and the classified material that has these values is selected.

Classification system and object dependencies

The variant configuration functionality also includes checks as to whether the configuration is complete and consistent. This means that you cannot end up with impossible configurations - a cabriolet with a sunroof, for example!

Product Structure Browser

Graphical display functions for showing the complex relationships between all the objects in a product are important in a modern PDM system. The PDM solution in R/3 includes the product structure browser, which can display different views on a product structure in the level of detail you require.

The product structure browser is fully integrated in the R/3 System. You can start browsing from a material, a document, or a change number. You can then explode the structure level by level using the mouse button, and access transactions for displaying or editing objects as required. You also have the



option of starting a workflow process from the product structure browser and displaying the documents linked to objects.

Navigating between objects in the product structure

The product structure browser is an important tool for evaluating an engineering change request (ECR), allowing you to navigate easily between objects in the product structure and copy objects affected by a change to the ECR.

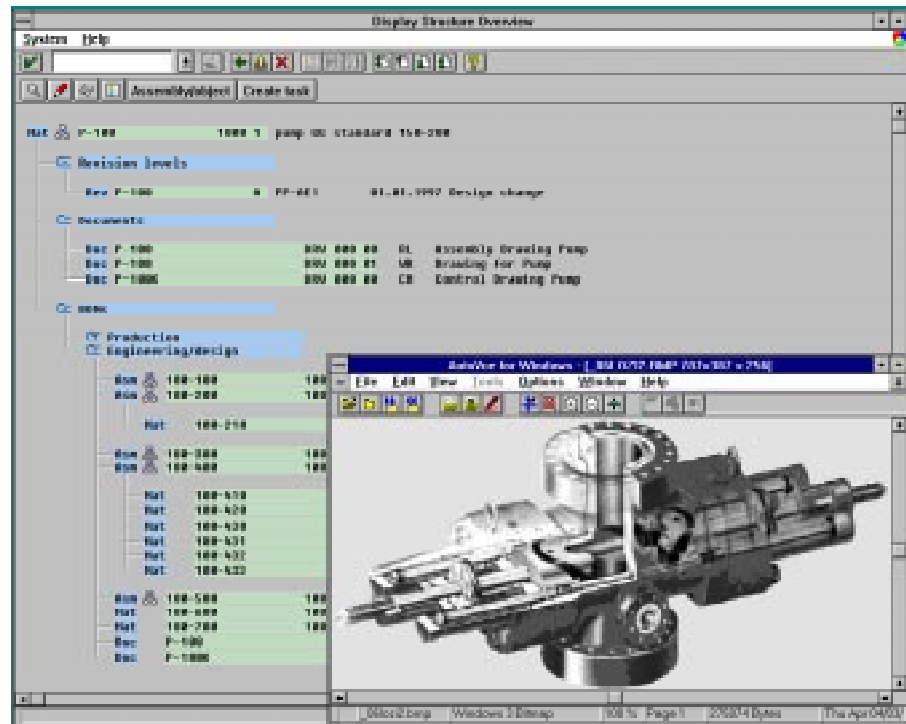


Fig. 12: Product Structure Browser

The high level of integration in the R/3 System also allows the product structure browser to access master data that is from areas outside the actual design environment, such as customers, vendors, and inspection plans in Quality Management. This allows you to see the relationships between objects throughout the product structure in graphical form.