

Product Data Management with IYOPRO PLM Components



Highlights

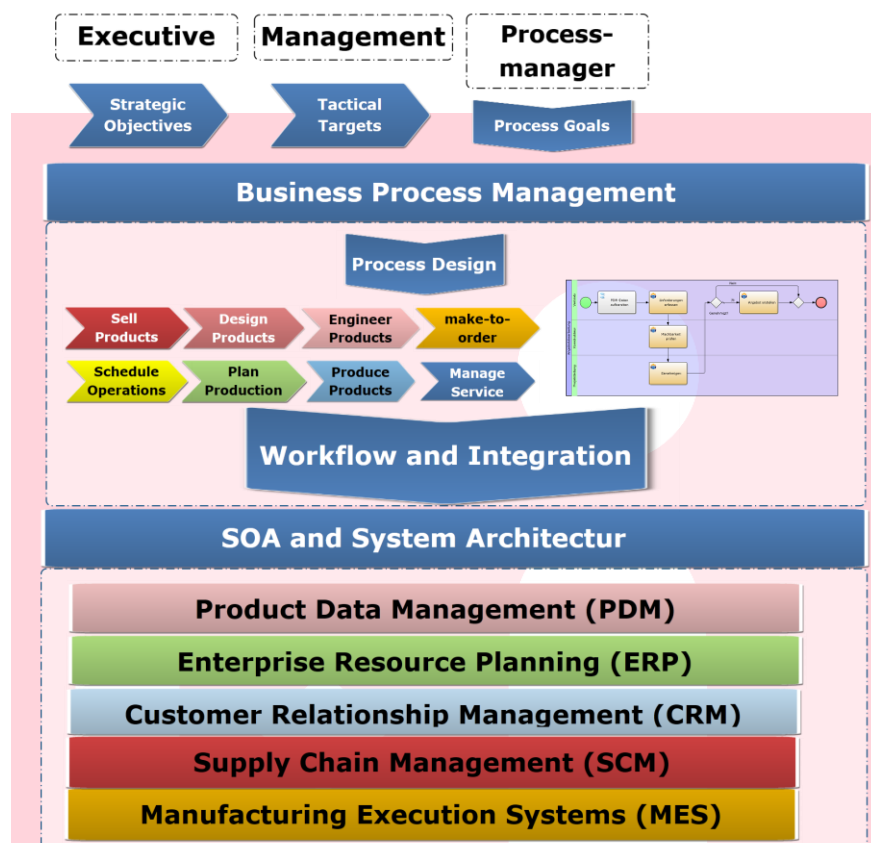
- Product Data Management focusing on
 - ✓ Project management
 - ✓ Part management
 - ✓ Variant management
 - ✓ Document management
 - ✓ Lifecycle management
- Setting up project management structures using project folders & project plans
- Project-related release and revision processes
- Product calculation for project times and costs
- Part management with version and revision management
- Management of models, drawings and documents
- Material management
- Product structure management
- Classification & class lists of characteristics for documents and parts
- Rule-based variant management, product configurator and form editor
- Workflow management (process control)
- CAx and ERP integration
- Data input and output management

PDM/PLM stand for Integration

The strategic objective of product lifecycle management (PLM) is to create an integral IT work platform comprising PDM, ERP, SCM, CRM, CAx, etc. This work platform enables you to implement all value adding processes (e.g. sales, product planning, product development, order engineering, work scheduling, production and service) with complete, up-to-date and consistent product and process data.

Or more simply put: information on a product can always be transparently completely, up-to-date and consistently managed for the duration of its entire life cycle – from design to recycling – by integrating processes, data and systems.

This Product Lifecycle Management requires process-orientated IT-support for activities throughout the various life phases of a product (machine, appliance, device, vehicle, system, etc.) from origin to use and decommissioning to energy-recovering disposal.



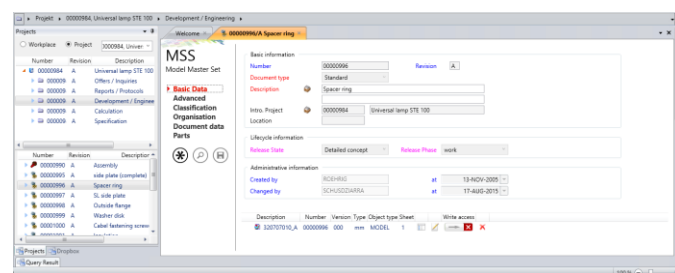
Project Management

Creating structure to save costs

Project management constitutes initiating, planning, monitoring and completing projects. When used in a PDM environment it establishes structures and enables integrative cooperation, for example, by means of project-related release and revision processes initiated through integrated workflow management.

In IYOPRO PLM Components projects are represented by the project master record (PMR). In the project master record, framework conditions are defined for each project – e.g. project name, project number, project manager, customers and contact partner, if necessary, as well as the project team.

For each project master record, a project folder structure is created. In general, most PSS attributes as well as the folder structure are predefined and created fully automatically based on the little information specified by the project manager.



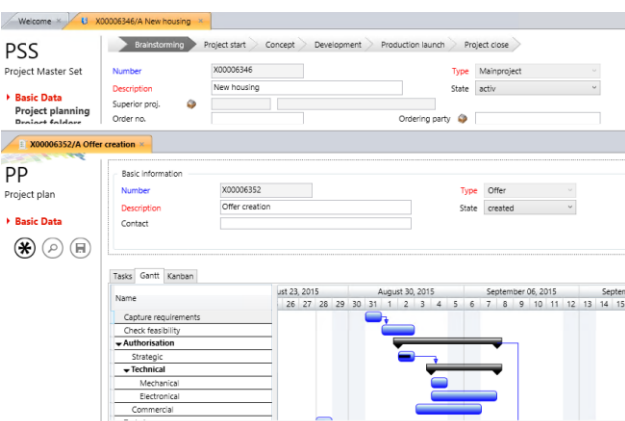
Project explorer with model master record

Additionally, individual pieces of information can be assigned to several projects.

Navigating through the project structure and project folder is easy and intuitive. IYOPRO PLM Components provides you a clear overview of all information necessary to interpret and process the data, e.g. released data or only the most recent versions, which eliminates the chances of you working with incorrect data sets. Similarly, the data can be displayed by time-period, for instance, "What did the project look like last week?" Various display filters, e.g. for emails or photographs as well as image previews, complete the display options; these provide transparency and considerably simplify researching and retrieving information.

When compiling the project team the team members are assigned their specific roles and, with it, corresponding authorisations to work with IYOPRO PLM Components.

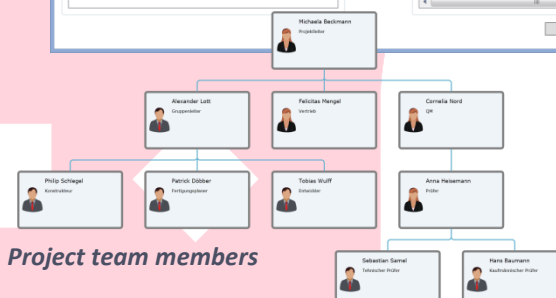
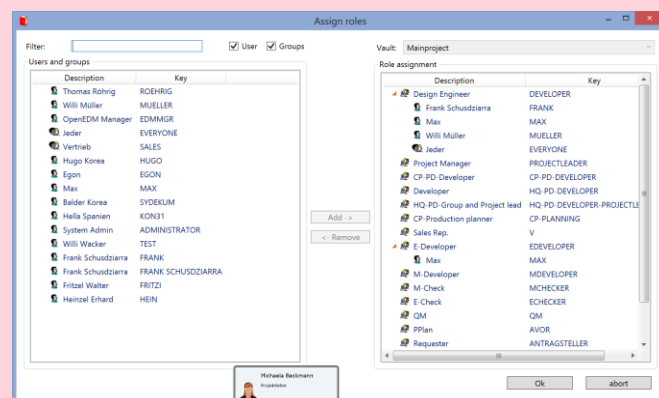
If a user has access rights for a project, he can link it to his workstation. This way, he has an overview of all projects that are currently relevant to him and can easily navigate between the projects.



Project master record (PMR) & Project planning (PP)

For many companies, creating a project is, for example, the result of a customer enquiry process. Information on project handling is managed in a project structure plan. The tasks included in the project can be obtained from the predefined activities of workflow management and if required, they can be individually tailored. This type of workflow-based handling of project offers and orders, for instance, has an immediate positive influence on project turnaround times, costs and transparency.

Product data created over the course of the project are stored in the project folders. These can be part master data, documents such as specifications, assembly instructions, CAD drawings, 3-D CAD models, emails, etc. – everything that is of significance as descriptive information for your project/product.



Project team members

Part Management

Creating structure to improve transparency

Without transparent management, the number of parts increases uncontrollably. Instead of going on an endless search to find a part that might or might not exist, you can simply model the part with the 3D-CAD system; this can easily prevent costs building up over the course of the process.

Efficient part management requires a flexible classification system as a basis in which standard and catalogue parts as well as construction parts (own and/or external parts) can be entered in the same manner.

Together with standardisation of in-house parts, classification inevitably leads to high re-utilisation rates, which in turn lead to considerable cost reductions. Standardised in-house parts can be entered in a flexible classification system on the basis of different requirements (construction, sales, etc.). The classification system requires structural elements to form classes and characteristics to describe the parts with respect to their form and properties.

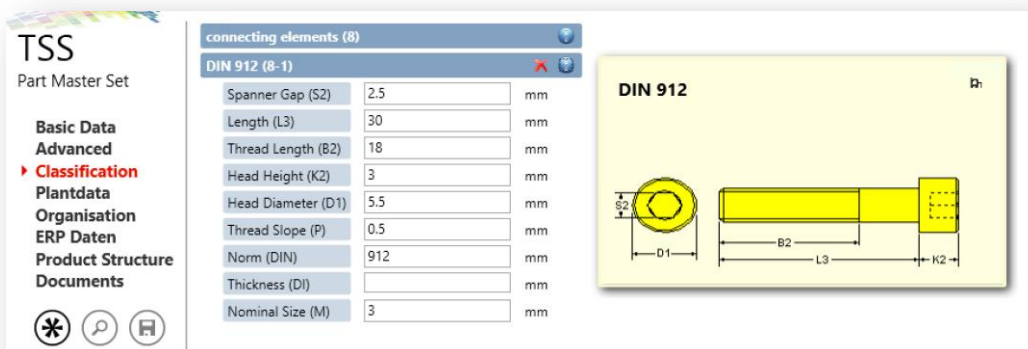
A corresponding view can, for instance, be transferred to an ERP system, where it can form the basis for production as a production part list.

The product structure in IYOPRO PLM Components has a time axis, which provides the user with a quick and easy overview of all changes in the development process and changes planned for the future. When displaying the structure in timeframe view, the user is provided with quick and easy insight into, for example, changes, using the implementation and expiry dates.

Product structures can be displayed in a detail view for detailed observations and in tree view, which also clearly shows even very larger product structures.

Using the parts application, you at all times have an overview of

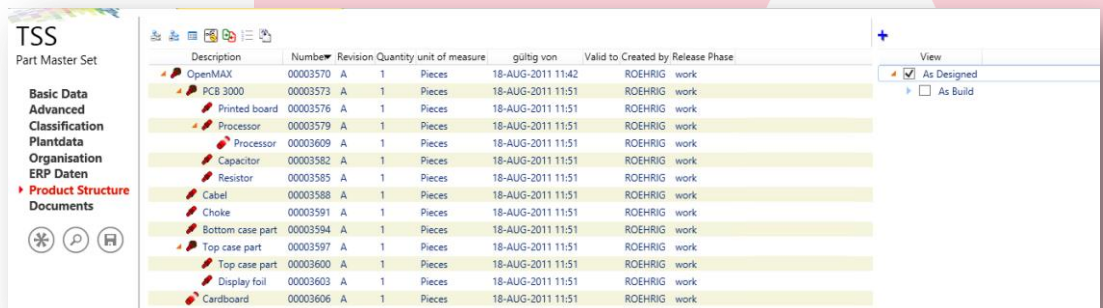
- In which parts and assemblies a component can be immediately re-used for
- In which finished products your parts are installed
- Or you can view the complete application.



TSS Part Master Set classification

Product structure

The product structure module describes the components that make up a part. With its view concept, IYOPRO PLM Components supports various requirements for displaying a product structure. The product structure can be displayed in different forms (as designed, as manufactured, as delivered, etc.), in which each view can be optimised for the respective intended use. This way, a production view can contain components that are not required in a construction view, to optimally support production processes.



Description	Number	Revision	Quantity	unit of measure	gültig von	Valid to	Created by	Release Phase
OpenMAX	00003570	A	1	Pieces	18-AUG-2011 11:42		ROEHRIG	work
PCB 3000	00003573	A	1	Pieces	18-AUG-2011 11:51		ROEHRIG	work
Printed board	00003576	A	1	Pieces	18-AUG-2011 11:51		ROEHRIG	work
Processor	00003579	A	1	Pieces	18-AUG-2011 11:51		ROEHRIG	work
Capacitor	00003609	A	1	Pieces	18-AUG-2011 11:51		ROEHRIG	work
Resistor	00003582	A	1	Pieces	18-AUG-2011 11:51		ROEHRIG	work
Kabel	00003585	A	1	Pieces	18-AUG-2011 11:51		ROEHRIG	work
Choke	00003588	A	1	Pieces	18-AUG-2011 11:51		ROEHRIG	work
Bottom case part	00003591	A	1	Pieces	18-AUG-2011 11:51		ROEHRIG	work
Top case part	00003594	A	1	Pieces	18-AUG-2011 11:51		ROEHRIG	work
Top case part	00003597	A	1	Pieces	18-AUG-2011 11:51		ROEHRIG	work
Top case part	00003600	A	1	Pieces	18-AUG-2011 11:51		ROEHRIG	work
Display foil	00003603	A	1	Pieces	18-AUG-2011 11:51		ROEHRIG	work
Cardboard	00003606	A	1	Pieces	18-AUG-2011 11:51		ROEHRIG	work

Product structure

Part master records (PMR)

The part master record (**PMR**) corresponds to the item or material master record in an ERP system. The main task of the part master record is to clearly describe a part with all its characteristics, which include:

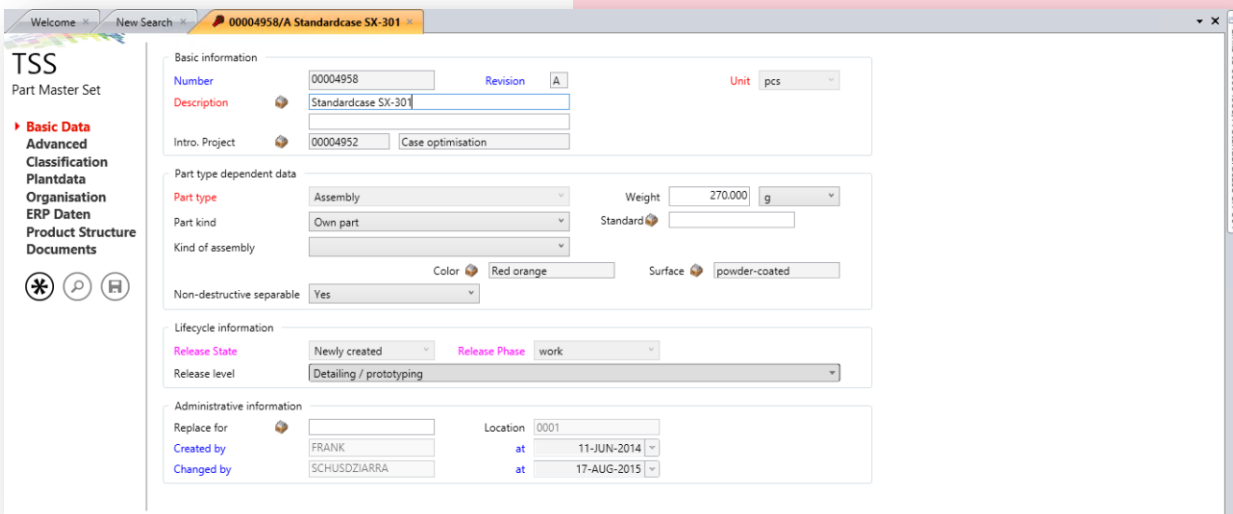
- **Descriptive attributes**
Part number, name, type (individual part, assembly...), etc.
- **Information on colour, material and surface quality**
References to property pages for colour, material and surface objects
- **Organisational data**
Which number/name/... have the customers, suppliers assigned to the part
- **Classifying properties**
Class system according to DIN 4000 with multiple classification and references
- **Descriptive documents**
References to the document management elements such as drawings, documentation
- **The product structure with different views**
Individual parts and sub assemblies which make up the part master record

This information makes the part master to be a universal point of reference, where information on products and their components can be obtained. From the part master, you can access all detailed information with just a mouse click.

You can directly read the development status of your product from the life cycle attributes, which include:

- **Revision**
This is updated every released updating cycle
- **Version**
This represents the progress status within a revision
- **Release phase**
Specifies whether an element is being processed, tested or has been released
- **Release status**
Specifies the maturity level of the object (concept, design, detailing, ...)
- **Use phase**
Specifies location-related use of the object (inactive, production run, active...)
- **Release stage**
Specifies the reason for the release being issued (e.g. prototype building, for planning, for pre-series...)

With this information, the product lifecycle can be clearly described and understood. This information is a prerequisite for PMR information to be exchanged with other systems (e.g. ERP) in a process-oriented manner. In the master record, it is also possible to clearly distinguish between different parts and handle them accordingly.



The screenshot shows the TSS Part Master Set interface. The left sidebar contains a navigation menu with options: Basic Data (selected), Advanced Classification, Plantdata, Organisation, ERP Daten, Product Structure, and Documents. The main window displays the 'Basic Data' tab for part 00004958/A Standardcase SX-301. The data is organized into several sections:

- Basic information:** Number 00004958, Revision A, Unit pcs, Description Standardcase SX-301, Intro. Project 00004952, Case optimisation.
- Part type dependent data:** Part type Assembly, Part kind Own part, Kind of assembly (empty), Weight 270.000 g, Standard (empty), Color Red orange, Surface powder-coated, Non-destructive separable Yes.
- Lifecycle information:** Release State Newly created, Release Phase work, Release level Detailing / prototyping.
- Administrative information:** Replace for (empty), Location 0001, Created by FRANK at 11-JUN-2014, Changed by SCHUSDZIARRA at 17-AUG-2015.

Basic data Part Master Record

Variant Management

Rule-based variant management

Wide-ranging customer requirements as well as international markets with local specifications often make it unavoidable having to deliver products in different variants. However, at the same time, with every product variant the costs to manage the various aspects increase immensely. With IYOPRO PLM Components we provide a rule-based variant management, which seamlessly integrates into other PLM modules. As such, your new products are constructed from available parts, and on the basis of existing sets of rules and decision tables.

Product configurator

IYOPRO PLM Components allows for the configuration of various product variants and alternatives, making your highly varied products instantly marketable. As the creation of products is rule-based, you can test for their manufacturability while the products are being configured. During the configuration process, IYOPRO PLM Components constantly checks the validity of the entries. Using exclusion rules prevents the selection of conflicting configuration options. Once the product configuration is completed, IYOPRO PLM Components decides whether such a product already exists and has been manufactured or whether it concerns a new product. In both cases, the product configurator provides the necessary operating documents such as stock lists and other production documents and transfers these to follow-up processes just as it would be done for every manually created product.

Decision tables & exclusion rules

The variant configuration is a set of rules that describes which specific product variants can be configured. The rules determine which component combinations are possible and permissible. Every rule object stands for several "if-then" expressions. This means that if one or several selection criteria apply, then one or several specific part variants can be realised. The so-called decision tables help you in configuring product variants.

Form editor

The configuration (composition) of a standard product from certain basic components forms the basis for making product variants. The end user goes through a series of questions to describe the desired variant with respect to function, technology, dimension and/or form. IYOPRO PLM Components generates a fully

automatically input form based on the rules described in the product configurator.

This form can be further refined using

the form editor. Using the drag & drop function, the required



Form editor for product configurator

Description	Number	Revision	Quantity	unit of measure	Position	Valid from	Valid to	Created by
PLE 40 gear box	X00006353	A	1			28-AUG-2015 12:01		SCHUR
Output	X00006368	A	1			28-AUG-2015 12:10		SCHUR
Output PLE40-1-ST T111	150828-00006356	A	1	pcs		28-AUG-2015 12:07		SCHUR
Output PLE40-1-TF T113	150828-00006359	A	1	pcs		28-AUG-2015 12:07		SCHUR
Output PLE40-2-TF T114	150828-00006362	A	1	pcs		28-AUG-2015 12:07		SCHUR
Output PLE40-2-SF T112	150828-00006365	A	1	pcs		28-AUG-2015 12:07		SCHUR
Lubricant	X00006371	A	1			28-AUG-2015 12:07		SCHUR
Oil BEM T115	150828-00006386	A	1	ml		28-AUG-2015 12:10		SCHUR
Oil TOPAS T116	150828-00006389	A	1	ml		28-AUG-2015 12:10		SCHUR
RB	X00006374	A	1			28-AUG-2015 12:07		SCHUR
Shaft PLE40-5-ST T211	150828-00006392	A	1	pcs		28-AUG-2015 12:14		SCHUR
Shaft PLE40-5-OP6 T213	150828-00006395	A	1	pcs		28-AUG-2015 12:14		SCHUR
Shaft PLE40-4-ST T212	150828-00006398	A	1	pcs		28-AUG-2015 12:14		SCHUR
Shaft PLE40-4-OP6 T214	150828-00006401	A	1	pcs		28-AUG-2015 12:14		SCHUR
RD	X00006377	A	1			28-AUG-2015 12:07		SCHUR
Pinion PLE40-5-ST T411	150828-00006404	A	1	pcs		28-AUG-2015 12:16		SCHUR
Pinion PLE40-5-TF T412	150828-00006407	A	1	pcs		28-AUG-2015 12:16		SCHUR
RE	X00006380	A	1			28-AUG-2015 12:07		SCHUR
RE1 - Cover	X00006422	A	1			28-AUG-2015 12:20		SCHUR
RE2 - Adapter	X00006425	A	1			28-AUG-2015 12:20		SCHUR
Adapter PLE40-8-85 T611	150828-00006410	A	1	pcs		28-AUG-2015 12:20		SCHUR
Adapter PLE40-8-85/14 T612	150828-00006413	A	1	pcs		28-AUG-2015 12:20		SCHUR
Adapter PLE40-9-85 T613	150828-00006416	A	1	pcs		28-AUG-2015 12:20		SCHUR
Adapter PLE40-9-85/14 T614	150828-00006419	A	1	pcs		28-AUG-2015 12:20		SCHUR
REa	X00006383	A	1			28-AUG-2015 12:07		SCHUR

Variant master record rule-based product structure

input elements can be positioned as desired. Additional information such as explanatory text, categories or images makes it even easier to configure the product configurator.

ET

Decision Table

Basic information

Description

Driven shaft

table name




Driven shaft

Type

One row

Calculate always

Basic Data



Input	Input	Input	Input	Output	Output	Output	Output	Output	Output	
Productclass	Overall size	Gear ratio	Lubricant	Shaft article	Shaft amount	Shaft unit	Lubricant article	Lubricant amount	Lubricant unit	
PLE	40.0	5.0	standard	T111	1	pcs	T115	0.002	kg	
PLE	40.0	20.0	standard	T112	1	pcs	T115	0.004	kg	
PLE	40.0	5.0	low temperature	T113	1	pcs	T116	0.002	kg	
PLE	40.0	20.0	low temperature	T114	1	pcs	T116	0.004	kg	

Decision table

Document Management

Documents, drawings and models

In IYOPRO PLM Components document management is divided into three areas:

- **General document management**
for example Office documents, emails, photographs + videos, specifications, ...
- **Model management**
for 3D CAD models from all current 3D CAD systems and representations in neutral formats (STEP, IGES, ...)
- **Drawing management**
for 2D CAD drawings and representations in neutral formats (PDF, TIFF, ...)

Assignment to master records

Every document in IYOPRO PLM Components consists of a master record and several document data sets (if required). For a component specification this can mean, for instance, that data sheets of various manufacturers can be summarised in a document. The same holds true for CAD models and drawings; for example, often a drawing is stored in different views, either in a fitted state or as it was delivered.

As in many cases a document describes a part or an assembly, a document master record can be assigned to the corresponding part master records. This ensures that you see which parts are described simply by looking at the documents.

Generally, all data types can be managed with IYOPRO PLM Components. Without special user interfaces for authoring systems, the IYOPRO PLM Components acts as an intelligent Windows Explorer with however all the benefits of a modern document management system, for instance:

- Versioning / Revisioning
- Document classification
- Document grouping in document, model and drawing master records

- Automatic number assignment
- Names from designation catalogues
- Document view (e.g. through viewer integration)
- Authorisation management

Document classification

Because of the object-oriented approach used in IYOPRO PLM Components, model and drawing management are derived from the document management module. This means that in addition to some special attributes and functions, which are required for models and drawings, they fully correspond to the range of functions of the document management module.

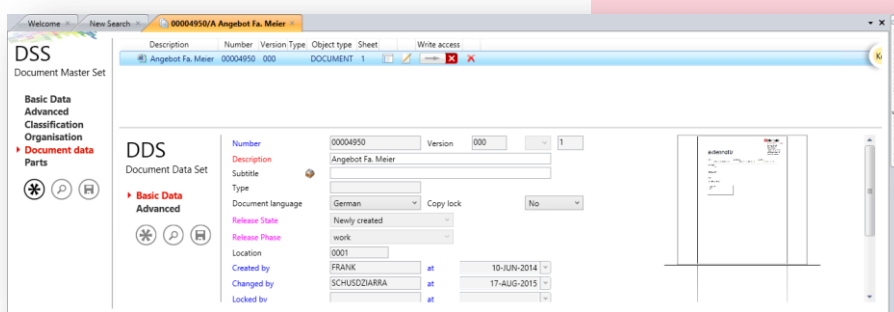
IYOPRO PLM Components links a generalised CAD interface to the standard CAD systems.

The following functionalities are available:

- Generating and automatic filling of a drawing border in CAD
- Automatic transfer of PDF drawings from the CAD system
- Automatic generation of models from characteristics (parameterisation)
- Automatic creation of (Office) documentation from characteristics
- Automatic adoption of document structures (e.g. individual parts of assemblies) as a template for creating product structures
- Blocking/unblocking mechanisms for PDM data from the application
- Automatic updating of assemblies for specific / latest component versions
- Support of the "Concurrent Engineering" regardless of location

A range of integration options

IYOPRO PLM Components now includes a number of interfaces from all current authoring systems. In addition to CAD and ERP systems, these include email programs, Office applications, data exchange systems and various display applications. IYOPRO PLM Components documents can also be accessed from web portals. For accessing these documents, functional components are provided, which can deliver the necessary data and documents to the portal using web services.

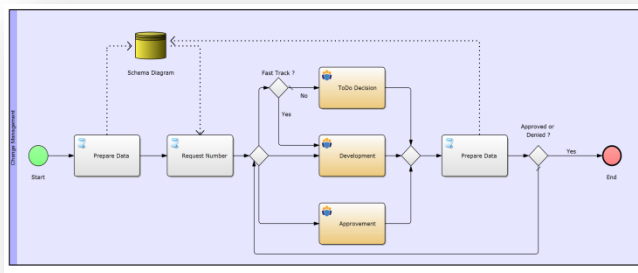


Basic data document master record

Lifecycle Management

Implementation of change processes using the PLM-based solution approach

One of the most important processes in the product lifecycle is the technical change process. The products are exposed to many changes not only in the development phase but also throughout their entire lifecycle, in order to increase comfort and efficiency and to reduce production costs.



Process for change processing

Change Request (ECR)

In general, the change process begins with the change request. It is used, among other things, to record the event that triggered the desired change. In addition, it has organisational information such as change category, the applicant, prioritisation, etc. In the change object field, the components and revisions are described which are affected by the change. Subsequently, different solution scenarios are worked out. For each of these solution approaches IYOPRO PLM Components supports the execution of an impact analysis. If the decision is taken to implement a solution approach, it then forms the basis of a Change Order.

Core information

Number: 00006668

Description: Plate STE 9000

Intro, Project: 00000984 | Universalleuchte STE 100

Trigger information

Category:

Triggered by:

Cause of change

Issue description

With an additional drill hole the plate 90034132 can be replaced with this plate. Cost reductions would be created in the areas of production and storage costs.

Assessment

Priority: medium

Target date:

Decision:

Basic data change request (ECR)

Change Order (ECO)

The Change Order option is used to implement a change. Generally, the implementation is accompanied by a change project. With its accompanying workflows, this change project takes over project monitoring. When the project is finished, the change request is also completed.

Release stage, release status, release level and use stage

The so-called lifecycle attributes are the core elements for consistent description of products and their revisions. These elements are used to clearly describe the state of a product revision. While the release stage only describes whether a object is currently being processed, tested or has been released, the release level indicates what is included in the release, for instance, for pre-series production, material pro-

Create offer

Create a new offer for the following project. Please transfer the costing information from the cost objects of the assemblies into the offer.

Projekt number

[Open project in IPC](#)

Provide the objects created and to be released.

Number	Revision	Description	Object type

Submit

Workflow form

curement, or series production. In the use stage, for each location an individual description is given for how the item is used there. It may be that one location produces the item in series, the other location does not use it at all and the third location is only responsible for spare parts. In larger parts, the states and transitions of the lifecycle attributes are automatically controlled by workflow processes.

In IYOPRO PLM Components, these processes are modelled and implemented with the BPM Suite IYOPRO. The BPMN 2.0 Notation provides all the necessary elements to display the company processes as well as ad-hoc processes, for instance, for data exchange of PDM objects with customers and suppliers.

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Intellivate is specialised in making processes of all types leaner, more robust and therefore more efficient using know-how and software tools. We help you see your data and process management as “asset information”, to lift this to a new working level and, finally, to improve the cooperation, the information interchange and, in turn, the productivity of your employees and investments.

In short: we create software that allows you to manage and structure the creation, processing and distribution of information along your value chains both adaptively as well as in ways specified by you. This ensures that your employees and your systems are provided with complete and consistent information at the right time.

Did we spark your interest? Please feel free to contact us!