



Codex of PLM Openness

The ReqIF Server CPO Fulfillment Report

Based on the "Codex of PLM Openness (CPO)"
Basic Understanding of Openness and Associated Requirements
Version 1.0, 08.03.2012

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Preamble

The manufacturing of complex technical products requires a multi-layered process environment in a number of different departments, from development and production right through to after-sales, with a large number of heterogeneous IT systems provided by numerous IT vendors.

Almost every one of these IT systems has to be linked with other IT systems. The amount of time and effort required by IT customers for IT integration is therefore extraordinarily high.

The openness of IT systems, especially the ability to integrate them into various IT system environments, is key to reducing the amount of time and effort involved. This can be achieved most efficiently if the openness of the IT system is based on established standards as far as possible. (cf. 2.5 Standards).

This Codex of PLM Openness (CPO) is intended to provide a basic understanding of the term “openness” and describe the associated basic requirements in a joint activity carried out by IT customers and IT vendors. The CPO is being created within the framework of a ProSTEP iViP project. It will be gradually expanded, and updated annually, to accommodate changing requirements.

CPO-relevant definitions are defined in a glossary, which is a separate supplement to the CPO. Key words that are defined in the glossary are underlined in the CPO.

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1 Fundamentals

1.1 Focus and Aims of the CPO

Focus

- Achieving a common understanding with regard to the openness of IT systems and related requirements in the context of PLM. It is being created jointly by IT customers and IT vendors as well as IT service providers.
- Focusing on the product creation process at the beginning of the CPO initiative. In later phases, the CPO will address the full product lifecycle.
- Self-commitment of participating companies on a voluntary basis, which comprises non-enforceable terms and does not constitute any legal claim.
- Ongoing activity with regular annual updates.
- Maintenance by a CPO organization under the auspices of the ProSTEP iViP Association.
- Reporting on the usage of the CPO (companies, acceptance of regulations, feedback).

Aims

- Transparency regarding the “openness of IT systems” within the context of PLM using impartial, non-discriminating criteria graduated in “shall”/“should”/“may”. (cf. 1.2 Definitions)
- Cost benefits for IT customers and IT vendors as well as for IT service providers.
- Market stimulation by encouraging competition between IT systems.
- Reference for bilateral contracts concerning the openness of IT systems.

The CPO does not aim to

- Restrict innovation and/or technical development.
- Disclose intellectual properties (IP) in any respect (e.g. source code of IT vendors).
- Exclude competitors from dedicated markets.
- Disclose competition-sensitive information (e.g. prices, license costs, new product developments, strategies, etc.)

1.2 Definitions

In general, definitions are provided in the glossary (see supplementary document), but because of their importance for the understanding of the CPO, some terms are explained under “Fundamentals”.

Openness

Openness is a capability provided by an IT system, and it is characterized by interoperability, portability and extensibility. These capabilities are implemented using IT interfaces, standards and the IT architecture. The openness of an IT system cannot be seen separately from the partners to the contract, i.e. the IT vendors and the IT customers.

Shall/Should/May

In order to differentiate between three different degrees of self-commitment, specific use is made of “shall”, “should” and “may”.

- “Shall”, or the term "REQUIRED", means that the definition or statement is an absolute requirement.
- “Should”, or the adjective "RECOMMENDED", means that there may be valid reasons under certain circumstances for ignoring a particular item, but the full implications must be understood and carefully weighed before choosing a different course.
- “May”, or the adjective "OPTIONAL", means that an item is truly optional. It often has the character of a best practice.

1.3 Necessity of Openness

- Designing the IT system environment is a primary task and the responsibility of IT customers.
- The IT systems use data which has to be linked or exchanged both vertically and horizontally.
- Figure 1 shows part of the whole PLM environment by way of example.
- Figure 1 classifies IT systems logically in PLM layers irrespective of their concrete technical implementation.

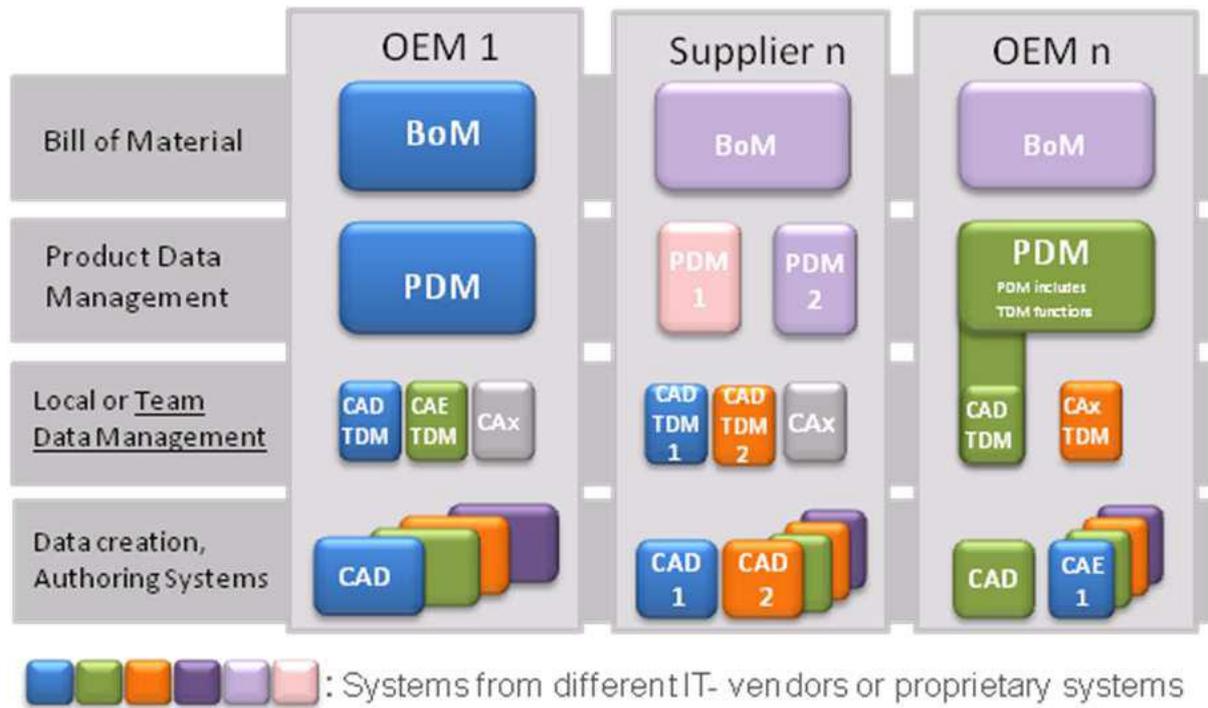


Abbildung 1 - Figure 1: Example of part of a PLM environment, demonstrating the necessity of openness for connecting a variety of IT systems from different IT vendors.

2 CPO Terms

2.1 Interoperability

IT customers develop and maintain very different PLM system environments (cf. Figure 1) due to specific process needs and different PLM histories (e.g. legacy systems). Openness in this respect means that an IT system has the ability to be integrated into different environments and that it has to communicate efficiently with various other IT systems.

R211 - 2.1.1 System integration based on process requirements

IT customers shall be able to realize system integration, on their own or via third parties, based on process requirements.

Priorität: required

Vendor Assessm. 4

Vendor Comment The ReqIF Server provides web-services for interactive or programmatic access to every object, in fact to every revision of every object. In addition, relationships and folder hierarchies can be retrieved via web-services.

Erstellt am 05/10/2012 04:45 PM von OD

Geändert am 05/14/2012 11:11 AM von OD

R212 - 2.1.2 Access to user data

IT users shall have access to their data. It shall be possible to exchange this data, including relations between the data, between IT systems.

Priorität: required

Vendor Assessm. 4

Vendor Comment The user data and its relations can be accessed individually or as a whole by exporting a RIF/ReqIF file.

Erstellt am 05/10/2012 04:45 PM von OD

Geändert am 05/10/2012 07:45 PM von OD

R213 - 2.1.3 Interfaces

Therefore IT interfaces shall be provided by the IT vendors.

a. These IT interfaces should be based on standards (if available).

b. IT customers should ask IT vendors about any risks regarding data and process integrity. IT vendors may provide best practices.

Priorität: required

Vendor Assessm. 4

Vendor Comment The sole interface of the ReqIF Server is a comprehensive web-service interface following the REST architecture model. The data can be retrieved in RIF/ReqIF, HTML, XML and JSON format. All characters are encoded as UTF-8.

Erstellt am 05/10/2012 05:00 PM von OD

Geändert am 05/10/2012 07:48 PM von OD

R214 - 2.1.4 Supported and state-of-the-art IT infrastructure

IT customers should use officially supported versions of IT systems and state-of-the-art levels of IT infrastructure to minimize the effort required to achieve interoperability.

Priorität: recommended

Vendor Assessm. 4

Vendor Comment The latest releases of underlying IT infrastructure are supported by the ReqIF Server. For details, please refer to <http://reqif.de/index.php/datasheet.html>

Erstellt am 05/10/2012 05:03 PM von OD

Geändert am 06/08/2012 06:57 PM von OD

2.2 Infrastructure

IT customers bear the high investment costs involved in developing and maintaining their IT infrastructure. This IT infrastructure comprises the network and system platforms (hardware, OS). Due to the fact that the IT infrastructure is continually evolving, long-term lifecycle planning of the respective IT components (hardware, OS) is required.

Openness in this respect means that an IT system can be integrated into an existing or planned IT infrastructure environment in the long term.

R221 - 2.2.1 Lifecycle planning

The IT customer and the IT vendor shall share lifecycle planning with regard to applied/supported hardware and operating systems.

The IT customer and the IT vendor should agree on the HW/SW platforms to be supported to minimize development and maintenance costs (i.e. Linux derivatives, etc.).

Priorität: required

Vendor Assessm. 4

Vendor Comment The supported platforms such as Application and Database Servers are listed on <http://reqif.de/index.php/datasheet.html>. Individual customers or customer user groups may share their infrastructure planning to make sure that our products are developed accordingly.

Erstellt am 05/10/2012 05:38 PM von OD

Geändert am 06/08/2012 03:40 PM von OD

R222 - 2.2.2 Communication of changes

Lifecycle plans may be subject to change, but because of the severe consequences (costs, long timeline) involved, deviations from these lifecycle plans shall be communicated as early as possible.

This communication may be at least one year in advance.

Priorität: optional

Vendor Assessm. 4

Vendor Comment Lifecycle planning or roadmaps are communicated via customer newsletter or eventually on user group conventions. In case support for certain platforms or platform versions is going to be terminated, affected customers are informed individually by mail. The same is true should product modules be replaced or discontinued.

Erstellt am 05/10/2012 05:39 PM von OD

Geändert am 06/08/2012 03:46 PM von OD

2.3 Extensibility

IT customers have to establish efficient processes based on suitable IT systems (cf. Figure 1) to achieve competitiveness in their market. The functionality provided by IT systems in the market frequently does not completely cover requirements in this regard.

Openness in this respect means that IT customers have the option of extending the functionality of an IT system in order to implement required process adaptations and to map their own know-how in the IT system.

R231 - 2.3.1 Development environment for extensions

IT vendors shall provide development environments for implementing extensions, which in particular

a. should provide the build-time environment for implementing changes/add-ons to the data model, the business logic and rules, and the user interface.

b. should provide the tools needed to create a runtime executable that can be implemented on top of the standard installed code.

c. should provide appropriate documentation of the interfaces (APIs) and the integration architecture.

Priorität: required

Vendor Assessm. 4

Vendor Comment The REST web-services are standardized to a point that there is no need to provide a development environment to customers. All popular programming languages provide standard libraries to access REST web-services.

The ReqIF Server has been architected according to the 'Service Oriented Architecture' (SOA) to be easily integrated in enterprise environments and to cooperate easily with other systems.

Erstellt am 05/10/2012 05:42 PM von OD

Geändert am 05/10/2012 09:31 PM von OD

R232 - 2.3.2 Third parties for extensions

IT customers shall be able to commission third parties to realize extensions (based on their IT customer license agreements).

Priorität: required

Vendor Assessm. 4

Vendor Comment Third parties with a wide variety of programming skills can be employed to develop extensions to the ReqIF Server. There is no or little constraint on selecting a technology for extensions.

Erstellt am 05/10/2012 05:44 PM von OD

Geändert am 06/08/2012 03:47 PM von OD

R233 - 2.3.3 Change requests

IT vendors shall provide a change request system and feedback regarding change requests within the agreed timeframe (customer contract agreement). This requirement shall be valid for sections 2.1 - 2.6 as well.

Priorität: required

Vendor Assessm. 4

Vendor Comment A JIRA issue tracking system is available at <https://www.excellent.de/jira/browse/REQIF>.

Erstellt am 05/10/2012 05:46 PM von OD

Geändert am 06/08/2012 03:29 PM von OD

2.4 Interfaces

In order to realize the required interoperability (2.1) and extensibility (2.3) of an IT system, IT customers need access to available, documented and performing IT interfaces.

R241 - 2.4.1 Common understanding

IT interfaces shall be documented based on a common understanding and methods of documentation.

Priorität: required

Vendor Assessm. 4

Vendor Comment The documentation provided is targeted at the respective audience, in particular system programmers or system administrators.

Erstellt am 05/10/2012 05:52 PM von OD

Geändert am 05/10/2012 08:00 PM von OD

R242 - 2.4.2 Maintenance statement for interfaces

IT vendors shall provide a maintenance statement for interfaces to IT customers one year in advance.

Priorität: required

Vendor Comment The product licensees are informed individually at least a year in advance, if:

- a new major version of the web-service interface is planned (which is not any more backward-compatible with earlier releases), and if
- maintenance of an older major version is terminated.

Erstellt am 05/10/2012 05:53 PM von OD

Geändert am 06/08/2012 04:37 PM von OD

R243 - 2.4.3 Release compatibility of interfaces

IT vendors shall endeavor to maximize version and release compatibility with regard to new releases of and changes to IT interfaces.

Priorität: required

Vendor Assessm. 3

Vendor Comment We use 'Major.Minor.Patch' version numbering according to <http://semver.org>. Development guidelines are followed to assure that within a major version all external interfaces are backward compatible. Thus, existing clients will continue to work with newer releases of the ReqIF Server. New web-services may be added; older web-services then having a functional replacement will be still available, but marked 'deprecated' in the documentation.

As the interface is still rather new, more frequent interface changes may be necessary when compared to mature systems.

Erstellt am 05/10/2012 05:53 PM von OD

Geändert am 06/08/2012 04:33 PM von OD

R244 - 2.4.4 Common IT interfaces

IT vendors should offer the same IT interfaces to IT customers (or third parties commissioned by these IT customers) as those used internally by the IT vendors, insofar as they have been published.

Priorität: recommended

Vendor Assessm. 4

Vendor Comment All web-service interfaces are made public. Internal interfaces are not designed to be used by external programs and will not be exposed. We will not develop or offer any modules using internal interfaces which have not been published.

Erstellt am 05/10/2012 05:55 PM von OD

Geändert am 06/08/2012 04:40 PM von OD

R245 - 2.4.5 No difference between batch and interactive interfaces

There should be no difference in the functionality and performance of IT interfaces with regard to batch processing and direct interaction.

Priorität: recommended

Vendor Comment There is no such difference in our products; both batch clients and interactive clients use the same web-services interface. In fact, we do not understand the requirement.

Erstellt am 05/10/2012 05:56 PM von OD

Geändert am 06/08/2012 04:42 PM von OD

R246 - 2.4.6 Cancellation of an interface

Cancellation of an interface shall be announced as early as possible.

- a. Cancellation of an IT interface by an IT vendor should be announced at least one year in advance.
- b. In the case of a cancellation, the IT vendor should provide an adequate replacement or, if this cannot be done in time, a workaround.

Priorität: required

Vendor Assessm. 4

Vendor Comment We commit to announce the cancellation of an interface more than a year ahead of time, if ever necessary. In that period, the interface is marked 'deprecated' in the documentation to signify that it should not be used any more in new applications.

Erstellt am 05/10/2012 05:57 PM von OD

Geändert am 05/10/2012 08:08 PM von OD

2.5 Standards

The term "standard" as used here is synonymous with norm, standard, industry standard, vendor-specific standard.

The development and maintenance of a complex system environment (cf. Figure 1) can only be done efficiently if standards are used as far as possible. This is valid for all the previously mentioned aspects of openness (interoperability, IT infrastructure and extensibility).

R251 - 2.5.1 Standards use and documentation

IT vendors should support relevant standards and document their usage. IT vendors shall provide a list of the standards implemented in a specific IT system.

Priorität: recommended

Vendor Assessm. 3

Vendor Comment We do support all relevant standards, official or de-facto (W3C, OMG and others), to ascertain that the ReqIF Server can be used universally. However, at the present time we do not have a comprehensive documentation of standards used.

Erstellt am 05/10/2012 05:59 PM von OD

Geändert am 06/08/2012 04:43 PM von OD

R252 - 2.5.2 Future standards

With regard to the support of future standards, IT vendors shall provide a statement of intent and should provide a roadmap relating to the usage of standards for specific processes.

Priorität: required

Vendor Assessm. 2

Vendor Comment We commit to respect upcoming standards, if relevant. However, we do not have a documented roadmap, yet. Customers may submit requests for features or standards compliance at any time.

Erstellt am 05/10/2012 06:00 PM von OD

Geändert am 06/08/2012 04:44 PM von OD

R253 - 2.5.3 Best practices

If supporting a standard, IT vendors should adhere to the related best practices and use cases (if available).

Priorität: recommended

Vendor Assessm. 4

Vendor Comment We are working with multiple partners providing client solutions for the ReqIF Server. The experiences are input to the requirement and release management processes.

Erstellt am 05/10/2012 06:01 PM von OD

Geändert am 05/10/2012 08:15 PM von OD

R254 - 2.5.4 Implementor Forums

To ensure standards-based interoperability, IT vendors should participate in the related Implementor Forum (if available).

Priorität: recommended

Vendor Assessm. 4

Vendor Comment enso managers gmbh is actively participating in the ProSTEP iViP ReqIF Implementor Forum.

Erstellt am 05/10/2012 06:02 PM von OD

Geändert am 06/08/2012 04:45 PM von OD

2.6 Architecture

The IT architecture comprises the components making up an IT system, the relationships between these components and the way in which they interact and have been integrated. IT customers need access to the individual components so that

- they can create GUIs (clients) for specific user groups which leverage the capabilities of the different IT systems, and
- administration and continued operation of the different layers (e.g. OS, DB, application and client) can be delegated to the appropriate internal organizations.

R261 - 2.6.1 Documented architecture

The IT system shall have a documented architecture.

Priorität: required

Vendor Assessm. 4

Vendor Comment The ReqIF Server has a clear architecture following the Java Enterprise Edition (J2EE). A comprehensive specification with architecture, use-cases and requirements can be audited by interested customers.

Erstellt am 05/10/2012 06:03 PM von OD

Geändert am 06/08/2012 07:03 PM von OD

R262 - 2.6.2 Separation of tiers

The IT system shall have a clear and documented separation of the individual tiers (e.g. n-tier architecture, peer-to-peer etc.).

Priorität: required

Vendor Assessm. 4

Vendor Comment The ReqIF Server has three tiers, namely database, business logic and user interface tiers. The tiers follow pertinent industry standards and open source libraries. The architecture may be audited by interested customers at any time.

Erstellt am 05/10/2012 06:04 PM von OD

Geändert am 05/10/2012 08:23 PM von OD

R263 - 2.6.3 Independent tiers

If appropriate, it should be possible to adapt the tiers independently of one another. This applies in particular to the presentation tier.

Priorität: recommended

Vendor Assessm. 4

Vendor Comment By using standard frameworks, it is possible to use a wide range of application servers, database systems and user directories. The clients are connected via web-services and can be developed independently using virtually any development technology (programming language).

Erstellt am 05/10/2012 06:05 PM von OD

Geändert am 06/08/2012 04:47 PM von OD

2.7 Partnership, IT vendors and IT customers

The openness of an IT system cannot be seen separately to its IT vendor or the IT customer:

- Contractual stipulations regarding customer-supplier relationships and, for example, third-party solutions are part of the overall "openness" picture.
- The requirements of IT customers and their purchasing behavior influence the further development of the openness of marketable IT systems.

R271 - 2.7.1 Intellectual property

IT customers and IT vendors show mutual respect for their respective intellectual property.

Priorität: required

Vendor Assessm. 4

Vendor Comment enso mananagers and eXXcellent solutions respect the ownership and intellectual property of the data stored in the ReqIF Server, as well of any self-commissioned client software.
Open source and commercial libraries used within the ReqIF Server are documented and their respective license provisions are respected.

Erstellt am 05/10/2012 06:06 PM von OD

Geändert am 06/08/2012 04:51 PM von OD

R272 - 2.7.2 CPO fulfillment report

IT vendors who signed the CPO agree to subject their CPO-related IT systems to the terms of the CPO and report on fulfillment (CPO statement).

This CPO statement may be part of the presentation of new IT systems or IT system updates/upgrades.

Priorität: required

Vendor Assessm. 4

Vendor Comment This is the ReqIF Server CPO fulfillment report.

Erstellt am 05/10/2012 06:07 PM von OD

Geändert am 05/10/2012 08:27 PM von OD

R273 - 2.7.3 Recognition of the CPO

IT customers who signed the CPO agree to the terms and definitions of the CPO and recognize the CPO as an evaluation criterion for IT systems.

Priorität: required

Vendor Assessm. 4

Vendor Comment enso managers and eXXcellent solutions agree with the CPO.

Erstellt am 05/10/2012 06:08 PM von OD

Geändert am 06/08/2012 04:51 PM von OD

R274 - 2.7.4 Ownership of user data

Data generated by IT users with an IT system is and remains the intellectual property of these IT users. Appropriate interfaces shall be available for accessing this intellectual property.

Priorität: required

Vendor Assessm. 3

Vendor Comment The user can read or export his data in a standard format at any time. We advertise "Your data is your's". A function to export historized data is planned, but not yet available.

Erstellt am 05/10/2012 06:09 PM von OD

Geändert am 06/08/2012 04:54 PM von OD

R275 - 2.7.5 Co-operations between IT customers

Co-operations (e.g. joint ventures) between IT customers should be made possible by means of license agreements from the IT vendors.

Priorität: recommended

Vendor Assessm. 4

Vendor Comment We allow the sale or transfer of licenses from an organization to another.

Erstellt am 05/10/2012 06:11 PM von OD

Geändert am 05/10/2012 08:31 PM von OD

R276 - 2.7.6 Extensions of IT systems

IT vendors shall support the integration and extension of their IT systems by IT customers and/or third parties in accordance to contractual stipulations.

Priorität: required

Vendor Assessm. 4

Vendor Comment There is no clause in the license agreement which limits a customer to freely decide on how to design system integration or extensions. Upon customer request, we are happy to add any interface or data representation to the system, if efforts are compensated accordingly.

Erstellt am 05/10/2012 06:12 PM von OD

Geändert am 06/08/2012 04:58 PM von OD

R277 - 2.7.7 Partnership models

IT vendors should offer appropriate partnership models for third-party companies.

Priorität: recommended

Status: 4

Vendor Comment We have a partnership model for third-party companies.

Erstellt am 05/10/2012 06:13 PM von OD

Geändert am 05/10/2012 08:33 PM von OD

R278 - 2.7.8 User communities

IT users and innovation communities should be supported by the IT vendors.

Priorität: recommended

Status: 4

Vendor Comment User and innovation communities are supported in the following way:

- annual meetings will be attended by a management representative of enso managers or eXXcellent solutions,
- they are queried for customer-driven feature requests and
- informed individually about future plans.

Erstellt am 05/10/2012 06:13 PM von OD

Geändert am 06/08/2012 05:00 PM von OD

2.8 Validity and Prerequisites

The validity and the prerequisites of the “Fundamentals” and the “CPO Terms” described in the sections 2.1 – 2.7 have to be determined:

- All interested companies, IT customers and IT vendors, should sign the CPO. IT vendors who have signed the CPO shall provide a list of their relevant products and the degree of fulfillment as a “CPO Statement”.
- All the companies that have signed the CPO (IT vendors: signature plus CPO Statement) and are members of the ProSTEP iViP Association belong to the “CPO Community” (cf. 3.1 CPO Bodies).
- Opting-out clause: A registered letter to the ProSTEP iViP board shall be sufficient.
- New major releases of the CPO have to be signed again by the members of the CPO Community. It is planned that one major release will be published each year.
- The terms are to be applied to the latest version and to all subsequent versions of marketable IT systems. IT vendors of IT niche systems may join the CPO initiative and subject their systems to the terms of the CPO as far as this is reasonable.
- If the marketable IT system provided by an IT vendor does not meet with the terms, a convergence path shall be described.

3 Organizational Rules

3.1 CPO Bodies

An appropriate organization ensures the long term development of the CPO initiative under the auspices of the ProSTEP iViP Association.

All the companies that signed the latest Major Release of the CPO (IT vendors: signature plus CPO statement) have the opportunity to play an active role in the CPO Community.

An elected part of the CPO Community is the “CPO Core Team”. It is intended that this team work on the CPO items described below and listed under “3.2 Generic Flow Chart for a Major Release” in an efficient manner.

CPO Community

The members of the CPO Community can (cf. 2.8)

- attend the annual CPO conference.
- elect and confirm the CPO Core Team out of the CPO Community.
- make proposals and discuss all relevant CPO items, e.g. the next major version of the CPO, with the CPO Core Team.

CPO Core Team

The CPO Core Team, comprising nine participants – at least two from each group (IT vendors, IT customers, IT service providers) – and including the chairman,

- is responsible for the annual CPO report
- finalizes the next CPO version
- is responsible for public relations
- organizes the annual CPO conference
- engages external support (coordinator)

Public Relations

Interaction with the “PLM world” (interested companies which are not part of the CPO Community) should be possible.

- Web presentation:

CPO and organizational information

List of companies that have signed the CPO

CPO Statements (voluntary commitment on the part of IT vendors), in the form of links to the respective IT vendor presentations

Contact address with an online-form for proposals

- Feedback process:

IT vendors should report to the CPO Core Team with regard to feedback from their customers or from the PLM world. This report should be kept neutral.

Costs/Effort involved in the CPO Initiative for Participants:

Each member of the CPO Community and the CPO Core Team bears his/her expenses on his/her own.

- Voluntary attendance at the CPO Community meetings
- Voluntary candidature for/membership in the CPO Core Team
- Cost of their CPO activities
- CPO Statement
- CPO website
- CPO feedback to the CPO Core Team

The ProSTEP iViP Association organizes the CPO Initiative and bears the cost of

- Engaging an external coordinator
- The website for the CPO initiative
- Conducting the annual CPO Community Conference (organization, facilities)
- Hosting CPO Core Team meetings (if desired)

3.2 Generic Flow Chart for a Major Release

The “Generic Flow Chart for a Major Release” describes the work performed by the CPO Community and by the CPO Core Team with regard to the typical cycle of a major release.

Figure 2: Generic Flow Chart for a Major Release

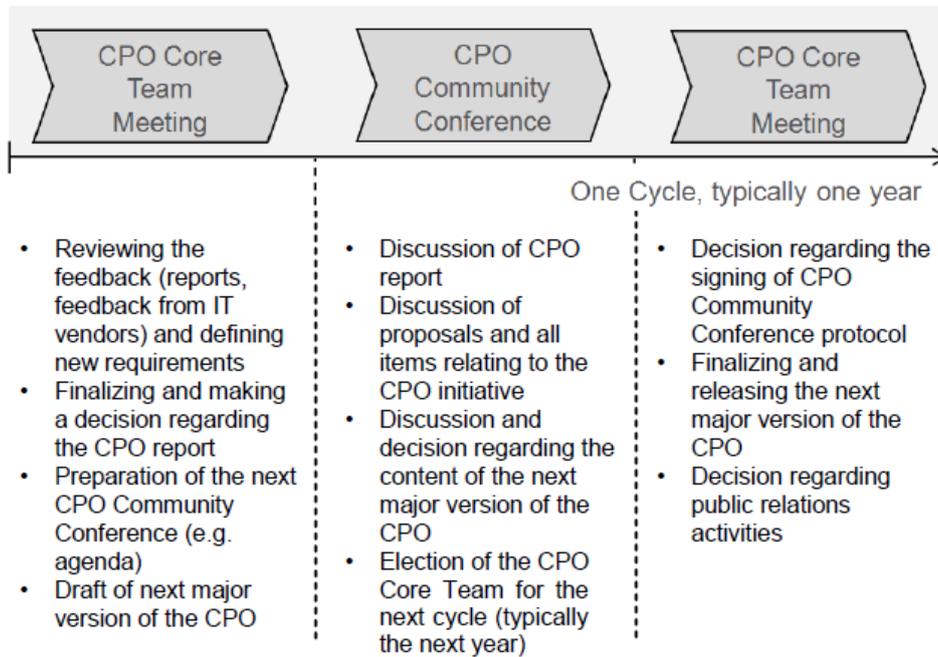


Abbildung 2 - Figure 2: Generic Flow Chart for a Major Release

4 Supplementary Documents

4.1 Glossary

The glossary constitutes part of the CPO (cf. page 16 ff.).

To help understand the CPO properly, all the underlined key words are defined in the glossary.

5 Signatures

With our signature, we admit to the Codex of PLM Openness (CPO), Version 1.0 in form of a selfcommitment on voluntary basis, which comprises non-enforceable terms and does not constitute any legal claim.

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Supplementary Document: Glossary for CPO 1.0

All definitions are to be seen in the context of PLM and the CPO.

Key words	Definitions
Architectural layer	Typical term for the different functional areas within an IT architecture.
Build time / runtime	Creation/execution of program code.
Business logic	Business logic describes the functional algorithms that handle the exchange of information between a database, the application (client/server) and a user interface. Business logic can be implemented by business rules and workflows thus describing the business behavior of an IT solution. While most of the business logic can typically be customized, there are always areas that need to be protected against user access for IP or data consistency reasons.
Cancellation of - interfaces - software products	The cancellation (withdrawal) of IT Systems, interfaces as well as APIs is individually managed as part of software contracts and in relation of warranty terms & conditions.
Data, "their data"	IT users own the input used in their interaction with an IT system and, at a minimum, the explicit output information.
Development environment	An environment for extending the data model and business behavior of a system. Typically, it is an integrated software application or a set of IT tools that provide comprehensive facilities for software development. The IT vendor provides a development environment or defines a set of tools for customizing/enhancing the PLM IT solution and defines the required prerequisites, which need to be provided by a customer or a third party.
Extensibility	Capability of an IT system to support functional extensions or adaptation by IT customers or third parties.
free/free of charge	free = access with no limits free of charge = no fees
Industry standard	Vendor- independent document, proven in practice. An (inter)national norm/standardization process was not performed.
Integration - process - data - system	Integration is a process involving the pre-agreed and defined exchange of information relating to data (data integration), processes (process integration) or IT systems (system integration).
Interoperability	Capability of independent, heterogeneous IT systems to work together as seamlessly as possible in order to exchange information in an efficient and usable manner.
IT	IT - Information Technology
IT architecture	Structured arrangement of the IT components in an IT system as well as documentation of their relationships (including interaction)
IT components	Element of an IT system with defined IT interfaces for connection to other IT components.

IT customer	Company that uses IT systems and/or tools for their business processes and which purchases/leases software licenses and/or services.
IT infrastructure	IT infrastructure refers to all tangible and intangible assets which allow the operation of IT systems.
IT interface (Software)	External or internal documented access to a software application/layer API - Application Programming Interface
IT niche system	An IT system that is developed to meet very specific requirements (industry-specific, customized, smaller, more manageable group of users, special solution for a particular task). Software for performing a specifically defined task complementing one or more IT systems.
IT service provider	Companies which provide services, e.g. perform integration tasks for IT customers.
IT system	IT system: Software for supporting PLM process areas. From a technical perspective, an IT system consists of IT components with a defined functional boundary. The IT system is based on an IT architecture. IT interfaces enable communication between IT components and communication with these components. The functionality of the IT system falls under the liability of an IT vendor.
IT user	Single person using an IT system or tool.
IT vendor	Company that develops/delivers IT systems or IT tools to IT customers as stipulated in a contract and which provides the customer with a warranty for these systems and tools. Typically, the IT vendor is also the IT manufacturer.
Norm	A norm is a legally recognized and agreed document that is subject to a standardization process and which becomes universally applicable upon publication. Standards are issued by (inter)national standardization organizations (DIN, ISO, etc.)
N-tier	Indicates the number (n) of architecture layers describing the software infrastructure of an IT system. Typically known is the 3-tier architecture: user interface (client), server and database.
OEM (Original Equipment Manufacturer)	The manufacturer of a consumer product (not limited to automotive manufacturers).
Platform	In the context of HW/SW, it is typically a specific combination of hardware and an operating system that allows software applications to be executed.
PLM - Product Lifecycle Management	In industry, product lifecycle management (PLM) is the process of managing the entire lifecycle of a product from its conception, through design and manufacture, to service and disposal.
PLM layer	Logical function unit which is part of PLM. Recognized units are CAD (design), TDM (Team Data Management), PDM (Product Data Management) and ERP (manufacturing bill of materials). The units can be arranged into a layer model PLM (PLM layer model).
Portability	Capability offered by an IT system that allows it to be executed in different operating environments.

Roadmap	<p>Specific details about future development plans. IT vendors/IT customers use it to announce the availability of new technologies/products:</p> <p>1) Generally speaking, a roadmap is not binding. It is up to the IT vendor/IT customer to decide whether they publish their future plans and strategies or not.</p> <p>2) The information regarding plans and strategies becomes binding within the framework of bilateral contracts (NDA etc.), for example:</p> <ul style="list-style-type: none"> - IT vendor provides availability dates for IT services (software/hardware/services/etc.) - IT customer provides implementation dates for deployment (e.g. PLM software).
Service	<p>1- Contractual fee based service engagement</p> <p>2- Programming interface (higher level of aggregation than APIs)</p>
Standard "relevant standard"	<p>A document which is developed with the participation of all interested parties and which has their approval. Standards are issued by standards organizations (ISO, OMG, W3C, ProSTEP iViP etc.). It often provides the basis for a norm. "Relevant standard" refers to common practice in the majority of enterprises in the industry.</p>
Supplier	A manufacturer of modules, components for a retail product.
TDM - Team Data Management	IT system for data management relating to one or more specific authoring systems (data-generating IT system). The TDM is usually closely integrated with a CAx system.
Third party	IT vendors which provide niche systems or extensions to IT systems for IT customers.
Upward/downward compatibility	cf. version/ release compatibility
Vendor-specific standard	Company-specific (proprietary) document from a manufacturer whose application is considered by many users as beneficial.
Version/release compatibility	Capability of an IT system release (version) to support the same features or functionality, the same data structures and the same integration opportunities as another release (version) for additional IT systems. A release usually includes the functions, data structures and integration capabilities of the previous version (so-called backward compatibility). More rarely, a release includes the functions, data structures and integration options provided by subsequent releases (so-called upward compatibility).
Web service	A web service is a method of communication between two electronic devices via a network

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