

# Codex of PLM Openness

## *Windchill Self-Assessment*

PTC is committed to PLM openness. In addition to acknowledging the value of openness to our customers, we view it as a competitive advantage. We recognize that in today's complex enterprise IT landscape, large-scale technology replacement is difficult, costly, and risky at best and is often infeasible. Through PLM openness, PTC sees opportunities to deploy select solutions within existing IT environments – opportunities that could not exist without the openness enabling cost-effective and reliable integration of our products into established IT ecosystems.

In this document, PTC provides an assessment of our current alignment with the specific terms laid out for IT vendors in the Codex for PLM Openness (CPO), version 1.0. Section headings and *italicized* text correspond directly to CPO content; PTC responses appear indented under their respective CPO terms. Unless specifically indicated otherwise, all statements pertain to PTC's Windchill® line of enterprise PLM products.

### **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.*

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

PTC's PLM products offer a variety of technological options to realize integrations:

- a comprehensive and documented set of Java APIs for creating Java-based customizations and integrations
- the [Info\\*Engine®](#) integration platform and related adapters for creating XML-based composite applications and integrations
- support for JMS-compliant message-oriented middleware (MOM)
- SOA support via a JAX-WS web services framework for deploying arbitrary, platform-independent web services, implemented using either Java or Info\*Engine®
- [Enterprise Systems Integration](#) for out-of-the-box bi-directional integration between Windchill® PLM and ERP systems

Additionally, PTC offers programmatic tool kits for its CAD products that enable custom PLM integration. PTC also offers training on the above technologies, best practices, and

partnerships with numerous 3<sup>rd</sup> party PLM integration specialists.

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

In addition to the core integration technologies described in response to CPO term 2.1.1, Windchill® offers additional ways for customers to readily access their data beyond the user interfaces of the applications themselves:

- an extensible export/import framework for exchanging data, including meta-data, binary content, and relationships in platform-neutral XML
- user-defined packages supporting the collection and export/import of product data for exchange between Windchill® systems
- a bulk migrator tool that facilitates importing data into Windchill® from other sources

Additionally, 3<sup>rd</sup> party integration specialists have developed integration solutions between PTC's PLM products and other IT systems.

## **2.1.3 Therefore IT interfaces shall be provided by the IT vendors.**

PTC offers numerous interfaces to its PLM products. Each involves standards applicable to its respective technological and business domain.

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

Standards relevant to PLM integration currently supported by PTC include:

- Java APIs: Java RMI and Javadoc
- Info\*Engine®: XML, Java, JSP, JDBC, JNDI, SMTP, and JMS
- web services: HTTP, SOAP, XML, WSDL
- STEP: PLM Services 2.0 utilizing AP 214

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

PTC offers best practices for integration via product documentation, technical support, formal training, an on-line searchable knowledge base, white papers, and consulting services.

## **2.1.4 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.**

N/A – this CPO term is applicable to IT customers only and not to IT vendors.

## **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.*

### **2.2.1 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.).**

PTC publishes a platform support matrix for each release of its PLM products at [www.ptc.com/support](http://www.ptc.com/support). The support matrix represents the combinations of platforms, operating systems, and third party products that have been tested and verified by PTC. These recommended product combinations are based on compatibility, testing, performance, and reliability. Other software combinations not shown here may perform properly, but are not qualified through PTC's testing and validation process.

PTC also publishes a Windchill® Future Support Summary matrix and post-release planned certifications. PTC customers can access the future support matrix at [www.ptc.com/view?im\\_dbkey=69784](http://www.ptc.com/view?im_dbkey=69784).

### **2.2.2 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.**

While such plans are necessarily forward-looking and are subject to change due to rapid evolution within IT industries, PTC publishes and maintains its planned platform support for future releases of its software at [www.ptc.com/support](http://www.ptc.com/support) (access requires a customer web account, which is available to all customers on active maintenance). To the extent that changing business circumstances allow, PTC endeavors to follow these plans.

## **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.*

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

#### **2.3.1.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.**

PTC provides all of the tools, libraries, and associated documentation necessary to extend the Windchill® data model and to realize customizations to the business logic and the user interfaces. In certain instances, tools originate from open sources. In such cases, PTC provides the instructions for obtaining, configuring and using these tools.

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

PTC provides all of the tools and associated documentation necessary to deploy extensions, customizations, and integrations to Windchill® on top of the standard installed code. In the event that such tools originate from open sources, PTC provides the instructions for obtaining, configuring, and using these tools.

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

PTC provides Javadoc documentation for its Windchill® Java APIs. PTC also provides manuals describing architectural features and examples of common varieties of supported customizations. All documentation, including the on-line Windchill® Help Center, is available to all customers with valid web accounts at [www.ptc.com/support](http://www.ptc.com/support). Additionally, the user interface components (aka common components) are documented in Windchill and code samples are provided.

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

Customers may commission third parties to realize extensions. Typically, customization licenses are required based on the number of customization developers. However, the same licenses purchased by IT customers for their own use may be used by third parties

commissioned by them without additional fee or obligation, provided that the terms of the license (such as the number of concurrent developers) are respected.

### **2.3.3 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.**

PTC has an ISO 9000-certified technical support process, which includes customer issue reporting, defect tracking, and the submission of enhancement requests. A customer may also choose to purchase the services of a TSAM (Technical Support Account Manager) who will work closely with a customer on the management of support issues, including enhancement requests. Additionally, PTC product management maintains a tradition of engaging directly with customers upon request to discuss both current and proposed product features.

## **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.*

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

PTC provides interface-specific documentation for Windchill® in Javadoc format for Java APIs and WSDL (Web Service Description Language) for web services. Documentation follows the applicable conventions in both cases. Additional documentation, including examples, is provided in HTML and PDF formats.

For user interface customizations, documentation is also provided in the form of online instructive examples. PTC provides many examples, explanations, best practices, and source code samples accessible via the Internet.

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

The Windchill® APIs are documented in published Javadocs, which include deprecation notices. These deprecation notices are published at least one release in advance of API changes. In addition, with each major release, PTC publishes a report detailing changes to supported Windchill® APIs.

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

Full version and release compatibility with regard to new releases of and changes to IT interfaces is always intended unless specifically indicated otherwise. Where deviations occur, these are addressed as bona fide defects according to PTC's support policies. In the event that interfaces are to become incompatible due to deliberate change, PTC follows a deprecation procedure and provides suitable alternatives in advance, as applicable.

### **2.4.4 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.**

All IT interfaces offered to IT customers are those used internally by PTC. However, PTC does reserve certain interfaces for internal use and does not offer these to customers for use in customizations.

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

The same interfaces are used to implement both batch processing and direct interaction. However, not all features available via product user interfaces have directly corresponding IT interfaces available for programmatic use. Such IT interfaces are selectively made available based on the needs and popularity of customization scenarios.

### **2.4.6 Cancellation of an interface shall be announced as early as possible.**

#### ***2.4.6.a Cancellation of an IT interface by an IT vendor should be announced at least one year in advance.***

Prior to cancellation of an interface, a deprecation period including at least one release is observed, giving IT customers the opportunity to change their implementations as described in the deprecation notice. The deprecation notices usually include an alternate interface to be used.

#### ***2.4.6.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.***

In the case of cancellation, an adequate replacement or workaround is typically provided. This information is documented in the deprecation notice for the canceled interface, which is made available at least one release in advance of the cancellation.

## 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).*

### 2.5.1 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.

PTC supports commercially and technically relevant standards within Windchill®. For web services, PTC supports various WS-I profiles, including WS-I Basic and WS-I Security. Within other integration tools, such as Info\*Engine®, PTC also supports JMS (Java Message Service) and the JSP/Servlet specification.

For data formats, Windchill® currently supports PLM Services 2.0 utilizing STEP AP 214. [Creo®](#) supports the JT geometry standard.

### 2.5.2 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.

As standards evolve and their relevance changes, so does PTC's support for them. Standard support is regularly part of PTC product and process roadmaps.

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

PTC strives to implement those parts of a standard that our customers indicate are relevant and are enablers of their business processes.

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

PTC participates in various standards bodies such as [OASIS](#), [ProSTEP iViP](#), and [OMG](#).

## 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.

### **2.6.1 The IT system shall have a documented architecture.**

Windchill® has a documented architecture. The various views of the Windchill® architecture relevant to customization are described in the *Windchill Customizer's Guide*. PTC also provides implementation and architectural detail and best practices through PTC's Enterprise Deployment Center.

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

Windchill® has documentation related to the customization of its three main tiers: data model, business logic, and presentation. These tiers are architecturally separate with the intent that each tier can admit customizations independently of the others.

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

The architectural intent in Windchill® is for each tier to be adapted independently of one another. Documented techniques and examples are provided to illustrate independent customization within each tier. For example, it is possible to create a separate user interface to Windchill.

## **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.*

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

PTC respects the intellectual property of its customers and strives to provide IT systems that both safeguard this data and make it readily available to appropriate users.

### **2.7.2 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.**

PTC is providing this document as an assessment of Windchill's current alignment with the CPO terms.

**2.7.3 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.**

N/A – this CPO term is applicable to IT customers only and not to IT vendors.

**2.7.4 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.**

PTC recognizes that data submitted to or generated by its software on behalf of users remains the intellectual property of those users. PTC provides numerous IT interfaces (described elsewhere in this document) and export/import capabilities to make this data as available as possible to appropriate users.

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

License arrangements are addressed contractually on a deal-by-deal basis.

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

PTC offers licenses for the extension and integration of their IT systems. These licenses can be used, as applicable, either by customers or by third parties commissioned by them.

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

PTC has an extensive [partner program](#) with dozens of active software and service partners.

PTC software partners have access to PTC licenses, technical support, and joint marketing support to aid in the development and marketing of complementary products, including products that support the integration of PTC IT systems with other IT systems.

PTC service partners extend PTC's capabilities and reach with certified consulting and

systems integration. Service partners provide consulting and training services.

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

PTC supports users and innovation communities in several ways. Below are some examples.

PTC actively supports a large organized user community, [PTC/USER](#), that enables PTC customers and product development professionals to actively participate in exchanging ideas, success stories, and best practices. This organization conducts numerous events throughout the year. Although it is independently run by users of PTC products, PTC provides active support for the group's activities, including the organization of its annual conference, [PlanetPTC](#).

PTC sponsors a BOCA (Board of Customer Advisors) community for specific purposes and regularly conducts usability testing with end users.

Customer-members of the PTC/USER Technical Committees (TCs) enjoy a close relationship with PTC, including previews to new products and releases and opportunities to influence product directions. TCs meet face-to-face twice per year (January and June) and hold many virtual sessions throughout the year.

PTC hosts an online community at [communities.ptc.com](#), where IT users can collaborate with each other and PTC personnel.

## 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.*

Section 2.8 of the codex does not define any terms requiring responses from IT vendors.