



Ten Questions to Ask PLM Solution Suppliers

*“What You Need to Know to Make
an Informed Decision”*

August 2010

A CIMdata White Paper

Ten Questions to Ask PLM Solution Suppliers

*“What You Need to Know to Make
an Informed Decision”*

August 2010

*Produced by
CIMdata, Inc.*

CIMdata[®]

<http://www.CIMdata.com>

CIMdata, Inc.

3909 Research Park Drive, Ann Arbor, Michigan 48108

Tel: +1 (734) 668-9922 Fax: +1 (734) 668-1957

CIMdata[®] is a Registered Trademark of CIMdata, Inc.

Copyright © 2010 by CIMdata, Inc. All rights reserved.

Ten Questions to Ask PLM Solution Suppliers

“What You Need to Know to Make an Informed Decision”

This CIMdata-authored white paper sets out to describe ten critical questions to ask PLM solution suppliers. These questions, which have been defined and validated based on CIMdata’s experience and specific research performed for this white paper, are often overlooked or glossed over when executing a PLM evaluation and selection program. If not asked and answered properly, the company executing the evaluation and selection program may find itself with a solution that is inadequate for their needs months or perhaps a year or so down the line.

1. Introduction

Evaluating and selecting a Product Lifecycle Management (PLM) solution supplier to become a long-term strategic partner can be a difficult and time-consuming process. Ultimately, asking the right questions can help you better understand both your needs and a solution supplier’s ability to meet them. You need to ask yourself what you need to know and what questions you should ask and why?

While there are many questions that need to be addressed, this paper focuses on ten critical questions that CIMdata believes every company should ask their potential PLM solution supplier. The answers received should provide significant insight into how the supplier’s solution will address the company’s critical business requirements related to PLM. It is important to note that the ten questions presented herein have been validated through CIMdata’s experiences and interviews of industrial companies regarding their PLM implementations. These interviews focused on the questions that they either asked, or later realized they would have benefited from asking the PLM solution suppliers considered.

The research for this paper was sponsored by PTC.

2. Business Challenges

Enterprises around the world are struggling to find ways to compete more effectively to survive and thrive. In this environment of industrial stress, companies are seeking better ways to utilize information technologies and the processes that they enable to successfully address their challenges. PLM is one of the most significant initiatives being pursued by companies in almost all major industrial sectors throughout the world.

CIMdata defines PLM to be a strategic business approach that applies a consistent set of business solutions in support of the collaborative creation, management, dissemination, and use of product definition information across the extended enterprise, spanning from product concept to end of life—integrating people, processes, business systems, and information. PLM forms the product information backbone for a company and its extended enterprise.

PLM is not just an Information Technology (IT) application. While most PLM environments are enabled using technology, improved business processes and integration with other business systems are also fundamental components of a successful PLM program. As a result, evaluating and ultimately selecting a PLM solution supplier is more than just comparing software features and functions. Customers need to understand how well a supplier’s solution can fit into, support, and enhance their business processes and culture. The PLM working environment interacts with other business processes and many different users need to work with PLM-managed product definition information captured in a Bill of Materials (BOM) and other product related areas.

3. Ten Critical PLM Questions

This section presents and discusses ten key questions that every company should ask their current or potential future PLM solution supplier. For each of these questions, it is important to know: (1) Do they provide such a capability; and more importantly, (2) How do they deliver that capability? The “how” is the critical factor. While multiple PLM solution suppliers may provide similar functionality and/or capability, how that functionality is delivered and how well it will work in your business and technical environments is what must be ultimately understood and

appreciated. These questions, which will be discussed in detail in this section, are as follows (note that these questions are not in a priority order as each is important in its own right):

- 1) How do you support multi-Mechanical CAD design and change management across distributed environments?
- 2) How do you support integrated MCAD, ECAD, software design, and configuration management (i.e., how do you support mechatronics)?
- 3) How can your solution enable the standardization of our business processes, as well as the replacement and/or consolidation of our business and IT applications?
- 4) How can your solution grow with our business from a basic PLM implementation to enable more advanced PLM capabilities?
- 5) What best practices are supported within your out-of-the-box solution that helps meet our specific business needs?
- 6) How do you support secure collaboration within our enterprise and across our supply chain?
- 7) Are all of your PLM applications on the same architecture, data model, and standards (and which are they)?
- 8) What tools are available and/or needed to configure and extend your solutions' data model, user interface, capabilities, workflow, etc.?
- 9) How can the proposed PLM solution be integrated within our current business systems and processes?
- 10) How does your architecture scale to meet changing business needs?

The following sections are provided to better understand the importance of each of these questions and how one would evaluate responses from PLM suppliers. With this in hand, any PLM solution evaluation and selection team should be ready to begin its important task with confidence.

For each question, we identify why that question is important and how you need to evaluate a solution provider's response to the question. Each company will have different business needs and your evaluation of the responses must take into account your specific business model, method of operation, current (and future) technology, and operational environment.

1) How do you support multi-Mechanical CAD design and change management across distributed environments?

Importance of Question

Most companies are not just working with internal resources, but also with their partners, suppliers, and/or customers throughout much of the product development process, and in fact, throughout much of a product's entire lifecycle. This often requires the interchange and use of design information created in multiple Mechanical-CAD (MCAD) systems. Being able to easily use (e.g., view, review, and modify) CAD models from multiple sources is key to working effectively within your supply chain.

Evaluation of Response

Fundamentally, you want to understand how your PLM solution supplier will help you work in a multi-MCAD environment—some that your company uses and perhaps some that your suppliers and/or customers use.

Specifically, what CAD systems are supported? What capabilities are provided to enable you to work with multi-MCAD data? How is information imported and exported between these systems? Are capabilities provided that allow a user to view assemblies that are comprised of parts from multiple MCAD systems? What file format is used to handle and work with multi-MCAD assemblies? Can you make changes to the multi-MCAD models/data and have those changes automatically replicated back to the originating system? Can you maintain revision and version control during the editing processes?

2) How do you support integrated MCAD, ECAD, software design, and configuration management (i.e., how do you support mechatronics)?

Importance of Question

More and more products include mechanical, electronic, and software components. In many cases, software is the difference between product variants and sometimes models. Being able to manage mechanical, electronic, and software parts and components as a single, integrated product representation is a key to better and more integrated product design. Companies need to ensure that they can effectively integrate all three into design and development within the overall product development process. They need to be able to ensure that changes made by a user that could impact

other areas are communicated effectively across all domains, e.g., Mechanical Computer-Aided Design (MCAD), Electronic Design Automation (EDA), Simulation & Analysis (S&A) and embedded software.

The increasing complexity of products (particularly the increased importance of electronics and software as differentiating factors between products) means that you need to fully understand the scope and specific capabilities for supporting seamless and transparent mechanical, electronic, and software design, configuration, validation, and management throughout the product lifecycle. Effective systems engineering and mechatronics support can be the difference between success or failure in the market place.

Evaluation of Response

You need to know what level of mechanical, electronic, and software design and development is supported. What design systems are supported and how are they integrated within the overall processes? It is important to know what information is managed and where and how you control changes in each domain that impact the others so that you maintain one integral definition of your product referenced by everyone. Try to understand how changes are communicated between domains so that configuration management is maintained consistently. You want to understand not only the capabilities offered but also how they are delivered so that you can determine if it will best fit your working (current or planned) environment and processes.

3) How can your solution enable the standardization of our business processes, as well as the replacement and/or consolidation of our business and IT applications?

Importance of Question

Simplification and standardization of business processes across the enterprise can provide significant benefits to a company. Implementing a PLM environment provides a company the opportunity to review their processes and rationalize their IT environment using PLM-managed workflows and applications that are designed to work together. You want to be able to reduce the number of different applications by replacing them with integrated solutions built on a common architecture. By standardizing processes and applications, an organization can reduce the complexity of the working environment. This makes it easier for employees to do their tasks since they have one source of information with a common U.I. across multiple

applications. Further, having fewer points of integration between applications reduces the cost of maintenance upgrades and support.

Evaluation of Response

What solutions are being provided as part of the proposed PLM environment? The supplier should explain how their solution could be used to standardize processes, including which ones are supported and the changes that they would recommend. What integrated applications do they provide that can replace the multiple applications currently being used to perform similar functions? One example would be to replace different requirements management tools from either a variety of commercial or homegrown applications with an integrated requirements management solution that is linked with other product development information and processes.

Does the proposed solution completely meet your requirements? If not, will you need to acquire additional modules from this solution supplier or possibly tools from other vendors in order to accomplish your application rationalization goals? What is the impact on other organizations that may be using the applications being replaced? Can they use the new, integrated applications or do they have other needs that cannot be met with the new application and processes?

4) How can your solution grow with our business from a basic PLM implementation to enable more advanced PLM capabilities?

Importance of Question

PLM solution suppliers evolve their offerings over time, introducing new capabilities. Often, you'll want to assess and accept many of these new capabilities as your business needs evolve. It is important to understand how a PLM solution supplier has architected their solution suite for the expansion of capabilities from basic data vaulting and BOM management to include capabilities such as options and variant management, product-related analytics, and product information publishing. You want to have a seamless expansion path that allows you to grow as needed without having to continually pay for re-implementation, or worse, maintaining ongoing customization of the solution. As a key enterprise investment, your PLM environment needs to be able to easily evolve to meet your growing business needs. You also want to understand the dependencies and costs associated with expansion.

Evaluation of Response

Are the new capabilities built on the same IT architecture and data model? Is the user interface paradigm the same and can it be tailored to new users' terminology and tasks to ease adoption and expanded use of product information?

You need to know what interdependencies exist and/or must be satisfied in order to deploy new capabilities so that you can fully evaluate the cost and impact of deploying them, e.g., additional software or solution modules, additional licenses and the cost of those licenses and maintenance, additional tailoring, or customization, etc.

It is also important to understand if your current IT infrastructure will support the new capabilities or will it have to be expanded, enhanced, or replaced? Find out what upgrade, migration, and expansion tools are provided to help you and how they work. How much of the expansion effort can be automated?

5) What best practices are supported within your out-of-the-box solution that helps meet our specific business needs?

Importance of Question

PLM solution suppliers are developing and delivering preconfigured solutions tailored to industries and specific business functions. These out-of-the-box (OOTB) solutions are intended to reduce the time and cost of deployment. The suppliers are incorporating best practices within their solutions as well. Some can be generically applied while many others are industry-specific. You need to understand what best practices the supplier is including and how they are delivered so that you can determine which apply to your business. The intent of providing OOTB solutions is to either eliminate customization, or reduce it to no more than 20% of the solution.

Evaluation of Response

Seek a detailed explanation of the best practices the supplier recommends and why they are recommended for you.

Are they tailored for your industry and more importantly, your business model? Do they include specific industry standards and if so, which and how? How are default workflows tailored for your industry? What can you do to tailor them for your specific organizational needs?

Check to see that the terminology is tailored for both industry standards and your users. Understand what is included within the supplier's solution, as well as what is

not included. How does that solution fit within the overall PLM environment? What dependencies, if any, exist for the OOTB solution? Can their OOTB solution be configured in a cost-effective manner that allows you to make it fit any unique requirements you may have?

6) How do you support secure collaboration within our enterprise and across our supply chain?

Importance of Question

In today's global economy, every company is working with a distributed workforce, partners, suppliers, and customers across their extended supply chain. You need to be able to work together effectively, and at the same time protect your intellectual property—even as you may work with competitors on selected programs. In general, it is important to know what types of security capabilities your PLM solution supports.

Evaluation of Response

How does the proposed PLM solution support external collaboration? What is the scope of collaboration supported e.g. inside and outside the firewall? What security protocols are supported? How can you configure and set up your PLM environment for collaboration, e.g., inside the firewall, DMZ, outside the firewall, hybrid solutions, etc?

How does the solution support secure change management in a distributed environment? How does it support digital rights management? How does it support isolating users and product information by program and individual partner so that competitors can work together when appropriate while maintaining Intellectual Property control?

7) Are all of your PLM applications on the same architecture, data model, and standards (and which are they)?

Importance of Question

Reducing the complexity of your overall PLM environment is important. It helps facilitate expansion, sharing of product information, and reduces the cost of support. The architecture of the PLM environment has a major impact on reducing complexity.

Evaluation of Response

Does your PLM solution supplier provide a single unified, or integral architecture? This means that all included

functional applications are designed and built on a common technology foundation and share a common data model and database. Does the PLM solution present the user a consistent context-driven interface tailored to role and task requirements regardless of the functional module in which they are working?

You need to know if the data model is consistent and used across all functional applications. You want to know if any proposed functionality and/or modules use a different database, data model, or architecture? What technology standards are used and supported, and how do they fit with your enterprise standards? What is the solution supplier's short- and long-term architecture strategy and direction for their product offerings? How do they support newly-acquired functionality and applications that are on architectures different than their core solution? Over time, you will need to incorporate solution elements that come from different solution suppliers. What is important is to understand that when such solution elements are used, you need to know how they can and will work together within your overall PLM environment.

8) What tools are available and/or needed to configure and extend your solutions' data model, user interface, capabilities, workflow, etc.?

Importance of Question

No PLM solution will fit every company perfectly out-of-the-box. While best practice is to use the solution without making changes to it, this is not always possible. In order to best leverage your PLM investments, you want to be able to tailor the PLM solution to meet your specific business needs and operational processes without having to do any coding or customization that will require long-term support. This significantly reduces the overall total cost of ownership and the cost of upgrading and expanding the PLM environment.

Additionally, you want the ability to carry forward any required tailoring and any extensions with the least effort and cost. You want to make sure that over time, you can continue to enhance and tailor the solution to fit your changing business needs without having to re-develop extensions each time you upgrade your solution.

Evaluation of Response

You need to understand what level of tailoring and customization the PLM supplier supports and in which areas. It is important to know any limitations that exist that may cause you to perform custom development.

When appropriate for your business needs, you want to be able to modify the data model, user interface, workflows, best practices, reporting, etc. using graphical administrative (or user) tools. It is important to understand how the supplier supports moving tailoring (and if necessary, customization) forward through upgrades and new releases. What limits or restrictions does the product have? How backward-compatible are their releases (e.g., can configurations, integrations, etc., performed on previous releases be brought forward without development work)?

9) How can the proposed PLM solution be integrated within our current business systems and processes?

Importance of Question

PLM is an enterprise investment and solution. As such, it needs to interact with other business applications and systems. It is important to know what capabilities the PLM solutions being evaluated provide to enable you to easily integrate (and support those integrations) with other systems. It is important to understand a supplier's integration methodology, support tools and technologies, and the out-of-the box integration solutions, (e.g., MCAD, ERP, SCM) they offer.

Evaluation of Response

Does the PLM solution supplier have defined and published APIs for all their applications and capabilities? What functions are not available? Do they provide the full suite of APIs as part of their solution? Are there any restrictions on what you can do to integrate with or tailor/customize your environment?

Do they provide integrations with other business systems? If so, which ones and how are they integrated? A standard PLM solution supplier-provided integration with an ERP solution does not mean that their solution will meet your business needs out-of-the-box. You may well need to modify that integration to support your business. What tools does the supplier provide to help you do that and are there any limitations on what you can do? What integration standards do they support? Do they support industry-specific standards and which ones?

10) How does your architecture scale to meet changing business needs?

Importance of Question

You should expect your PLM solution and environment to expand in scope over time as your business evolves and your ability to utilize extended PLM capabilities increase.

Factors that drive expansion include an increase in the quantity and complexity of data being managed, the number of concurrent users accessing the solution, the number of locations where users can access the solution, and the capabilities enabled.

You need to understand how the PLM solution is architected for growth in scope and how new capabilities can be deployed incrementally. You need to know if your environment can be supported on a single instance or can/must it be delivered across a federated environment of multiple like or similar instances.

Ask your solution supplier to quantify the sizes and typical configurations of their largest implementations. You want to be sure that the potential number of users, data being managed, and performance levels can be supported over time as the solution expands. You need to be able to predict performance and be able to proactively improve your infrastructure to support the required level of performance. You don't want to find out three or four years later that the solution you chose has hit a wall when it comes to its ability to support your growing company.

Evaluation of Response

You need to ask the PLM solution supplier for examples of how they would architect your solution for use in a distributed environment to accommodate increased capabilities and performance. You need to understand if product information and data will be distributed, federated, or downloaded to make it accessible to users in remote locations. Get a good understanding of the ways in which users will access different types of data such as the meta data about a file or the actual CAD model. Knowing the user options for data access will enable you to better tailor the work processes and user interfaces interactions associated with that data.

Ask for explanations of what limits may exist and what determines those limits. Get references from companies that have deployed the proposed solution on a larger scale. You want to know what if any, growth issues they had and how the supplier addressed them. It will also be important to know what they implemented and how it is being used so that you can determine its relevance to you. Ask the

solution supplier for, and evaluate performance data, e.g., file transfers, user response times, etc.

4. Summary and Conclusions

Businesses around the world are investing in PLM at increasing levels as it has validated its worth in enabling companies to become more effective, more innovative, and more successful. Selecting the PLM solution supplier that can best meet your business requirements can be a difficult process. Asking the right questions can help you better understand both your needs and a supplier's ability to meet them.

Understand your business requirements and review issues that you have had in past implementations of PLM and other business solutions. Ask specific questions and whenever possible, use examples that address your detailed requirements. This will help ensure that you understand what you can and cannot do with the proposed solution. Be sure to get a complete understanding of the cost involved in deploying a new or expanded PLM solution. This will help you define your total-cost-of-ownership and your potential return on investment.

PLM solution suppliers provide a rich suite of capabilities. They support best practices that vary by industry and business functional area. However, each company can have unique needs in how processes are implemented and what terminology is used (and the meaning of that terminology). Asking detailed questions relevant to your requirements will enable you to better select and tailor a solution that meets your needs so you are not disappointed later.

It is critical for you and your suppliers to have a full understanding of your PLM needs, how the supplier is going to satisfy them, and what you will be required to do (e.g., training, process change, etc.) in order to ensure success. PLM suppliers want you to have a smooth production ramp-up and knowing your requirements helps them to help you satisfy them. Use these ten questions as a guide to enable you to focus on the most critical areas for successful implementation of a new (or expanded) PLM environment. Getting answers to these questions can help you select the right PLM solution partner and maximize the success of PLM within your company.

About CIMdata

CIMdata, a leading independent worldwide firm, provides strategic consulting to maximize an enterprise's ability to design and deliver innovative products and services through the application of Product Lifecycle Management (PLM) solutions. Since its founding more than 25 years ago,

CIMdata has delivered world-class knowledge, expertise, and best-practice methods on PLM solutions. These solutions incorporate both business processes and a wide-ranging set of PLM enabling technologies.

CIMdata works with both industrial organizations and suppliers of technologies and services seeking competitive advantage in the global economy. In addition to consulting, CIMdata conducts research, provides PLM-focused subscription services, and produces several commercial publications. The company also provides industry education

through PLM certificate programs, seminars, and conferences worldwide. CIMdata serves clients around the world from offices in North America, Europe, and Asia Pacific.

To learn more about CIMdata's services, visit our website at www.CIMdata.com or contact CIMdata at: 3909 Research Park Drive, Ann Arbor, MI 48108, USA. Tel: +1 (734) 668-9922. Fax: +1 (734) 668-1957; or at Siriusdreef 17-27, 2132 WT Hoofddorp, The Netherlands. Tel: +31 (0)23 568-9385. Fax: +31 (0)23 568-9111.



CIMdata, Inc. • 3909 Research Park Drive • Ann Arbor, MI 48108 USA
Tel: +1 (734) 668-9922 • Fax: +1 (734) 668-1957 • <http://www.CIMdata.com>