



**Meeting the Challenges of
Transitioning PLM Implementations**
*“A Review of Siemens PLM Software
Customer Experiences”*

December 2009

A CIMdata Program Review

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*Produced by
CIMdata, Inc.*

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Meeting the Challenges of Transitioning PLM Implementations

“A Review of Siemens PLM Software Customer Experiences”

This CIMdata-authored review describes some key challenges faced by companies as they transition their PLM implementations through the series of version releases provided by their PLM solution suppliers. As examples, CIMdata describes a number of long-term customers of Siemens PLM Software to assess their approaches and experiences in addressing this often-challenging issue.

1. Introduction

Enterprises worldwide are faced with significant challenges as they strive to compete more effectively. In increasing numbers, businesses have committed themselves to transforming the way they operate in order to become more innovative, effective, and responsive to the markets they serve. To facilitate new processes that can transform these businesses into successful endeavors, companies generally utilize information technologies as primary enablers. In this environment, Product Lifecycle Management (PLM) is one of the most significant initiatives to be introduced into industrial companies in the last several years. PLM has evolved significantly since its early introduction many years ago, and has become one of the major enterprise information technology-based (IT-based) initiatives that touch individuals and organizations across the enterprise and its value chain.

IT-based initiatives offer significant opportunities to organizations, especially broad enterprise-focused ones like PLM, but they also bring their own set of issues. A major issue that has challenged companies implementing PLM over the years has been the difficulty of evolving their PLM environment through the ongoing introduction of new versions of software that are provided to them by their PLM solution suppliers. This can be especially difficult when their PLM environment has been integrated into their overall suite of enterprise technologies and the associated applications have been tailored and customized to fit the organization more effectively. As technologies have improved over the years, and PLM solution suppliers have embraced and incorporated these newer technologies into their own PLM solution suites, their customers have often been faced with substantial challenges in adopting the newer, improved, and enhanced capabilities.

A common complaint from companies with PLM implementations has been that technology changes

introduced by their PLM suppliers have often caused them difficulties as those newer technologies have been inconsistent (with their previous versions) in both architecture and application software, and not easily evolved within the company's IT environment. A key question is, “What are the major characteristics of a PLM implementation that enable it to evolve consistently, while avoiding severe trauma and production disruption in the process of upgrading?”

In this market environment, Siemens PLM Software (Siemens) has consistently attempted to position itself as a PLM solution supplier committed to ensuring that customers can upgrade to successively newer versions of their software without significant trauma—therefore their solutions are safe choices. Siemens has communicated this to the market through positioning messages such as “customer focused,” “we allow no customer to fail,” “leave no customer behind,” etc. Siemens reports that they have demonstrated their commitment to these philosophies over the last several years through the experiences of many companies in their customer base. In an effort to review Siemens' statements, CIMdata has interviewed a number of Siemens' customers to gain a better insight into their experiences relative to the challenges that they have faced in evolving their PLM implementations. This paper provides CIMdata's perspectives on the results of those interviews.

This paper does not attempt to compare Siemens customers' experiences with the customer experiences of any other PLM solution supplier (i.e., it is not a competitive comparison). Rather, it is an attempt to better understand, from the experiences of a number of Siemens' customers that have implemented their PLM solutions over an extended period of time, what has allowed them to evolve their PLM environment with as little trauma as possible. Of course, we will also share their perceptions of working with Siemens during this journey.

We recognize that not all customers of Siemens, or any PLM solution supplier, are completely satisfied—to believe so would be fantasy. We could also write a paper that focused on the horror stories of various implementations that have gone poorly for any PLM solution supplier. However, that isn't the intent of this paper. This paper is intended to explore the situations that a number of successful companies have faced over a prolonged period of time as they have endeavored to keep their PLM environments current, productive, and an integral part of their overall IT environment. Their experiences provide valuable insights for other companies as they develop and evolve their own PLM environments. The following sections of this paper address:

- *Industry Challenges*—A description of the current market dynamics and situation regarding typical PLM implementations as they are evolved over time through the introductions of newer technologies and integrated into an overall enterprise systems environment.
- *Siemens PLM's Position*—A brief perspective on Siemens PLM Software's history in the PLM market, suite of solution offerings, and positioning in the market. This section also provides a background for the customer reviews that follow.
- *Customer Examples*—This section includes the results of CIMdata's discussions with a number of Siemens' customers that have had relatively long-term, enterprise-focused PLM implementations.
- *Summary*—A brief summary and concluding comments.

2. Industry Challenges

Enterprises around the world are struggling to find ways to compete more effectively and be successful in the markets they serve. Continuous competitive pressures force many companies to re-evaluate themselves, and find better ways of operating by enabling more innovative approaches to improve their deliverable products and their internal processes. In today's tough economic climate, companies struggle to focus additional attention on improving efficiencies and cost management.

In order to facilitate the implementation of new processes that can transform businesses into successful endeavors, companies generally utilize information technologies as primary enablers. In this environment, PLM is one of the most significant initiatives to be introduced into industry in the last several years.

However, PLM is not just another suite of computer applications. PLM is a business strategy to more effectively support the total lifecycle of a company's products with processes that enable collaboration throughout the full product lifecycle and across partner networks. PLM utilizes IT-based technologies that support product and process development, and foster innovation at all stages of the lifecycle.

CIMdata defines PLM as “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 and increasingly global enterprise, and 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 participants. It is composed of multiple elements including: foundation technologies and standards (e.g., visualization, collaboration, enterprise application integration, etc.), information authoring and analysis tools (e.g., mechanical design, electronics design, software engineering, manufacturing process design, technical publishing, finite element analysis, etc.), core functions (e.g., data vaults, document and content management, workflow, product structuring, program management, etc.), functional applications (e.g., configuration management, engineering change control, simulation, etc.), and business solutions (e.g., new product introduction, supply chain collaboration, maintenance repair and overhaul, etc.) that incorporate best practices and methods.

PLM has evolved substantially over the past several years. While once predominately focused on engineering mechanical design, its reach across the extended enterprise continues to grow and cover a broader range of activities from early-stage product strategy planning to product and manufacturing engineering, and through to product maintenance, support, and decommissioning. PLM's expansion across this wide range of areas is not unexpected. The overall vision of PLM has traditionally included the ability to leverage product definition information (mechanical, electronic, and software) across the extended enterprise from concept to end of life. In fact, the philosophy and subsequent delivery of commercially-available solutions to satisfy this all-encompassing role throughout the full product lifecycle has been consistently evolving and maturing for years.

As PLM initiatives within companies around the world continue to expand in concert with the broadening scope of the vision, PLM has clearly become one of the major enterprise IT-based initiatives. However, with this expanded role and coverage, the requirements have

increased for coherent and consistent integrations among PLM solutions, and both other major enterprise systems (e.g., Enterprise Resource Planning (ERP), Customer Relationship Management (CRM), etc.) and focused solutions that address the needs of targeted groups within the PLM environment (e.g., Mechanical CAD, Electronic Design Automation (EDA), etc.). As a result, the integrations that must be developed and maintained between the PLM environment and other IT application suites throughout an enterprise have become extensive, and must be able to be maintained effectively as those application suites evolve through successive releases of newer versions.

A key benefit that derives from the expanded view of PLM is the outstanding opportunity to achieve cross-disciplinary synergy by facilitating the exchange of information between different parts of the organization throughout the entire product lifecycle. This increasingly-holistic view of product lifecycle management enables companies to eliminate many of the traditional organizational barriers that have long blocked the free flow of information among groups. This vision is becoming a reality in a growing number of companies and the scope of their PLM implementations demonstrates it.

While the expanding role of PLM offers tremendous benefits for organizations, it also demands some relatively sophisticated support to enable development and ongoing support of the integrations between the PLM environment and the myriad of other applications and systems utilized within the enterprise. For example, PLM environments have traditionally been faced with the challenge of effectively integrating engineering design tools with the underlying PLM architecture. However, now PLM has been expanded to include Digital Manufacturing solutions that enable product design and production workflow simulation to be developed collaboratively instead of in isolation, and allow further collaboration with factory automation systems. As a result, the demands for integration to create a more seamless flow of information between virtual product and process designs and the physical world of the shop floor are increasing significantly. The integration of electronics components and embedded software as part of the complete product adds even more data and process integration points.

Additional examples could be described across all phases of the product lifecycle, but the overall impact of this expansion is clear—requirements for PLM integration across multiple application suites across the enterprise are continuing to increase and play a major role in the ultimate success of the company's PLM initiative, including integration with other enterprise-focused solutions such as

ERP. Fundamentally, these integrations cannot be easily maintained if the base PLM environment is not maintained in a somewhat consistent manner as the technologies supporting the environment continue to change.

The suppliers of PLM solutions have diligently worked to ease the trauma of migrating from one version of their system to the next, but it is certainly not painless. When considering the impact of system version upgrades, the impact on previously-developed integrations between the PLM environment and various application suites cannot be ignored. The initial development of integrations is only the beginning. The ongoing maintenance of these integrations while both the PLM environment and the various application suites evolve, and are enhanced and revised on a regular basis provides an even bigger challenge.

PLM solution suppliers are caught in a difficult position. They must continue to expand and enhance their offerings on a regular basis in order to remain competitive. The world of technology continues to evolve rapidly, and new technologies frequently emerge that can be effectively employed within a PLM environment to provide expanded capabilities and the opportunity for even greater benefits due to both architectural advantages and enhanced applications functionality. This dictates that PLM solution suppliers embrace these new technologies for the benefit of their customers. However, the incorporation of new technologies and the expansion and revision of their solutions based on existing technologies all result in a continuous stream of newer versions of their PLM solution suites—a stream of revisions that their customers must somehow evaluate and (hopefully) absorb into their own environments.

In this situation, customers are faced with newer releases of PLM solutions that are not necessarily easy to accommodate. In some cases, underlying data models are changed, resulting in major data migration activities in order to implement newer system releases. In other cases, application functionality may be incompatible with application capabilities that were previously available in the solution. In cases like these and many others, the result is substantial stress on the implementing company, as they attempt to stay as current with their suppliers' releases as possible (in order to take advantage of new features), with their limited resources and the willingness of their users to accept new versions of implemented software. All PLM solution suppliers have been faced with these customer situations. Sometimes they have been handled quite well, and others times not.

This problem has been exacerbated by the consolidation among suppliers of PLM solutions that has been occurring over the past several years. With consolidation, various

suppliers have become the providers of multiple technology-based solutions that were developed independently, with different (and often incompatible) architectures, underlying data models, and application suites. As customers attempt to utilize these newly “acquired” technologies, the integration path is sometimes traumatic.

CIMdata’s observation, based on more than 25 years of strategic PLM consulting support to industrial companies throughout much of the world, is that organizations desire solutions that evolve forward rationally and don’t create substantial barriers in transitioning from one version of the technology to the next, or even from one generation to the next. If there is some discontinuity in systems architecture or capability, customers want the value of moving to the new generation to be very high compared to any pain associated with migration. They also want to see that a rational evolutionary path is clear, available, and well-supported by the software supplier through a combination of both well-developed tools to facilitate the transition and active professional support to ensure that the transition is accomplished as intended.

As with other enterprise solution suites, PLM solutions are adopting more and more widely-accepted standards and technologies. Service Oriented Architecture (SOA) is but one example of a technology/architecture that is being adopted by PLM, ERP, and IT platform suppliers. While not a panacea, SOA can help soften the impact of introducing new versions of product suites.

In addition to rational evolutionary software paths, companies in industry have increasingly recognized the necessity of establishing a long-term partnership with the supplier of their fundamental PLM environment. The commitment to a long-term PLM strategy dictates that the program be planned with considerable forethought and be supported consistently. PLM solution suppliers and their major customers have discovered that a close long-term partnership contributes substantially to successfully achieving this objective.

3. Siemens’ PLM Position

Siemens PLM Software, with headquarters in Plano, Texas, is a business unit of the Siemens Industry Automation Division. The Siemens Industry Automation Division (headquartered in Nuremberg, Germany), a division of the Siemens Industry Sector, is a worldwide leader in the fields of automation systems, low-voltage switchgear, and industrial software. Its portfolio ranges from standard products for the manufacturing and process industries to solutions for whole industries and systems that encompass

the automation of entire automobile production facilities and chemical plants.

In January 2007, Siemens AG announced its intent to acquire UGS for \$3.5 billion and make it part of the company’s Industry Automation Division. In May 2007, Siemens’ acquisition of UGS was finalized, and the UGS organization essentially became the new Siemens PLM Software organization. The previous UGS organization and now Siemens PLM Software has a long history in the PLM market as one of the major suppliers of PLM solutions to industry. CIMdata estimates that Siemens PLM Software’s revenues in 2008 were over \$1.5 billion, and their overall PLM expenditure “footprint” (including the additional money that customers spent with Siemens’ partners) exceeded \$2.6 billion.

According to CIMdata’s research, Siemens PLM Software was the second-largest overall PLM revenue generator among the PLM Mindshare Leaders, and had the largest direct revenues and market presence in the collaborative Product Definition management (cPDM) sector in 2008. Each year, CIMdata identifies a select set of PLM solution suppliers as “PLM Mindshare Leaders” to indicate their role as leading companies in the PLM industry that have distinguished themselves through a combination of revenue and thought leadership. Siemens PLM has been among CIMdata’s PLM Mindshare Leaders for many years. CIMdata estimates that Siemens PLM Software continued to increase its license revenues in 2008 in spite of a very difficult worldwide economy, with its greatest growth in the Teamcenter business line. Siemens PLM Software is a global supplier of PLM solutions with offices and customers around the world.

Siemens provides one of the broadest and deepest suites of PLM solutions in the industry, and has continued an aggressive program of acquisition and partnership development to broaden their offerings further. Currently, their suite of offerings includes solutions targeted at several of the PLM-related market segments, including cPDM, Mechanical Computer-Aided Design (MCAD), Simulation and Analysis, Digital Manufacturing, Numerical Control (NC), and a host of additional collaborative tools. Within their cPDM solution, they provide application-focused offerings focused on engineering process management, bill of materials management, systems engineering and requirements management, portfolio and program management, strategic supplier relationship management, manufacturing process management, simulation process management, compliance management, content and document management, formulation and recipe management, maintenance-repair-overhaul (MRO), and a variety of analytics and collaboration support tools.

The point in mentioning the breadth of Siemens' suite of PLM solutions is not to glorify the extent of their offerings (some competitors have extensive offerings as well), but to clarify the challenge that this creates in keeping such a broad suite evolving in a consistent manner that allows customers to implement newer and newer versions of the solutions with minimal stress. Over the years, as a suite of solutions becomes broader, it becomes more difficult to keep the entire solution set consistent. New developments that take advantage of new technologies can challenge the ability to keep data migration and applications compatibility issues minimized. Acquisitions of new applications or technologies often create the same kind of challenges. When remembering that customers do not typically upgrade their implemented solutions as quickly as suppliers release new versions, that the implemented versions are often customized to some extent, and that the implemented solutions usually include integrations with other enterprise-based systems, the challenge of keeping an implemented set of solutions moving forward in a consistent fashion that does not cause major cost and difficulty is daunting.

Siemens' background as a PLM solution supplier has seen them recognized as one of the leading suppliers to some of the largest companies of the world. Their longest-running experiences have been in the automotive and aerospace/defense industries, where they have often been involved in very large implementations with significant numbers of users spread across distributed operations. Consistent with industry trends, they have focused significant attention in more recent years toward solutions for smaller companies, but their background has included customers that, in many cases, host sophisticated implementations with the use of many Siemens-based applications and multiple integrations to other enterprise-focused systems.

Also consistent with the evolution of PLM in industry, Siemens has begun focusing additional attention on industries such as consumer packaged goods, that have not previously been substantially exposed to PLM. In support of these initiatives, Siemens has established a set of major relationships with systems integrators that can utilize their own industry-focused domain expertise in combination with Siemens product suites to improve their overall offering for their clients.

Siemens is clearly not the only PLM solution supplier that faces these challenges, but due to its breadth of solutions, their history of new technology development, pace of acquisitions, scale of customer implementations, and sophisticated relationships with systems integrators, it is an excellent example of a solution supplier that must address

the challenge of ensuring that their customers can evolve with them in a rational manner as they continue to enhance and broaden their solution suite.

Given the challenges that major PLM solutions suppliers must address in order to guarantee long-term customer success and positive supplier-customer relationships, Siemens has consistently strived to position itself as being focused on enabling its customers to "relatively" easily transition forward with their PLM solutions. Siemens' messages to the industry have been focused on "we leave no customer behind," and "we won't let a customer fail," etc.

Siemens' explanation of how they address these challenges has often focused on the use of technologies to help "bridge" and "evolve" their customer's implementations from an older technology to a newer one. Additionally, they have typically used 3-5 year product "roadmaps" to describe the evolutionary stages through which their current applications are expected to pass and how current architectures are expected to evolve during that timeframe. These are generally used to communicate the implementation tracks that they recommend as the most effective for customers during the same timeframes.

CIMdata's observation is that Siemens' public roadmaps have been quite valuable for their customers, and others in the industry, in establishing a level of confidence in Siemens' development plans and helping customers plan the evolution of their own implementations. However, the real test of whether this approach has worked, and whether Siemens (or any other) PLM solution supplier has effectively supported customers through major technological transitions can only come from actual customer experiences over a prolonged period of time.

A key issue that has impacted companies around the industry has been the consolidation among major suppliers. Companies such as Siemens have acquired many companies and merged them into the overall Siemens organization. For example, Siemens PLM was formed from the merger of UGS Solutions and SDRC. Of course, those two major entities were each formed from the acquisitions of several smaller companies. So whenever these acquisitions occur, as the technologies are absorbed into the overall solution of the parent entity, the issue of transition of the technology, data, systems, etc. is one that impacts all associated companies, whether they are customers, prospects, partners, etc. The same philosophy that has driven Siemens PLM to ensure that customers can transition forward with them as new versions of the products are released drives the way that they have dealt with acquisitions—the major focus has been on keeping these companies solid without serious upgrade issues.

As mentioned in the preceding section of this paper, companies in industry have increasingly recognized the necessity of establishing a long-term partnership with the supplier of their fundamental PLM environment. CIMdata's observation is that Siemens has been one of the major PLM suppliers that has embraced this philosophy, and their public positioning has served to communicate this objective to the market.

4. Customer Examples

This section includes a summary of CIMdata's discussions with a few Siemens customers that have had relatively long-term relationships with them. During our interviews, we asked them to address their experiences in managing long-term PLM implementations and their perspectives on issues that they consider critical to enabling a successful long-term PLM environment as an integral component of their overall enterprise IT architecture. In the course of these discussions, they also shared their views of Siemens as their partner.

4.1 FMC Technologies

FMC Technologies, Inc. (NYSE:FTI), headquartered in Houston, Texas, USA, is a global leader in providing technology-based solutions for the energy industry. The company designs, manufactures, and services technologically-sophisticated systems and products through its Energy Production Systems and Energy Processing Systems businesses. These groups provide offerings such as subsea production and processing systems, surface wellhead systems, high-pressure fluid control equipment, measurement solutions, and marine loading systems for the oil and gas industry.

In order to understand the background and evolution of PLM at FMC Technologies (FMC), CIMdata interviewed Mr. Steve Joiner, the Manager of Engineering Systems at FMC's Energy Systems group. According to Mr. Joiner, FMC's Energy Systems provides comprehensive systems to support energy producers. This group does product development and manufacturing at multiple locations around the world, with each site providing a "Center of Excellence" for one of FMC's product lines.

FMC has been utilizing PLM for many years, and have had a long-term relationship with Siemens as their primary PLM solution supplier. FMC reports that they initially began working with Siemens PLM Software in 1992, when they began their transition to 3D mechanical CAD (MCAD) with Unigraphics (provided by UGS, a predecessor to Siemens PLM Software). Prior to that, FMC had been

supporting their engineering design activities solely with 2D MCAD applications. Upon implementing Unigraphics, FMC recognized the need for cPDM capabilities and launched an implementation of Siemens' iMan product. CIMdata's perspective is that FMC was one of the most visible and active PLM implementations in the mid-1990s.

According to FMC, that initial implementation of iMan required a lot of co-development work between FMC and Siemens (iMan was a relatively new solution at the time, and FMC was one of its earliest implementations). According to Mr. Joiner, "There were a lot of early bumps with the implementation, and we were both learning as we went, but Siemens worked with us to make things right and were an excellent partner for us. That sense of attention has been consistent through today." He reported that Siemens deployed several people on-site to help them make the transition during the initial period. He continued with the comment, "Since that early start, Siemens really gained experience in what it takes to make our transitions smooth, and the transitions from one version to the next over the past 15 years has been quite straightforward. They have provided us with the right tools and support to make the migrations work. Siemens has made clean migrations and code re-use a core value."

The transitions that FMC has encountered over the years, for both their MCAD and cPDM implementations, have ranged from relatively small updates to major architectural changes. FMC reports that the next transition for them is in moving to Siemens NX6 for MCAD and that they are discussing a move to the new Unified Architecture version of Teamcenter for cPDM. They also reported transitioning from some non-Siemens applications to Siemens-supported applications during this same process as situations changed and additional Siemens applications became available. Mr. Joiner commented that they currently have seven sites that are operating with the identical Teamcenter installation.

Mr. Joiner reported that PLM is viewed within FMC as one of the three core strategic enterprise systems—systems that establish environments that are fundamental to operating their business. FMC's core strategic systems are ERP (SAP), global scheduling and capacity planning (Primavera), and Engineering (Teamcenter plus FMC's design tools). These core systems receive substantial internal attention and visibility. In that regard, they are continuously challenging themselves to ensure that they are "doing the right thing." According to FMC, ongoing business risk assessments have reinforced the group's belief that PLM is critical to FMC's continued business success.

No major enterprise system implementation goes without any stress, and FMC is not immune to these difficulties. According to Mr. Joiner, FMC's biggest frustration with

regard to the evolution and transition of their PLM implementation has been the rapid pace of change in product capabilities and fundamental architecture. He commented, “New releases are quite frequent (sometimes twice a year) and that causes a lot of internal work to accommodate transitions. Maybe for a new customer that isn’t a big issue, but for more mature customers, we can’t accommodate changes in our production implementations that quickly.” He further commented, “It’s not really a big issue for us to solve. We just don’t implement new versions as soon as they are released. We typically run with our existing implementation for 2-3 years, and then implement a ‘jump’ to the newest. It means that the system transition tools need to be able to accommodate transitions over more than one version, but Siemens has supported us well during these transitions.” CIMdata has seen similar “version upgrade” implementation philosophies adopted by several other companies in many industries.

FMC reports that they have consistently received substantial personal commitment and attention from key Siemens management team members over the years. This has been visible through on-site visits, participation in planning sessions, and a variety of other activities. The net result is that FMC reports feeling confident that Siemens is committed to supporting them over the long term.

In response to CIMdata’s questions about what methods have been used to help plan their implementation upgrades and long-term plans, FMC made particular comment about their discussions with Siemens regarding Siemens’ product development “roadmaps.” According to Mr. Joiner, “Siemens’ product development roadmaps have been a valuable resource for an open dialog of issues and planned development work with Siemens. Knowing their roadmap over the next 3-5 years is incredibly important to FMC. We can base our plans on it. We may not like all of their plans, but we can provide our feedback and then make our own plans with reasonable confidence. We’ve only seen very infrequent changes in direction from Siemens; some small changes, but not major ones.” He continued, “In some cases, Siemens has directly responded to FMC’s feedback and accommodated FMC’s issues within their roadmap development.”

In response to CIMdata’s question about what FMC expects from a partner to ensure long-term success, Mr. Joiner responded with three major characteristics that must be consistently delivered:

- *Added Value*—The partner and their deliverables must consistently add value to FMC’s business.
- *Integrity*—The partner must stick with what they say and deliver what they promise. We depend

upon their direction in establishing our own plans.

- *Support*—Systems must be delivered and supported by the partner in a manner that enables easy evolution forward without serious trauma, and provides the migration tools necessary to support the process effectively.

Mr. Joiner summarized FMC’s relationship with Siemens by saying, “The longevity of our PLM environment is a statement in itself about Siemens’ ability to support FMC very well for many years.” CIMdata’s observation about FMC as a result of our interview is that they have gained confidence over the years in their ability to plan for, and manage the evolution of their PLM environment without significant business difficulties and the associated risks—due to a combination of both the technical transition paths provided by Siemens and the close partnership that they have developed with them.

4.2 BSH Bosch und Siemens Hausgeräte GmbH (BSH)

BSH Bosch und Siemens Hausgeräte GmbH (BSH), headquartered in Munich, Germany, is a worldwide leading manufacturer of home appliances. BSH is based on a joint venture (launched in 1967) between Robert Bosch GmbH (based in Stuttgart) and Siemens AG (based in Munich). Currently, BSH reports that they had annual sales in 2008 of more than 8 billion Euros, and operate 42 factories in 13 countries in Europe, Latin America, Asia, and the U.S. BSH also reports that they operate a global network of sales and customer service firms, which is comprised of about 60 companies in almost 40 countries, employing more than 39,000 people. BSH’s product range is marketed under a large number of brands that encompass both large home appliances and consumer products. Relative to our review of them for this paper, on their website they state, “The company’s actions and development are determined by a consistent policy of innovation and quality.”

BSH has had a long relationship with Siemens PLM, with experiences related to many of the Siemens PLM offerings. CIMdata interviewed Mr. Uwe Tontsch to gain a better perspective on these experiences and on BSH’s view of PLM and its value to their organization. Mr. Tontsch is the head of IT for industrial engineering and product development processes including product engineering and manufacturing engineering processes.

BSH began implementing major PLM-enabling technologies in the late 1970’s with an implementation of CADD5 from Computervision. Since then, they have progressively moved forward in a step-by-step fashion to

expand their support for various product and manufacturing engineering processes and improve their overall product development program. According to BSH, they began their relationship with Siemens PLM (through its predecessor organizations) by implementing Metaphase to manage engineering process control in 1996. They transitioned to Unigraphics for mechanical design in 2000, began implementing Tecnomatix for manufacturing engineering support in 2003, and adopted Teamcenter Community and JT in 2004. From this brief picture of the various PLM-enabling technologies that BSH has implemented, it is easy to see that they have embraced a broad perspective for their PLM program.

According to Mr. Tontsch, BSH is now in the process of launching a program to implement a new PLM backbone architecture based on the Teamcenter Unified Architecture solution from Siemens PLM. BSH reports that they also started an extensive new multi-year program which is intended to provide a next-generation environment for their organization that supports consistent and managed product structure process including bills of material (BOM) across the various groups, from engineering, through manufacturing and sales. In addition, they intend to incorporate product portfolio management support and enable an extensive virtual reality program.

As a part of this project, Mr. Tontsch reports that BSH intends to consolidate the past 13 years worth of custom-developed processes into their new common environment built upon a relatively standard system implementation. He further commented that BSH has worked diligently to implement consistent work processes across divisions within their group, to facilitate communication, and support collaborative work incorporating distributed teams in their operations. Mr. Tontsch commented that one of the keys in achieving effective common processes across the company is to ensure that the processes are simplified; standard overall processes that allow sufficient local flexibility to accommodate key differences. He reported that this approach is critical for the common processes to be embraced and supported by the various divisions. One of the areas that has been prioritized for attention during their program is the integration of processes between product engineering and manufacturing engineering—to implement a more effective concurrent engineering (or “cooperative production engineering”) environment in order to reduce the time necessary to achieve volume production and increase the quality of both product and manufacturing process design. Mr. Tontsch emphasized that BSH’s objective is to optimize both product and process designs “prior” to start of production, not after.

Mr. Tontsch commented that BSH’s executive team considers this new program to be critical to the continued success of their business. BSH’s experiences have been extensive and according to Mr. Tontsch, “Everyone understands the critical nature of the processes enabled by PLM.” The benefits that BSH has derived from their PLM investments have been very good and continue to encourage additional investment. Although the current stress from the worldwide economic situation is impacting BSH as it is companies around the world, BSH sees this as pushing it toward even more efficiency across the organization, a move facilitated by an effective PLM environment. According to Mr. Tontsch, PLM is considered strategic to BSH and their relationship with Siemens PLM is considered to be one of their three strategic IT partners, along with SAP and Microsoft.

BSH reports that they have been working closely with Siemens PLM on their new program, just as they have been working with them over the past several years. Mr. Tontsch commented that Siemens PLM has been very valuable in helping them understand the best paths for moving forward in order to make the project go more smoothly. The product development roadmaps provided by Siemens PLM have been very helpful, according to Mr. Tontsch, to help BSH better understand what specific technology will be available at what specific version, so that they can plan their transition more effectively.

He further commented that BSH has been working closely with Siemens PLM through several significant systems transitions over the past years. Of course there have been issues at times, but Mr. Tontsch reiterated that they have jointly worked through any issues as they arose, and that they view their relationship and support from Siemens PLM to have been very good. He stated, “Siemens PLM is one of the few suppliers that can provide full support for PLM in a single integrated system architecture. The Siemens PLM support for BSH’s Microsoft strategy is a key element and their end-to-end engineering process support is critical.”

Based on our interview, CIMdata’s observation about BSH is that they are substantially committing to implementation of a new, integrated platform to support their PLM strategy based upon the confidence they have gained over the past several years in the value of PLM for their business. The ability to plan and manage their evolution through major architectural changes is also based on the confidence that they have developed in their strategic partner, Siemens PLM, to help them transition through this implementation successfully.

4.3 Xerox

Xerox Corporation (NYSE:XXR), headquartered in Norwalk, CT, USA, was founded in 1906. Today Xerox is one of the world's leading suppliers of technologies and services focused on supplying "smart document" solutions focused on three primary markets: high-end production and commercial print environments, small to large networked offices, and value-added services. Their offerings provide a broad range of systems that include digital color and black-and-white printing and publishing systems, digital presses and "book factories," advanced and basic multifunction systems, and laser and solid ink network printers, copiers, and fax machines. They also offer associated software, support, and supplies such as toner, paper, and ink.

Xerox has been working with Siemens in support of PLM solutions for several years. In order to better understand the PLM program at Xerox and their experiences in evolving their program over the last several years, CIMdata interviewed Mr. Korhan Sevenler, Xerox's PLM Director.

According to Mr. Sevenler, Xerox began their relationship with Siemens in 1998, with the decision to implement Siemens' I-deas, an MCAD solution, and DMCS, a cPDM solution (provided by SDRC, a predecessor to Siemens PLM Software). Mr. Sevenler reports that these solutions have formed a basis for Xerox's product development support, and have been continuously evolving over the years since their initial implementation. Additional technologies and tools have been added over time, such as Siemens' Vis collaborative suite. Today he says, these solutions are used globally within the Xerox product development organization, with the exception of a single product development site that is utilizing an alternative MCAD tool.

Mr. Sevenler commented that the evolution of Siemens-based solutions has been ongoing during the intervening years, with a full transition from the I-deas product suite to the newer NX suite for MCAD product development. Xerox's DMCS solution went through a transition to Metaphase, then to Teamcenter Enterprise, and now is transitioning to the new Unified Architecture version of Teamcenter. These transitions have represented a very significant evolution of both the MCAD and cPDM technologies in use at Xerox, with substantial extensions of capabilities and major changes in the underlying architectures during the course of the transitions. The evolution of these product suites has encompassed the merging of product lines from two major companies that were merged into one (UGS and SDRC) and the subsequent development of completely new architectures and

applications suites for each of the product families (i.e., MCAD and cPDM).

Mr. Sevenler commented that during the evolution of Xerox's PLM environment, several things have enabled this transition to progress relatively smoothly. He made particular comment about Siemens' sharing of their product development roadmaps as a key contributor to their comfort. He stated, "Siemens has been reasonably on-target with their promises. Initially, their targets were a bit vague, but they have improved substantially over the years. Users always want capabilities faster, but if they understand what the vendor is trying to do and when they plan to do it, then it builds confidence when the vendor delivers according to their promises." In Siemens case, he said, "The roadmaps for NX and Teamcenter (after the acquisition by Siemens) didn't seem to build a big hype and that was good. They have built a trusting relationship with us."

Mr. Sevenler emphasized that even with the existence of accepted product development roadmaps, for the transitions to be accomplished with a relatively low level of pain, the solutions must be delivered in a manner that technically facilitates upgrades between versions and must be provided with accompanying migration tools that facilitate the process as automatically as possible. This requires that the underlying data models are consistent enough to permit straightforward movement to the newer version, and that the application functionality does not eliminate capabilities previously supported. Mr. Sevenler made it clear that new capabilities and database extensions are welcome, as long as they don't clash with the previously-implemented environment. The upgrade process can be even more complex when companies upgrade by skipping over intermediate versions of a product; the consistency of data models and application frameworks is even more critical.

During Xerox's evolution with PLM solutions, they have also embraced the critical role that PLM plays in contributing to their business success by enabling initiatives focused on reduced time-to-market, improved quality, and reduced costs. When asked whether PLM is considered strategic within Xerox, Mr. Sevenler stated, "Yes, especially within the last several months we have seen a major recognition within Xerox of PLM's strategic value. This can be attributed to PLM being recognized as helping both individuals and the organization in a variety of ways, and to the growing overall level of PLM education; people now know what it is and what it can do."

The net result of this experience over the past few years, reported Mr. Sevenler is that, "Siemens has become accepted as a 'business partner' of Xerox and isn't considered just a software vendor. The newer offerings have been viewed positively and people within product

development are looking forward to the implementation of the latest versions.” Mr. Sevenler also pointed out that the transition of architectures and capabilities from version to version have been well handled, but the impact on integrations to external third-party applications has still been a challenge. He commented, “This is a challenge that I don’t expect to see go away any time soon.” Due to the key role that PLM solutions play within Xerox, it has been incumbent upon them to reconsider their commitment to Siemens solutions whenever there has been a major point of transition, for example, when Siemens announced their transition of both the Unigraphics and I-deas MCAD product lines into a consolidated NX solution suite. Through these transitions, Xerox has continued to remain committed to working with Siemens, and this has clearly been influenced by their relatively positive experiences with Siemens’ previous technology transitions.

5. Summary

Enterprises worldwide have committed themselves to transforming the way that they operate in order to become more innovative, effective, and responsive to the markets they serve. In this environment, PLM has become a key weapon that companies are using to facilitate these transformations.

A major issue that has challenged companies implementing PLM over the years has been the difficulty of evolving their PLM environment through the ongoing series of new versions of software that are provided to them by their PLM solution suppliers. PLM solution suppliers have embraced and incorporated newer technologies into their solutions to enhance the value of their offerings, but the continuous stream of new versions don’t just provide valuable new capabilities, they can also cause considerable difficulty if the migration between versions is not well supported and managed.

In order to investigate the question, “What are the major characteristics of a PLM implementation that enable it to evolve consistently, while avoiding severe trauma and production disruption in the process of upgrading?” CIMdata interviewed a few Siemens customers with long-term PLM implementations to understand their experiences and their perceptions of what has enabled them to evolve their PLM environments successfully. Their experiences provide valuable insights for other companies as they develop and evolve their own PLM environments. Based on these customer interviews and experiences with many other companies that have implemented PLM environments over the past several years, the key characteristics that are

needed to ensure PLM transitions are as non-traumatic as possible can be summarized as:

- PLM solutions that embrace the use of accepted industry standards, to soften the impact of change
- PLM architectures that embrace SOA, which are designed to enable relatively “plug-and-play” replacement of components without severe disruption
- Consistent data models and database architectures that can be dynamically updated
- A complete suite of migration tools that can perform most version upgrade migration tasks automatically
- Visibility of a long-term evolution roadmap that defines growth and transition paths for the solutions
- A partnership relationship with your PLM (and other enterprise application) solution supplier and implementers

The key characteristics that were just summarized clearly identify that overcoming the difficulties of transitioning a PLM solution over the long-term requires a combination of technical and non-technical capabilities. For years, a common mantra in the PLM industry has been that PLM implementations demand a partnership between the supplier and the customer—our interviews with companies that have long-term successful PLM implementations have reinforced that opinion and reiterated the need for precise technical tools and assistance in making their transitions successful. The Siemens customers that we interviewed provided ample descriptions of the value that consistent architectural development, solid migration support tools, a clear transition roadmap for their PLM solution and a solid partnership with their PLM solution supplier provide in ensuring their own long-term success.

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. CIMdata helps industrial organizations establish effective PLM strategies, assists in

the identification of requirements and selection of PLM technologies, helps organizations optimize their operational structure and processes to implement solutions, and assists in the deployment of these solutions. For PLM solution suppliers, CIMdata helps define business and market strategies, delivers worldwide market information and analyses, provides education and support for internal sales and marketing teams, as well as overall support at all stages of business and product programs to make them optimally effective in their markets.

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.

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