



**The Power of Partnership**  
*“Why Working Smarter Matters”*

*March 2011*

**A CIMdata White Paper**

# **The Power of Partnership** *“Why Working Smarter Matters”*

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*Produced by  
CIMdata, Inc.*

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# The Power of Partnership

## “Why Working Smarter Matters”

*Today’s manufacturing industries are under continuous global pressure to quickly respond to their customer’s needs by delivering innovative products faster while operating in a more efficient manner. Meeting these challenges requires companies to work smarter. They need to be better able to optimize all the resources of the business while removing boundaries and inefficiencies between their organizational silos. This paper describes the challenges companies are facing, why and how they need to work smarter, how a SOA-based enterprise information and process management approach enables a smarter business, and how IBM and Siemens PLM Software have teamed to form an alliance that leverages the strengths of each to enable companies to accelerate their business.*

## 1. Introduction

Business networks are becoming increasingly globalized as more and more companies compete internationally. But while globalized markets expand business opportunities, they also intensify competitive pressures. The challenge for success is to ensure global competitiveness by capturing long-term, leading positions in tomorrow’s markets.

Global competition, product complexity, time to market, cost and quality continually drive businesses to become more efficient and innovative, especially in the manufacturing industry. Maintaining a competitive position in today’s global market requires accelerating the pace and efficiency of the business while getting the most from its business systems, information technology (IT) infrastructure, people, suppliers, and partners.

This paper discusses how an IBM and Siemens PLM Software (Siemens) Alliance is integrating and leveraging their individual corporate capabilities and solutions to help customers accelerate their businesses and bring innovative products and services to the market faster while using less resources. The goal of this IBM-Siemens alliance is to help companies’ technology enabled businesses work smarter by deploying environments that maximize flexibility and responsiveness for rapidly changing business needs.

This paper also describes a vision for *Integrated Enterprise Systems (IES)*—a flexible, scalable approach that brings enterprise applications together, improving the way information from all areas of a business is used to make smarter decisions resulting in better products, lower risk, and improved ROI. The Alliance is working to help companies deploy IES that can support them in today’s fiercely competitive global market with the scalability to meet the needs of the future.

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## 2. Business Challenges

To succeed in today’s global economy, companies have to think and act internationally and work smarter. Key areas for success must include:

- *Product innovation and leadership*—requires better collaboration among internal groups, partners, and customers to bring the right products, to right market faster.
- *Operational effectiveness*—addresses improving the manner in which companies plan for and execute their manufacturing production, optimize their supply chain, and utilize their personnel more efficiently throughout their extended enterprise.
- *Customer responsiveness and satisfaction*—requires maintaining close contacts and interaction with customers on a proactive basis.

Most companies today are supporting complex IT environments and infrastructures including a significant number of application-to-application integrations. These environments include multiple development technologies, data models, databases, user interface paradigms, and integration tools. Each application or business solution tends to be on a separate upgrade or refresh cycle, and frequently has dependencies with other technologies such as the release level of the underlying database management system. These factors reduce the flexibility of a company to respond to changes in their business strategy, market pressures and advances in solution functionality, and ultimately have a negative impact on a their ability to keep costs down, update and improve the applications and processes, and maintain a competitive market position.

Improving how a company deploys effective enterprise-wide business solutions requires an organization's processes be supported by an environment in which individual solutions are integrated into or built on a "seamless" platform. This platform must enable desired organizational processes and also integrate effectively with other major business systems and their business processes throughout the enterprise. This is best accomplished by implementing unified IT platforms that support standard IT services and data models. A unified platform will not necessarily provide for every need, but should be capable of integrating with the company's various technologies and solutions to address the additional capabilities required to meet the needs of the business today and well into the future.

Companies continue to make individual, yet often enterprise-level investments, to address their business needs—Enterprise Resource Planning (ERP) and Supplier Resource Management (SRM) for operational effectiveness, Customer Relationship Management (CRM) for customer responsiveness and satisfaction, and Product Lifecycle Management (PLM) for product and service leadership, to name a few. However, most companies have made these enterprise investments independently of one another. Each of these enterprise-level solutions has been selected based on solving department or group needs, and not with the intent of creating a single integrated solution that solves the enterprise's end-to-end process needs supporting the business.

These departmental solutions are often provided by different suppliers and developed independently; based on different technologies. This results in increasingly complex IT and often disconnected business process environments that are costly to operate and improve. Such technology diversity makes it difficult to implement effective end-to-end processes that addressed business issues, for example, product ideation, development, and launch. Furthermore, companies frequently use custom implementations of function-focused applications to address specific issues (e.g., contract administration). Unfortunately, significant time and cost is required to link these disparate solutions together. Additionally, non-value added work is required just to find and transform information created in one domain for use within another.

Specific challenges that companies must address include:

- Siloed and/or distributed development organizations that have grown through acquisition, investment, and rationalization, each having a specialized focus. Their focused

applications do not support effective enterprise collaboration which reduces business efficiency.

- Embedded software's pervasive role in product innovation has made managing the complexity and effectiveness of software development, testing, and support increasingly critical to any company's success.
- Evolving business models are being driven by customers' demands for increased product differentiation and customization, and the strong desire to actively participate in the development process.
- Enterprise environments continue to expand in complexity with a growing need to bring multi-discipline data together to improve decision-making across the company.
- Aging and changing workforces continue to drive many industries to face a generational transition. Significant waves of retirements are creating challenges in knowledge retention while emerging talent brings fresh and innovative approaches to work, collaboration, and technology utilization without concern for protecting business assets or trade secrets.
- Proof of compliance has increased the demands on product data and traceability throughout the product lifecycle and has increased the risk, cost, and time to bring innovative products to market.
- Interdependent design and supply chain optimization continues to push the limits of technology and organizational efficiencies, increasing the need for more effective collaboration.

### 3. Integrated Enterprise Systems

As companies have continued to invest to stay competitive, they have deployed focused solutions that address their major business functions. Each of these solutions has delivered gains in efficiency and specific organizational benefits. However, they have not, by themselves, maximized the end-to-end benefits for the enterprise. The increasing diversity of technology, applications, data models, and the exponential increase in integrations required to support these focused solutions negatively impacts a company's ability to remain agile and competitive. Users must learn and operate multiple applications that often have different user interfaces and working paradigms while IT organizations must learn and support differing technologies.

To accelerate an enterprise, to enable it to work more effectively and efficiently, faster and smarter, requires deployment of Integrated Enterprise Systems. An IES must be flexible and scalable to accommodate global growth and partnerships, be easy to use, and provide an extremely high level of reliability and quality. An IES needs to help improve the quality and speed of decision making, both organizationally and across the entire enterprise, by uniting organizational users, enterprise users and management, and ultimately by providing the tools necessary to be highly productive and competitive.

An IES needs a foundation positioned to support the complete decision-making processes across an enterprise. This foundation must be able to be quickly implemented with minimum impact to current operations. A key element of an IES is a unified Service Oriented Architecture (SOA). They also are built using standard user interaction paradigms such as a web browser or a Microsoft Windows interface. A SOA-based unified architecture is one in which functional applications and modules are designed and built on a common technology foundation and share a common data structure. Within the application suite of a unified architecture solution, information created in one module is immediately visible and available in all other modules without additional data entry or transformation.

Companies are adopting SOA-based solutions because they provide a cost-effective, easily adoptable, business-oriented platform for delivering required business functionality. The most effective SOAs are loosely coupled, highly reliable, business process focused, and they support heterogeneous IT environments. While no single product suite supports every application needed by an enterprise, a SOA-based unified architecture provides the foundation upon which additional applications can be built. These additional integrations can take advantage of the platform's common data structure for information exchange, common services, and its common user interface paradigm. Building on this architectural foundation to support additional applications helps reduce the overall complexity of the environment.

SOA-based unified PLM architectures support easier and faster integration of business systems and the ability to more easily replace or insert applications within the overall environment. This improves a company's ability to create and sustain a flexible, productive IES environment. The use of industry standard interfaces and a SOA facilitates many of the issues identified when integrating a diverse set of applications and functions across an enterprise.

A key benefit of integrating enterprise business solutions with an IES approach is the opportunity to facilitate cross-disciplinary synergy through a two-way process-directed

exchange of information both upstream and downstream across the product lifecycle and throughout the enterprise. In this way, information can be leveraged effectively for performing tasks in multiple disciplines, which in turn may provide valuable information that impacts product design, engineering, sales and marketing, manufacturing planning and production, service, and support. Enterprises can rationalize and harmonize their business processes and the solutions and applications used to support them at the enterprise level, thereby further reducing the complexity of the overall environment and optimizing the whole instead of sub optimizing a single process, function, group, or department.

This can enable an enterprise to increase the benefits they derive from their technology, application, and other IT investments. The business value of such an integrated, end-to-end approach is that processes are optimized not for individual departments or groups but for the entire enterprise, across the full business lifecycle—planning products that fit into the company's business, and developing products that meet those plans that can be profitably built and supported.

## **4. The IBM & Siemens PLM Software Alliance**

As customers have pursued incremental improvements within their individual business operations IBM and Siemens recognized the need to bring these enterprise point solutions together to enable a business to work smarter. A principle objective of the IBM-Siemens alliance is to extend traditional enterprise solutions beyond existing process, technology, business and cultural barriers, and to help companies fully integrate their enterprise systems throughout and across their overall business. In 2009, Siemens and IBM entered into a strategic alliance to help meet the growing challenges of better integrating PLM and other enterprise systems.

Siemens is a leader in Product Lifecycle Management technologies and delivers broad capabilities via their unified PLM suite and associated implementation services. IBM is a leader in business transformational services and predictive analytical technologies as well as IT related infrastructure components, industry best practices and implementation services that help continuously improve an enterprise's IT enabled process business environment. Both companies have a history of collaborating to solve customer challenges. They use their knowledge of industry-specific best practices, and support of industry and internal corporate standards to develop focused solutions for their

customers. They both have large, globally-oriented customers and working with these companies has helped each to develop a better understanding of what it takes for an industrial company to compete successfully in today's highly competitive global market.

Siemens focuses on creating solutions designed to enable collaborative product development and production

planning. They are working to bring PLM technologies together with Siemens Industry Automation technologies to help improve global end-to-end development, production, and support environments along the extended value chain. They state that they have a philosophy of “Smarter Decisions, Better Products” and are designing their products to support that philosophy.

Current Enterprise Application Environment	Challenges	Benefits of Integrated Enterprise Systems
<ul style="list-style-type: none"> <li>Specialized/functional enterprise applications</li> </ul>	<ul style="list-style-type: none"> <li>Proprietary or internal architectures</li> <li>Individual standards by application</li> <li>Not interconnected</li> <li>Independent, non-synchronized upgrade and refresh cycles</li> </ul>	<ul style="list-style-type: none"> <li>Unified architecture and framework</li> <li>Common technology foundation</li> <li>End-to-end business processes</li> <li>SOA and industry standards</li> <li>Uniform standards across enterprise</li> <li>Improved productivity</li> <li>Improved, smarter decision making and management</li> <li>Improved connectivity–people and processes</li> <li>Reduced complexity across business applications</li> <li>Simplify the user experience</li> <li>Leverage knowledge–predictive analytics and reporting</li> <li>Common management structures</li> <li>Uniform change control across the enterprise</li> <li>Faster deployment and upgrade</li> </ul>
<ul style="list-style-type: none"> <li>Increased/recurring Total Cost of Ownership (TOC)</li> </ul>	<ul style="list-style-type: none"> <li>Multiple vendors</li> <li>Multiple training courses</li> <li>Non-standard user experience</li> </ul>	<ul style="list-style-type: none"> <li>Reduced quantity of vendors – reduced TOC</li> <li>Reduced training requirements – simplified training</li> <li>Common user experience-improved flexibility to use resources</li> <li>Lower administrative costs</li> <li>Improved operational and personal productivity</li> </ul>
<ul style="list-style-type: none"> <li>Multiple data structures and architectures</li> </ul>	<ul style="list-style-type: none"> <li>Not synchronized</li> <li>Not connected across functional or organizational boundaries</li> <li>Increased potential for error</li> <li>Complex data retention strategy</li> <li>Incompatibility of architecture and data models between applications and solutions</li> </ul>	<ul style="list-style-type: none"> <li>Common data models – uniform synchronized data across organizations</li> <li>Reduced potential for data error</li> <li>Standardized toolsets</li> <li>Increased flexibility and adaptive structure</li> <li>Simplified long term data planning</li> <li>Improved scalability and performance</li> <li>Reduced cost of deployment and operations</li> <li>Simplified integration across business processes</li> <li>Ability to rationalize and harmonize solutions</li> <li>Seamless/transparent data and process flow between functional modules</li> </ul>
<ul style="list-style-type: none"> <li>Multiple/specialized vendors</li> </ul>	<ul style="list-style-type: none"> <li>Increased overall costs</li> <li>Disjoint operations</li> </ul>	<ul style="list-style-type: none"> <li>Total system view – enterprise wide</li> </ul>

**Table 1 – Challenges and Benefits of Integrated Enterprise System**

Siemens is concentrating their product strategy around the following strategic priorities:

- **Personalize** the users’ experience by recognizing who they are and actively presenting them with only the information they need to perform their tasks.
- **Clarify** the users’ understanding by presenting “rich” information in an intuitive way and enabling them to navigate to associated data from different disciplines and sources.
- **Assist** users proactively to make collaborative decisions, by aggregating, analyzing and monitoring information, notifying them when action is required and suggesting collaborators who can aid in their decision-making.
- **Validate** user decisions against best practices, by applying analytical techniques to assess alternatives and capture decision-making best practices for future reference

For nearly a century, IBM has created technology, products, and services (hardware, operating systems, software, middleware, etc.) to help enterprises compete successfully. They are working to demonstrate smarter systems built using flexible, open, and standards based technology and best practices that can deliver quantifiable benefits. IBM’s Watson super computer represents an example of a smarter system. This technology is currently being applied in the

healthcare industry to improve the quality of information directly applied to patients and that help personalize the medical care experience.

IBM is shaping their strategy around the following strategic priorities:

- Creating high-value solutions through modular and open technologies, including virtualization, information on demand, and service oriented architecture (SOA).
- Enabling clients to integrate and innovate their operations and business models, and thus to grow and improve profitability.

The primary goals of the IBM and Siemens Alliance are to deliver Integrated Enterprise Systems that:

- Help accelerate and empower the complete enterprise—not just separate organizational silos.
- Enable companies to deploy simplified business processes and make changes easier.
- Help develop standards-based open architectures that are better able to scale globally and minimize complexity.

Leveraging the commonality between Siemens PLM and IBM strategies, architectures, products, services, and open standards, the Alliance is concentrating on enterprise problems to help make “SMARTER” a reality for



Figure 1—Teamcenter Functional Structure

management and decision makers at all levels of the business.

Siemens' product and technology contribution to the alliance includes Teamcenter—a widely used PLM solution that is now delivered on a SOA-based unified architecture. Teamcenter's four-tier SOA platform and common data model has been designed to enable customers to more easily configure and expand Teamcenter's functionality. Additionally, it has been designed to reduce the effort and cost of expansion and evolution as well as to make it easier to integrate Teamcenter functionality with other business systems.

Teamcenter includes fourteen functional areas that address business needs and three foundational areas, as illustrated in Figure 1.

Teamcenter is globally available and applicable to many industries including Automotive, Aerospace & Defense, Industrial, Electronic & High Tech, Energy, Shipbuilding, Medical & Pharmaceutical, and Retail. Siemens is helping companies define and deploy comprehensive PLM environments, and is providing industry tailored best practices and serves as a trusted advisor to their customers. Siemens states they have defined openness as a key foundational element of their business strategy and technology vision—a strategy that is intended to better enable their solutions be integrated with third-party solutions, customer-developed solutions, and older versions of Siemens' solutions.

As part of their alliance, IBM and Siemens state that they are committed to maintaining an open technological environment so their customers can integrate and interoperate solutions developed or obtained from other sources with the solutions provided via IBM's Product and Service Framework (PSF) and Teamcenter. They each state that one of the strengths of their alliance is that the open approaches they independently followed have simplified their ability to work together, and integrate their

technologies and solutions suites.

Teamcenter is the first IBM Certified PSF Ready Platform, pre-configured with IBM WebSphere Application Server and IBM DB2. Teamcenter takes advantage of DB2's autonomic maintenance capability, which enables the system to maintain itself and reduce operational costs. (Note: autonomic computer systems monitor and regulate themselves without external intervention much in the same way as our autonomic nervous system.) It also uses DB2's automatic storage management facility for on-demand storage allocation.

IBM's primary contribution to the alliance is their PSF and the best practices they have developed around it. IBM developed the PSF using experience obtained through over 25 years of helping clients address manufacturing integration problems. It is a roadmap for change that a customer adopts over time versus buying it outright like a traditional product. Based on business priorities, customers engage with IBM to deliver a solution to a particular business problem in one of three process lifecycle domains as illustrated in Figure 2.

These domains bridge business functions boundaries, helping companies who deploy them to address industry challenges associated with complex business ecosystems. The three domains supported by PSF are:

- *Insight and Product Innovation*—designed to help create new, innovative products and services while reducing time and costs by deriving insights from markets, partners and employees, and manage product portfolios and integrate software, electronic and mechanical development. The capabilities previously included in IBM's Product Development Integration Framework are part of this domain.
- *Operations and Supply Chain Optimization*—reduce operating expenses, maximize cash flow and return on net assets by optimizing supply and demand processes, enterprise business intelligence, and enhance health, safety, compliance and environmental governance initiatives.
- *Marketing, Sales, and Service Differentiation*—designed to help enter new growth markets, increase revenues, and improve customer

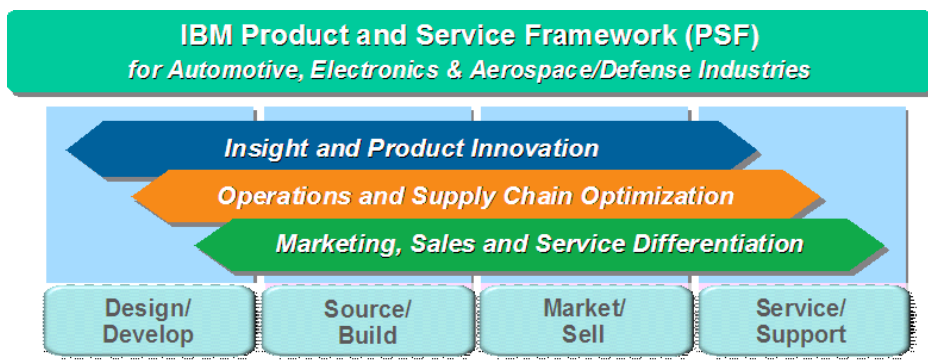


Figure 2—IBM's PSF Model

intimacy by providing value-added services that enhance the customer's experience and the company's return on assets, as well as optimizing internal commerce and fulfillment functions.

Within each domain exists a set of projects, which are the consumable units of the framework. Each project is built using common software building blocks and includes IBM software, pre-built industry specific accelerators and pre-defined business process workflows that incorporate best practices that can be used to reduce the time and effort to configure and deploy enterprise solutions. Once a project is operational and delivering value, additional projects can be deployed by leveraging the capabilities established. Open standards are a key part of the framework, which simplifies integration and information sharing as additional capabilities are established. The initial release of PSF provides capabilities and templates to support the Electronics, Automotive, and Aerospace & Defense industries.

The objective of the PSF is to form a foundation upon which enterprise solutions in all domains can be synchronized. This means that they can share common information and processes so that users working in one domain can utilize the information created in other domains in a consistent manner to help them make more informed decisions and perform their work tasks in a more efficient manner.

IBM's Global Business Services (GBS) is a leading systems integration and consultancy with experience and expertise in industry domains, process re-engineering, consulting, and IT management and operations. GBS provides system integration, application modernization and management services to define, configure, and deploy PSF based solutions for manufacturing projects in Electronics, Automotive and Aerospace and Defense.

As a leading supplier of IT technology, IBM also delivers hardware and operating systems platforms and many of their products enable the PSF, including:

- Tivoli
- Rational
- WebSphere Application Server
- Lotus
- DB2
- IBM servers and operating systems

The IBM-Siemens Alliance has on-going collaborative initiatives to develop solutions that address the challenges that arise in integrating PLM into the extended enterprise. The current collaborative initiatives are:

- Enterprise business process integration and change management
- PLM unified BOM transition
- The engineering cloud
- Mechatronics and ALM/PLM integrated management
- Extended Digital Manufacturing

As part of these initiatives, IBM and Siemens are working with customers to help develop these solutions and the best industry-focused best practices that will be used to enable these solutions. Figure 3 presents the industries to which the PSF is being applied and major collaborative programs of the alliance.

Through their extensive experience IBM and Siemens understand the challenges of integrating PLM with other enterprise applications. The following is one customer's comment about the alliance and its potential benefit to them:

*"... we are more committed than ever to making PLM an integral part of our overall enterprise strategy so that all stakeholders have a single view of all product and process information. The integration of IBM middleware with Siemens' PLM applications, combined with industry knowledge and expertise of these two global leaders will not only help us meet these commitments, but should have a positive effect on our overall ROI."*  
*Automotive Customer Quote*

IBM and Siemens state that they will continue to advance their collective capabilities across the enterprise to deliver the solutions necessary to help their customers remain competitive, to remain profitable and to enable growth under increasing competitive environments.

## 5. Summary and Concluding Remarks

Maintaining business competitiveness requires product innovation and leadership, operational effectiveness, and customer responsiveness and satisfaction. Companies need to establish and use IT platforms and architectures that enable seamless integration of information and processes across business domains in a flexible manner. The IBM and Siemens alliance was formed to address this need and to help companies work smarter by optimizing their complete enterprise, not just individual organizational silos.

The IBM-Siemens' integrated solution set helps companies improve their ability to deploy an environment that can be



**Figure 3—IBM-Siemens Alliance Focus and Initiatives**

continually improved and adopted to changing market and business needs in a more cost efficient manner. Using the solutions and services provided by IBM and Siemens, companies can better define and deploy Integrated Enterprise Systems that leverage their business resources and IP throughout their enterprise.

The alliance’s goal is to enable a company to rethink the people and process aspects of their business to take full advantage of their investments in solutions and infrastructure platforms and eliminate process, data, security, and application silos. As companies use the integrated PSF and Teamcenter solutions they should be better able to continually expand the use of business information across their extended enterprise and implement more complete end-to-end processes. This will help the business respond more quickly to changing needs while reducing the cost of support.

Siemens PLM and IBM state that they will continue to advance their collective capabilities across the enterprise to deliver solutions that can enable a company to remain competitive, remain profitable and enable growth while responding to increasingly competitive environments. Both Siemens and IBM are dedicated to solving their customers’ most difficult problems.

Together, IBM and Siemens are working to harmonize and integrate their technology, knowledge, and experience across a wide collection of industries and technologies to help their customers deploy true cross enterprise solutions that reduce the overall complexity and cost of support of their IT landscape. Their goal is to help companies deploy

complete end-to-end business solutions that enable businesses to work smarter, faster, and compete more effectively.

The IBM-Siemens alliance solutions should be considered by customers with a need to improve business operations and to develop integrated enterprise-wide business solutions.

## About CIMdata

CIMdata, a leading independent worldwide firm, provides strategic management 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 certification 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](http://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 Oogststraat 20, 6004 CV Weert, The Netherlands. Tel: +31 (0)495.533.666.

# SIEMENS

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