

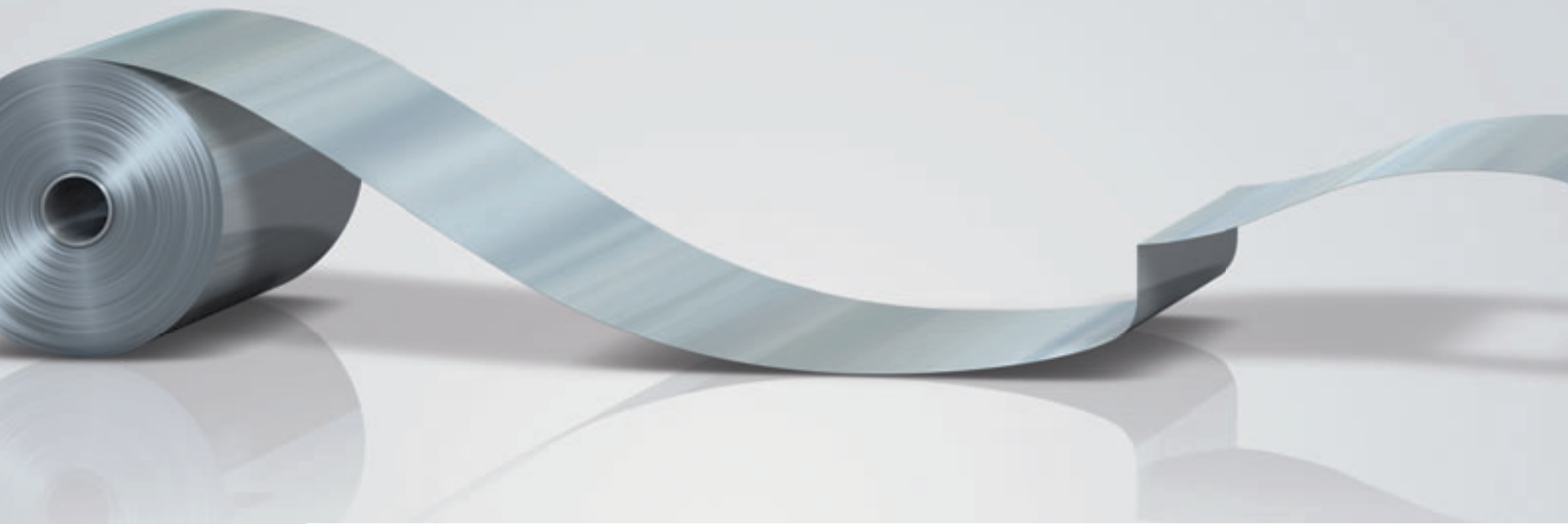


Non-Stop Manufacturing Excellence.

# Automotive

Answers for industry.

**SIEMENS**



## Answers to your challenges

How can the potential of emerging markets be best economically tapped? What possibilities are there of reducing manufacturing costs? Would it be best to do this throughout the entire life cycle? How can production line flexibility be increased to such an extent that individual customer wishes are easier to fulfill? And how can the availability of systems and high production quality be sustainably assured across distributed locations? Siemens provides the answers to all these questions.



## Non-stop profitability.

The automotive industry has always set standards in automated production. It is a source of impulses for innovative technologies and a pacemaker for excellent production processes. As a close partner of this industry, Siemens has been committed for several years to consistently increasing the level of performance.

Keeping in mind the structural changes in automotive production within the scope of global competition, we orient ourselves strongly to the central challenges of our customers: reducing costs, increasing flexibility and assuring availability. To this end, we are always taking up new issues. The

most recent example: the “digital factory” – one of the key technologies in the competition for costs and markets.

To develop this potential, Siemens has expanded its portfolio to include market-leading Product Lifecycle Management software. On the basis of this extensive hardware and software portfolio, we can evolve and implement holistic concepts. Not just across all trade activities, but throughout the entire value-added chain. From product design through all engineering disciplines, from digital planning to vehicle production.

With a clear focus on standardization and consistency in engineering, we develop tailored manufacturing concepts. For both established markets and also for emerging countries – and we provide processes that ensure maximum profit and high availability.

With our comprehensive industry-specific expertise and our unique support and service concept, we accompany the automotive industry and also the machine and system manufacturers around the globe and throughout the life cycle. Siemens focuses very clearly on one goal: non-stop manufacturing excellence for automotive manufacturers around the world.

# Exploit market opportunities

Whether premium vehicles for established markets or high-volume models for emerging markets.

Regardless of the continent on which you want to grow – Siemens is only one step away from you with the most profitable manufacturing concept.

To be successful in international automotive markets you have to adjust to the general local conditions. In established markets, the variety of models and innovative features such as intelligent safety and infotainment systems are in demand. In emerging regions, however, profitable high-volume models are crucial.

As your technology partner with a global presence, we are not only extremely familiar with the production of automobiles, but we also know exactly what is important in the various markets. With this expertise, Siemens will support you in implementing the most profitable production process – worldwide.





Massively impressive.



Impressive mass.

# Profit internationally

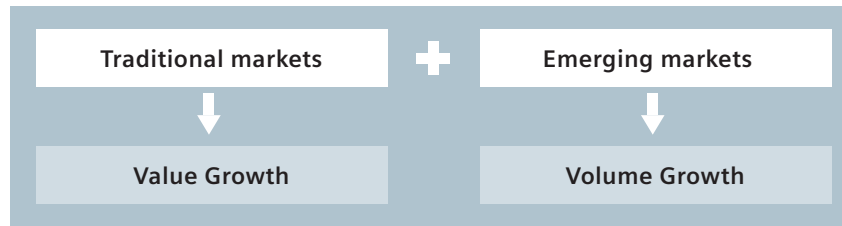
## Automation as required

It makes no difference whether you want to boost your flexibility in established markets with highly automated systems or whether you want to manufacture profitably in emerging markets.

The precise degree of automation you wish for can be achieved with Siemens products, systems and solutions. For example, we offer you a wide variety of products and systems in various degrees of functionality, from standard to high-feature, that can be tailored exactly to your respective application. Moreover, for the areas of assembly technology, conveying technology, production logistics, testing

technology and vehicle diagnostics, Siemens has valuable market-oriented solutions in store for you.

Despite the flexibility that our portfolio offers you, one thing always stays the same: the high quality of our products, systems and solutions ensure powerful, highly available and profitable production processes throughout their life cycle.



In all international automobile markets, Siemens supplies you with the automation technology for the most profitable production process in each case.



Be it maximum flexibility in established markets ...



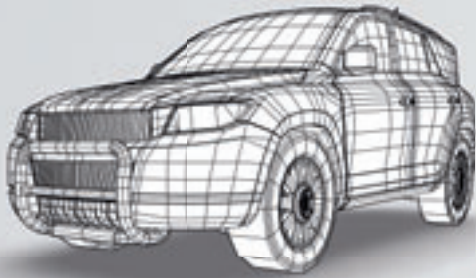
... or profitable mass production in emerging countries – we support both.



Optimize.

## Cut costs

Is it possible to manufacture profitably, regardless of the market? Thanks to the intelligent combination of Product Lifecycle Management software and Totally Integrated Automation, you can cut effort and costs – from the first concept of a new vehicle through its market launch to the model change.



## Digitize.

For years now, Siemens has been pursuing a clear objective for automobile industries around the world: time and cost savings – from development through implementation to maintenance and retrofit. We achieve this through a consistent and standardized hardware and software portfolio that is easy to engineer and substantially increases the efficiency of production processes and cuts costs throughout the product and production life cycle. Considering

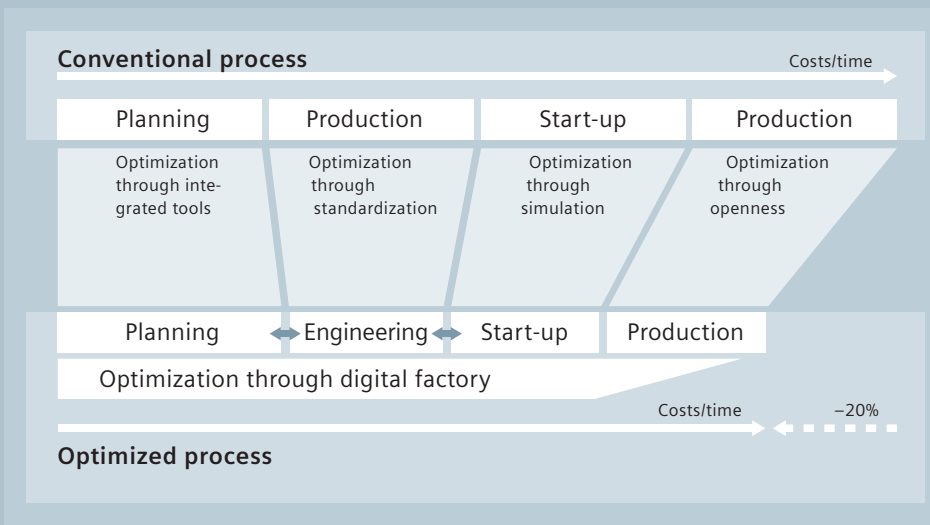


## Profit.

rising costs and competitive pressure in global markets, international automobile manufacturers must squeeze maximum efficiency out of their processes. Not only in production, but also in the development stage.

One of the key technologies in the struggle for costs and markets is the digital factory. Thanks to the integration of innovative Product Lifecycle Management (PLM)

software in the product life cycle and the Totally Integrated Automation portfolio, which is based on open standards, from this point forward, Siemens is in a position to increase the efficiency of the entire product life cycle. Your advantages: the time to market is shortened and investment costs reduced – both by up to 20%.



The intelligent combination of Product Lifecycle Management software and Totally Integrated Automation cuts the time for engineering, start-up and production, and so the costs by up to 20%.



Digital plant engineering boosts efficiency and simplifies the implementation of standardized production standards.

# Optimize the life cycle

## **Plan virtually, profit in the real world**

With a uniquely comprehensive range of software for Product Lifecycle Management (PLM), Siemens covers both the entire product and production life cycles. Practice-proven tools support you in every process step – for example with the realization of a product design in line with requirements, an efficient product data management system or virtual factory planning and commissioning.

PLM is a crucial success factor for the future. Intelligent Product Lifecycle Management not only provides for more highly efficient processes with enhanced profitability and a shorter time to market, but it also promotes the automobile industry in almost all its key issues – from global engineering through mechatronics, standardization and reusability, change management and strategic

sourcing to knowledge-based engineering and production.

By integrating PLM and Totally Integrated Automation, we want to arrive at a seamless transfer of data and knowledge in the future. From the digital factory to the real one. From the product design through digital plant engineering to the optimally automated production process.

## **Standardize worldwide, manufacture uniformly**

Moreover, the combination of PLM and Totally Integrated Automation creates ideal prerequisites for implementing global production standards. As your international partner, Siemens will help you in every way possible. With a totally standardized product and system range that is available worldwide, and with the appropriate

service and support throughout the life cycle. We define our standardized system components together with you and your machine and plant manufacturers. This simplifies engineering and the stocking of spare parts while ensuring consistently high production and product quality. Further advantages: uniform order processing and global maintenance and service concepts.

Solutions for Powertrain are the perfect example of an optimally standardized automation solution. On the basis of a universal hardware and software platform, complete production lines can be automated efficiently and reliably with the aid of our highly developed standard components from the SIMATIC, SINUMERIK, SIMODRIVE and PROFINET portfolio. Worldwide – and directly from a single source.

# Produce more flexibly

For automobile manufacturers, not only profitable, but also flexible production counts.

On demand, different models on one line. Siemens gets them there.

Increased competition in the international automobile markets has clearly increased the dynamics in manufacturers' portfolios over recent years. Production has to adjust faster and faster to new models and a large number of individual feature variants. The consequence: complexity is growing in production and logistics.

There is also a wish for greater model diversity within one and the same production line, i.e. for being flexible. We will assist you in achieving this with innovative and cost-effective solutions, also as a general contractor.

Just-in-Sequence is a further key issue of modern automotive production. To optimally fulfill individual customer wishes, the right component has to be ready for installation on the respective body at the right time and in the right place. This logistical challenge can only be mastered with an appropriately dimensioned Manufacturing Execution System. If you procure materials, assemblies or whole assembly units from external suppliers, you need a cross-location solution. And precise identification of each individual component is crucial.





Open the door ...

... to new production diversity.

# Reduce complexity

## **Flexible processes, efficient supply chain**

For the flexible and efficient design of your production and logistics processes, Siemens offers you special solutions on the basis of our industry-specific, modular SIMATIC IT MES system and the SINUMERIK Manufacturing Excellence portfolio in combination with innovative radio frequency identification systems (RFID).

With real-time information, our RFID solutions help you to reliably locate every single component within your production, providing you with the appropriate documentation for tracking and tracing and enhanced efficiency production control. To make sure that the right component is in the right place at the right time.

## **Wireless networking, easy and reliable**

Industrial Wireless Communication (IWLAN) offers considerable potential for boosting flexibility in production and for cutting both complexity and costs at the same time. Wireless communication makes it possible to interface automation cells despite complex space conditions. An example of flexibility is the integration of Safety Integrated technology in PROFINET via IWLAN. Very fast changes and add-ons are possible and life cycle costs are reduced.

## **Engineer digitally, act more flexibly**

The digital factory also supports flexible and time-saving production. Thanks to digital plant engineering, new or changing production processes can be simulated and implemented more easily and faster. Recurring partial steps can be standardized, stored digitally and, in the future, integrated quickly and easily in new system structures. Thanks to virtual commissioning in combination with, for example, Totally Integrated Automation, which enables data to be transferred from the digital factory, future production changes can take place much faster.



With different strategies, we support the automobile industry in flexible and efficient production control



Innovative technologies are the key to higher flexibility and reduced complexity in automotive production

# Increase availability

Flexible production processes that are to contribute to profitability must do one thing: they must be highly available. Siemens will help you in keeping downtime low and availability high with intelligent service strategies and worldwide support.

Global automotive manufacturers rely on highly flexible and profitable production lines. Where costs are concerned, one thing particularly counts: maximum system availability. One minute of downtime alone can mean follow-up costs of up to \$ 100,000.

Siemens makes sure that it won't go that far. With our own claim to quality that we consistently apply in everything we do worldwide. With integrated solutions for a highly dynamic and powerful production

process that is distinguished by minimized downtimes and a uniformly high quality level. With targeted innovations for your industry that help to increase availability, for example by means of improved process control. Or with tailored service strategies that help you in manufacturing excellent vehicles at any time and in any place with maximum performance.

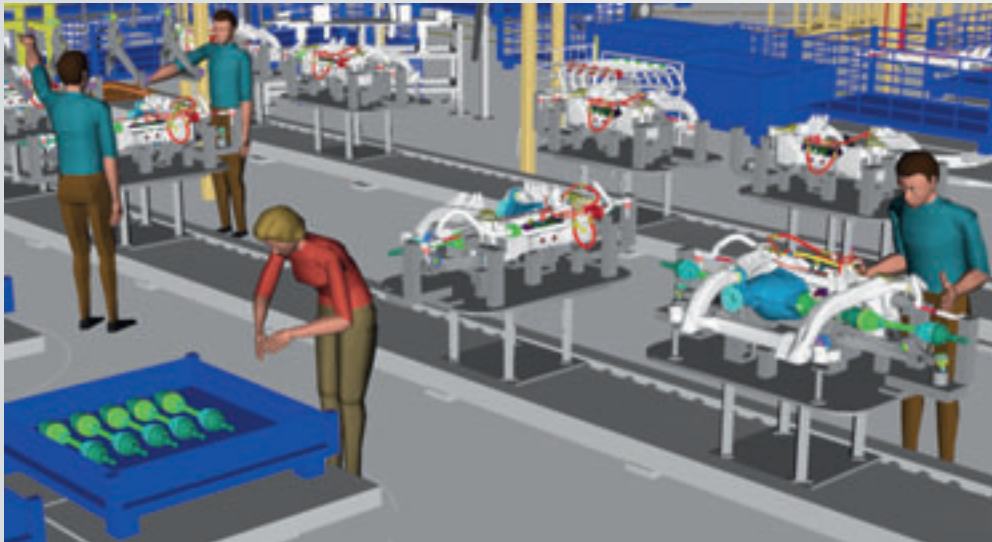




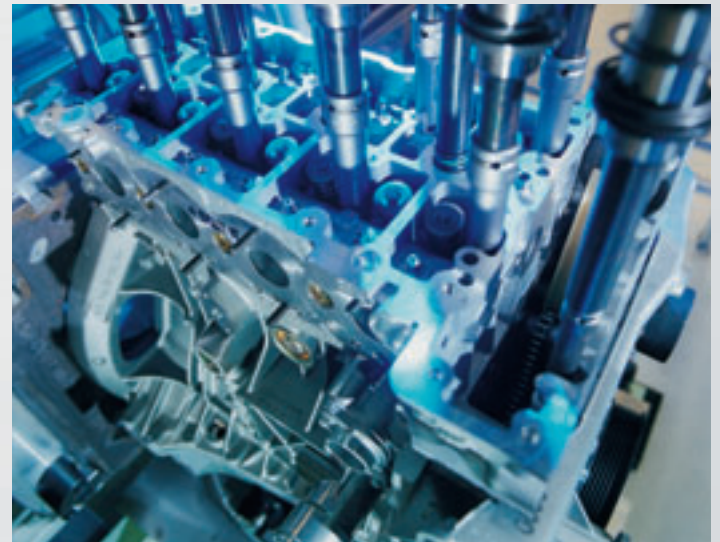
No downtime.



Just uptime.



Digital simulation prior to commissioning signifies reduced coordination effort and more reliable plant architectures ...



... and leads to high product quality

# Assure quality

## **Integrate total automation, produce high availability**

With Totally Integrated Power – the Siemens technological platform for uniform power distribution in buildings – and Totally Integrated Automation, we are able to integrate all process steps relevant to automotive production in a single, flexible, highly available and profitable system. From incoming goods to outgoing goods, and from the production control level to the corporate management level. The result: uniform plant structures and reduced interfaces for higher availability altogether.

## **Engineer digitally, boost efficiency**

Performance can be increased even further by means of digital plant engineering. The future production plant is created virtually, in the form of a 3-D model to which all project participants have access. On the basis of digital simulation, systems can be configured more easily and can be tested

more efficiently. Reduced coordination effort and effective error exclusion already ensure a substantially faster workflow and more reliable system architectures from the outset.

## **Take optimal preventive action, manufacture excellently**

Another way to increase availability and reduce downtimes is to use intelligent maintenance. The goal: to efficiently identify faults and minimize any future potential disruptions. The SIMATIC Maintenance Station makes an essential contribution towards meeting this goal. It creates an overview of all data relevant to maintenance, which is clearly displayed by means of SIMATIC HMI and is translated to informative analyses via SIMATIC IT. That way, maintenance can already respond before faults occur. This creates planning certainty and enables economic use of resources. In preventive and predictive maintenance of your machines in the powertrain area, SINUMERIK Manufactur-

ing Excellence also assists you with condition monitoring, maintenance and data management.

Complete integration in Totally Integrated Automation ensures a genuine added value because existing engineering data can be used for maintenance. Data communication is consistent. And as automation and maintenance access the same data, handling of the system is very simple.

## **Reduce interfaces, minimize risks**

Production quality crucially depends on the optimal interplay of all components. With competence in mechanical engineering and automation technology that is unique in the world, Siemens offers you complete turnkey solutions from a single source, with high value created throughout the life cycle. The result: intelligent integration, optimum transfers and minimum interface losses.

# Automotive Industry Suite

Our Automotive Industry Suite is a unique, optimally coordinated range of products, systems, software, services and process expertise for meeting the challenges in your industry. Whether you require a total or partial solution or an individualized package, you always decide how Siemens can best contribute to your success. One thing is clear: specific plant solutions can be developed faster and easier, and expanded more flexibly than ever before, thanks to our Industry Suite solutions.

## **Product Lifecycle Management**

Consistent use of digital product data and other relevant information – from a single data source – in all relevant processes is the key to success in automotive production. With our comprehensive portfolio for Product Lifecycle Management, the automobile industry can proactively meet its current requirements such as globally distributed locations, very close cooperation with suppliers, variant diversity, short model launch cycles, environmental protection requirements and high quality at low costs.

## **Totally Integrated Automation**

With Totally Integrated Automation, you set standards in productivity and assure your competitiveness. The product and

system range ensures consistent automation from the press shop to the ready-to-drive automobile, from the production line through the production control level to interfacing with the corporate management level. The result: shorter time to market with considerably reduced life cycle costs.

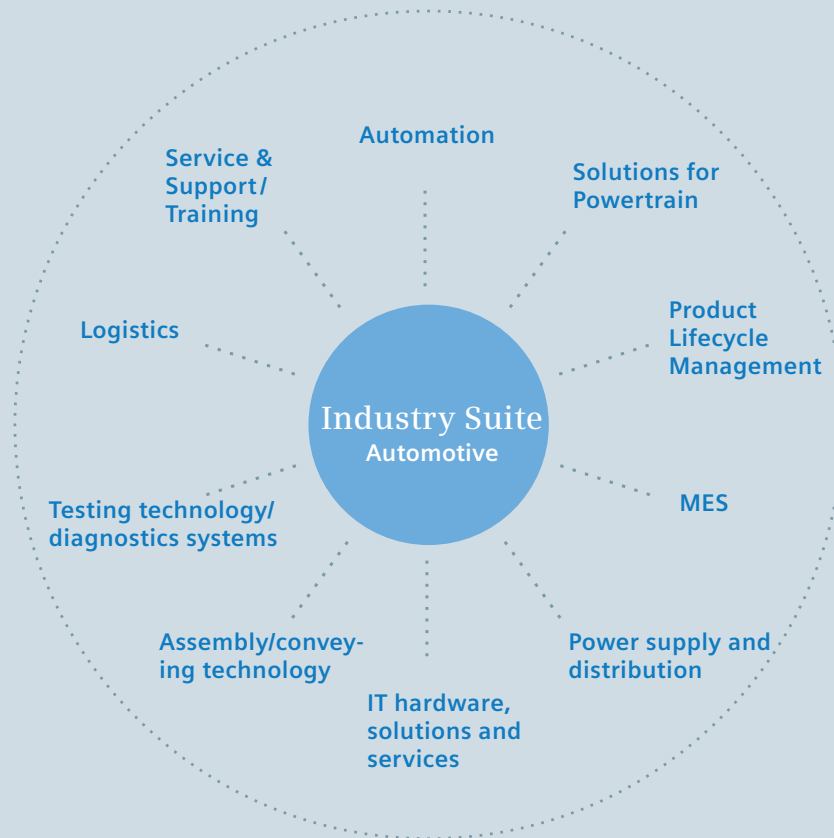
## **Totally Integrated Power**

With the Totally Integrated Power technological platform, Siemens offers end-to-end solutions for power distribution in non-residential and industrial buildings from medium voltage to the power point. This enables potential savings where planning, configuration, erection and operation are concerned. Our products and systems support the high demands of the automobile industry. Innovative busbar trunking systems, for

example, ensure reliable system operation and offer high flexibility in the event of production changeovers. Efficient power management, which can be integrated easily in the automation solution thanks to identical communication standards, also helps to cut energy costs.

## **IT hardware, solutions and services**

When it comes to your IT, Siemens has an extensive range of solutions and services to offer you. From state-of-the-art hardware and software to completely tailored IT solutions. With unique SAP and industry expertise, we ensure harmonized and standardized IT infrastructures and optimized processes. This creates a lasting added value for the automobile industry.



#### Tailored automation

On the basis of our extensive process expertise, Siemens provides tailored automation solutions and we support the entire implementation process from analysis through creation of individual concepts to specific implementation. Control cabinet construction, assembly, start-up support, services – our solution covers every aspect of your plant's the life cycle.

#### Solutions for Powertrain

Our modular automation concept makes your production line a road to success – on the basis of a flexible modular system with standard components well known throughout the world and harmonized to the individual requirements of your production process. Solutions for Powertrain also impress on account of our project management and our professional services for the entire operating phase, which cut long-term costs and increase your plant's availability and productivity.

#### Product Lifecycle Management

Thanks to the integration of pioneering software and services for Product Lifecycle Management (PLM), Siemens is the only vendor in the world able to offer you totally integrated systems and solutions for the entire product life cycle: from the product design and



portfolio and program management, through digital system planning and simulation, to production. By tightly meshing PLM and automation, we continue to create an optimal basis for the digital factory.

#### **Manufacturing Execution Systems**

Industry-specific solutions for the analysis, modeling and implementation of production processes can be realized quite efficiently with SIMATIC IT. Interfacing to operations management ensures optimized business processes, facilitates modification of production processes and cuts life cycle costs. The Siemens SINUMERIK Manufacturing Excellence portfolio supports the particular requirements in the powertrain area with NC program, tool and maintenance as well as data management.

#### **Efficient power distribution**

As a leading manufacturer of power supply and distribution products and systems, we offer future-proof concepts for demand-oriented, consistent and, above all, efficient power distribution from a single source. From the point of origin to the consumer. With intelligent components for medium and low voltage and innovative power management systems that support you in reducing energy costs on a long-term basis.

#### **IT hardware, solutions and services**

For optimum business processes altogether, Siemens offers you the entire IT spectrum: from in-vehicle software, through vehicle diagnostics systems to product lifecycle management, enterprise resource planning and integration services for manufacturing execution systems – supplemented by consulting services specific to the automotive sector to enable you to implement your IT projects with an effect on the bottom line.

#### **Assembly and conveying technology**

Whether modernizing or building from scratch: with completely tailored solutions, we support you in realizing optimal cost-effective systems distinguished by an interaction of all components, reduced interfaces and intelligent integration. Provision from a single source assures a high degree of reliability and efficiency.

#### **Testing technology and diagnostics systems**

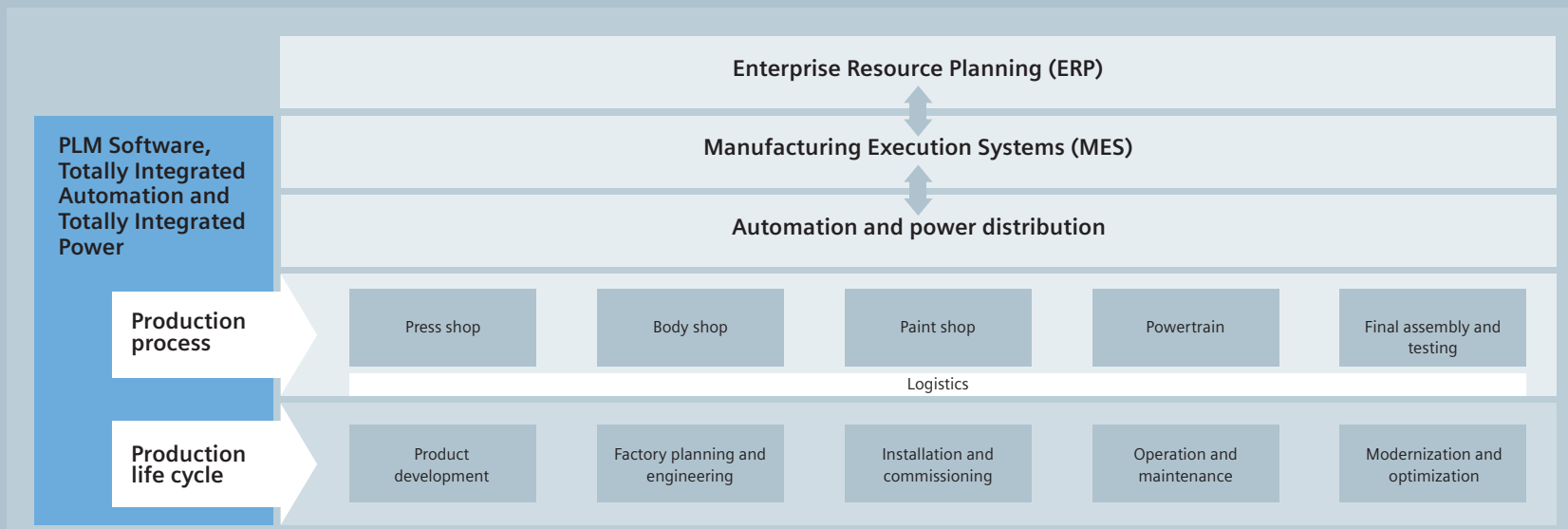
Peak performance by the automobile manufacturers and their suppliers is the result of intensive research and development along with high production quality standards. Siemens test racks and diagnostics systems for EOL applications, and our motor, gear and vehicle test equipment for research and development, are just the reliable solutions for these demands.

#### **Perfect logistics**

Whether you require individual solutions or turnkey systems: Siemens offers efficient solutions and is, therefore, your ideal partner for all logistics processes. We combine proven components to form tailored systems that are perfectly matched in terms of mechanical and automation engineering and which can be integrated into your IT or ERP systems.

#### **Service, support and training**

A strong team of experienced specialists will help you worldwide, in more than 100 countries, with one of the most extensive service offerings on the market. Be it a single task or a complete maintenance agreement, we will accompany you throughout the entire life cycle. From the system design to the retrofit. With competent service and support and with practice-oriented training covering all the products offered by Siemens.



With PLM software, Totally Integrated Automation and Totally Integrated Power, Siemens integrates all process steps of automobile development, production plant planning and automotive production in a flexible, highly available and profitable system.



## At your service – worldwide

As a global technology partner, Siemens helps the automotive industry in every important international market. With intelligent solutions for more flexible and more profitable production methods and with proactive support – in all aspects of your global automotive business.



As a long-standing and close partner to the automotive industry, Siemens is present with appropriate automotive experts in all the industry's focus regions. Both in established markets and also in emerging countries.

Our automotive specialists are not only experts in their own fields, but are also extremely familiar with the respective market. They know how to shape automotive production on an international scale and how to make it profitable.

Siemens not only offers you local support, but also an active global service. Through our account management program, a central contact is at your service who will take care of all the issues related to your global production processes.

Each account manager has distinct process engineering expertise and pools all our services in one place. In a team with our experts, account managers work out the right strategy for you, establish all the necessary local contacts, coordinate im-

plementation and ensure a smooth and fast project performance. Your advantage: less planning and coordination and, more importantly, faster time-to-market.

With an extensive industry-specific portfolio of products, solutions and services, Siemens supports automotive manufacturers in all markets throughout the life cycle of a product or system by implementing profitable production processes. Take our word for it. We are at your service – worldwide.

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