



# The Next Stage of Digital Transformation in Germany:

Cloud PLM Paves the Way to More Product Innovation and Efficiency

An IDC White Paper, sponsored by Dassault Systèmes

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## Introduction

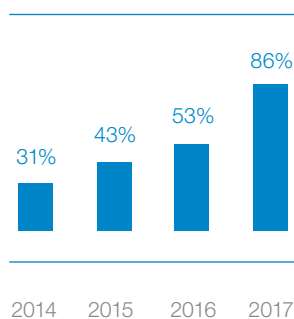
Digital transformation is currently leading to significant changes in German industry. It empowers enterprises to newly shape established value-added processes, to more firmly integrate clients and partners, to implement technology-based product innovations, and to generate new business concepts. The strength of this transformation lies in innovative technologies and concepts, and digital data, which is of growing importance for the business success of every kind of enterprise.

Increasing digital value creation enables and demands of organizations a rethinking of the way in which they handle data and information – and a new form of cooperation. That impacts both internal processes and interaction with external partners, with suppliers, and with clients. The situation remains that in German enterprises much information, time, and turnover are lost through fragmented and analogous procedures.

The structuring of a digital platform that merges existing data silos, and ties in newly emerging information will become a decisive factor for future cooperation and power to innovate within organizations. Here product lifecycle management (PLM) assumes a central role for industrial enterprises by creating a uniform data platform for workers, partners, and clients. Plus, the growing presence of PLM from the cloud offers enterprises new opportunities like fast provision of services, less up-front investment, or a subscription-based payment model.

Against this background IDC questioned 100 businesses in the German manufacturing sector in October 2017. The sample design is comparable with IDC's Industry 4.0 studies of recent years, meaning that developments onwards from 2014 can be demonstrated. The present White Paper is meant to give IT and lines of business stimulating ideas and recommendations on how to successfully develop and grow digital innovation potential in their enterprise.

Attention to Industry 4.0 among professionals and managers



N = 314 (2014), N = 417 (2015), N = 363 (2016),  
N = 103 (2017) incl. screenouts, weighted  
by 2014

## Industry 4.0 has reached the next stage in Germany

In last year's White Paper we ascertained a change of mood in German industry. A growing number of industrial enterprises have recognized digital transformation as an opportunity to master operative challenges like process optimization and improvement of efficiency that lie ahead. The development has strengthened again substantially this year.

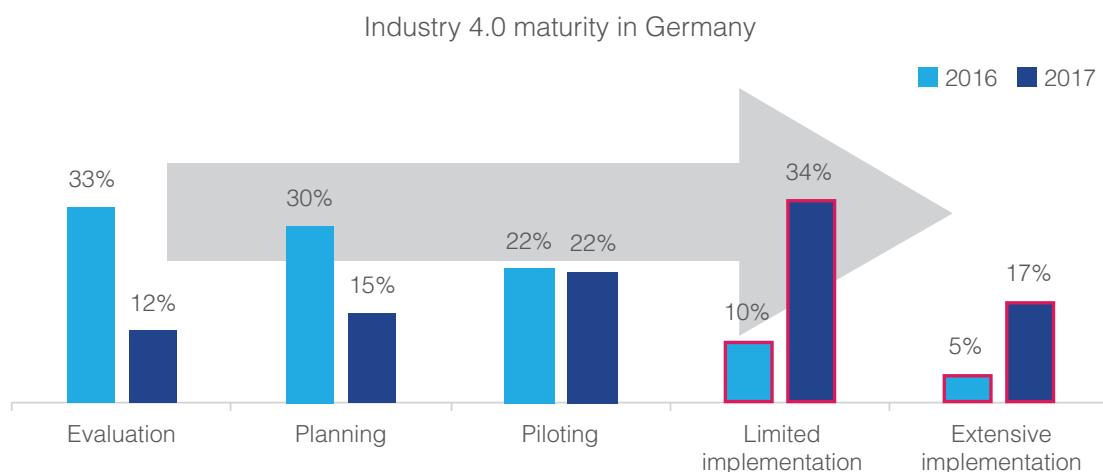
Plus, grasp of the fact has noticeably matured that through digital technologies and data is able not only to enhance excellence of operation but also, and to a greater degree, to boost innovative power throughout an enterprise. Industrial enterprises nevertheless reported last year of significant difficulties in leveraging their digitalization initiatives. These consisted in particular of translating

pilot projects into ongoing operations, and rolling them out on a broad base. Current results show: 2017 is the year of the Industry 4.0 breakthrough. In recent months many enterprises have increased the pace of their activities, and developed successful migration concepts for their pilot projects. Whereas in 2016 it was every sixth enterprise, today every second one questioned has implemented Industry 4.0. The progress they are making is highly visible, because they are less involved in initially evaluating but more in implementing and working. At the same time new possibilities and ideas for Industry 4.0 initiatives continue to be investigated. These include, for instance, more intensive networking of the shop floor and cooperation or product innovation on a larger digital scale.

The digital pioneers have already taken a lead over its rivals however. Plus, digitalization has dropped barriers to entering a market to such an extent that enterprises from quite different markets enter a competitive situation. So it is a matter of further increasing speed to develop pilot projects with a promising business case as fast as possible, and to implement them.

## Figure 1

Much motion in Industry 4.0 maturity: Enterprises have made a large leap from evaluation to implementation

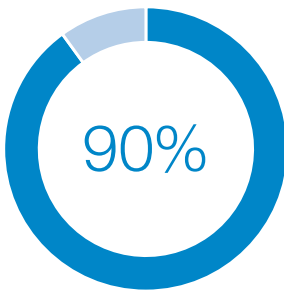


Q: In what phase is your organization in implementing Industry 4.0 initiatives?  
 N = 201 (2015), N = 200 (2016), N = 100 (2017)

Source: IDC, 2017

## Front-to-end digitalization is decisive for successful transformation

One reason for increased Industry 4.0 maturity is no doubt the improved exchange of information in many of the enterprises questioned – inhouse and with the ecosystem consisting of partners, suppliers, and clients. Digital data and information are at the center of Industry 4.0 initiatives, and their successful implementation depends essentially on digital continuity in the value-added process. Only in this way can experience from manufacturing be fed back swiftly to product development for example, or material requirements be sent automatically to the supply chain.



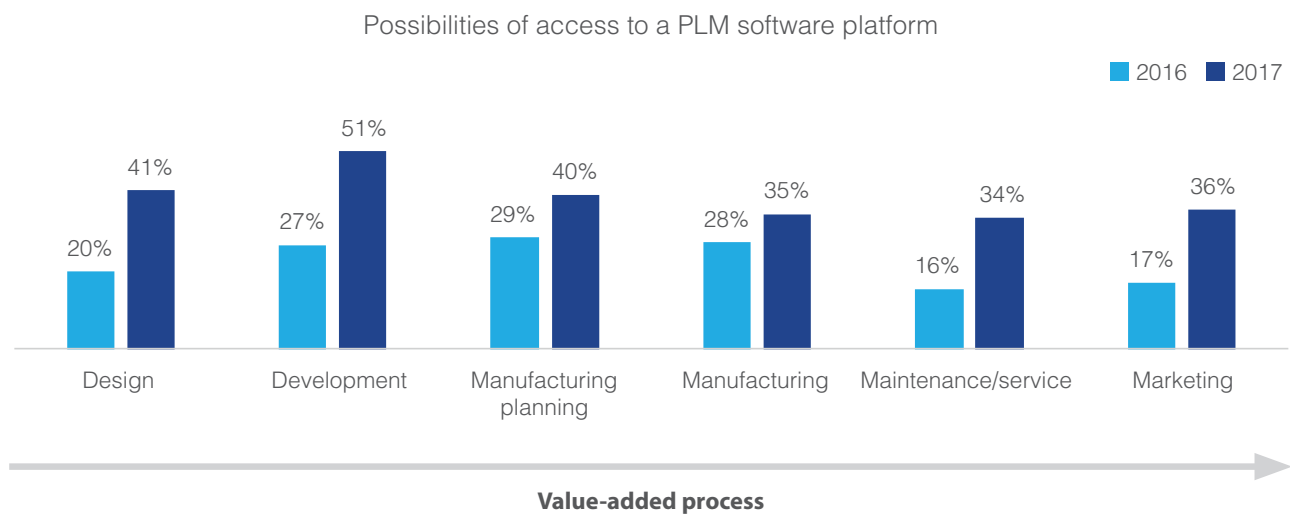
In 90% of enterprises questioned too much time is lost for harmonization between departments.

Product lifecycle management platforms play a central role. They help to create a uniform database for all actors on the product lifecycle stage, and lay a foundation for digital twins for example, virtual maps of planned products. Compared to one year ago, organizations have very much enlarged the use of PLM systems. This applies to divisions like design and development, which detect possible problems before the actual creation of a product by simulation on a digital twin for example, so that manufacture of the product is consequently more efficient.

Nevertheless, there is still potential for improvement in almost all enterprises. 90 percent of those questioned report that too much time is still required for harmonization between departments and process steps in their enterprises. 32 percent of participants in the questionnaire are even of the opinion that their enterprise is losing turnover because of poor cooperation between departments. Integration of the ecosystem is the next, and an essential step that many companies still have to take. Because digital business, more than ever before, will call for an exchange of information in realtime with partners and clients.

Figure 2

An exchange of information along the value-added process has markedly improved



Q: In what divisions of your company is a PLM software platform implemented offering a uniform database?  
 N = 174 (2016), N = 100 (2017), percentage values show share of divisions with access to a uniform PLM database

Source: IDC, 2017

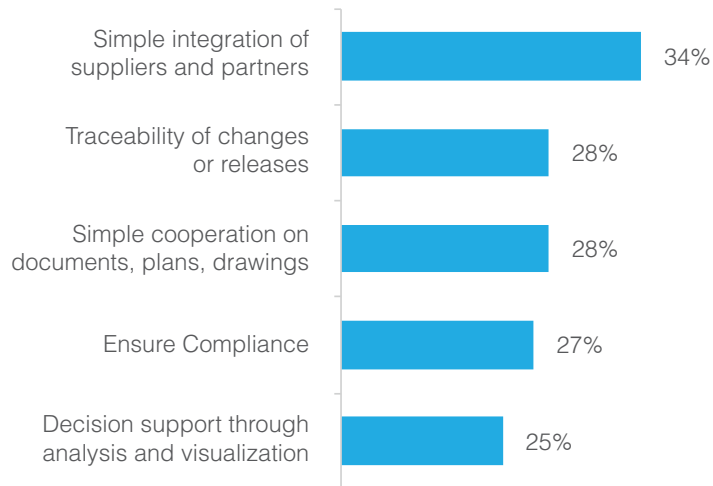
## PLM as platform for product innovation and efficiency

Many industrial enterprises recognize that there is still much potential especially for integrating suppliers, partners, and clients. Time to market can be substantially reduced, and product quality assured by better and faster harmonization with the supply chain. Clients can also more easily produce ideas and feedback. Most of the enterprises asked consequently see simple exchange of information with the external ecosystem as the

most important PLM function. Cross-department or cross-division cooperation plus the implementation of compliance specifications also count as major services of a PLM platform. Product lifecycle management can thus make a valuable and important contribution to the digital transformation of industrial enterprises.

## Figure 3

### The five major functions of a PLM software platform



Q: What do you think are the three most important functions of a PLM software platform?  
N = 100, selection of three most important functions, figure shortened

Source: IDC, 2017

But to meet the increased demands of digital transformation, product lifecycle management must also continue to develop. IDC is convinced that PLM will in future become a product innovation platform. This development is based on an understanding that product innovation is set in motion by all internal and external parties involved, and does not arise solely in a design office, R&D laboratory, or engineering department. A product innovation platform, as IDC sees it, will be featured as follows:

- **Fast cooperation** along the value-added chain: This includes, for example, processes between engineering, manufacturing, supply chain, and service, or with clients.
- The principle of **collaborative manufacturing**: Engineering and design work closely from the start of the product lifecycle with manufacturing.
- A **holistic view** of data enabling analysis and simulation along the product lifecycle.
- Integrated **quality and service information** through product flaws or client feedback enabling product improvements.

The named features are decisive to gain momentum in digital transformation, and to grasp the opportunities of Industry 4.0 in terms of product, manufacturing or business model innovations. PLM as a product innovation platform will thus in future, in the view of IDC, take on an important role in the digitalization projects of German industrial enterprises.

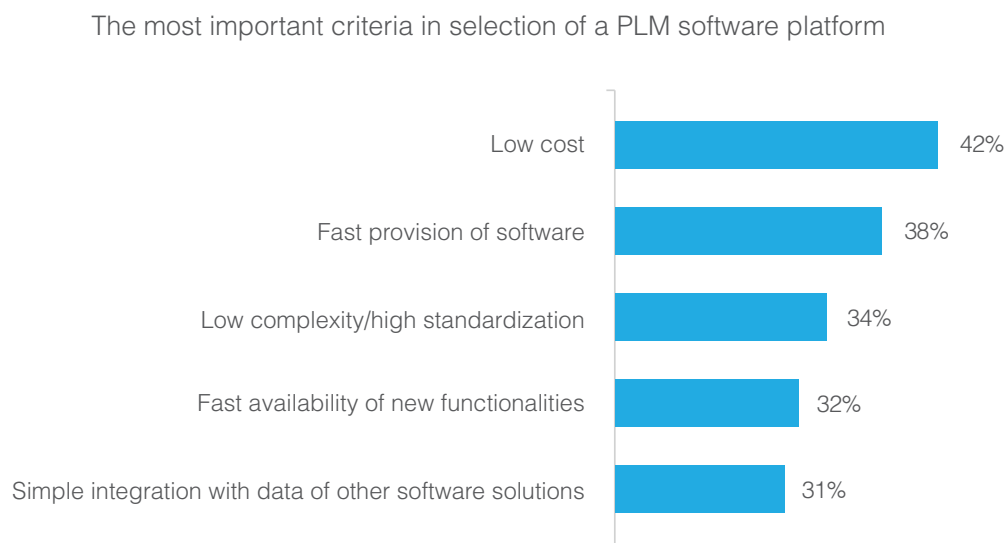
## PLM from the cloud accelerating the pace of innovation in digital transformation

Product lifecycle management undergoes a development process not only in terms of functionalities. The same applies to the different resource models of the software. In simple terms a distinction is made between resources in one's own data center (on-premise), and resources from the cloud. The benefit of cloud services over the classic model is that the effort and expense of corporate IT for installation and maintenance can be significantly reduced, and resources thus released for other tasks. They require less lead time investment, can be booked more flexibly, and new functionalities are automatically added through regular updates by the cloud provider.

Advantages like these enhance agility overall, and also address the most important wishes for selection of PLM software from the viewpoint of IT and lines of business. In the procurement of PLM the decision-makers asked value in particular in terms of lowest possible cost, fast availability, and a large degree of standardization. This is precisely where the cloud can outpoint the classic on-premise model. It is thus hardly surprising that today 56 percent of the enterprises asked draw at least part of their PLM services from the cloud. The other enterprises are very much prepared for the future to provide part of their PLM solution on-premise and part from the cloud.

### Figure 4

The cloud provision model addresses the most important criteria in PLM selection



Q: What do you think are the three most important criteria in selection of a PLM software platform?  
N = 100, selection of three most important criteria, figure shortened

Source: IDC, 2017

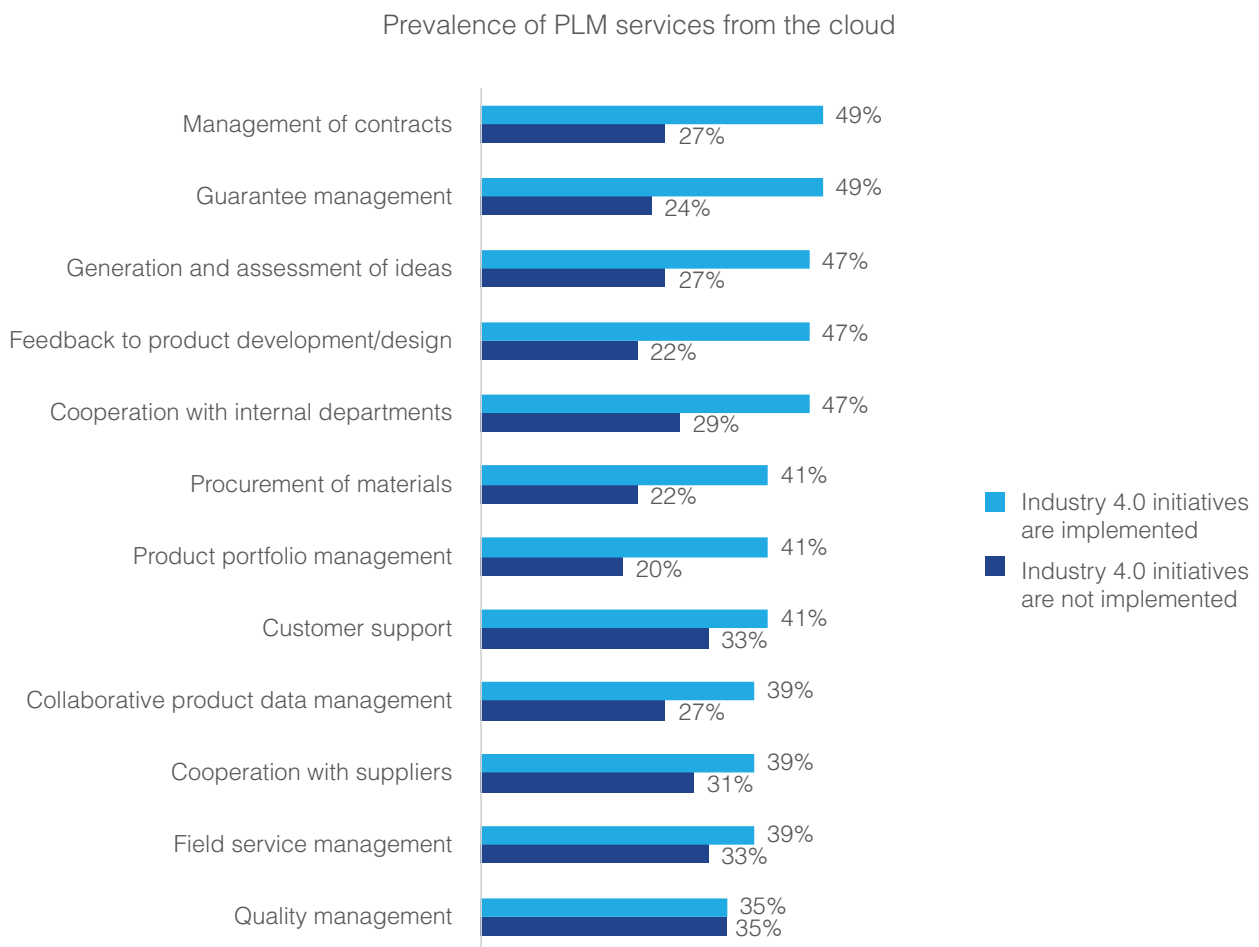
The results of the questionnaire match other IDC studies on cloud use in Germany. The reservations of many decision-makers have abated in recent years, being replaced by discussion of the value added of the resource model. Nevertheless, the initial reservation has meant that German industrial enterprises are about 18 to 24 months behind US enterprises in their use of cloud PLM. So in the months to come it is a matter of making up lost ground.

## Industry 4.0 pioneers back on cloud PLM

Forerunners in Industry 4.0 degree of maturity (cf. Figure 1) use PLM services from the cloud much more often than their competitors. They profit from contract and guarantee management for example, from idea and feedback possibilities, and cross-department cooperation over the cloud. The results of the questionnaire clearly show: Cloud services are an important key to get ahead at pace in digital transformation.

### Figure 5

Enterprises get ahead faster in digital transformation through PLM services from the cloud

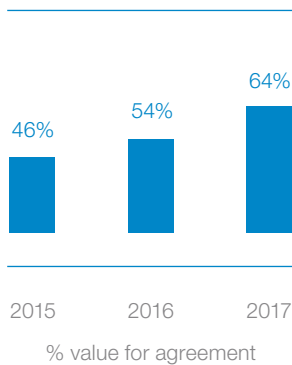


Q: What PLM services do you draw from the cloud?

N = 51 (Industry 4.0 initiatives are implemented), N = 49 (Industry 4.0 initiatives are not implemented); multiple choices

Source: IDC, 2017

### Cloud computing accelerates implementation of Industry 4.0



N = 314 (2014), N = 417 (2015), N = 363 (2016),  
N = 103 (2017) incl. screenout, weighted after 2014

In the coming years IDC expects first to see a mixed, hybrid approach of cloud and on-premise services in many enterprises, combining the advantages of both models. An increasingly open attitude to cloud services does not mean that the matter of where data are stored has become insignificant. 83 percent of those questioned still see storage of data in Germany as important. But things are set to start stirring in the matter, because the majority of IT and lines of business views the EU General Data Protection Regulation as an effective means of regulating secure use of cloud services.



## Conclusion

In the past twelve months enterprises in the manufacturing sector have taken a large leap forwards in implementing Industry 4.0 initiatives. But that should not be taken as a reason to rest on one's laurels. Instead the successes achieved should serve as an incentive to increase the speed of implementation – in joining IT and operational technology, in developing innovative technology-based products, or in realizing front-to-end digital value added.

The structuring of a uniform data platform has been an important requisite for many enterprises to implement the innovations and improvements of the last months. IDC is convinced that PLM will continue to develop in the next few years to become a digital platform for product innovation. This will further optimize not only cooperation across internal departmental boundaries, but in particular with partners and suppliers in the external ecosystem.

IDC sees the cloud resource model developing midterm to become the de facto IT architectural model of digital transformation. This development will also extend to product lifecycle management. The increasing use of cloud PLM services in German industrial enterprises is proof of this development. But we expect most enterprises to initially combine the advantages of cloud and on-premise services by a hybrid approach. Without doubt however, enterprises will be able to speed their digital transformation by broad-based use of PLM services from the cloud.



## Recommendations

### 1. Speed up your Industry 4.0 activities

The next months and years will decisively influence whether your enterprise will be winners or losers of digital transformation. Increase dynamism in the digitalization initiatives of your enterprise. Use the possibilities of the cloud, adding agility and pace to your initiatives.

### 2. Improve cooperation along the value-added chain

Too much time and turnover are still lost through inefficient cooperation between divisions, and integrating partners and clients. Structure a uniform data platform offering internal and external actors all relevant information, and promoting feedback of ideas and processes.

### 3. Examine the use of PLM from the cloud

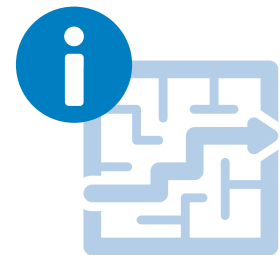
Forerunners in Industry 4.0 profit in their PLM services from the cloud, offering them simple access to new functionalities, exoneration of corporate IT, and flexible accounting concepts. Examine which of your PLM services you can resource as a cloud service, and use the advantages of cloud provision.

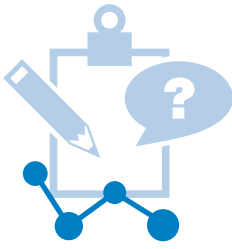
### 4. Use the holistic view of your data for analysis and simulation

Digital continuity along the product lifecycle gives you the possibility of optimizing the creation process from product idea through to product operation. Use analysis and simulation to avoid problems before they appear.

### 5. Promote an innovation culture in your enterprise

Product innovations will in future be created in all departments, from design through to service, and also be suggested and initiated by partners and clients. Promote the contribution of ideas and experience from all actors by offering them a central platform, and supporting this by an incentive system.

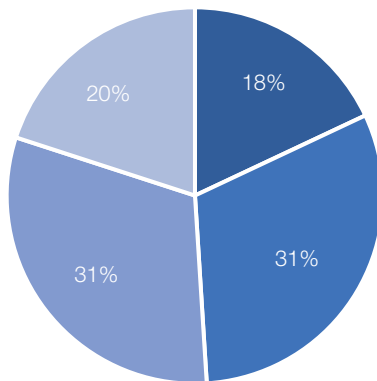




## METHODOLOGY

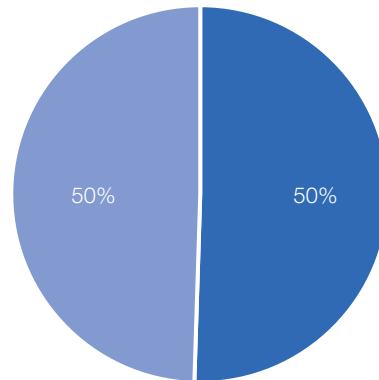
The results of this White Paper are based on questions put to 100 IT and lines of business in Germany in October 2017. The sampling is distributed in terms of enterprise size, key activities, industries, and divisions as follows:

Employees



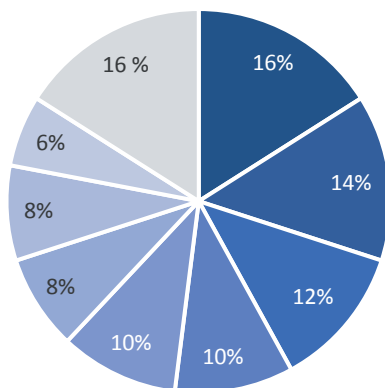
- 250–499 Employees
- 500–999 Employees
- 1000–2499 Employees
- 2500–4999 Employees

Key activities



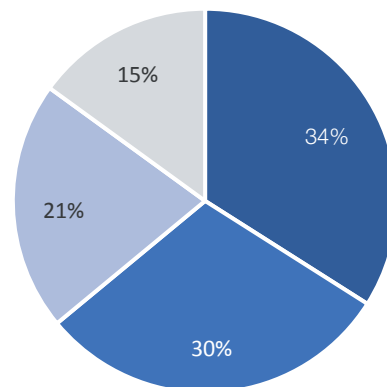
- Factory supplier
- Factory operator

Industry



- Automotive
- Environmental technology
- Electronic and optical
- Textiles, clothing, leather goods
- Pharmaceutical
- Foodstuffs, beverages
- Oil and gas
- Chemical products
- Other

Divisions



- Production environment
- IT
- Engineering
- Logistics/warehousing

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