



Industry 4.0 in Northern Bavaria

Short version of the research study
"Connected Production"



Industrie- und Handelskammern
in Nordbayern



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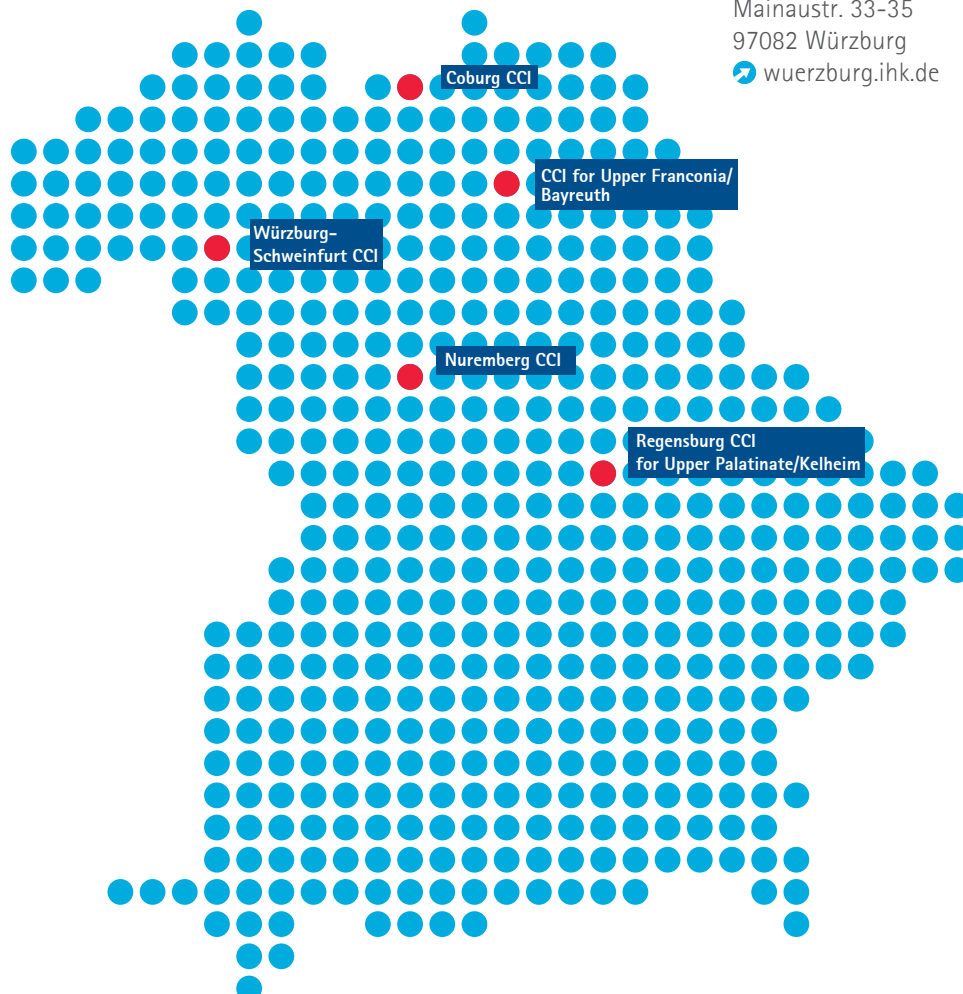
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Results in the overview

Northern Bavaria is ready for Industry 4.0

Every second company in Northern Bavaria is already addressing the subject of Industry 4.0. Only one company in five is not yet aware of Industry 4.0. As a rule, the larger the company, the more likely it is to be addressing the issues involved.

The findings of the survey conducted among manufacturing companies regarding their degree of readiness for Industry 4.0 show that companies in Northern Bavaria are significantly ahead of those in Germany as a whole.

The reasons for this include the following factors:

- The historical industrial character of the region provides the best possible conditions for implementing Industry 4.0. Industry's high share of the economy at 36 percent is mainly attributable to the rural regions of Coburg, Bayreuth and Regensburg.
- At the same time, b2b services are one of the region's strengths, particularly in the Nuremberg and Würzburg metropolitan areas.
- In addition to a broad research base, there are clusters, such as „Automation Valley Northern Bavaria“, that have been driving collaboration in the field of Industry 4.0 for more than ten years.

Differing degrees of affinity to Industry 4.0

Web crawl research identified a total of 2,748 companies in Northern Bavaria as having an affinity to Industry 4.0, with „Nuremberg region“ leading the field. However, the proportion is comparatively high in the other regions too. Considering Germany as a whole, Erlangen, Nuremberg and Regensburg are among the top 25 cities with the greatest affinity to Industry 4.0.

Number of companies in Northern Bavaria with affinity to Industry 4.0

(Affinity to Industry 4.0 as percentage in brackets)

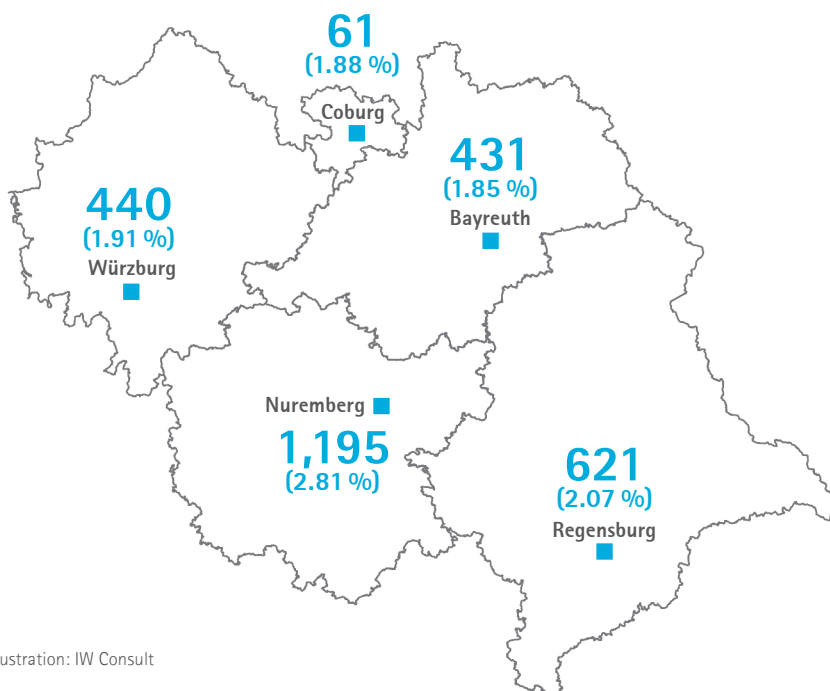


Illustration: IW Consult

Method

The core of the study was a comprehensive survey of 354 companies. More than 80 percent were small and medium-sized enterprises (SMEs) with fewer than 250 employees. The subject of the analysis was the degree of readiness for Industry 4.0 of manufacturing companies (178) and solutions providers (176).

In addition, a method mix of web crawling, expert interviews and literature analysis was used.

Webcrawling

To measure affinity to Industry 4.0, the websites of more than 120,000 northern Bavarian companies were searched for 25 keywords such as big data, smart services or 3-D printing and 100 synonyms.

Readiness model as a compass

Individual degrees of readiness

263 companies received an individual evaluation of the six Industry 4.0 dimensions. On the basis of a benchmark profile, the companies can see where they are particularly well prepared and where there is need for improvement.

The survey is based on the readiness model developed jointly by IW Consult and FIR, the research institute for rationalization at Aachen University. The model investigates the Industry 4.0 concept in six dimensions:

- **Strategy and organisation:** To what extent has Industry 4.0 been integrated and implemented in company strategy?
- **Smart factory:** To what extent are production and production planning connected and digitally mapped?
- **Smart operations:** To what extent are processes – even those beyond the company's boundaries – digitalised?
- **Smart products:** To what extent do products have additional information and communication technology (ICT) functionalities and are thus able to communicate and interact with higher-level systems along the value chain?
- **Data-driven services:** To what extent does the company offer data-based services that can only come into play when products, production and customers are connected?
- **Employees:** Are the skills of the employees in the company adequate for Industry 4.0 to be implemented?

On the basis of these six basic dimensions, it was possible to identify a total of 17 fields with appropriate indicators.

Dimensions and associated issues regarding Industry 4.0

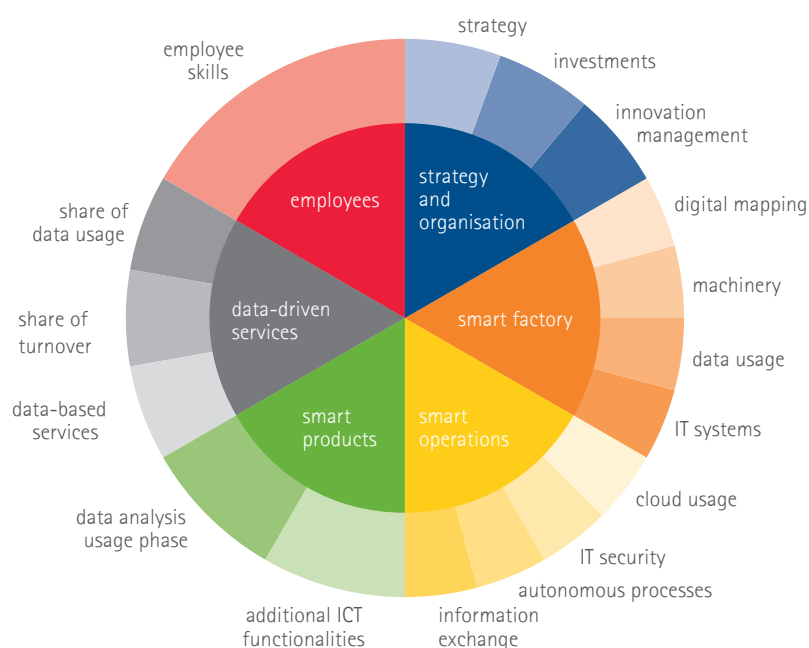


Illustration: IW Consult, based on IW Consult/FIR, 2015, Readiness for Industry 4.0

Manufacturing industry shows highs and lows

With regard to Industry 4.0, companies in Northern Bavaria's manufacturing sector are significantly ahead of their competitors in the rest of Germany.

In Northern Bavaria the number of companies qualifying as experienced in Industry 4.0 is ten times the German average. 3.3 percent of Northern Bavarian companies in the manufacturing industry reach level 3 (Experienced) on a scale of 0 to 5, compared with only 0.3 percent in Germany as a whole. These companies have begun a systematic approach with regard to formulating strategy, connecting products, processes and customers and virtually mapping the physical world.

However, the vast majority of companies (i.e. 68.8 percent) has not yet taken any specific steps towards implementation (readiness level 0). For Germany as a whole the figure is as high as 85 percent. None of the companies surveyed reach the top level 5 (Excellent).

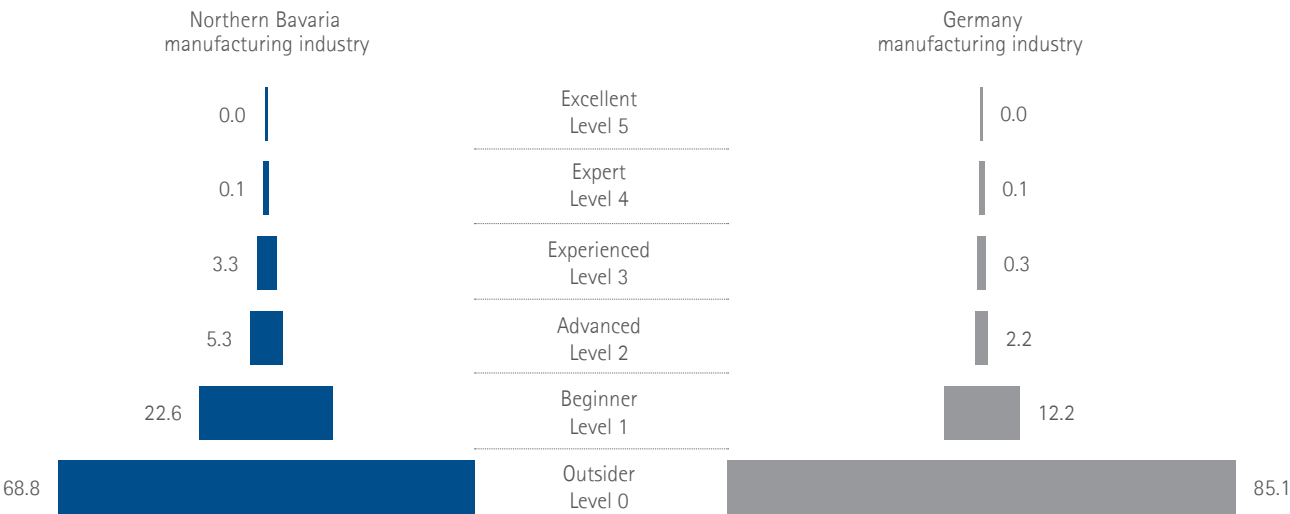
The findings show a marked trend in terms of size: Almost one out of two large companies has already reached level 2 or higher. This applies to only one in four among medium-size companies. Among small companies the proportion is minimal (5.4 percent).

Data-driven business models

Data-driven business models are considered the key opportunity offered by Industry 4.0. This is underlined by four expert interviews conducted along the automotive supply chain. However, with regard to data-driven services, 93.5 percent of the companies surveyed are at readiness level 0 and are therefore ranked as outsiders. In other words, at present the opportunity is above all a challenge.

Industry 4.0 readiness in Northern Bavaria and in Germany as a whole

Manufacturing industry; figures as percentage; n=152/602



Deviations from 100 percent result from rounding differences
Illustration: IW Consult
Source: IW Köln/IW Consult, 2016, "Digitalisierung, Vernetzung und Strukturwandel – Wege zu mehr Wohlstand", Cologne

There is a time lag of ten months between the findings for Germany as a whole and for Northern Bavaria, those for Germany as a whole having been obtained first. During these ten months, engagement with the subject of Industry 4.0 is likely to have intensified in all companies. The differences are so great, however, that the effect of the time lag is probably relatively small.

What companies and regional bodies should do now

Where chambers of commerce and industry should act according to the companies surveyed:

consulting
and informing
regional
networks
knowledge
and technology
transfer
training
expand
regional
R&D
infrastructure

The need for action can be seen from the findings of the company survey. It is necessary to encourage implementation of Industry 4.0 by removing obstacles (see chart), making use of the insights gained from the expert interviews and drawing conclusions from the analysis of strengths and weaknesses.

Obstacles to implementation of Industry 4.0

Findings of company survey: "I (tend to) agree", percentage share; n = 292

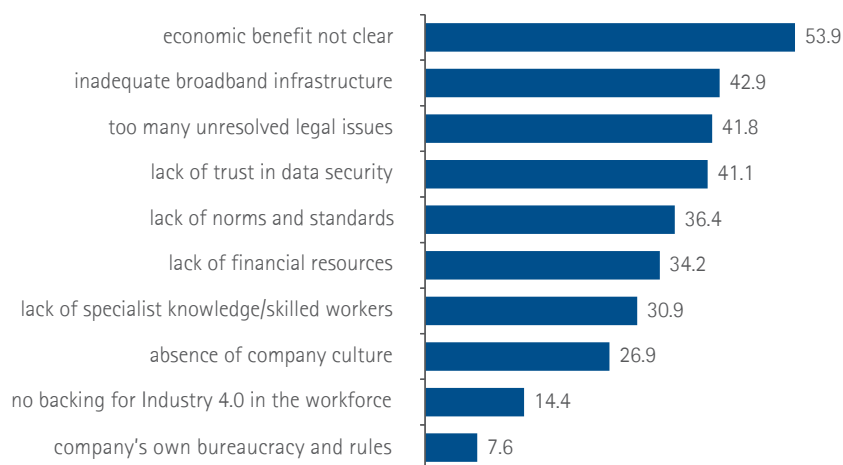


Illustration: IW Consult

What has to be done to exploit the opportunities presented by Industry 4.0 in Northern Bavaria:

Pilot projects – create more space for innovations

Companies have to be given more opportunities to test their own Industry 4.0 solutions in environments provided by research institutes. They could then draw economic benefits from the results.

Digital innovation hub in Northern Bavaria

The initiative „Automation Valley Northern Bavaria“ should cooperate more closely than before with other clusters to promote innovation not only in production, but also throughout the entire product life cycle.

Business environment and infrastructure

A region-wide broadband infrastructure must be provided with particular need for action in the rural areas.

Industry 4.0 start-up hub

Industry 4.0 and digitalisation have to be incorporated more strongly in support for start-ups. The number of digital start-up centres has to be increased rapidly.

Skilled workers

While companies in the metropolitan areas are able to recruit skilled workers by cooperating with universities, action needs to be taken to make rural areas more attractive.

Digital optimism in companies

It is imperative that the opportunities offered by digitalisation and automation are made clear to companies. Not only do they increase efficiency in production; they also provide the stimulus for new business models. Industry 4.0 thus contributes to the sustainability of the region as an industrial base.

Publishing information

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