FEGIME

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Voice

NEWSLETTER

SPECIAL EDITION

Editorial

Processors are getting smaller and more powerful, data storage is becoming cheaper, databases are growing, the "Internet of Things" is coming. Increasing digitalisation is changing society and business. New business models are emerging – and the manner in which industry produces is changing. In Germany, a catchy phrase has been found for the future of production: "Industry 4.0". This refers to the fourth industrial revolution following the development of the first practical steam engine 300 years ago.

The 2016 Hannover Fair showed us just how far the development has advanced. FEGIME's "Preferred Suppliers! play an interesting dual role here: on the one hand with their innovative solutions they are driving networked production and its fascinating possibilities – and on the other they use the advantages of digitalisation themselves in their own factories.

In this special issue of the FEGIME Voice we would like to highlight certain aspects of this development. This is a risky undertaking because a book would be better suited to this goal than a newsletter. It is not solely a question of technology but also of political, economic and sociological issues.

So, please regard these pages as a stimulus to ask questions of our partners in the sector, because they are at the forefront of this development. When you talk to our suppliers, you will rarely hear the word revolution. Those involved in the process know just how complex the tasks are. Progressing to a perfectly interlinked network of added value can be better compared to a rapid evolution. One thing is certain: there is no time to lose.

David Garratt

INDUSTRY 4.0

Shaping the Digital World

Digitalisation is gaining speed. After the steam engine, electrification and automation comes Industry 4.0 – production technology, automation and the Internet are all merging. From chains of added value, networks of added value are emerging. What does this mean for the future?

A new love affair? FEGIME's Preferred Suppliers and top politicians are meeting astonishingly frequently of late. The German chancellor Angela Merkel visited one of Siemens' factories in Amberg more than a year ago. This April, amongst other things, she visited the stands of ABB, Phoenix Contact and Weidmüller (see photographs above) at the Hannover Fair together with President Barack Obama.

Is our technology now simply receiving the attention it deserves? No, there is a lot more to it than that. Because the partners mentioned – as well as many others – are driving digitalisation and with it "Industry 4.0" forward. The expression "Industry 4.0" was coined in Germany. Many attribute the invention of the expression to ... >>

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The diagram shows in a simplified form the demands made of intelligent manufacturing. Security is made up of the dimensions operating security (safety) and protection from manipulations (security).

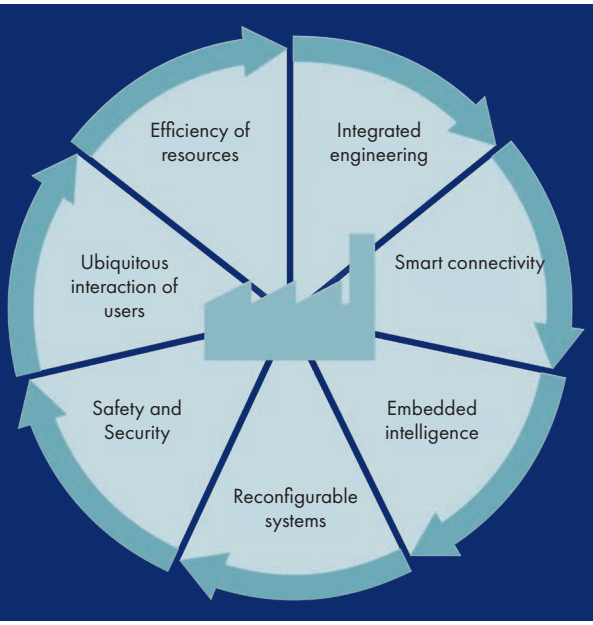


Diagram: Phoenix Contact

>> ...the informatics professor Wolfgang Wahlster. Industry 4.0 refers to the fourth industrial revolution following the previous stages: steam engine, electrification and automation. That is so plausible that, in the meantime, the expression Industry 4.0 is also being used in other European countries.

The fourth industrial revolution is being driven by the development of IT and the Internet. Companies will network their product development, equipment, warehouses and operating materials internationally. The networked departments, machines, warehousing systems and operations exchange information independently, are able to trigger actions and to control each other independently.

Industry 4.0 is not only considerably increasing productivity and efficiency but also provides an opportunity to manufacture individual products with the aid of automation. Under these conditions, even individual units can be manufactured as efficiently as a mass-produced article. A Rolls Royce for the price of a Fiat 500? This example might be an exaggeration but shows the direction in which we are travelling. The Siemens factory in Amberg already referred to is considered a shining example of a new way of producing. And Phoenix Contact uses intelligent production in order, for example, to manufacture the many versions of the I/O-system Axioline more efficiently.

Nevertheless: even these technically and intellectually ambitious examples are only the beginning. Because Industry 4.0 goes beyond the product, production and the factory and ultimately embraces the whole network of added value. This also includes for example the electrical wholesale sector. By now at the latest it should be clear that a comprehensive exchange of data is involved – and with it data standards.

The German government recognised the development early and therefore launched the initiative "Industry 4.0" many years ago. Involved are, amongst others, the IT sector, mechanical engineering and the electrical industry. The joint objective is to maintain Germany's position as a significant industrial location. German industry should remain the equipper of the world's factories – for that reason, a large network of companies, universities and other institutions has already been created that is driving technology, research and standardisation. Whoever sets the standards has a head-start in international competition.

The network made up of people, machines and manufacturing is referred to as the Cyber Physical System (CPS) or intelligent technical system.

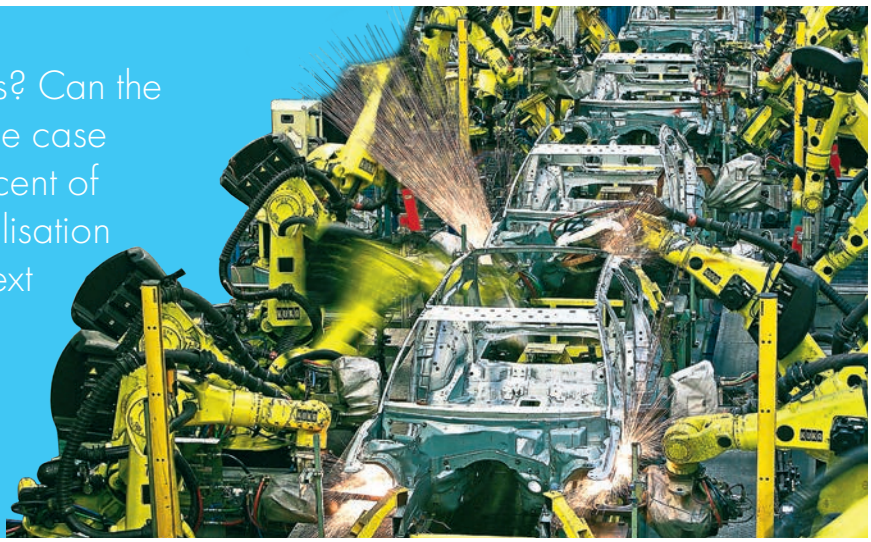
Europe is becoming networked

The example has been imitated. In all European countries, there are initiatives that are pursuing the same goal. That obviously also applies in the USA. The Hannover Fair therefore signified the beginning of many new cooperative ventures and initiatives. One of the most important is the European Commission's "Digital Package" launched on April 19th. The EU commissioner Günther Oettinger would like to set up an industrial strategy in the field of Industry 4.0 covering the whole of Europe. The keystones include the coordination of national initiatives and investments as well as centres of skill and excellence.

And here we return to the Hannover Fair: the USA stands for large software companies, whilst European industry's strengths lie in the hardware, the equipment. Even if all experts are agreed that software is rapidly gaining in importance – software must work together with hardware if things are to work properly. The USA is convinced that cooperation will also provide stimuli for its "reindustrialisation".

These are all indications of how far we still have to go. That is why technicians rarely speak of a revolution – they know what problems still have to be solved and prefer to talk of rapid evolution. It is not sufficient to install a few components in

Does digitalisation entail the loss of jobs? Can the factory do without people? This is not the case in German industry. More than 35 per cent of companies with a high degree of digitalisation intend to create more jobs during the next 12 months.



order to establish "Production 4.0". The project is much too complex for that.

Because in this environment a fundamental transformation of work and types of organisation is underway. To this must be added many technical and even legal challenges such as IT standards, extremely high quantities of data, the necessary data security – and the question of who – ultimately – owns the data. A further important issue is employment.

Studies predicting that digitalisation would cost millions of jobs attracted considerable discussion at the World Economic Summit at the beginning of this year. Without doubt, digitalisation will change our world – there is considerable evidence that simple routine work will disappear. But that is already the case, even without Industry 4.0. This is why in Germany the trade unions are already participants in important forums dealing with this issue.

But there is no cause for pessimism. History shows that technical progress has entailed more work rather than less. Anyone who does not trust history can examine the examples. Our partners Weidmüller and Phoenix Contact manufacture for Industry 4.0 by using Industry 4.0. For many years now both companies have been growing at an extraordinary pace and are continually opening new buildings to house new employees. And what's more: not only these companies are making intensive efforts to train their employees in order to equip them for a digital future.

There is nothing pre-ordained about the development of technology, rather it offers a range of options. But one option is not available: everyone has to face up to digitalisation in order to contribute to the networked future.

Links | all interactive

The European Commission wishes to promote digitalisation in industry, too. Information on national and regional initiatives involved in digitalisation in industry can therefore also be found on the Commission's website. The links are derived from a summary, all of which is available here.

- Made Different
- Flanders Make
- Marshall 4.0 (Wallonia)

- Plattform Industrie 4.0
- Mittelstand 4.0
- Smart Service World
- Autonomik fur Industrie 4.0
- It's OWL (Ostwestfalen-Lippe)
- Allianz Industrie 4.0 (Baden-Württemberg)

- FIMECC PPP Programmes
- DIGILE
- TEKES

- Nouvelle France Industrielle
- Industrie du Futur
- Transition Numérique
- Le Programme des Investissements d'Avenir
- Plan Industries Île-de-France

- Programme in Region Western Greece

- PRODUTECH

- Smart Industry (NL)

- Internet of Things and Industry 4.0
- Fabbrica Intellingente
- Ass. Fabbr. Intell. Lombardia

- INNOMED
- INNOLOT
- CuBR
- BIOSTRATEG

- Industria Conectada 4.0
- Basque Industry 4.0

- High Value Manufacturing Catapult
- Innovate UK
- EPSRC Manufacturing the Future
- Action Plan for Manufacturing (Scotland)

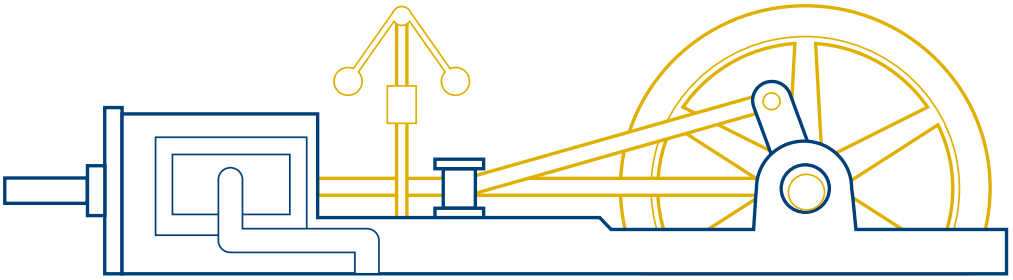
Industry 4.0 – The Next Revolution

From the steam engine to the smart factory

Industry 1.0

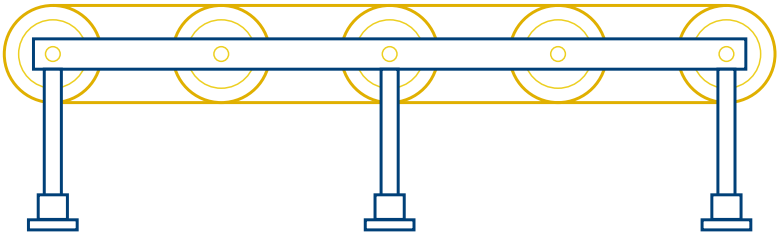
1712

The first practical steam engine was built by Thomas Newcomen in the »Black Country« in the British Midlands.



1870

Industry 2.0



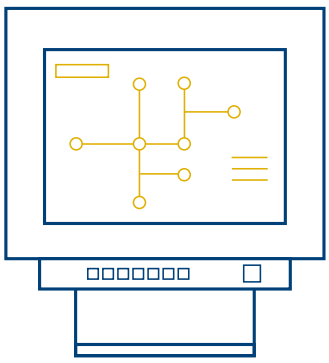
The first raised conveyer belts in Cincinnati, USA.

Industry 3.0

1969

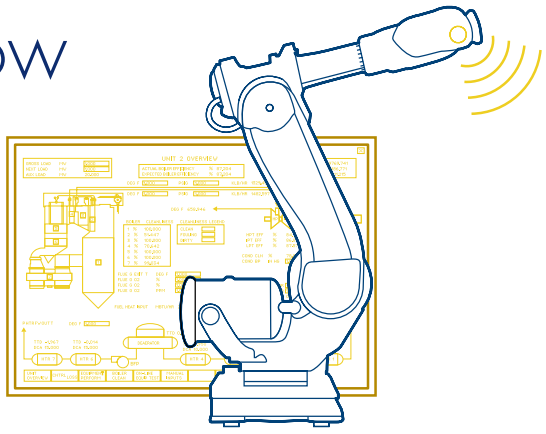
Richard Morley and Ode J. Strugler are the fathers of Programmable Logic Control (PLC).

Morley presented a semiconductor-based sequential logic system in 1969.



tomorrow

Industry 4.0



Smart Factory, Cyber Physical Systems and the Internet of Things.

Grafik: ABB

Digitalisation and Data

FEGIME is also working intensively with Siemens on the digital future. In April, a workshop with FEGIME Future and the Board of Directors showed the role played above all by data.

Satisfied with an excellent workshop in Erlangen: the Siemens team, FEGIME Future and FEGIME's Board of Directors.

The Raw Material of the Future

Satisfied, Valentin Dinkelbach cradles his black notebook in his hand. "That was a very good day," he says and smiles. "Lots of notes." He had filled over a dozen pages at the workshop with FEGIME Future and the Board of Directors. Held in April in Erlangen, Nuremberg's neighbouring city, the workshop was devoted to the digital future.

Valentin Dinkelbach is FEGIME's Key Account Manager at Siemens – and for our group, the face of an international corporation that also wishes to play a leading role in the digital world.

The first presentation showed how Siemens sees the future and the path before us – and also sorted out some concepts. The future is clearly positioned under the heading "The Internet of Things". Today, there are already more networked devices in the world than people. This development is gaining in speed - all other sectors are systematically subordinate to it: Smart Home, Smart City, Smart Mobility, Industry 4.0 etc.

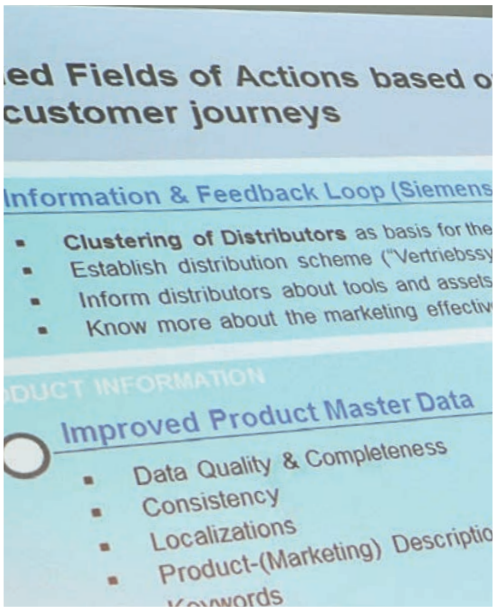
Both business models and decision processes will change under the influence of digitalisation. The famous Forrester study "The Death of a B2B Salesman" by Andy Hoar and Peter O'Neill was presented. The authors claim that in USA by 2020 a million B2B salesmen will have lost their jobs. Only more complex tasks will push up the requirements for additional staff. In this vision of the future day-to-day business and solutions will all be dealt with online.

How do things look at FEGIME at the moment? In short: with the central European database and the opportunities it provides our group is in a very good position. And it is thanks to FEGIME Future that this project was launched.

Different speeds

But reports from the members of the FEGIME Future group also showed that throughout Europe we are faced with very different markets and very different speeds of change. In some countries there are members that do over 60 percent of their business via their online shops. Others offer the possibility of buying online – but their clients don't really use it very much. In addition: a lot of members do not have many industrial customers because they are specialised on residential business. Many of these clients still prefer personal contact with their FEGIME wholesaler.

An additional technical hurdle is still high-speed Internet access. The top rankings in the European



Union were occupied in 2015 by Denmark and Sweden. More than half of the companies with ten or more employees there have access to high-speed Internet. It is less common in Italy (14 per cent) and Greece (15 per cent). Germany too occupies only a middling position in Europe, slightly above the average of 29 per cent.

That means that, contrary to many forecasts and studies, the world of electrical technology is not moving that quickly in all areas. Siemens and FEGIME Future therefore used the meeting to talk calmly about what has to be done in the near future.

A further issue is marketing in digital times, because customers' behaviour is changing: they are actively searching in the Internet for solutions to their problems. Today however the evaluation of a product or a solution takes longer than the search. Therefore, ultimately, the vital question to be posed is: how do I use the Internet to win these customers' trust?

Data and standards

Technical issues dominate the workshop. The careful presentations made by Siemens' IT specialists show how many points from previous meetings have already been dealt with. A further indication of how closely and continuously FEGIME is also working together with Siemens on the digital future.

But no strategy works without comprehensive solutions down to the last detail. The key issues here are data and standards. Siemens is one of FEGIME's suppliers with the best data. But the European database also demands a high degree

Valentin Dinkelbach also presents charts on the well-known study »The Death of a B2B Salesman«.

Arnold Rauf (right) suggests that a different way of thinking might be better for the digital future.

of commitment from an international company like Siemens. You can check a lot of countries and a lot of details with FEGIME. For example, the advantages of the FEGIME database are based on the ETIM standard. But it is possible that an ETIM text is longer than an ERP system can deal with. Nuno Requetim from Portugal proposes an initial solution: "Put the most important details at the beginning of the text". Or ETIM data for the British and the Irish markets. "We need this", says Barry Doran from Ireland.

What data is needed?

Or the question posed by Siemens: "What specific data do you need?" The short answer was provided by Arnold Rauf, Managing Director of FEGIME Deutschland: "All of it!" His answer was triggered by FEGIME's goal: to make the European database and the associated online shops the largest and most informative pool of data in our sector.

Data quality, additional data for marketing, frequency of data delivery – all these points were discussed in Erlangen. Data is the raw material of the future. But the discussion clearly shows that a complete representation of analogue reality at the digital level is an enormous task.

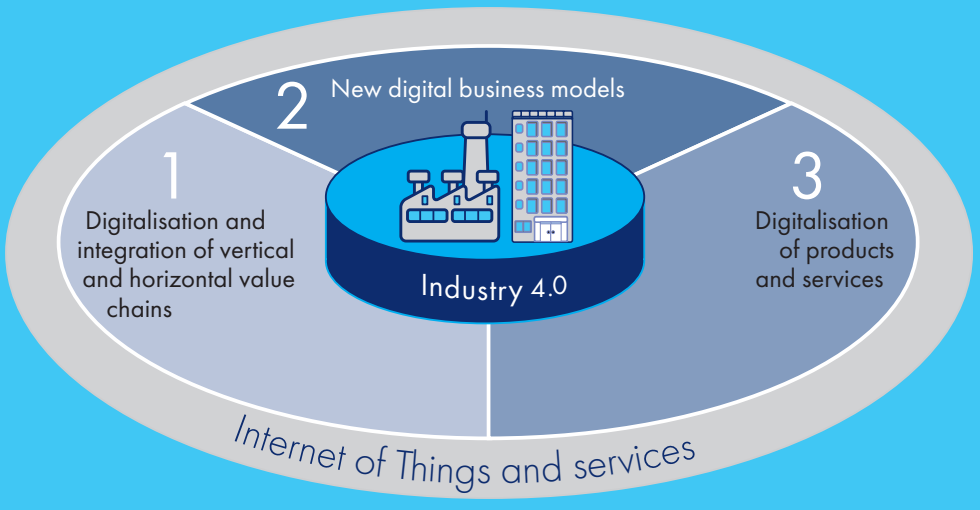
Arnold Rauf suggests that a different way of thinking might be more suited to the digital future. "We must experiment, make a start and have the courage to make changes", he says. "To strive for perfection at every stage only hinders us." It is unusual that a German should cast doubt on perfection but that only goes to show how disruptive digitalisation is.

Only one thing won't change: if the digital world is to become a success, analogue techniques must retain their importance: discussion, listening – and notebooks. Valentin Dinkelbach still has quite a few to fill.

The Internet of Things and Industry 4.0 are changing business

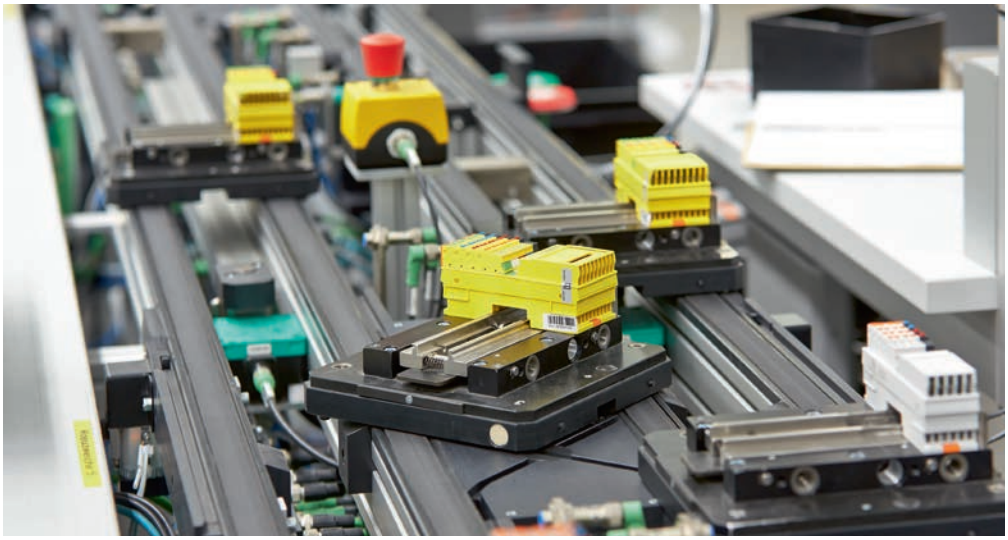
Siemens believes that today every company must ask itself three questions:

1. **How can I digitalise my value chain?**
2. **Which new business models can I offer my customers?**
3. **Which products and services can be digitalised?**



Production

More efficient, flexible and ergonomic: an example from Phoenix Contact shows the advantages Industry 4.0 brings to production.



Intelligent Production

Industry 4.0 is still a vision for many companies. Phoenix Contact is already putting it into practice. The company recognised early on that a different way of manufacturing is required because, with many products, the number of variations is increasing whilst the required number of units is declining. The objective: to move away from rigidly interlinked machines to systems that can be used flexibly.

Phoenix Contact offers an example of the advantages provided by networked manufacturing with the I/O modules of the Axioline product family. The Axioline product portfolio is continually refined and supplemented. The large number of designs and sizes (geometric variability) demands appropriate variations in manufacturing – and therefore flexible, freely combinable manufacturing processes. Apart from the very smallest batch sizes and the manufacture of different variations, the processing of prototypes and samples also requires the production of a batch size of only 1.

Standard interfaces

In order to be able to react quickly to new requirements, an interlocking, scaled manufacturing system has been created. All workplaces, assembly/process cells, assembly machines and test cells required for the production of the various Axioline modules can be linked to this system. A circulation system for work-piece carriers that can be extended as required permits the flexible networking of all possible manufacturing resources in a single production system (Figure 1).

The system also offers a high degree of workplace ergonomics. Thus it brings the product to be processed to the employee and enables him to carry out various functions at a single workplace. Moreover, the employee is supported by an assistance system and appropriately designed manual workplaces.

In addition to suitable circulation architecture, two pre-conditions must be fulfilled. Firstly, a standardised electrical and electro-pneumatic interface is required that enables the use of different manufacturing resources – from the manual workplace to the fully-automated labelling cell. Secondly, all resources involved require a control of their basic processes that is independent and irrespective of the product in order to enable their decentralised integration into the concept.

Plug & work

With the provision of electricity, compressed air and a data interface for the control system via so-called docking stations, almost every kind of manufacturing process can be integrated into the production system. That applies both to the manufacturing cells developed by the company's own tool shop and to the machine parts and processes purchased from other manufacturers. Because the parameterisation of the linked machine parts is stored decentrally in its internal cell control, they can easily be docked into the conveyor belt circulation system by simple connect and release – this is done with the control system's process-editor by "Plug and Work".

The advantages of this process integration are obvious. For example, start-up scenarios for new products can be reproduced in a better manner, because the system can be simply scaled from manual to fully-automatic manufacturing. Moreover, the manufacturer can react quickly to increasing demand. In addition, similar processes are simply duplicated.

An additional benefit is derived from the possibility of implementing refinements in

Figure 1: The flexible production system allows I/O-modules in many variations to be manufactured economically.

Figure 2: The flexible work-unit carrier can accept different products and their variations.

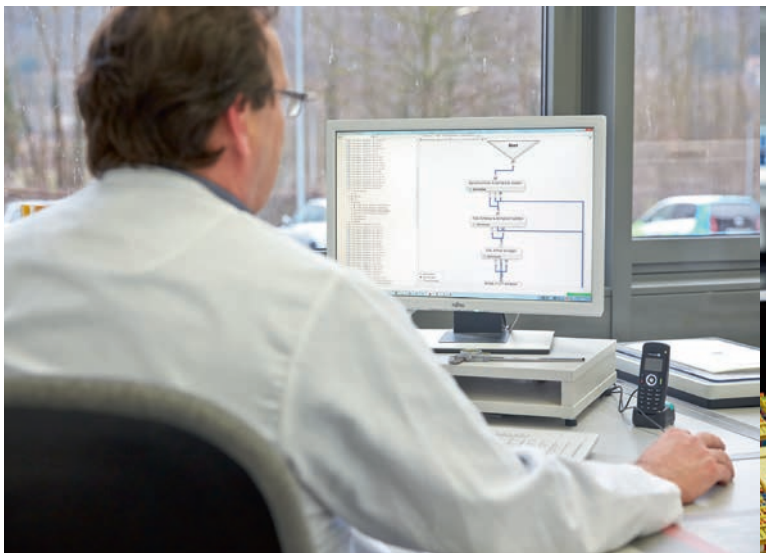


Figure 3: A graphic editor makes the simple configuration of process steps possible.

Figure 4: The operator assistance system guides the employee through the varying process steps.

production processes simply and quickly into the manufacturing system. For this purpose, individual modules just have to be exchanged. The work-piece carrier system also provides a greater degree of freedom in the products that are to be produced. This is because the system permits flexible use for different products and their variations without mechanical adjustments becoming necessary (Figure 2).

Control systems developed in house

A control system developed by Phoenix Contact meets the requirements set by the flexibility and plug-in capacity of the Axioline machine. The control system is responsible for two functions:

1. All the product and manufacturing data required to produce a batch of one are combined, administered and distributed by the control system. Various types of ERP, PLM and MES systems up to and including machine control can be integrated into the control system via interface modules. Order information can be transferred directly from the ERP system into the equipment or alternatively added to the system on site.

2. The control system takes over the coordination and control of the processes carried out in the production line. This includes both the automatic and variation-specific transport of the work-units to the correct process or test cell as well as the situation-based user interactions and process steps. The employees in manufacturing can therefore adjust and parameterise the process steps themselves depending on the product variation and even install new product variations. Since configuration is possible by way of a graphical process-editor, no programming knowledge is required for this purpose (Figure 3).

The Axioline modules are labelled by laser (photo). Inside the labelling cell, a picture processing system ensures an individual placement correction of the labelling of each individual article. The employee therefore no longer has to correct the print pictures manually. Subject to geometric individual part and assembly tolerances, the actual positioning of the fields to be marked are first compared with the desired picture of the product by means of the picture processing before labelling takes place. In this way, the location of the laser label is automatically corrected. This takes place within a prescribed tolerance zone, irrespective of the accuracy of the adjustment of the equipment and the plug attached to it. In addition to the final check of the quality of the label, the camera system checks that the mounted plugs are complete and correctly assembled.

In future it will be possible to read the processing positions of the robot and the print pictures automatically from the digital products. In this way, different products and their variations can be flexibly processed without manual programming or teach-in.

Digital provision of all relevant data.

It is planned in future largely to automatically parameterise processes in the event of different product variations. For this purpose, all digital information on the product to be manufactured – also referred to as digital products – will be used as a basis. By documenting all module, process and test data, the manufacturing chronology of an individual product can be re-constructed a long way back into the past.

The machine parameters, order data and additional information will be clearly visualised on terminals and manual processes optimally supported by operator assistance systems – for example, assembly, handling and set-up work. In this way, manual work that will always be required can be simplified and simultaneously the ergonomic aspects are improved. The system leads the employee step-by-step through the operating processes (Figure 4).

Moreover, the availability of all data in digital form makes paperless manufacturing possible. The flexible processes of the equipment also save resources because products are automatically extracted from the line should, for example, electronic modules on the printed circuit board be defective. Once the defects have been manually remedied, the product is reintroduced and checked.

The World of Work

How is Industry 4.0 changing the World of Work? Will there be factories without people? What do we have to be able to do tomorrow? Dr. Eberhard Niggemann, Head of the Weidmüller Academy provides some answers.

More Opportunities than Risks

FEGIME Voice: The press likes to forecast that digitalisation and consequently Industry 4.0 will cost millions of jobs. The factory without people is a common horror scenario. If we look at Weidmüller – and other companies in their area and in our sector – they are growing continually and steadily. They are constantly putting up new buildings for new employees. Will digitalisation cost us jobs or not?

Eberhard Niggemann: It is a fact that at Weidmüller, overall, digitalisation has so far had no negative effect on jobs We are very optimistic for our company. Certainly, particular types of work will disappear – as is the case with every completely new technology. But new jobs will also be created, particularly in those companies that are driving technological trends. Germany in particular is pre-destined to considerably increase its competitiveness and to create more jobs through new technology. Even if the balance is negative – as forecast by IAB, for example – the bottom line is that in Germany 60,000 jobs could disappear. But given total employment in excess of 40 million people, this would represent only 0.13 per cent of all jobs.

Another study by the Fraunhofer Institute for Employment and Organisation for example estimates a change in employment ranging from 1.5 million more to 1.5 million fewer jobs in the manufacturing sector, depending on the development of the degree of automation, wage costs and other key factors. Overall, at Weidmüller we see far greater opportunities than risks.

What new demands does digitalisation make of employees?

Many jobs will require new skills as a result of Industry 4.0. Employees will have to perform more demanding jobs with greater added value but also have more variety in their work as a result of the use of more intelligent assistance systems. New work processes will be created. It is therefore highly likely that individual expertise will increase in importance. Overall, professions in manufacturing will have a greater IT content and become more inter-disciplinary since increasingly intelligent machines and systems will assist people.

Dr. Eberhard Niggemann, Head of the Weidmüller Academy.

Working close to the customer and the creation of individualised product solutions will also become more important. Certain tasks however will be eliminated: this applies in particular to routine jobs but also to physically hard and dangerous work.

What is Weidmüller doing to keep employees up to date with change?

As responsible employers, we are doing our best to prepare for Industry 4.0. We are intensely involved with the challenges of the future and the increasing networking of global markets and manufacturing locations. It is therefore more important than ever, also with regard to employee qualification, to be open to new developments. In the "Weidmüller Academy", we have already focussed our training concept on the future issue of "Industry 4.0" and are trying to win over our employees to the concept as early as possible. Something which will increase considerably in importance in the future is the subject of lifetime-learning and self-teaching – and that is what we are working on.

With Industry 4.0, multi-disciplinary knowledge, understanding of the ways of working and thinking of corresponding disciplines and thinking in comprehensive processes is important. These patterns of thought must be further developed and expanded because, in addition to technical skill with specialist knowledge, employees must acquire more systems knowledge. Learning patterns are moving more and more in the direction of informal and inter-active learning that can take place anywhere and at any time via tablet or smartphone. New multimedia, social media and Cloud technologies will further change and revolutionise learning. Work and learning will merge into each other more and "keeping up-to-date" will become routine.

What is Weidmüller doing for employees in production?

We are currently carrying out pilot-projects based on everyday production in the Smart Factory. These include the use of data spectacles, man-machine collaboration with robots as well as handling self-optimising systems. As a company, we introduced intelligent energy management into our own production system that already became part of our manufacturing routine in 2011.

What are you doing for employees with a higher education background?

An important subject is inter-disciplinarity. This means that we prepare our employees for new forms of cooperation. We have also created

positions for a new practice-integrated dual study course "Technical Informatics". In this way, our young academics are prepared even more intensively for the hybridisation of the technology and software areas of knowledge.

Moreover, know-how is continually expanded in the company by means of a large number of final examination and project work in which students and professors and our employees work together. That is a gain in knowledge both for us and for the universities. For example, one of our employees recently received an award from the Heinz Nixdorf Institute for the best student paper of the year.

We are also actively involved in initiatives and working groups with universities in order to develop applications-oriented training models from the university for companies.

Do the tasks differ by country?

Certainly, production here in Germany occupies a leading position as regard new technical developments, also on account of the proximity to research that Germany, and particularly East-Westphalia, offers. But we will also use the chances internationally that the Smart Factory offers.

Anyone acquainted with the region knows that you exchange information with companies such as Phoenix Contact, Harting, Wago and others. Do your "colleagues" also do that? Or are there even joint projects?

Weidmüller is involved in industrial associations and networks, cooperates with universities and companies in order to advance innovation and technology. Thus, we are involved in the Industry 4.0 platform but also in the ZVEI as well as in the VDMA and acatech, for example. We are very deeply involved in 'it´s OWL': that is where Weidmüller, together with international market leaders in mechanical engineering, electricity, electronics and the automotive supply industry as well as internationally renowned leading research institutions, concentrates its strengths in the leading-edge cluster. The common goal is to achieve a leading position for our local OWL region in global competition for intelligent technical systems.

In spite of a great many differences, we also have a lot of similarities with our competitors and partners in the region, for example our common interest in certain standards. We work very constructively with each other in the leading-edge cluster in pre-competitive cooperation. Thus we have already worked on a joint project with Hettich [one of the largest manufacturers of furniture fittings in the world] on self-correcting manufacturing and with Lenze [a leading specialist in motors and automation in mechanical engineering] on energy-efficient intra-logistics.

There is also an exchange of knowledge that is particularly beneficial to our industry and the region, particularly as regards reproducing value chains for new technologies. The limits of giving and receiving are however also clearly set down.

Many thanks for the comments, Dr. Niggemann!

Abbreviations and Terms

acatech
German Academy of Technical Sciences

IAB
Institute for Labour Market and Vocational Research in Nuremberg

it´s OWL
Acronym for »Intelligent Technical Systems East-Westphalia-Lippe«. A network of 180 companies, universities, research institutes and organisations. Their aim is to facilitate the jump from mechatronics to intelligent technical systems. Phoenix Contact and Weidmüller are amongst its members.
> Link on page 3

OWL
Acronym for the region » East-Westphalia-Lippe « in the German state of North-Rhine-Westphalia. > See above: it´s OWL

Plattform Industrie 4.0
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VDMA
Association of German Mechanical Engineers and Equipment Constructors

ZVEI
Central Association of the Electro-technical and Electronics Industry

FEGIME
generating value

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MEETINGS

23.11. – 25.11.16	Shareholders' Meeting, Nuremberg
07.12. – 08.12.16	Supplier Event, Israel
08.02. – 10.02.17	FEGIME Future, Budapest (with OBO)
08.03. – 10.03.17	Shareholders' Meeting, Bucharest
04.04. – 06.04.17	BOD Meeting, Hamburg
05.04. – 07.04.17	FEGIME Future, Hamburg (with HellermannTyton)
18.05. – 20.05.17	Shareholders' Meeting & Congress, Warsaw