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for Economic Affairs
and Energy

Mittelstand-
Digital

SMEs Digital

Strategies for the digital transformation

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New opportunities for SMEs thanks to digitisation

All companies, regardless of size or sector, are affected by digitisation and interconnection. This applies just as much to a traditional butcher's shop in a rural area as to suppliers catering to industrial corporations all over the world, or a small hairdressers' salon.

Small and medium-sized companies – the "Mittelstand" – provide well more than half of all jobs in Germany and make a major contribution to the economy: approx. 35% of total corporate turnover in Germany is generated by SMEs. Companies with fewer than 500 employees host more than 80% of training places in companies in Germany (Source: Wirtschaftsmotor Mittelstand – facts and figures on German SMEs, Federal Ministry for Economic Affairs and Energy 2018).

If they are to maintain their success in future, companies should grasp the opportunities offered by digitisation.

Buzzwords and a jungle of potential suppliers

Concepts like "artificial intelligence", "cloud computing" and "digital workplace" are not always easy to understand. It is often difficult to assess what will suits one's own company and what solutions make sense and will work. After all, there are so many ways to use digital technologies, ranging from having a corporate website to automating individual steps in the manufacturing process, to overhauling business process completely. Just as diverse as these options are the large numbers of suppliers vying for customers for their products dedicated to SMEs. The solutions they present usually differ with regard to functionality, performance, price and service packages. Many companies feel overwhelmed by the sheer amount of information they receive, and by the lack of transparency.

There are many SMEs rightly asking themselves: is all of this really important? What do I need for my company?

Demanding customers, new competitors: why digitisation is so important

Digitisation is also changing customers and their behaviour. They have become well-informed stakeholders with their own networks. This has put them in a stronger position. Customers today are already demanding tailored solutions and batch-size one products for the same price they would pay for mass products. They expect swift and convenient deliveries and excellent customer services. They know that digital technologies make all of this possible. Only those able to meet these customer demands and willing to adjust all of their operations to suit the customer will be able to retain their competitive edge. At the same time, the value chains of many product and services providers are visibly changing, as are the markets.

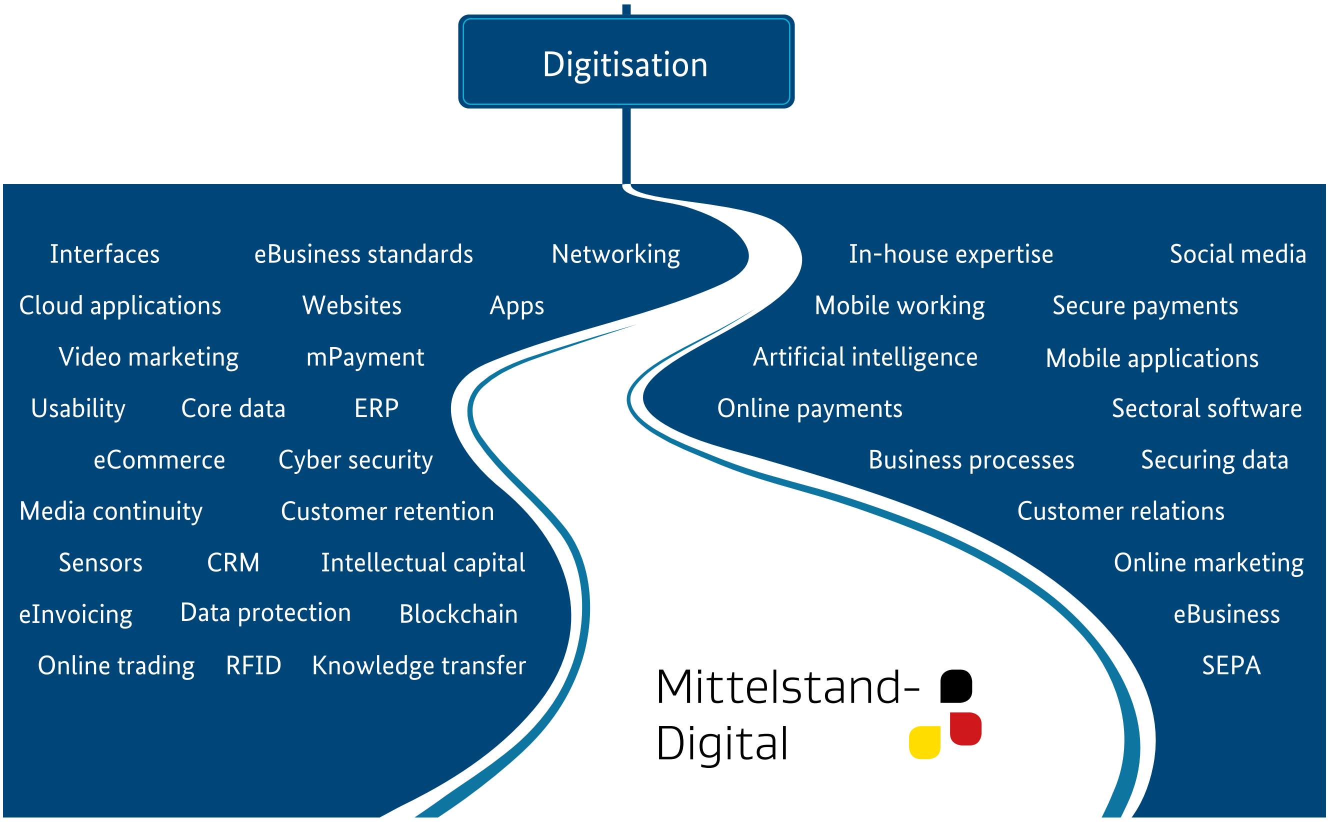
New opportunities thanks to more efficient processes, new customers and business models

Digital technologies also open up tremendous opportunities for small and medium-sized enterprises. These technologies can be used to develop brand new business models, build a new customer base and encourage customer loyalty. Mittelstand companies can also catch up with large corporations – which tend to be quicker to make their way into the digital age – thus ensuring that they can continue to supply to these companies. Digital technologies have the potential for SMEs to become more efficient, be it with regard to procurement, manufacturing or administrative processes. Small and medium-sized companies can save a great deal of time and money by using things like smart, interconnected machinery, electronic invoicing and mobile time tracking.

However, it is not only the processes themselves that change, but also the working environment the workforce finds itself in. Digital and connected operations are associated with a loss of old job profiles and the emergence of new ones. This is why it is important for firms not only to look at the technical aspects of digitisation but to also prepare their staff. Companies are well-advised to ensure that their workforce are given ownership of the process of change and can build the expert knowledge and skills they will need to complete their new tasks. This is crucial to the success of the digital projects – as is continuous training, which is in fact one of the keys for any company to be successful in the digital age.

SMEs Digital: informed advice for small and medium-sized companies, free of charge

There are many small and medium-sized companies feeling a little out of their depth when it comes to the digital transformation. Unfortunately, there is no one-size-fits-all approach when it comes to the digital era. But there is an approach for every company, And no firm has to embark on finding it all by themselves.



The Federal Ministry for Economic Affairs and Energy supports small and medium-sized companies as they embrace digitisation. SMEs Digital shows the opportunities for small and medium-sized companies and points them to ways in which they can successfully implement digital technologies. Companies can make use of information that is accessible, unbiased and geared towards real-life use, and of specific advisory services designed to help firms develop and implement their own strategy for digitisation.

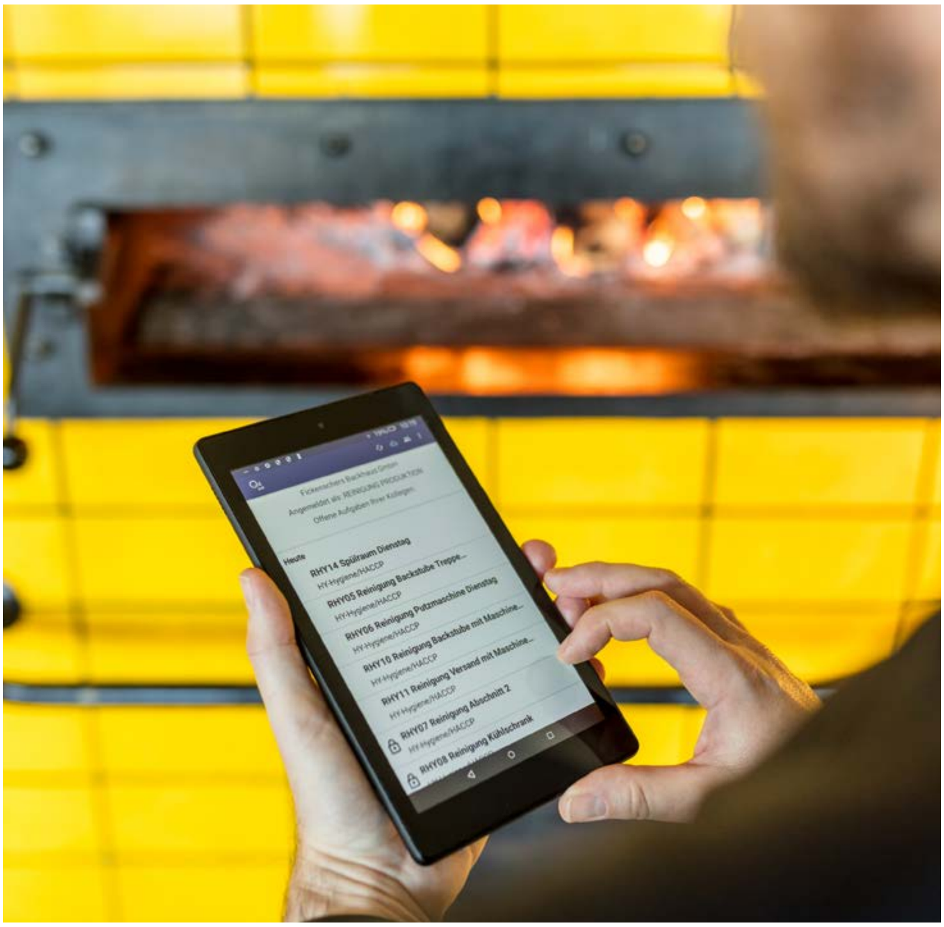
Since 2015, the Economic Affairs Ministry has set up a total of 26 Mittelstand 4.0 centres of excellence which provide the Mittelstand (small and medium-sized enterprises) with information and specific support about digitisation. A combination of regional centres of excellence in all parts of Germany and specific thematic centres delivers a wide range of support for all sorts of sectors and corporate needs.

Workshops, training sessions, practical tests, webinars and surgeries: all of the services offered by the centres of excellence are impartial, easy to understand and designed specifically with small and medium-sized enterprises in mind. The Federal Ministry for Economic Affairs and Energy ensures the services can be used free of charge.

This brochure provides an overview of the Mittelstand 4.0 Centres of Excellence and offers some practical examples of how digitisation pays off for small and medium-sized enterprises.

What makes SMEs Digital special can be seen in this film (in German)

Digital plans, traditional bread



All of the staff rotas are documented digitally in Fickenschers Backhaus.

Born to bake: Andreas and Florian Fickenscher are already the eleventh generation of the family to run the bakery: a company that has developed continuously since 1625 and now has eight outlets, 85 staff and 15 trainees. As the company has expanded, the demands placed on planning staff rotas and merchandise have risen. The brothers felt they were spending far too much time on this, time they would have preferred to invest in artisanal baking. They therefore decided to digitalise the billing systems and staff rotas. Planning shifts, handling applications for leave, clocking in and out, paying bonuses – even the rota for cleaning services is fully automated and electronically documented. “Our company has always been open to digitisation – all of this work has saved us valuable time. It means that we can look after the things that are important to us: the actual baking and the tastiest recipes,” says a happy Andreas Fickenscher. Old family recipes and digital technology ensure that the Bakery 4.0 offers its customers bread that tastes like it always has done.

But it’s not just about the quality of the baking. They also attach great importance to staff satisfaction. Florian Fickenscher explains: “At a time when there is a skills shortage, it is becoming increasingly important to offer good training and keep our job attractive. One of the biggest barriers to learning the skills of a baker or confectioner is the night work. Our processes mean that we can simply move many operations to daytime.” The dough development rooms cut out up to 70% of the night work: the dough made in the afternoon can mature there. And the staff can get down to baking as soon as they begin their morning shift. The message has got out about the new working hours: the company has no more problems with recruitment. Also, the digital communication platform means that all the tasks can be communicated in a way that enables disabled staff, e.g. deaf colleagues, to be well integrated into the team.

Staff at the Digital Crafts Centre of Excellence supported the process and are still in contact with the company following the roll-out. For example, the company recently offered additional training courses on product presentation and drew on the expertise of the Centre: the digitisation of the bakery is well on the road to success.

A video (in German) of the digital success story.

Going digital step by step

For more than 30 years, MÖLLE GmbH has been making individual inner packaging out of cardboard and plastic for products like medicines, marshmallows and car parts. In order to equip the company and its 150 staff for the digital future, managing director Klaus Eckert worked with the IT and technology departments to develop a strategy which meets MÖLLE's needs. He says: "Industrie 4.0 is helping us compete and boosts our profitability. You will only survive on a changing market if you keep up with the times and the state of the art."

In a first step, all the manufacturing machines were fitted with tablets to record the production data. In addition, machine set-up times, faults, break periods and production figures can be entered. Once the shift manager has verified the plausibility of the data, they are analysed by a computer tool that was designed in-house. This analysis makes it possible to render the processes more transparent and, ultimately, more efficient.

After it became clear that traditional production and resource planning was losing too much information and time, the second step followed: the introduction of ERP software (ERP stands for "enterprise resource planning"). The system is based on a standard database which was customised for the company and can be extended in-house. This has made MÖLLE's process system more transparent. The staff now only see what they need for their own work, but remain involved in the development process, resulting in greater acceptance and ownership of the system.

Finally, the company took the third step: with help from the Mittelstand 4.0 Centre of Excellence in Kaiserslautern, it aimed to digitise an existing production facility. A machine which cuts out crosspieces from solid cardboard for internal packaging was given a retrofit. A pressure sensor is now continuously monitoring the weight and thus the consumption of the roll of cardboard. This not only monitors the consumption of resources, but also makes the logistics more efficient by giving the staff in the store rooms plenty of notice about when a new role is needed. Volker Westermayer, manager of the digitisation product at MÖLLE, explains: "The added value for us is particularly the fact that by retrofitting the old machine, we can basically keep using it as before. We can now obtain digital data from a previously analog machine and use the data to optimise our processes."

The implementation of the company's digitisation strategy has so far been a big success – it's quite possible that further steps will follow.

You can find the video about digitisation at MÖLLE here (in German).

The staff at MÖLLE are backing the digitisation of the company.

Local support: the Mittelstand 4.0 Centres of Excellence

The Mittelstand 4.0 Centres of Excellence have been established to support SMEs in all matters digital. The centres help companies assess their own digital efforts, develop a digitisation roadmap tailored to their individual needs, and support them as they select and implement specific action. Furthermore, they also give advice as to whether a certain technical solution makes good economic sense and as to whether it requires additional security safeguards to be put into place.

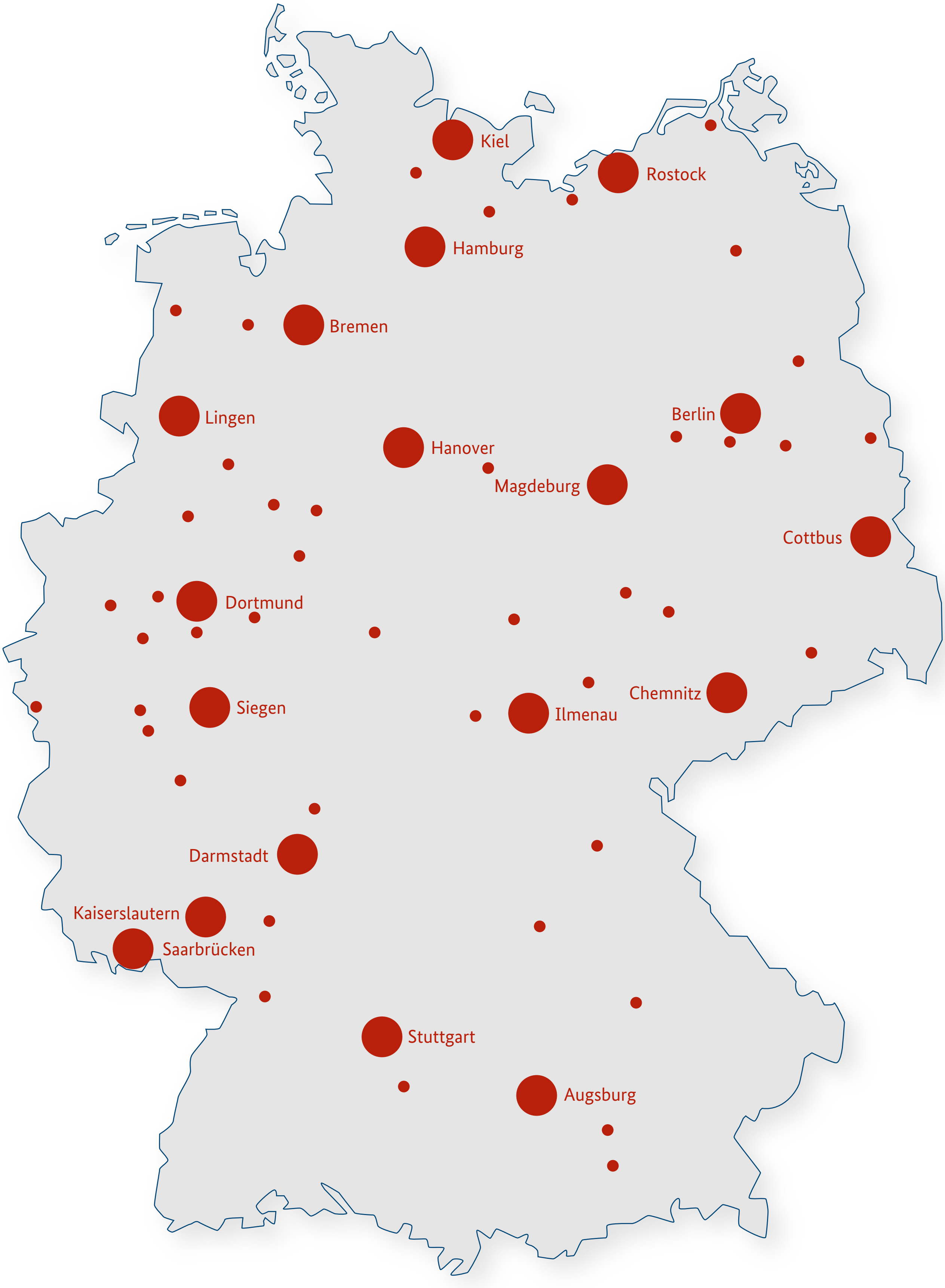
In addition to the regional Centres of Excellence, there are also dedicated centres for “Digital Crafts”, “eStandards”, “IT industry”, “Communications”, Planning and Construction”, “Textiles Network”, “Usability” and, since July 2019, “Trade”. These specialised centres, which are supported by regional contact points, offer their support to companies all over Germany in specific sectors or about specific topics.

A key asset of the centres is the fact that all learning and demonstration are modelled upon real companies. This means that company executives can gain a realistic impression of how digital technologies could transform their operations. There are also demonstration factories where companies can test their own technical solutions, e.g. software controlling their production. This allows for this kind of new technology to be tested before it is used in real-life production.

All of the services provided by the Centres of Excellence are independent of any suppliers, transparent, complete and designed to be easy to understand.

See here for yourself how the Centres of Excellence work.

An overview of the Centres of Excellence



A brief description of the regional Mittelstand 4.0 Centres of Excellence

The Centres of Excellence serve as companies' regional point of contact for all matters digital – irrespective of whether executives would like to learn more about digital manufacturing, security-related aspects of new technologies, or whether they would like to test a new technology. Beyond these more general issues, each centre has its own specialised focus, e.g. specific expertise in IT law or the structure of digital business models, or special demonstrators for specific sectors and company types.

Each centre has its own website, where companies can find out about services and special events such as workshops, network meetings, or training sessions.

Mittelstand 4.0 Centre of Excellence Augsburg
Demonstrated Industrie 4.0 solutions at four sites; Mittelstand 4.0 information mobile touring the region

- Focus on manufacturing: machinery, metallurgy and vehicles
- Expertise in automated manufacturing, logistics 4.0, work 4.0, digital business models
- Demonstrates connected manufacturing, smart assistance systems, sensor networks

www.kompetenzzentrum-augsburg-digital.de

Mittelstand 4.0 Centre of Excellence Berlin
Demonstration centre complete with mobile demonstrators touring the whole of Germany

- Cross-cutting issues that are relevant to all SMEs
- Assesses and helps adjust business models and develop new digital business ideas
- HR: hiring and retaining staff
- Digital marketing: winning over new customers, accessing new markets
- Digital solutions for greater efficiency and effectiveness
- IT security and raising awareness of IT risks and how to address these

www.gemeinsam-digital.de

Mittelstand 4.0 Centre of Excellence Bremen
New digital applications at six test and simulation labs; Digital Ambassadors

- Expertise in maritime industry and logistics, wind energy, aerospace, automotive industry, food and beverages, luxury foods, alcohol and tobacco
- Digital communications and services, digital transport and cargo handling; digitisation in product management
- Digital value-added services; stock-taking of digital progress
- 3D manufacturing and digital assistance systems

www.kompetenzzentrum-bremen.digital

Mittelstand 4.0 Centre of Excellence Chemnitz
Digital solutions in five testbeds and training labs, and on a mobile roadshow

- The centre's work is underpinned by the following notion: in the digital world of manufacturing and work, humans will act as enablers
- Step-by-step solutions for companies, their processes and technologies, products and services, the law, human beings and work
- Connecting humans and machines within the company and across companies
- Legal toolbox 4.0: what companies need to know about data protection, data security and liability

www.kompetenzzentrum-chemnitz.digital

Mittelstand 4.0 Centre of Excellence Cottbus

Model factory, intralogistics lab and test centre demonstrating staff-centred digital solutions

- Modular and needs-based services for the digital transformation
- Automation solutions, human-robot collaboration and assistance systems
- Digitisation of logistics and manufacturing
- Learning partnerships for staff, management, executives, employers' and employee representatives

www.kompetenzzentrum-cottbus.digital

Mittelstand 4.0 Centre of Excellence Darmstadt

Two learning labs for skills-driven and applied know-how transfer in 5 areas

- Work: designing user-friendly assistance systems and eliminating risks
- Efficiency: improving lean production using digital technologies
- Energy: connecting machines, processes and building technology for greater energy efficiency
- Ideas: recognising the potential of the digital transformation and developing new business models
- Safety: addressing IT risks associated with digital networks

www.kompetenzzentrum-darmstadt.digital

Mittelstand 4.0 Center of Excellence Dortmund

Point of contact for digital manufacturing and logistics, demonstration centres in three regions (Ruhr, Rhineland; Eastern Westphalia-Lippe)

- Expertise for the lead markets of mechanical engineering and plant construction, manufacturing technology, mobility and logistics, information and communications industry
- 21 service modules to facilitate a targeted introduction of digital products and processes
- Smart automation of products and manufacturing systems; new solutions for manufacturing technology
- Autonomous and flexible logistics systems

www.digitales-kompetenzzentrum-dortmund.de

Mittelstand 4.0 Centre of Excellence Hamburg

Smart factory and test lab demonstrating the interplay of different digital technologies

- Focus on logistics across the entire supply chain
- Digitisation of order management as part of the manufacturing process
- Training, HR organisation and management in the digital age
- Development of new business models
- 360° perspective on additive manufacturing
- Online marketing and eCommerce

www.kompetenzzentrum-hamburg.digital

Mittelstand 4.0 Centre of Excellence Hanover

Generic factory, nine specialised factories and a mobile factory provide for a variety of demonstration and testing possibilities

- Manufacturing and associated expertise in areas such as data acquisition, additive manufacturing, retrofitting, MES/ERP, digital assistance systems, lean, energy transparency, AR/VR applications
- Work, organisation and skills in the digital transformation
- Legal challenges associated with digitisation
- IT security and cybercrime

www.kompetenzzentrum-hannover.mitunsdigital.de

Mittelstand 4.0 Centre of Excellence Ilmenau

Five model factories demonstrating ways to connect staff, machinery and processes

- Cooperating within and across companies using digital communications and data exchange platforms
- 3D scanning and additive manufacturing
- Integrating digital technologies in existing systems and installations
- Digital monitoring of machines and data recording
- Introducing manufacturing control and steering systems; automation in manufacturing

www.kompetenzzentrum-ilmenau.digital

Mittelstand 4.0 Centre of Excellence Kaiserslautern
Demonstration Center SmartFactoryKL, complete with a mobile demonstrator for training and a manufacturer-neutral Industrie 4.0 production installation

- Development of digitisation strategies, innovative business models and a cooperation platform
- Development of digital expertise; training
- Self-evaluation tools for companies regarding digitisation
- Training and continuing education for people and management 4.0

www.kompetenzzentrum-kaiserslautern.digital

Mittelstand 4.0 Centre of Excellence Kiel
Digital factory, KIN Food Institute with test lab and Uni-TransferKlinik illustrate tasks and challenges of digitisation. A special focus is placed on mechanical engineering, food and medical technology. The main areas covered are:

- Digital business models: How to design profitable digital business models and to link digital services with traditional products and services
- Interoperability: How to get IT systems in the production and management fields to work together, information about AI and its opportunities
- Profitability: Support with questions about optimising time-intensive processes and improving flows of material goods and information

www.digitales-kompetenzzentrum-kiel.de

Mittelstand 4.0 Centre of Excellence Lingen
Three test and simulation labs for data-driven digital solutions

- Focus on the maritime economy, agriculture, commerce and crafts
- Methods and procedures for developing digital, data-driven business models
- Information, training and support for small and medium-sized enterprises

www.kompetenzzentrum-lingen.digital

Mittelstand 4.0 Centre of Excellence Magdeburg
An experimental factory and mobile demonstrators allow visitors to truly experience the digital transformation

- Connected technology and standardisation:
- making companies fit for the digital future
- Digital business models: boosting competitiveness and innovation
- User-friendliness and a positive response: designing the digital workplace and supporting staff through digital change
- Safety and security: protecting sensitive business data and assessing IT security levels of digital technology

www.kompetenzzentrum-magdeburg.digital

Mittelstand 4.0 Centre of Excellence Rostock
Demonstrators in Rostock, Stralsund and Neubrandenburg for digital solutions for the healthcare and tourism industries

- Focus on medical technology, healthcare and tourism, especially health tourism
- Raising awareness of the potential for digitisation for SMEs
- Digital skills building for staff
- Individual digitisation strategies complete with implementation projects

www.kompetenzzentrum-rostock.digital

Mittelstand 4.0 Centre of Excellence Saarbrücken
Former manufacturing premises where there are now several demonstrators of Industrie 4.0 applications tailored to SMEs

- Specialist expertise around digitisation in the automotive industry, in mechanical engineering and plant construction, engineering, tool-making, logistics and transport
- Supply-chain networks across different companies
- Support for digitisation projects, including related adjustments/transformation of business models

www.kompetenzzentrum-saarbruecken.digital

Mittelstand 4.0 Centre of Excellence in Siegen

Five demonstration and learning factories dedicated to skilled labour in the digital transformation

- Changes in the way work is organised: recognising the potential of digital technologies, adjusting management processes, defining new roles, training staff
- Human-machine interaction and assistance system designed to support work processes
- Occupational safety and health: challenges associated with health and safety rules; data protection

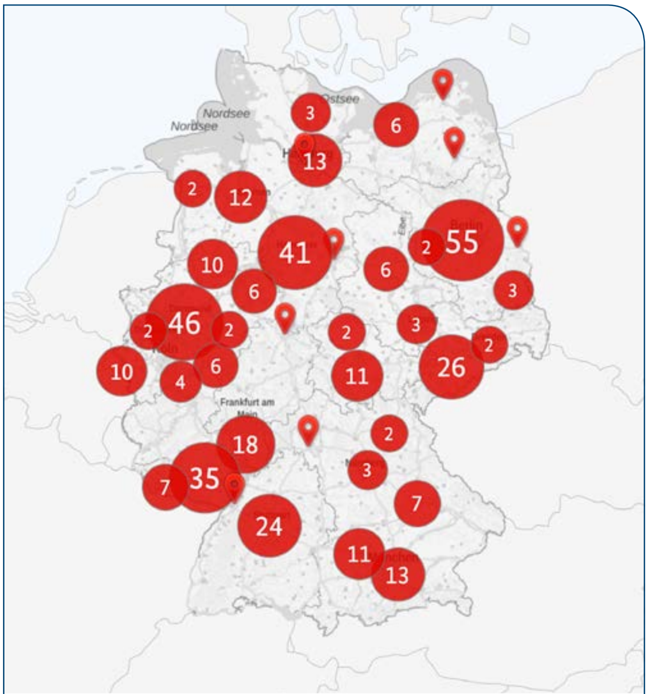
www.kompetenzzentrum-siegen.digital

Mittelstand 4.0 Centre of Excellence Stuttgart

Two contact points in Karlsruhe and Stuttgart demonstrate how digital applications can be integrated in the value chain and make it more effective

- Digitising the entire value chain: manufacturers, suppliers, suppliers of infrastructure, service providers, final consumers
- Focus on digital manufacturing, Smart Mobility, Smart Home (digital construction and building technology), Smart Health (digital technologies in nursing)
- Development of digital business models; IT security

www.digitales-kompetenzzentrum-stuttgart.de



Find out online where all the Mittelstand 4.0 Centres of Excellence are with their regional contact points, practical examples and demonstration facilities.

The Mittelstand 4.0 thematic centres

The thematic centres of excellence offer support to small and medium-sized enterprises from certain sectors or on specific issues. In addition to the main offices of each of these centres, they have several branches around Germany.

Most of the regional contact points have a particular focus of their own. As with the regional Mittelstand 4.0 Centres of Excellence, the services of the thematic centres are free of charge and impartial.

Centre of excellence for digital crafts

Five regional showcases bring digitisation to crafts businesses and highlight the opportunities associated with the use of digital tools

- Bayreuth: new manufacturing and automation technologies
- Oldenburg: digital information and communications technology
- Dresden: digital business models
- Koblenz: digital processes
- Krefeld: digital construction and Building Information Modelling (BIM)

www.handwerkdigital.de

Mittelstand 4.0 Centre of Excellence for eStandards

Expertise in the field of digital standards and sustainability, open workshops in Cologne, Hagen and Leipzig, mobile open workshop allowing for various tests and training options

- Support for companies implementing eStandards within their organisation or group or across organisations
- Focus on manufacturing and crafts, healthcare, logistics and commerce
- Expertise in the field of standards in regulated markets and in connected manufacturing

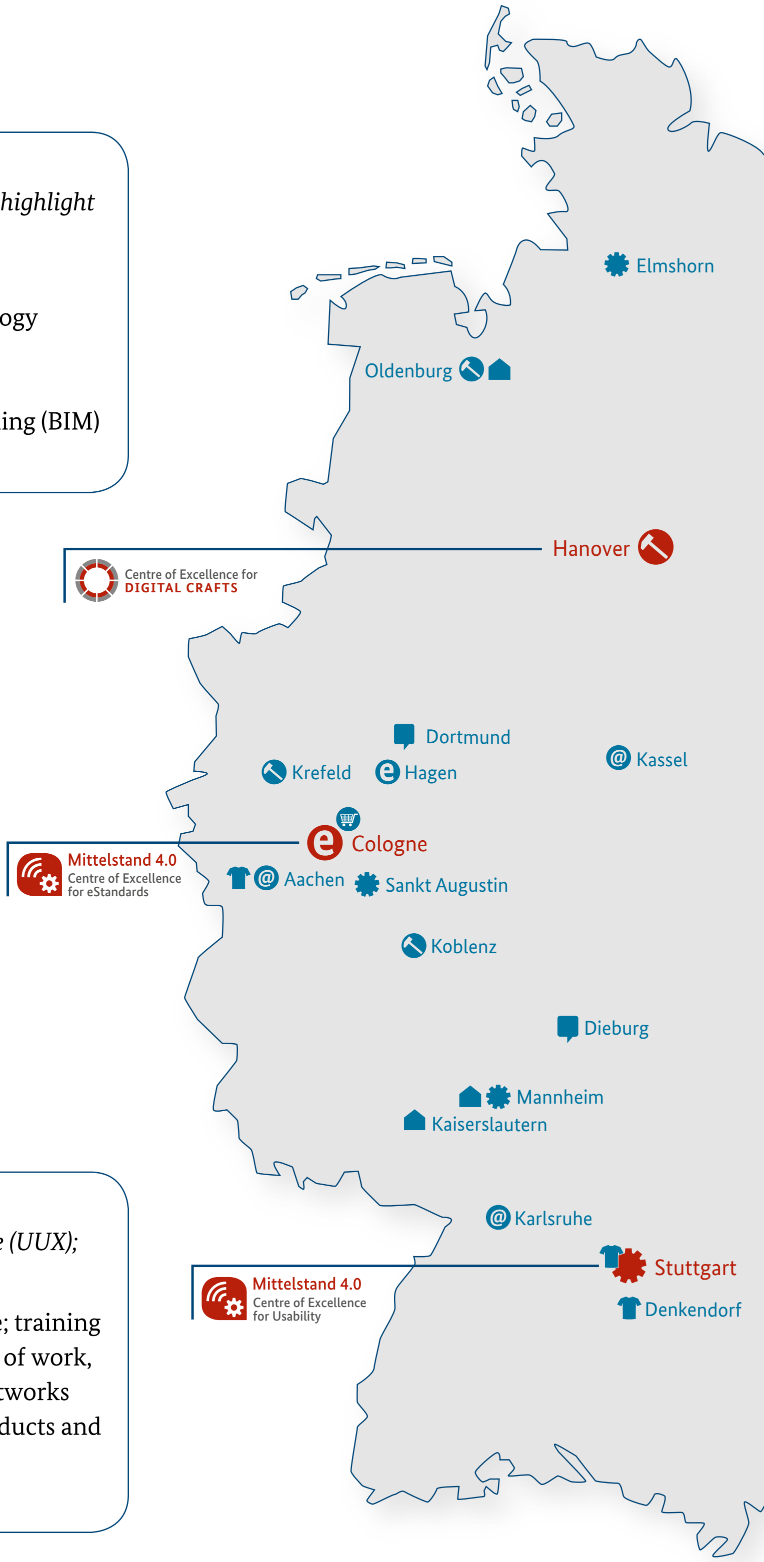
www.kompetenzzentrum-estandards.digital

Mittelstand 4.0 Centre of Excellence for Usability

Support with regard to Usability and for a positive User eXperience (UUX); four regions (north, east, central, south Germany)

- Raising awareness among SMEs providing and using software; training
- Focus on tools and demonstrators: innovation and the future of work, agility, solutions facilitating cooperation within corporate networks
- Support for UUX-driven developments and for the use of products and services

www.kompetenzzentrum-usability.digital

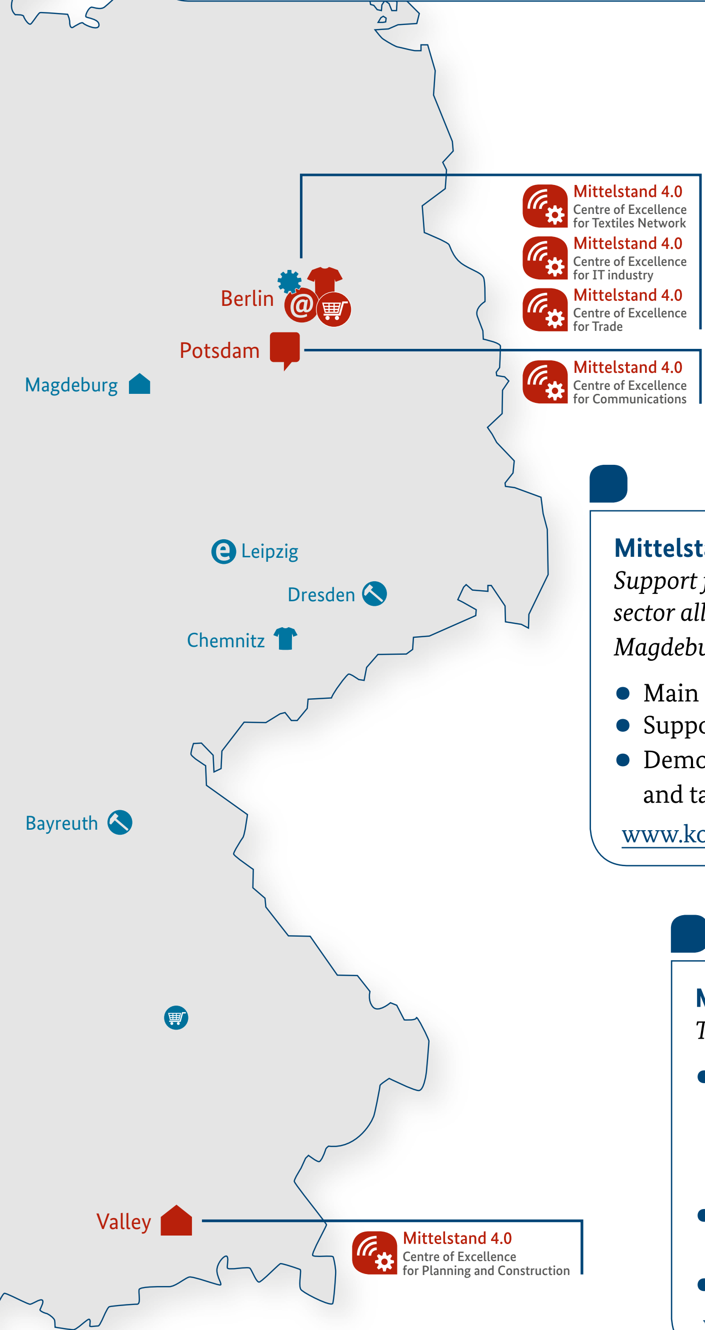


Mittelstand 4.0 Centre of Excellence for Textiles Network

Four regional showcases in Aachen, Chemnitz, Denkendorf and Stuttgart and one cross-cutting showroom in Berlin support companies in the textile industry and in related industries

- Support during the phase-in of digital processes
- Work 4.0: Assistance systems and workforce training
- Individual connected production
- New digital business models based on smart (textile) products
- Smart sensor technology

www.kompetenzzentrum-textil-vernetzt.digital



Mittelstand 4.0 Centre of Excellence for IT industry

Four contact points with a headquarters in Berlin and regional contact points in Aachen, Karlsruhe and Kassel

- Empowering and raising awareness of the digital transformation among the IT industry
- Fostering networking between SMEs in IT (matchmaking and online platform)
- Support for cooperation in consortia: legal forms, compliance and IT security, project management
- Services related to interoperability: identification and definition of open standards

www.itwirtschaft.de

Mittelstand 4.0 Centre of Excellence for Communications

Three regions are focusing on the human side. The focus is on change management, staff management, communications and trust in technology. Topics:

- Efficient management of digital change
- Correct internal and external communication
- Building trust in technology
- Sharing knowledge about digitisation
- Developing digital business models
- Driving in-house innovations

www.kompetenzzentrum-kommunikation.de

Mittelstand 4.0 Centre of Excellence for Planning and Construction

Support for SMEs embarking on digitisation in the construction and real-estate sector all across Germany, with five regional sites (Mannheim, Oldenburg, Magdeburg, Kaiserslautern and Holzkirchen)

- Main focus: Project design, planning, construction, crafts, operations
- Supporting companies in using digital methods and tools
- Demonstration and testing possibilities tailored to individual industries and target groups

www.kompetenzzentrum-planen-und-bauen.digital

Mittelstand 4.0 Centre of Excellence for Trade

The future of trade – nationwide services and contact points

- In-depth expertise in: platform economy, payment systems, merchandise systems, AI in trade, digitisation at the point of sale, shop concepts, revitalisation of inner cities, managing returned goods, additive manufacturing in trade
- Services: workshops, webinars, individual surgeries, hands-on digital solutions to try out in the DiMo (Digital Mobile Trading)
- Four contact points: Berlin, Regensburg, Cologne, Langenfeld

www.kompetenzzentrumhandel.de

Going digital at the wind turbines

The results of the technical inspection are collated digitally on the spot.

IFE Group have been offering services to people operating wind-powered installations from any manufacturer for more than 20 years. In addition to planning and advisory services, as well as technical and clerical management, the focus is particularly placed on the technical inspection of wind turbines. The company's staff travel not only around East Frisia, but all around Germany and Europe to test the condition of the equipment and to document the findings. Over the years, the market for wind energy and thus the number of clients have grown. For Philipp Schild, managing director of IFE Emden, the time had come to digitise all the work processes and thus to make them more efficient. He contacted the Mittelstand 4.0 Centre of Excellence in Hanover: "The hope was that the digital transfer concept would work better if a partner was on board to help."

The staff were involved from the outset. At a kick-off workshop, the team from the centre of excellence started by developing a common understanding of the digital possibilities in the company. Here, it became clear that the inspection reports were first written down by hand, and then digitised afterwards in the office. However, this process was not only time consuming, it was also a source of errors. Mobile terminal equipment improved the process.

In the next step, the centre's experts agreed with the management on the demands to be met by the digital assistance system. A roadmap for the switchover was drawn up. Philipp Schild is very positive about the work done with the centre of excellence: "The conceptual input was really helpful, and the workshop gave our colleagues an initial idea of what Industrie 4.0 can mean in practice."

The staff are also happy about how it has gone: "The report is practically finished when you leave the wind turbine, and so it reaches the client more quickly. We can now use the time in the office for other things."

The film of the practical example can be found here (in German).

Sea buckthorn manufacturing relying on digital merchandise tracking

Soon after the family firm was founded on a sea buckthorn plantation in Brandenburg, Christine Berger GmbH & Co. KG discovered the opportunities afforded by digitisation: the first beginnings took the form of a website and online shop. The next step was to use new technology to get a grip on the increased internal and external demands in the merchandise process. Managing Directive Dorothee Berger explains: "For our company, digitisation means safeguarding our future."

The company, which now produces more than 50 sea buckthorn products like juice, jam, sweets and cosmetics, wanted to go a step further and digitise all its merchandise flows. Previously, delivery notes, shipping papers and invoices were sent to the accounting department on paper and then stored there in digital form. The company only conducted visual inspections of its stocks, so that the data were not available in real time for the purchasing and product planning processes. The sold products were only registered electronically when they were sent out. This was uneconomic in the long term – a digital merchandise management system was needed. Dorothee Berger saw the need to involve the approximately 20 staff members in the process.

The factory was supported by "Digital together", Berlin's Mittelstand 4.0 Centre of Excellence. The Jam 4.0 project ran from mid-2016 to the beginning of 2017. In this period, the team from the centre of excellence started by analysing the central processes in the store room: they monitored what happened and talked to the staff. After that, they focused on finding a digital solution which would meet the specific needs of Christine Berger GmbH & Co. KG. To do this, the team from the centre of excellence and the staff did some traditional brainstorming but also used creative methods like "How might we" questions and the "idea napkin", a special form of collecting ideas.

The solution – digital scales and meters which register all the quantities and deviations in real time and forward the data to the digital merchandise management system – first had to be tested in real-life conditions. In order to visualise the procedure before it was actually purchased, the team from the Centre of Excellence developed some prototypes. Dorothee Berger is extremely positive about the cooperation: "The intensive analytical work identified highly complex interrelationships and made them easy to understand. The outcome really is worth its weight in gold." The collaboration succeeded in making the sea buckthorn factory's merchandise management system fit for the future.

The practical example can be viewed here (in German).

The introduction of the digital merchandise management system facilitated the production processes.

A bit of history: the early days of SMEs Digital

The dynamic pace of digitisation has been dominating day-to-day business life for such a long time now that it is hard to imagine a time without computers, the internet and smart services. At the same time, what we now call "digitisation" has only taken shape over the last few decades – even just the last few years. This development is also reflected in the history of SMEs Digital.

The establishment of the SMEs Digital research priority in 2011 by the Federal Ministry for Economic Affairs and Energy brought together all the transfer activities for the digital transformation targeted at the SME sector. Since then, SMEs Digital has shown small and medium-sized enterprises ways to safeguard and enhance their competitiveness.

Today, the main focus is on promoting and implementing digital processes, but back then the companies were still busy introducing eCommerce. At the same, therefore, the initiative concentrated on helping companies to roll it out. The regional and thematic Mittelstand 4.0 Centres of Excellence all around Germany, and their practical examples and demonstration facilities, still benefit from that today.

eStandards – standardising business processes ensuring success

One of these initial projects was "eStandards – standardising business processes ensuring success". It was launched in 2011, and up to the end of 2018 developed a total of 20 projects offering solutions for a seamless use of information and communication technology in SMEs. The outcome was best practice examples, advisory modules for training, demonstrators and online tools. The Mittelstand 4.0 Centre of Excellence for eStandards is continuing this work.

Simply using intuition – usability for SMEs

The "Simply using intuition - usability for SMEs" initiative, which ran from 2011 - 2018, aimed at finding user-friendly ICT solutions for SMEs. 17 projects looked into the question of what methods are needed to design software and digital equipment so that it can be used intuitively and effectively. It quickly became clear that standardised approaches do not help SMEs. A set of modular usability solutions was therefore developed to meet each company's individual needs.

Network for digital literacy within business

The "Network for digital literacy within business" aimed to help SMEs get a foothold in digitisation. Between 2012 and 2015, a total of 38 regional contact points offered impartial and free-of-charge information about hardware, software and IT solutions. eBusiness pilots helped companies to find IT tools and solutions which were tailored to their needs. Former eBusiness pilots are still working in many Mittelstand 4.0 Centres of Excellence today.

The experience they have gained in the three initiatives "Digital literacy", "eStandards" and "Usability" is still being put to good use in the Mittelstand 4.0 Centres of Excellence and thematic centres, passed on to SMEs and constantly updated. SMEs Digital is thus keeping pace with digitisation and is sufficiently flexible to identify new developments and trends early on and to adapt its services and transfer methods to continue helping the SMEs to meet the challenges of the digital era.

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Associated research

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