

Overview on External Consulting Providers

Industrie 4.0 – Consulting



Edition 2016

Two Worlds – one Vision



Dr. Michael Kruppa

Industrie 4.0 is a technology driven topic. The industrial adaptation of technologies derived from the „Internet of things“ does not only promise improved productivity but furthermore, it allows the development of new solutions both for production and the products themselves and also for completely new services.

Industrie 4.0 is happening at the borderline between industry and IT. In order to recognize and realize the potential hidden in Industrie 4.0, completely new strategies and thought patterns will be necessary. While thinking and acting in industry focus on long life cycles of machines and plants, IT development is mainly influenced by short, incremental development cycles. Only those capable of addressing Industrie 4.0 from both sides will benefit from the potential promised by the industrial adaptation of the “Internet of things”.

Several studies have shown that many machine and plant manufacturers have very limited access both to IT talent as well as digital thinking in general. External support may be helpful when developing technical solutions and new business models in the context of Industrie 4.0.

In 2014 the VDMA founded the Forum Industrie 4.0 to support the realization of the vision of Industrie 4.0. In the action field of “business models” the VDMA is developing new services and events to support the VDMA member companies on their way towards new Industrie 4.0 business models.

The purpose of the collection „Industrie 4.0 – Consulting“ is to provide an overview of existing consulting offers in the area of Industrie 4.0 business models to machine and plant manufacturers. By means of detailed consulting profiles the companies may find the right provider for their specific topics.

The collection does not claim to be complete – however, we are going to update and extend it regularly. We will be happy to include new providers and are looking forward to your input.

Dr. Michael Kruppa

VDMA Industrie 4.0 Forum
Business models

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aveniture

aveniture is the boutique-consultancy for industrial strength futures studies. We connect foresight, technology and consulting a unique way. As an Advanced Foresight Group member, we provide a one-stop-shop for future-oriented enterprises and services. For large as well as for small and medium enterprises. By permanently monitoring trends, technologies and scenarios – including those for Industrie 4.0 – we provide up-to-date information and competencies. Helping our clients achieving 100 pc futures-competency is our vision. In acting and preparing for a not always predictable future. We are answering the questions: what creates growth, how do companies grow and how to master the risks involved.

Focus and concept of consulting offerings in the field of Industrie 4.0 and business models

Innovation projects with a unified approach for product-, market, and business-model innovations.
Scouting / Scanning / Monitoring the corporate environment: Markets, Technologies, cross-industry, science, start-ups.
Identifying and forecasting for new technologies e.g. in Industrie 4.0, digitization, additive manufacturing &c.
Implementing foresight projects and processes for new product ideas, new business areas, strategic directions, new markets.
Coaching of professional and managerial staff on the future.

What differentiates your offerings from others? What makes you special?

Unique combination of engineering and futures competency; of methodological and professional expertise.
Our services rest on the basis of futures studies.
We use an interdisciplinary approach (customers, needs, competition, technology, political/ societal environment) to provide a panoramic view ("365°") and knowledge for effective action.

Quantitative information:

(Group of companies)
Number of employees: 17
Number of employees with experience in mechanical engineering or Industrie 4.0: 6
Number of consulting projects in the last 3 years in the area of business models for Industrie 4.0: 7

References in the Industrie 4.0 field

Smart Grids – Impacts on conventional power-generation technologies and equipment, technical specifications, price-level, in the future energy market.

Additive manufacturing technologies for individualized decorative design of gifts.

Delphi-Study for an aerospace company (scientific supervision)

Identifying technologies for future automobile-manufacturing

Publications and studies around Industrie 4.0 / Mechanical Engineering / Digitization

Benchmark: Utilizing Technology for Industrie 4.0 (23 Companies)
Industrie 4.0 – Basics. Short study and transfer-seminar for CSR/CRRC
Poster-exhibition 'Work 4.0'

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Extract from:

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The Boston Consulting Group

The Boston Consulting Group (BCG) is a global management consulting firm and the world's leading advisor on business strategy. We partner with clients from the private, public, and not-for-profit sectors in all regions to identify their highest-value opportunities, address their most critical challenges, and transform their enterprises. Our customized approach combines deep insight into the dynamics of companies and markets with close collaboration at all levels of the client organization. This ensures that our clients achieve sustainable competitive advantage, build more capable organizations, and secure lasting results. Founded in 1963, BCG is a private company with 85 offices in 48 countries.

Focus and concept of consulting offerings in the field of Industrie 4.0 and business models

- Industry 4.0 Health Check: Assess plant maturity level w.r.t. advanced manufacturing technologies
- Business Model Innovation
- Innovation Center for Operations (ICO): BCG technology immersion factories with use-case demonstrators
- Industry 4.0 framework: Diagnosis (drivers & trends, internal perspective, external perspective) and Strategy development
- BCG Lean Transformation Framework: Lean Manufacturing, Lean Services, Lean Engineering
- Mobile Lab: Enablement simulation workshops for discrete manufacturing and process industry
- BCG Supply Chain Management Framework to transform supply chain digital requirements

What differentiates your offerings from others? What makes you special?

- < 200 I4.0 Projects in design, production, logistics
- Multidisciplinary team for end-to-end Digital delivery (BCG Industrial and Functional expertise, Digital Ventures, Platinion, BCG Analytics)
- Comprehensive Digital Value proposition, with broad range of 'starting points' for digitalization
- Collaborative approach of client teaming and involvement builds momentum for lasting change
- Mobile Lab for Enablement of client teams

Quantitative information:

Number of employees: **12.000**

Number of employees with experience in mechanical engineering or Industrie 4.0: **> 1.500**

Number of consulting projects in the last 3 years in the area of business models for Industrie 4.0: **> 200**

References in the Industrie 4.0 field

Automotive OEMs and suppliers

- Creation of I4.0 roadmap and piloting for a variety of automotive OEMs and suppliers

Machinery OEM

- Development digital "pay per usage" business model

Industrial Automation SME

- Development of I4.0 offerings & infrastructure

Multinational technology conglomerate

- Development of digital strategy base for new offering & business models and creation of concrete business opportunities along entire portfolio

Diversified industrial technology conglomerate

- Development of additive manufacturing strategy

Durable consumer goods producer

- Development of the layout and implementation of Industry 4.0 use cases in the planned new factory

Publications and studies around Industrie 4.0 / Mechanical Engineering / Digitization

- "Time to Accelerate in the Race Toward Industry 4.0"
- "Factory of the Future"
- "Industry 4.0: The Future of Productivity and Growth in Manufacturing Industries"
- "Man and Machine in Industry 4.0"
- "The Robotics Revolution: The Next Great Leap in Manufacturing"
- "The Double Game of Digital Strategy"

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Capgemini Consulting

Capgemini Consulting is the global strategy and transformation consulting brand of Capgemini Group. With more than 180,000 employees in more than 40 countries, Capgemini is one of the world's leading providers of management and IT consulting, technology services and outsourcing services. At Capgemini Consulting, more than 10,000 consultants assist organizations in their sustainable change processes. The services range from the conception of innovative strategies to their implementation, always with a clear focus on results. Throughout the extensive changes wrought by digitalization in the economy and in society, Capgemini Consulting accompanies leading enterprises and public institutions in their individual digital transformation.

Consulting emphasis and consulting concept in the field of Industry 4.0 and business models

The consulting emphasis of Capgemini Consulting is aligned with our **Industry 4.0 framework**. The framework reflects the principles of a sustainably value-creating digitalization for manufacturing enterprises:

- Industry 4.0 opens up potential along the entire value chain and must be holistically conceived
- Successful digitalization requires a significant change in organizational structures, leadership mechanisms and corporate culture
- Digitalization must be carried out and driven by top management

As a starting point for Industry 4.0 transformations, our digital day concept has proven to be very powerful: Comprising benchmarks, best practice use cases, and technology expertise, an initial picture of the digital future of enterprises is created in a workshop-based approach over the course of 4-6 weeks.

How does your offer differ from others? What makes you special?

Capgemini Consulting can look back on many years of experience as a leading advisor on transformation – from our groundbreaking "Business Transformation" approach to our current focus on "Digital Transformation." Since 2008, we have bolstered this leading role through a research collaboration with the MIT Center for Digital Business in Boston. This is supplemented by numerous international projects with market leaders in their respective industries in the context of Industry 4.0. Our profile is rounded out by a strong collaborative approach to working with our clients as well as long-term success in sustainable organizations development in the digital age, and by Capgemini Group's profound understanding of technology and solution expertise together with its technology partners.

Quantitative information:

Number of employees: >10,000 (worldwide) / >1000 (Germany, Austria and Switzerland)

Number of employees with experience in manufacturing & Industry 4.0: >3000 / >450

Number of consulting projects in the past 3 years in the field of business models for Industry 4.0: 80 / 30

References in the Industry 4.0 environment

- **Renesas:** Development of an Industry 4.0 business model and solution portfolio in the field of industrial automation
- **Leading agricultural machinery manufacturer:** Development of a digital strategy and digital business models for the aftersales business
- **Siemens Building Technologies:** Design and introduction of a platform for the distribution and management of digital services (Remote Service Management) in the field of building automation
- **Faurecia:** Design and execution of an enterprise transformation towards the "Digital Enterprise," including in the areas of smart factory and supply chain (implementation of 50+ use cases)
- **Automotive OEM:** Development of a smart factory strategy, including an implementation roadmap
- **Valeo:** Joint marketing of a digital service solution (InBlue® Smart Key) through a strategic partnership

Publications and studies in the last 3 years on Industry 4.0/Engineering/Digitalization

- Dedicated website on the topic: <http://mc.capgemini.de/magazin/industrie40/>
- Industry 4.0 – The Capgemini Consulting View. From Hype to Business Value: Accelerating Your Industry 4.0 Transformation (to be published Q3/2016)
- Leader 4.0: Leadership in the Context of the Industrial Revolution (2016)
- Going Big: Why Companies need to focus on Operational Analytics (2016)
- Implications of Industry 4.0 for CIOs (2016)
- Industry 4.0 – The Capgemini Consulting View. Sharpening the Picture beyond the hype. (2014)
- Digitizing Manufacturing: Ready, Set, Go! (2014)
- Digital Value Networks in the Tool Manufacturing Industry (2014; in cooperation with RWTH Aachen)

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"Industry 4.0 Business Models – Overview of Consulting Providers," VDMA, May 2016

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conmotion Business Consulting

For 16 years, conmotion has been the partner for project- and process management within national and international industrial companies. Our range of services focuses on the main core business processes: development, industrialization, order management, production, purchasing and supply chain management for discrete manufacturing companies. The Lean Management principles are an essential cornerstone of our transformation projects. In the Industrie 4.0 sector we provide a methodology and maturity level system to determine the position of the business on this regard and to implement improvements for the digital transformation that are structured, measurable and transparent.

Focus and concept of consulting offerings in the field of Industrie 4.0 and business models

- Positioning and roadmap based on a four-dimensional assessment with MAI 4.0
- Transformation supervision using standard project management tools and methods, ensuring the technological-rule Integration
- Ensuring sustainability and targeted control with the maturity level system EMMELI 4.0



References in the Industrie 4.0 field

- Technical concepts and implementation of technological development plans (link between product configuration and service components)
- IT-supported process for deviation permit (concession management) between customer and supplier
- Digitization of technical processes in the aviation industry
- Digitization of the procurement process chain (source-to-pay process)
- Establishment of inter-company process chains by using electronic Marketplace technologies
- Concepts for controlling the material flow with e-Kanban, among others.

What differentiates your offerings from others? What makes you special?

- In addition to the technological and procedural integration we focus on aspects such as the anchoring of Industrie 4.0 in the company strategy and control, and the reflection of Industrie 4.0 in new business models.
- Organizational aspects and human factors receive a special involvement.
- A sustainable implementation methodology with incorporated metrics is delivered through the maturity level system.

Publications and studies around Industrie 4.0 / Mechanical Engineering / Digitization

- Industrie 4.0 as a driver of growth and productivity from an economic point of view
- Industrie 4.0 as a catalyst for innovation

Quantitative information:

Number of employees: 15
Number of employees with experience in mechanical engineering or Industrie 4.0: 8
Number of consulting projects in the last 3 years in the area of business models for Industrie 4.0: 7

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Ernst & Young GmbH

EY is a global leader in assurance, tax, transaction and advisory services. For EY Advisory, a better working world means solving big, complex industry issues and capitalizing on opportunities to help deliver outcomes that grow, optimize and protect our clients' businesses now and in the future. We help you explore the possibilities, innovate to create your digital vision, use analytics to inform decisions and deliver value while managing risk. We work hard to understand our clients' issues and are driven to ask better questions in the pursuit of making their businesses work better.

Focus and concept of consulting offerings in the field of Industrie 4.0 and business models

- Development of digital strategies
- Buildup of digital business models
- Identification of market potentials
- Creation of Industrie 4.0 and Internet of Things architecture concepts
- Feasibility testing of IoT scenarios
- Creation of realistic use cases and feasibility studies (Proof of Concept)
- Implementation of Industrie 4.0 pilot projects
- Project and program management
- Process optimization along the whole value chain

What differentiates your offerings from others? What makes you special?

EY offers experienced consultants with interdisciplinary competencies and special knowledge in the field of digitalization. With our designated experience of digital transformation, extensive IT knowhow and excellent supply chain and business process competencies, we are your partner for customized solutions from management consulting up to technical implementation

Quantitative information:

Number of employees: **3.300 employees in our Supply Chain and Operations Advisory Practice**

Number of employees with experience in mechanical engineering or Industrie 4.0: **more than 200 employees**

Number of consulting projects in the last 3 years in the area of business models for Industrie 4.0: **more than 50 worldwide**

References in the Industrie 4.0 field

- Manufacturer of Beverage Filling Plants and packaging Machines
 - Systems engineering approach for the development of smart, connected products
 - Market study for IoT and MES software offering
- Tier 1 Supplier of Powertrain and Chassis Components
 - Setup of Internet of Things Lab
 - Validation of the IoT business models
- OEM / Truck & Bus Manufacturer
 - Study to define the cooperation of Lean Manufacturing and Industrie 4.0 within the internal production system
 - Use cases for the application of augmented reality to their operations, mainly in plant maintenance and completely-knock-down scenarios with third party service providers

Publications and studies around Industrie 4.0 / Mechanical Engineering / Digitization

- „Industrie 4.0 – das unbekannte Wesen?“
- „Born to be digital: Wie führen-de CIOs sich auf eine digitale Transformation vorbereiten“
- „Big data: changing the way businesses compete and operate“
- „Analytics: Don't Forget the Human Element — Data and Analytics Impact Index“
- „Are you managing digital disruption or is it managing you?“

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Fraunhofer Institute for Industrial Engineering IAO

Fraunhofer IAO supports companies and institutions on their way to new business models, efficient processes and economic success. With profound understanding of organizational forms and technologies we achieve the transfer of applied research into practice. Our customers are both large companies and SMEs. We offer them unique knowledge advantage and demonstrate possibilities of how to adapt this knowledge to their individual requirements and to use it profitably. In this way we place the human being at the focus of our work and always keep an eye on social impacts. See www.iao.fraunhofer.de for more information.

Focus and concept of consulting offerings in the field of Industrie 4.0 and business models

- Fraunhofer IAO offers its production assessment 4.0 as an unique, maturity-level-based consulting concept for systematically identifying potentials and the 'right' application, thus transferring them to a company specific roadmap.
- Introduction of interactive Industrie 4.0 application with participation of actors involved.
- Strategic orientation and transformation management for digitalization. Development of future scenarios.
- Test bench for Industrie 4.0 business models
- Next Generation Product Lifecycle Management (PLM) for Industry 4.0

What differentiates your offerings from others? What makes you special?

- Besides technological consideration, there is a strong focus on organization and process management.
- Holistic approach, including product development, order processing and indirect areas close to production
- Quantitatively and qualitatively assessable Industrie 4.0 application
- Strong know-how of change management in the field of Industrie 4.0, both for large companies and SMEs
- Expert network and international expertise

Quantitative information:

Number of employees: 560

Number of employees with experience in mechanical engineering or Industrie 4.0: not applicable

Number of consulting projects in the last 3 years in the area of business models for Industrie 4.0: 20

References in the Industrie 4.0 field

Worldwide multitude of successful consulting projects with well-known reference customers from machinery and plant engineering, automotive and supply industry, medical technology and household appliances.

A large number of successfully completed and ongoing joint projects (BMBF) with leading research organizations and industrial companies, e.g. KapaflexCy, MetamoFAB, Jump4.0.

BorgWarner Ludwigsburg GmbH, KapaflexCy's project partner, was awarded in 2014 by the magazine 'Produktion' with the 2nd Industrie 4.0 Award, a special prize for innovative labor organization. In 2016, the future laboratory Produktionsarbeit 4.0 was honored for being one of the 100 places for Industrie 4.0 in Baden-Württemberg.

Publications and studies around Industrie 4.0 / Mechanical Engineering / Digitization

- Production work of the future – Industrie 4.0
- Industrie 4.0 – Economic potential for Germany
- Industrie 4.0 – A revolution of work structure

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Fraunhofer Institute for Manufacturing Engineering and Automation

With over 1000 employees, Fraunhofer IPA is one of the largest institutes in the Fraunhofer-Gesellschaft. The combination of industry specific know how of our business units and the technological knowledge of our departments forms a tailored range of services for small to large enterprises. Since more than two decades Fraunhofer IPA researches on flexible, self-optimizing and interacting production structures – today known as »Industrie 4.0«.

Focus and concept of consulting offerings in the field of Industrie 4.0 and business models

In the context of Industrie 4.0 Fraunhofer IPA has developed numerous solutions and offers various services in these areas of expertise: IT architectures for production, Business models and use cases, Smart objects, Human Machine Interfaces and Communications. Here are some of our services:

- Business model development
- Development and implementation of Industrie-4.0-solutions
- Seminar series Industrie 4.0

What differentiates your offerings from others? What makes you special?

- Neutral consulting and assessment as independent partner
- Transfer of research results into innovations for industry
- Individual composed project teams
- Excellent research and industry network (e.g. Plattform Industrie 4.0)

Quantitative information:

Number of employees: 506 + 453 research assistants
Number of employees with experience in mechanical engineering or Industrie 4.0: ns
Number of consulting projects in the last 3 years in the area of business models for Industrie 4.0: ns

References in the Industrie 4.0 field

Research projects:

- Virtual Fort Knox research platform
- Future Work Lab
- Applikationszentrum Industrie 4.0
- Mittelstand 4.0

Industry projects:

- HPE: Federal platform Virtual Fort Knox
- Kuka: Business model consulting
- Mitsubishi: IT architecture for production
- Trumpf: Future sheet metal manufacturing

Publications and studies around Industrie 4.0 / Mechanical Engineering / Digitization

(Only available in German)

- »Industrie 4.0: Entwicklungsfelder für den Mittelstand – Aktuelle Hemmnisse und konkrete Bedarfe«
- »Industrie 4.0 – Chancen und Perspektiven für Unternehmen der Metropolregion Rhein-Neckar«
- »Geschäftsmodell-Innovation durch Industrie 4.0«
- Strukturstudie »Industrie 4.0 in Baden-Württemberg«

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Friedrich-Alexander University Erlangen-Nürnberg Chair of Industrial Management

The Chair of Industrial Management at the Friedrich-Alexander University Erlangen-Nürnberg headed by Prof. Dr. Kai-Ingo Voigt deals with the following research and teaching topics: technology and innovation management, (digital) business models, management of industrial companies, Industrie 4.0, industrial services, e-mobility, technology perception, management of global production networks, crowdsourcing, entrepreneurship and creativity management. In addition, the chair draws on a significant number of research projects with well-known companies.

Focus and concept of consulting offerings in the field of Industrie 4.0 and business models

The chair's field of research focuses on the influences of Industrie 4.0 on established industrial business models and the emergence of novel (digital) business models. Furthermore, the implications for small and medium-sized enterprises are analyzed. Associated, the particular focus of the research is on the integration of economic, ecological and social benefits of Industrie 4.0 for the sustainable implementation of the value-adding paradigm. In doing so, particularly quantitative and qualitative empirical research methods are employed in order to provide practical as well as relevant insights and results.

What differentiates your offerings from others? What makes you special?

Contrary to the widespread technological focus of research and discussion on Industrie 4.0, the chair of industrial management takes an economic and business perspective. Accordingly, scientific theoretical and empirical research methods are applied. Particularly the latter allow for valuable insights in managerial practice within the context of Industrie 4.0.

Quantitative information:

Number of employees: 14

Number of employees with experience in mechanical engineering or Industrie 4.0: 5

Number of consulting projects in the last 3 years in the area of business models for Industrie 4.0: 12

References in the Industrie 4.0 field

The chair already presented research results at several conferences and fairs, e.g.:

- Hannover Messe (2015)
- Scientific convention of the Erich-Gutenberg-Arbeitsgemeinschaft Cologne e.V. (2015)
- Symposium "Digitization and Industrie 4.0" of the Ministry of Economy and Finances Baden-Wuerttemberg (2015)
- Annual conference "digitization and added value" at the competence center for business models in the digital world, University of Bamberg (2015)
- Keynote "Wirtschaft 4.0" at the institution of economic research of the chamber of commerce, Bozen (2016)
- Josephs - Die Service Manufaktur, lecture on Industrie 4.0 (2015)

Publications and studies around Industrie 4.0 / Mechanical Engineering / Digitization

- Kiel, Arnold & Voigt (2016) Geschäftsmodelle im Umbruch durch Industrie 4.0. Productivity, 21(2).
- Kiel, Arnold, Collisi & Voigt (2016) The Impact of the Industrial Internet of Things on Established Business Models. Proceedings of the 25th IAMOT Conference, Orlando.
- Arnold, Kiel & Voigt (2016) How Industry 4.0 changes business models in different manufacturing industries. Proceedings of the 27th ISPIM Conference, Porto.

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IPRI – International Performance Research Institute Performance Management in the Era of Industrie 4.0

IPRI is a research institute in the area of performance measurement and management of private and public enterprises. We focus on research projects, working groups and studies regarding questions of performance management within the context of Industrie 4.0. We cooperate with a variety of medium-sized enterprises to develop and implement practical solutions for the performance management in the era of Industrie 4.0.

Focus and concept of consulting offerings in the field of Industrie 4.0 and business models

Our consulting offerings focus on:

- Identification of **digital business models** for manufacturing companies, e.g. by using digital business model patterns or design thinking approaches, as well as
- **Innovation workshops** for further developments within the area of smart production and smart products & services.

What differentiates your offerings from others? What makes you special?

Our offerings are unique because...

- ...the question of how to increase the **economic benefits** of Industrie 4.0 are focused on and
- ...our consulting offerings in the field of Industrie 4.0 have been **implemented successfully in many cases**.

Quantitative information:

Number of employees: about 20

Number of employees with experience in mechanical engineering or Industrie 4.0: 20

Number of consulting projects in the last 3 years in the area of business models for Industrie 4.0: >15

References in the Industrie 4.0 field

The Following references are to be mentioned:

- Development and implementation of the IPRI-Industrie 4.0 Roadmap in several industrial enterprises
- Innovation workshops with well-known Southern German manufacturing companies in the Business Model Lab 4.0
- Big Data analyses like analyses of patents for innovation management as well as evaluation of social media data for capacity planning
- Discussion and further development of our consulting offerings with about 30 companies in the AK 4.0 (in cooperation with IHK Ulm)

Publications and studies around Industrie 4.0 / Mechanical Engineering / Digitization

Publications:

- Roadmap Industrie 4.0 – Guideline for successful implementation of Industrie 4.0
- Industrie 4.0 – 101 Industrie 4.0 business models

Studies:

- Industrie 4.0 – Profit and cost effects in manufacturing companies
- Chances of the digital transformation for companies of the logistics sector

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Roland Berger

Roland Berger advises major international industry and service companies as well as public institutions. Our services cover the entire range of management consulting from strategic advice to successful implementation: e.g. new leadership and business models; innovative processes and services; M&A; private equity and restructuring and management support on large infrastructure projects. Roland Berger is one of the leading consultancies in the field of digitalization.

Consultancy emphasis and consultation concept in the range of Industrie 4.0 and business models

Roland Berger advises users, suppliers of Industrie 4.0 technologies as well as governmental entities and industrial associations. Focal points of our consulting services are amongst others:

- Quick audit – Which i4.0 technologies are already in use and how is the company equipped for i4.0?
- Strategy development
- Program management support for i4.0 activities
- Content-related support to special topics (e.g. Cyber Security)
- Market potential analysis
- Business model realignment

What differentiates your offerings from others? What makes you special?

Roland Berger is the only management strategy consultancy with comprehensive project experience in all relevant areas (users, suppliers and governmental entities / associations) and is thought leader in Industrie 4.0 and digitalization. We create our know-how and offering not at the office desk, but together with our clients.

Quantitative data:

Number of employees: 2,400

Number of employees with expert knowledge in mechanical

engineering and Industrie 4.0: 100

Amount of consulting projects in the last three years on business models for Industrie 4.0: 20

References in the area of Industrie 4.0

Range of accomplished projects performed by users, suppliers and governmental entities / associations:

- i4.0 strategy for one of the world's leading factory automation provider (supplier) – development of a long-term strategy with respect to future product offering, positioning, competencies and partnerships
- Industrie 4.0 agenda and roadmap for a high-tech conglomerate (user) – creation of transparency on existing applications and implications per function as well as identification of need for action and focal points for a business development roadmap
- Study on digital challenges for the German industry sector for BDI – analysis of current conditions and potential value chain scenarios as of 2015, timetable and action plan for the German industry as well as recommendations for government and associations

Publications and studies in the last three years Industrie 4.0 / mechanical engineering / digitalization

- Industrie 4.0 – The new industrial revolution
- Die digitale Transformation der Industrie – Was sie bedeutet. Wer gewinnt. Was jetzt zu tun ist
- The Industrie 4.0 transition quantified – How the fourth industrial revolution is reshuffling the economic, social and industrial model
- Digital factories – The renaissance of the U.S. automotive industry
- Automotive 4.0 – A disruption and new reality in the U.S.
- Cyber-Security – Managing threat scenarios in manufacturing companies
- Predictive Maintenance – Is the timing right for predictive maintenance in the manufacturing sector?

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Extract from:

„Industrie 4.0 Business Models – Overview on Consulting Providers“, VDMA, May 2016

Contact: Michael Kruppa • VDMA Industrie 4.0 Forum • Phone +49 69 6603-1495 • E-Mail michael.kruppa@vdma.org

ROI Management Consulting AG

With more than 2,000 projects to our name, ROI is one of the leading corporate consultants for Research and Development (R&D), Manufacturing and Supply Chain Management (SCM). We assist industrial companies worldwide in optimizing their products, technologies and manufacturing networks and utilizing the potential of the Internet of Things (IoT) for business model and process innovations.

Focus and concept of consulting offerings in the field of Industrie 4.0 and business models

Analysis of Industrie 4.0 potentials
Digitization strategies
Proof of concept and implementation support

Optimization of software development processes and organization

Factory planning

ROI IoT Fab and Learning factor
IoT trainings
IoT testbed – Realization of minimum viable products

Annually awarding the best I4.0 solution in cooperation with the magazine Produktion since 2013

What differentiates your offerings from others? What makes you special?

Seamless and hands-on support from strategy to roll-out
Extensive Industrie 4.0 and IoT Experience
Proven and pragmatic methodologies
Extensive training program
Factory planning based on lean and Industrie 4.0

Quantitative information:

Number of employees: 100
Number of employees with experience in mechanical engineering or Industrie 4.0: 20
Number of consulting projects in the last 3 years in the area of business models for Industrie 4.0: 15

References in the Industrie 4.0 field

Automotive OEM and 1st-tier supplier
Aerospace supplier
Special purpose vehicles
Machine building

Publications and studies around Industrie 4.0 / Mechanical Engineering / Digitization

ROI DIALOG 49: Inside the Smart Factory
ROI DIALOG 48: X-Ray Inspection - Creating and managing transparency
ROI DIALOG 46: New Old Economy - Surviving in an Age of Convergence

Numerous articles in daily press as well as specialist magazines

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Extract from:

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Strascheg Institute for Innovation, Transformation & Entrepreneurship

The Strascheg Institute for Innovation, Transformation & Entrepreneurship (SITE) at the EBS Business School is one of the leading university institutes in Germany for the topics of innovation management, transformation management & entrepreneurship. Following the central idea that “Creating and Managing Success through Innovation”, the SITE focuses on “Generating Innovation”, “Implementing innovation”, and “Controlling innovation”. Hence, the goal is to increase companies’ competitiveness by sustainably increasing their innovative strength. With the foundation of the Center for Digital Transformation, SITE devotes itself to entrepreneurial challenges which companies have to face in order to master the 4th industrial revolution in the most effective and efficient way.

Focus and concept of consulting offerings in the field of Industrie 4.0 and business models

Cross-industry exchange, practice-oriented (project) research and expert coaching in the following fields:

- Big Data / Predictive Analytics
- Business Model Development
- Competence Management
- Controlling & Performance Measurement
- Corporate Management
- Digital Transformation
- Digitization
- Innovation Management
- Security Management
- Tech Start-Ups



What differentiates your offerings from others? What makes you special?

Excellence in research and teaching, competence in state-of-the-art topics as well as a strong network with corporate- and family businesses distinguish our institute. Our foundation consists of long-standing expertise in the industrial and the service sector, which we are steadily developing further. In addition to this, we see ourselves as practical pioneers and sparring partners for new value-creation models and innovation by making use of individual concept and methodology toolboxes. As an independent research institute, we are able to provide you in a neutral way with the newest information from the desired I4.0 subject area and to connect you with our partner network, if necessary.

Quantitative information:

Number of employees: 30
Number of employees with experience in mechanical engineering or Industrie 4.0: 10
Number of consulting projects in the last 3 years in the area of business models for Industrie 4.0: 5

References in the Industrie 4.0 field

- Focus Group, Smart Innovation within Industrie 4.0¹ (Participants: 8 medium-sized to large companies in the mechanical engineering sector)
- Study „Industrie 4.0 at the Hannover Messe 2015“ (Contract Research)
- Study „Trends in Industrie 4.0 2016“ (Contract Research, currently surveyed)
- Study „Information Security in Industrie 4.0“ (Contract Research)
- Study „SMART OpEx – The digital agenda for the COO in the financial and insurance industry“ (Contract Research)
- Numerous expert coachings & Insight Workshops

Publications and studies around Industrie 4.0 / Mechanical Engineering / Digitization

- Gleich/Losbichler/Zierhofer (Eds.): Unternehmenssteuerung im Zeitalter von Industrie 4.0: Wie Controller die digitale Transformation erfolgreich steuern, 2016
- Gleich/Grönke (Eds.): Controlling & Big Data, 2014
- Gleich/Thiele/Munck (2016): Die Auswirkungen von Industrie 4.0 auf das Werkscontrolling von morgen, in: Controller Magazin, 41 (3), p. 78–82.
- Gleich/Schwarz/Munck/Deyle (2015): Industrie 4.0 – zwischen Evolution und Revolution – Potenziale, neue Geschäftsmodelle und Auswirkungen auf das Controlling der Zukunft, in: Horváth/Michel (Eds.): Controlling im digitalen Zeitalter, Stuttgart, p. 101–121.
- Roßmeißl/Gleich (2014): Industrie 4.0 – Herausforderungen für das Produktionsmanagement und -controlling, in: Horváth/Michel (Eds.): Controller Agenda 2017, Stuttgart, p. 23–35.

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UNITY

UNITY is the management consultancy for future-oriented corporate management. We drive our clients' innovative strength and operational excellence as well as support them on their way to Industrie 4.0. Our wide range of consulting services, such as product development, sales, marketing, production and supply chain are an ideal basis for focused Industrie 4.0 consultation. Together, we have been leading projects to success since 1995. Clients from the automotive, aerospace, manufacturing, healthcare and medical technology, energy, pharmaceutical and chemical industries trust our expertise – from SMEs to global players. With 210 employees, we are present at 14 locations worldwide and lead projects around the globe.

Focus and concept of consulting offerings in the field of Industrie 4.0 and business models

- Potentials Analyses Industrie 3.x/4.0, Assessment/Readiness Check
- Strategy-, Business Model Development
- Digitalization
- Architectures/Technology/Platforms
- Automation MES
- Work 4.0/HR/Chance Management
- IT-Conception, IT/OT-Architectures, IT-Security concepts
- End-to-End-Processes in production und in the supply chain
- Transformation und Roadmapping

References in the Industrie 4.0 field

- Industrie 4.0 Readiness CAD/CAM for Voith Turbo
- Market and feasibility study for the product portfolio of „Digital Plant“ at Siemens
- Factory planning for the restructuring of Wheels & Brakes at Lufthansa Technik
- Smart Factory Planning for CP autosport
- Business model development and the benefits of vehicle data for connected services for an automotive OEM
- Development of IoT business models for a pump manufacturer
- Technology Roadmap: Backend-functions and technologies for highly automated driving for an automotive-OEM

What differentiates your offerings from others? What makes you special?

Our clients profit from our direct link to science and research in Industrie 4.0 projects. UNITY is a core member of the Leading-Edge Cluster „it's OWL“ (*Intelligent Technical Systems OstwestfalenLippe*), that has a research budget of 100 Mio. euros and is one of the most significant projects in the context of Industrie 4.0. Furthermore, we actively participate in other research projects such as GEMINI -“Business Models for Industrie 4.0“ and Inbenzchap – “International Benchmarks in Industrie 4.0“, and are involved in various thematic networks at acatech, the core driver of Industrie 4.0 in Germany. In addition, UNITY is a member of the Smart Electronic Factory that creates, tests and validates Industrie 4.0 solutions in a real production environment for mid-sized companies.

Publications and studies around Industrie 4.0 / Mechanical Engineering / Digitization

- Series OPPORTUNITY: “Seize the Opportunity of Industrie 4.0“ and “Systems Engineering-The Next Level of Product Development“
- Book “The Management Issue of IT – How Cloud Computing and Social Media Can Drive Business Growth“
- Study: Success Factors in Reference Architectures, “On the Way to Industrie 4.0,” a series by Leading-Edge Cluster “it's OWL“
- Lünendonk Handbuch Consulting 2016: Article „Industrie 4.0 – Corporate IT as a Strategic Success Factor for Future Competitiveness“

Quantitative information:

Number of employees: **210**

Number of employees with experience in mechanical engineering or Industrie 4.0: **130**

Number of consulting projects in the last 3 years in the area of business models for Industrie 4.0: **40**

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Extract from:

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Dr. Wieselhuber & Partner GmbH

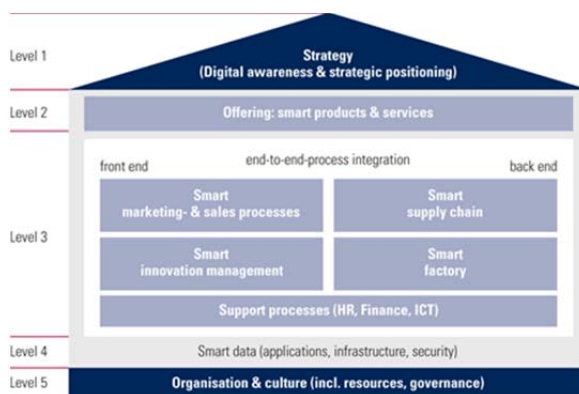
Dr. Wieselhuber & Partner is an experienced professional management consultancy for companies of all sizes in a wide range of industry sectors.

We put a focus on strategy implementation, digital transformation, leadership management, innovation and new business, sales and marketing, operations, optimization of capital resources and structural financing, as well as restructuring and reorganization in order to support the top management and eliminate corporate crises.

Focus and concept of consulting offerings in the field of Industrie 4.0 and business models:

- Digital strategy and business (re-)modelling
- Development of smart products and services
- Digitalization of the customer interface (front end)
- Agile production and supply chain (back end)
- End-to-end process integration

W&P digitalization house:



What differentiates your offerings from others? What makes you special?

1. Comprehensive consulting approach: strategy and business model, operating model and process and technology excellence, financing and investment management
2. Pragmatic, hands-on approach with focus on family-owned business and small and middle-sized enterprises
3. Individual solutions based on the specific situation of the company and its industry (no „stereotype solution“)
4. Neutrality towards IT and software providers
5. Thirty years of successful collaboration with our clients

Quantitative information:

Number of employees: 90

Number of employees with experience in mechanical engineering or Industrie 4.0: >30

Number of consulting projects in the last 3 years in the area of business models for Industrie 4.0: >20

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References in the Industrie 4.0 field:

- Redesign of business model, incl. development of smart services
- Machine integration for establishment of production controlling in real time
- Customer analytics and collaborative planning as key element of a strategic & operational planning process
- Creation of an end-to-end planning across CRM, SCM and PLM modules
 - Conception of lot size 1 manufacturing
 - Predictive maintenance to increase overall equipment effectiveness (OEE)
- Optimization of production and capacity planning thanks to a connected production in real time

Publications and studies around Industrie 4.0 / Mechanical Engineering / Digitization (in German)

- „Chancen der Industrie 4.0 erkennen und nutzen“
- „Geschäftsmodell-Innovation durch Industrie 4.0“
- „W&P-Digitalisierungsleistungsprospekt“
- „W&P-Operations-Leistungsprospekt“
- „W&P-Management Support H1 2016“
- „W&P-Restructuring & Finance 2016: Digitalisierung“

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