

Internet of Things – Industry 4.0

Role of the Chemical Industry

Second Circular



Thursday, September 1st, 2016
Merck KGaA
Atrium, Building B4
Darmstadt, Germany

INDUSTRY 4.0

The keyword “Industry 4.0” is no longer only an empty cliché or a black box, it is currently probably the most important topic within German economy.

More and more companies from different industries have already identified the potential of first approaches and solutions. Yet: Not only will existing processes be revolutionized – but also new businesses and business models will arise.

In general, “Industry 4.0” is a key factor for the sustainability of the German industry and specifically for the chemical and pharmaceutical industry. It is not about if the fourth industrial revolution will take place or when – it is about who can set technology standards and the universal language to create a billion dollar business.

Different quotes may illustrate the game-changer-potential of “Industry 4.0”:

“The economy is on the threshold of the fourth industrial revolution. Therefore, the real and virtual internet world will grow together to the internet of things.”

(High-tech Strategy of the German Ministry of Science and Education)

“Industry is the driving force for innovation, growth and social stability. At the same time, competition gets more intensive. Customers are expecting shorter intervals for new, high quality products and a personalized offer. The solution: “Industry 4.0”, the vision of a German high-tech strategy for the future of the industry.”

(Siemens)

“Today, after the steam engine, the assembly line and electronic devices, our economy will see the fourth industrial revolution: the networking of products, machines and tools in the “Industry 4.0.”

(Der Spiegel)

How do companies implement industry 4.0?

- How to prepare the organization for the upcoming transformation implicated by 4.0?
- How to create radical innovative business models?
- How to create new sets of Key Performance Indicators (KPIs) and how to change organizational forms?
- How will the organization 4.0 look like?
- How will we measure the performance of a business characterized by its rapid business model changes?

What will industry 4.0 mean for the chemical industry?

A chemical company is naturally process oriented, with excellence in managing ultra-complex processes, very strong in product and processes innovation in existing business models – but we may be less well prepared for very dynamically changing business model environments.

- What future business models will arise through the data made available that will play a role in the changed eco-systems of the value chains?
- How will data integration change our manufacturing capabilities and IT infrastructure?
- What should we do to evaluate and prepare for industry 4.0?
- On which basis do we decide to invest into a 4.0 business model, if not NPV?

AGENDA

What are the perspectives & lessons learned
from trendsetters & early movers and niche players?

What are the different views from the chemical
industry?

Industry 4.0 – Role of the Chemical Industry

Potential Paradigm Shifts in Value Creation-Business Modell

AGENDA

09:30	Introduction	Prof. Dr. Klaus Griesar/ Dr. Hervé Baratte		
09:45	Key Note	Oliver Edinger	Industrie 4.0 and the Internet of Things – Big Deal or Big Hoax for the Chemical Industry?	SAP
10:25	Case Study	Miguel Angel Fernandez	Is the Chemical Industry ready for Digitalization?	Siemens
10:55	COFFEE BREAK			
11:25	Case Study	Dr. Matthias Manger/ Patrick Strauss	Bringing IoT to Effective Pilot Operation	IBM
11:55	LUNCH BREAK			
13:25	Case Study	James Kugler	Pragmatically Radical Digitalization	Merck
14:05	Selected Topic	Tobias A. Thiele	Next Generation Laboratories – How Industry 4.0 will Change the Lab Industry in the Near Future	Köttermann Systemlabor
14:35	Case Study	Dr. Frithjof Netzer	BASF 4.0 - Driving Digital Transformation in the Chemical Industry	BASF
15:15	COFFEE BREAK			
15:45	Case Study	Dr. Wilhelm Otten	Industry 4.0 in Process Industry – An Opportunity to foster Productivity and Flexibility	Evonik Industries
		Henrik Hahn	Industry 4.0 – just a technology fad or driver for growth	
16:25–16:40	Closing Remarks	Prof. Dr. Klaus Griesar/ Dr. Hervé Baratte		

IoT is much more than IT technology.

Industry 4.0 is much more than manufacturing process optimization.

Organization Committee

Dr. Hervé Baratte | Prof. Dr. Klaus Griesar | Manuela Wallesch

CONFERENCE PROGRAM

09:30 – 09:45**Introduction***Prof. Dr. Klaus Griesar & Dr. Hervé Baratte*

09:45 – 10:25**Industrie 4.0 and the Internet of Things – Big Deal or Big Hoax for the Chemical Industry?***Oliver Edinger (SAP)*

- Unravel the “tech babel” of Industry 4.0, Internet of Things, Smart X, and Digitization
- What areas that can best benefit from the use of new digital technologies
- The Internet of Things is no science fiction – Examples from various industries
- How to succeed and lead the pack in absence of established best practices

10:25 – 10:55**Is the Chemical Industry ready for Digitalization?***Miguel Angel Fernandez (Siemens)*

- Market observation shows a slow adoption of digital solutions in the chemical industry.
- While the necessary technology is available today – e.g. by leveraging data for process optimization – the implementation is progressing slower than in other industries.

11:25 – 11:55**Bringing IoT to Effective Pilot Operation?***Dr. Matthias Manger, Patrick Strauss (IBM)*

- Interactive style discussion leveraging lessons learned from IBM’s IoT engagements
- Main focus on process domain
- Outline on core drivers and ingredients for successful piloting
- Potential and practical focus areas for quick-wins

CONFERENCE PROGRAM

13:25 – 14:05

Pragmatically Radical Digitalization

James Kugler (Merck)

- Leveraging technology to make people's lives easier
- Rethinking business model
- The power to predict

14:05 – 14:35

Next Generation Laboratories – How Industry 4.0 will Change the Lab Industry in the Near Future?

Tobias A. Thiele (Köttermann Systemlabor)

- Status quo laboratories
- Trends
- Together we are strong – Nexygen® faces Lab 4.0
- Products, services, new business modelss

14:35 – 15:15

BASF 4.0 - Driving Digital Transformation in the Chemical Industry

Dr. Frithjof Netzer (BASF)

- Digital trends & core technologies
- Topline growth through digital models & connectivity
- Change management through digital transformation campaign

15:45 – 16:25

Industry 4.0 in Process Industry – An Opportunity to foster Productivity and Flexibility?

Dr. Wilhelm Otten (Evonik Industries)

- Industry 4.0 has been focused mainly on mechanical production at the beginning
- The new element are cyber physical systems that are able to communicate
- For process industry, this implies transparency and efficiency in three dimension: Supply chain, asset life cycle and vertical integration
- These developments are enablers for increasing efficiency and new production technologies, i.e. remote operation and modular plants

Industry 4.0 – just a technology fad or driver for growth

Henrik Hahn (Evonik Industries)

- Globally, the chemical industry is discussing the potential impact of Industry 4.0 extensively.
- Whereas the term Industry 4.0 has been coined more in the technical context, the market and customer perspective can be regarded as the strategic tie-in for value creation by digitalization. Looking at relevant end markets it can be observed that digital technologies and data-driven businesses change the competitive landscape with implications along the value chains.“

16:25 – 16:40

Closing Remarks

Prof. Dr. Klaus Griesar & Dr. Hervé Baratte

SPEAKERS



**Oliver
Edinger**
SAP

*Vice President and
Head of Internet
of Things / Industrie 4.0 Germany*

Oliver Edinger serves as Vice President and Head of Internet of Things/Industrie 4.0 Germany at SAP Deutschland SE & Co. KG. Mr Edinger and his team of cross-functional experts are responsible to engage with customers on their Internet of Things and Industrie 4.0 journeys and bundle all the SAP expertise required to help customers to succeed on their mission.

From 2003 until 2006 Mr Edinger was a member of the executive leadership team and authorized officer of a mid-sized consulting company.

After rejoining SAP in March 2006 Oliver Edinger held various sales and sales management positions, including the one as Managing Partner for SAP's global SIEMENS business.

Mr Edinger holds a degree in business administration from the University of Giessen.

“The Internet of Things blurs the boundaries of markets. And there is no reason why the next UBER, the next airbnb, the next Amazon or the next 3D printer manufacturer will not emerge in the chemical industry and eat your lunch. In order to stay relevant, incumbents must leverage Internet of Things capabilities to further improve operational efficiencies, products, services and last but not least re-imagine business models.”



**Miguel Angel
Fernandez**
Siemens

*Process Industries and Drives
Division
Process Automation
Automation and Engineering*

Mr. Miguel Angel Fernandez holds a degree in physics of the University of Karlsruhe / Germany. He joined Siemens in 1986 and held various positions in PM for Process

Control and sales in the chemical and pharmaceutical market for automation and control systems. Since 2008 he is responsible for sale into the chemical industry covering the portfolio of Automation systems, Field-Instrumentation, Drives, Motors and the subsequent services.

“The digital transformation in the chemical industry has started already. Nucleus of this transformation are companies willing to question their traditional procedures. With the concept of the digital enterprise Siemens offers solutions to take advantage of the available tools today and to improve efficiency via integrated engineering and integrated operations.”



**Dr. Matthias
Manger**
IBM

*Associate Partner Pharma Life
Sciences*

PhD degree in Chemistry

16 years of experience in SC operations strategy consulting and implementation for Life Sciences and other industries

Subject Matter Expert (e)commerce and multi-channel distribution solutions in Retail



**Patrick
Strauss**
IBM

*Subject Matter Expert for Supply
Chain Visibility and Internet
of Things (IoT), Industry 4.0*

15 years of practical M2M & IoT experience across various industries.

Subject Matter Expert on Supply Chain Visibility.

Industrialist Lecturer for Supply Chain and IoT at Cranfield University, UK.

“IoT has the power to involve and impact the whole organization. As such, it requires a framework and technical resources supported by corporate senior management and finance but, at the same time small IIOT projects can result in important early wins. Thus basing IIOT on processes and a culture that encourages local business units to experiment and continuously innovate and improve is critical referencing most recent project experience from IBM.”

SPEAKERS



**James
Kugler**
Merck

Chief Digital Officer

Degree in Biomedical Engineering from Washington University in St. Louis.

Research experience at Harvard & MIT in Bioinformatics, Computational Biophysics, Genomics / Genome Sequencing.

Started working at Sigma-Aldrich in 2008 in Corporate Strategy & Planning, then moved to eBusiness, Global New Product Development & Introduction, Biology Product Management, and back to eBusiness.

Big nerd.

“Digitization – Driving innovation faster forward.”



**Tobias A.
Thiele**
Köttermann Systemlabor

Managing Director

Managing Director at KÖTTERMANN Systemlabor (280 employees), leading manufacturer of laboratory furniture made of steel.

Former: Marketing & Innovation Director at SCHOTT Glas.

Member ofACHEMA-Committee and ofVGKL (association of wholesale and foreign trade of nursing and laboratory supplies).

Participation in Committees, e. g., FNL a (DIN Standards Committee Laboratory Devices and Installations) and CEN (European Committee for Standardization).

“Industry 4.0 will change our business tremendously. The slow and traditional companies will see this as a thread. A 70 year old lab furniture manufacturer sees this as a great opportunity. Let us think disruptive!”



**Dr. Frithjof
Netzer**
BASF

*Senior Vice President,
Project Leader BASF 4.0*

Frithjof Netzer leads the digital transformation at BASF across divisions, regions and functions with the BASF 4.0 project.

Digital core technologies such as internet of things, big data analytics, mobility devices and augmented reality are systematically merged with BASF's value chain. This includes procurement, supply chain, logistics, engineering, manufacturing, marketing & sales and innovation. Based on this BASF adds value to customers through digitally enabled products and services. Horizontal and vertical connections are used to increase effectiveness and efficiency of customer and supplier interactions. Frithjof joined BASF in 1999 and held a variety of business and procurement leadership roles in coatings, hygiene, petrochemicals and performance chemicals. His jobs were located in Münster / Germany, Mt. Olive, NJ (USA), Charlotte, NC (USA), Ludwigshafen / Germany and Hong Kong.

He holds a doctoral degree in business administration from the University of Münster, Germany based on research work in the airline industry.

“Shaping powerful digital ecosystems with internal and external partners is a key to success.”



**Dr. Wilhelm
Otten**
Evonik Industries

*Technology & Infrastructure
Head of Process Technology &
Engineering*

Education: Mechanical engineer incl. automation, PhD in process engineering

Experience in process, project and plant engineering and services, controlling and management

Head of Evonik Process Technology & Engineering

Chairman of the Board of NAMUR (international association of users of automation technology)

“Industry 4.0 has reached process industry. Technological developments are well aligned in process industry and have accelerated in the recent years. Nevertheless gaining the benefits and increasing productivity and flexibility are the major challenges.”



**Henrik
Hahn**
Evonik Industries

Digitalization Strategy

Since 01/2016 Head of Digitalization Strategy, Evonik Industries AG

From 01/2013-12/2015 Strategy Consultant, Evonik Industries AG

From 08/2007-12/2012 Head of a Corporate Start-up, Evonik Industries AG

Academic background in process technology and economic sciences

“Ultimately, digitalization is not a technical topic, but will affect interactions with customers and how we run, grow and innovate our businesses – the way we work. It's not just about data - trust is the very currency of the digital age.”

Participants

Around 130 participants are expected – mostly from the chemical industry, involved in Business Management, Marketing & Sales, R&D, and Business Development ...

Location

Merck KGaA
Frankfurter Straße 250
64293 Darmstadt, Deutschland

How to get to Merck: see next pages

Association for Chemistry & Economics

The Association for Chemistry & Economics (VCW) is the established network for chemists and other employees in the German chemical industry with focus on economic issues. VCW is a forum of discussion for chemists with economy-oriented background. VCW organizes activities, such as conferences, workshops, training and seminars.

For more information:
www.gdch.de/vcw

HOW TO GET TO MERCK | Directions for passenger cars

Merck KGaA · Frankfurter Str. 250 · 64293 Darmstadt, Germany

Merckgroup.com

A5 – coming from the north or south:

Leave the autobahn at the exit “Darmstadt Nord/Industriegebiet”.
(see FURTHER DESCRIPTION below)

A67 – coming from Mainz:

Leave the autobahn at the exit “Büttelborn”, follow the **B42** towards **Weiterstadt**, then drive towards **Darmstadt**, cross the bridge over the **A5**.
(see FURTHER DESCRIPTION below)

A67 – coming from Mannheim:

When you get to the autobahn junction **Darmstadt**, change to the **A5** going towards **Frankfurt** and continue until you reach the exit “**Weiterstadt**”.
(see FURTHER DESCRIPTION below)

FURTHER DESCRIPTION:

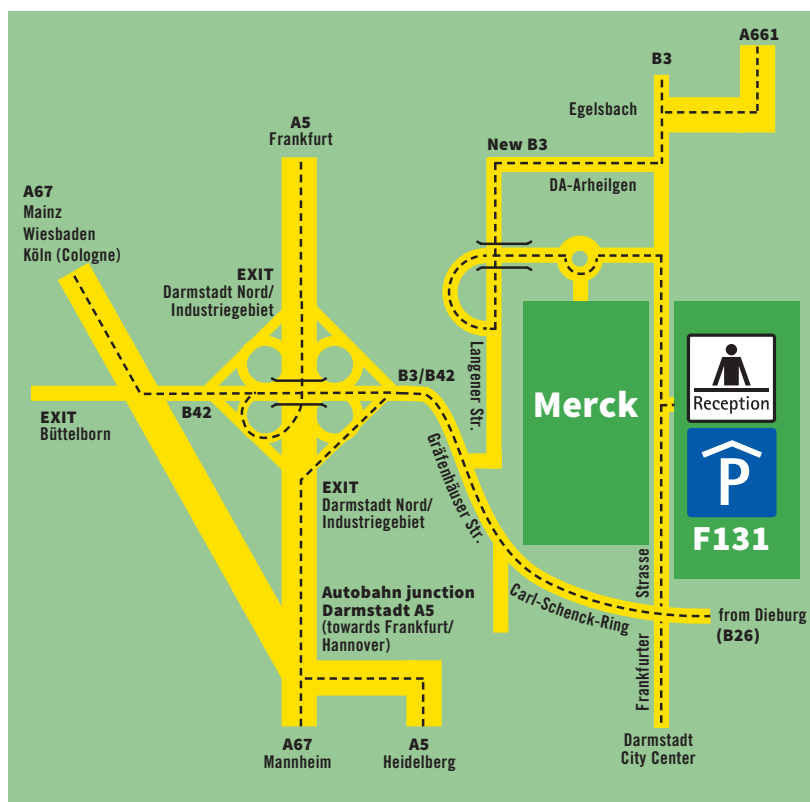
After exiting the autobahn at **Darmstadt Nord/Industriegebiet**, or after crossing the bridge over the **A5**, take the **B42/B3** (Gräfenhäuser Strasse) towards Darmstadt.



Follow the sign “**Merck for passenger cars**” shortly before the railway underpass. After the railway underpass at the major traffic light intersection, continue straight ahead towards **Messel** via the **Carl-Schenk-Ring** up to the set of traffic lights on **Frankfurter Strasse**. Turn left here. Around 300 meters after the **Shell filling station** (on your right) you will turn right to reach the signposted **visitors’ parking garage** (“**Besucherparkplatz**”).

A661 – coming from the northeast:

After the **A661** autobahn converges with the **B3** in **Egelsbach**, continue driving towards Darmstadt, then follow the **B3** (**Langener Strasse**) and turn right towards **Darmstadt-Arheilgen Süd**. At the traffic circle, take the second exit onto **Virchowstrasse**. After 300 meters, take a right at the traffic light onto **Frankfurter Strasse**. Follow the signs to the **visitors’ parking garage** (“**Besucherparkplatz**”).



Coming from Darmstadt City Center or the B26 from Dieburg:

Follow the **Rhönring** or the **Cityring**, turn onto the **Frankfurter Strasse** towards **Darmstadt-Nord/Arheilgen**. After passing the **Shell filling station**, turn right after about 300 meters to get to the signposted **visitors’ parking garage** (“**Besucherparkplatz**”).

VISITOR RECEPTION:

Our Visitor Reception is located above the parking garage. Our staff at Visitor Reception will be happy to assist you further.

Please be sure to bring a **valid form of identification** with you (e.g. identity card or passport).

HOW TO GET TO MERCK | Arriving by public transport

Merck KGaA · Frankfurter Str. 250 · 64293 Darmstadt, Germany

Merckgroup.com

If using long-distance rail connections ...

you will arrive at the **Central Railway Station** (“**Hauptbahnhof**”) in Darmstadt (rail timetables at www.bahn.de). You will then need to get to the **Merck visitors' entrance**, **Frankfurter Strasse 250**.

By train:

- Visitors arriving at “**Darmstadt Hauptbahnhof**” (**Darmstadt Main Station**) can reach the “**Nordbahnhof**” (**North station**) by changing to a connecting train traveling to **Dieburg-Aschaffenburg** or to **Wiebelsbach-Heubach** and **Erbach** in the Odenwald.
- Visitors arriving by train from the direction of **Dieburg**, **Aschaffenburg** or **Erbach** in the Odenwald can exit the train at “**Darmstadt-Nordbahnhof**”.
- From “**Frankfurt Hauptbahnhof**” (**Frankfurt Main Station**), there is a direct connection to the “**Nordbahnhof**” every two hours.

Trams and buses:

- You can take the **H-Bus** (direction **Kranichstein**) or **F-Bus** (direction **Oberwaldhaus**) to the **Luisenplatz** and then change to a **No. 6, 7 or 8 tram** in the direction of **Arheilgen**, and get out at the **Merck tram stop**.
- You can take the **No. 2 tram** (direction **Böllenfalltor**), **No. 3 tram** (direction **Lichtenbergschule**) or **No. 5** (direction **Kranichstein**) to “**Luisenplatz**”, then change to a **No. 6, 7 or 8 tram** in the direction of **Arheilgen**, and get out at the **Merck tram stop**.
- You can take the “**R**” bus from “**Hauptbahnhof**” to “**Nordbahnhof**” and walk approximately 3 minutes to the **visitors' entrance** in building **F131**.



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