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The future of Swiss  
manufacturing is smart

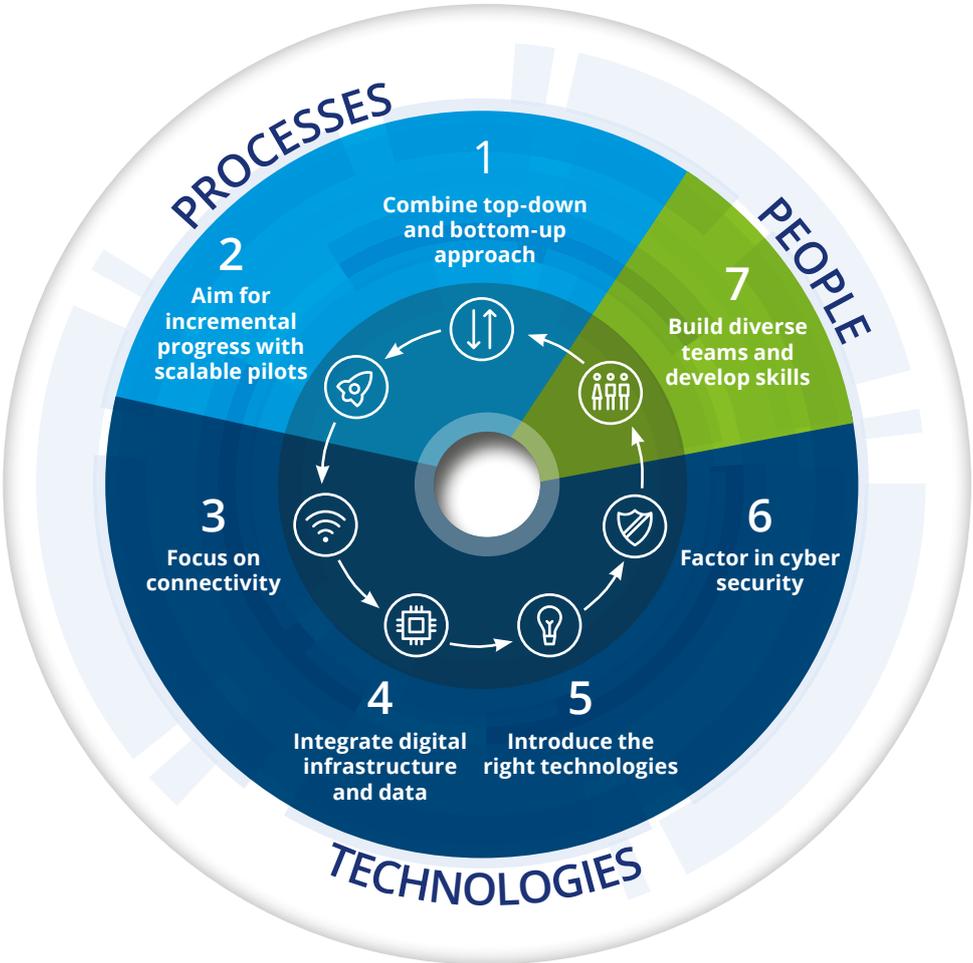
# Table of contents

Introduction	<b>03</b>
Combine top-down and bottom-up approach	<b>04</b>
Aim for incremental progress with scalable pilots	<b>05</b>
Focus on connectivity	<b>06</b>
Integrate digital infrastructure and data	<b>07</b>
Introduce the right technologies	<b>08</b>
Factor in cyber security	<b>09</b>
Build diverse teams and develop skills	<b>10</b>
Conclusion	<b>11</b>
Interviews	<b>12</b>
Authors	<b>17</b>

# Introduction

There is broad consensus amongst manufacturers that smart factories are strategically important and will be a game-changer for operations in the future. Given both the operational effectiveness and cost efficiencies, as well as the boost to competitiveness and sustainability, that smart factories offer, it is clear that they hold huge potential to transform the way products are made. Manufacturing companies in Switzerland have started to implement smart factory transformations and find themselves at different points on their journey. To better understand their experiences and learnings so far, we interviewed a range of senior leaders who are involved in smart factory initiatives within their organisations.

These discussions with key players across the manufacturing sector in Switzerland revealed a consistent set of considerations which are critical to successful smart factory implementation. These include:



# 1. Combine top-down and bottom-up approach

Smart factory transformations require a significant investment of time, people and financial resources. For this reason, strong and visible leadership is critically important to get the rest of the organisation on board and successfully drive such a change.

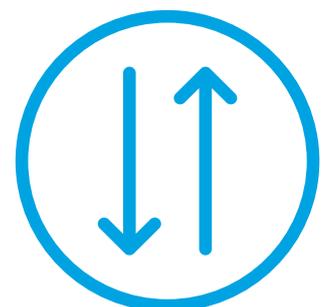
Internal engagement over this period is usually challenging as such an organisational change has significant potential to impact the roles of employees. In this regard, [Daniel Meier, Vice President Design & Manufacturing at Burckhardt Compression](#), refers to the 'accordion effect', commenting that 'the great initial enthusiasm is often followed by a decline in momentum when realising how holistic and huge the transformation will need to be.' It is therefore important that the change effort is led from top down with clear and consistent leadership communication.

Companies agree that successful smart factory implementation also requires cross functional support within the company. To truly optimise such a transformation,

other functional leaders – for example, supply chain, operations, procurement and others – will need to apply their minds to both the impact and potential of the smart factory on their own business areas, as well as to how it affects collaboration with other areas. According to [Alberto Martinez, Chief Digital Officer at Bystronic Group](#), 'Competition across silos such as design, manufacturing or sales, can result in a disconnect. To achieve end-to-end connectivity, it is important that everyone shares information and learns from each other.'

The 'bottom up' effort is also critically important. The shop floor is considered key to a successful smart factory implementation. Employees on the ground – such as plant managers, engineers, operators, technicians and others – are well positioned to both drive the change and also advocate for the expected benefits. For example – Burckhardt Compression runs a bottom-up project using a cell logic which focuses on smart factory value creation across

5-6 areas. 'There is no one-size fits-all approach and the depth of automation within each area is different' says Burckhardt Compression's Daniel Meier.



## 2. Aim for incremental progress with scalable pilots

Generally, while manufacturing companies in Switzerland agree that greenfield situations present the best opportunities to start a smart factory journey, there is acknowledgement that digitalisation of factories can also happen brownfield where many opportunities for automation may exist – even though it can be more challenging to do, given the potential disruption involved. According to [Guilherme Rocha, Senior Digital Project Manager at Oerlikon Digital Hub](#), 'The road from prototypes to business impact is a long one.' Most companies seem to favour developing an overall roadmap but then following an incremental approach where the implementation of smart technologies often initially happens in smaller batches or in scalable pilot projects, with wider roll-out or large scale implementations following later. In this way they can start small, learn and adapt, and then scale their solutions more broadly.



### 3. Focus on connectivity

Companies in Switzerland agree that connectivity and appropriate digital infrastructure is key to the success of smart factory initiatives. In the absence of new applications and processes being able to connect to the network, sharing and accessing information will simply not be possible. The connection of IT with OT enables automation, generates more predictive and adaptive data and creates the added value required for successful smart factory transformations. 'We have an end to end vision to become more connected right across the value chain with the help of technologies' says Guilherme Rocha at Oerlikon Digital Hub. To achieve this we 'work off a foundation of standard process integration, collect data from production sites and supply chains and finally introduce more IoT in production to leverage more data and create more value for our customers.'

Connectivity underpins the interaction of all digital parts in the manufacturing process. While, initially such digital

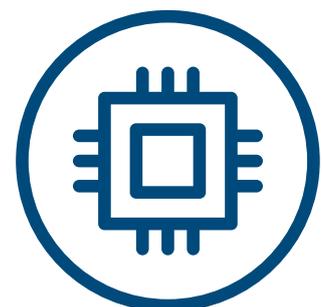
interaction may start with off the shelf technologies like smart phones/tablets, ultimately it has the potential to move everything. With this in mind, the range of machinery and devices across which connectivity needs to happen is also important. Smart factory implementation often involves connecting old machines with newer and more advanced manufacturing technologies. This means that data can take many formats and cleansing and mapping efforts are crucial to ensure that data from one system can be combined and leveraged with data from another.



## 4. Integrate digital infrastructure and data

Developing a master data point of view is one of the biggest challenges in smart factory implementation. The migration and mapping of legacy data, in particular, can be difficult – especially when some manufacturers are heavily file based and this needs to be transformed into a new process flow. Any successful smart factory transformation will need to factor in consistent and accurate data communication from engineering through to manufacturing and across potential legacy systems. While hardware connectivity is easier to achieve in IT/OT integration, some manufacturers express reservations about machine performance being potentially impacted when an IoT box is connected to the controls. For this reason, developing a broader integration between IT and OT and achieving balance among their competing priorities (for example – maintaining system integrity for IT and managing the reality on the shop floor for OT) is a key focus.

Overall, there is definitely greater openness to digitise and automate processes as manufacturers acknowledge that customer expectations are changing and different user experiences are required. The pandemic context has only accelerated the need for more remote services and controls. [Thorsten Mathäus, Global Business Development Manager Logistics at ABB Robotics](#), points out that 'Reacting to such new customer requirements will also require new distribution models and manufacturers will have to act fast and learn from other industries that are leading in this space. Often the products that come out of the smart factory are still moved manually. New transport modes and paths ensuring faster and more timely delivery to customers will need to be enabled with the help of IoT.'



## 5. Introduce the right technologies

While most manufacturing companies in Switzerland are keenly observing the key smart manufacturing trends and development of the latest technologies, there is broad agreement that the flow and collection of accurate data is a foundational element for new enabling technologies to facilitate smart factory success. With this in mind, technologies such as AI, sensors and networks are expected to play an even greater role in the future – especially given the potential they hold to transform and combine diverse data to create added value for manufacturing processes.

Thanks to analytics and machine learning, the opportunity to look at data in a different way and correct inaccurate data in advance can provide a significant advantage. Covid 19 has clearly sped up the development of technical solutions and innovations. For example – VR and AR goggles can be used during acceptance testing when physical presence is limited.

[Yann Ulrich, Portfolio Manager Digital Enterprise at Siemens Schweiz AG](#), mentions 5G being a key trend that allows for less latency and more performance which is specifically relevant for edge computing. 'This technology will allow for fragmented data from different systems to be newly calculated,' he says.

3D printing is also regarded as an important future trend with potential to be a game changer – however, currently the biggest barrier to entry remains the size of components, cost of materials and process times. While blockchain is not necessarily seen as essential to track and trace within companies, in the context of smart technologies to support sustainability, it could potentially be used to trace raw material in the supply chain. Companies are of the view that technologies which increasingly anticipate customer expectations such as real-time tracking across product life cycles or production and distribution processes, will definitely play a greater role in the future.



## 6. Factor in cyber security

Cyber security is becoming increasingly important as manufacturing companies in Switzerland progress further along their smart factory journey. According to Guilherme Rocha at Oerlikon Digital Hub, 'The more we digitise the greater our vulnerability. Data sharing will have to factor in value to be shared, as well as confidence in the security aspects of sharing.' Ensuring appropriate security solutions in the face of cyber risks will require clear communication and increasing cross functional co-operation between IT and operations – functions that are usually not directly interfacing with each other. Cyber security/risk will also need to form part of ongoing learning and development interventions that will be designed to support smart factory implementations.



## 7. Build diverse teams and develop skills

It is clear that successful smart factory transformations require diverse teams with a range of different capabilities. Key skills include engineering, information technology, supply chain, production, data management, analytics, digital marketing, finance and user interface designers, among others. Cross-functional teams will also help to boost innovation and ensure that the smart factory offers value across the whole organisation. It is therefore important that leaders of smart factory implementations ensure that the right skills are recruited and deployed at the right time.

Manufacturing companies in Switzerland are well aware of the need to build the pipeline of talent, skills and new ways of thinking and working, to achieve successful smart factory transformations. Many are ramping up smart factory capabilities with a specific focus on critical thinking, digital expertise, engineers and specialists in IT and automation.

According to Burckhardt Compression's Daniel Meier, 'Job profiles and required skills

are continuously changing on the shop floor. Nowadays, work preparation (AVOR) also includes data integration, simulation and programming, in addition to tools set-up and controls.' The right talent is being sourced both internally and externally. Yann Ulrich at Siemens Schweiz AG refers to 'Siemens' 'growth mindset' campaign which supports a continuous learning and development agenda.' He also mentions the 'importance of leaders driving ongoing learning rather than it being solely an individual responsibility.' The ability of companies to attract new skills (for example – collaboration with universities and other partners), build on existing skills sets and create a culture of constant learning, will be critical to drive the acceptance of smart factory solutions and support employees as they adapt to the changes.



# Conclusion

While it is clear that the future of manufacturing in Switzerland is increasingly smart, there is no single approach to a successful smart factory implementation. Companies will have to remember – apart from the technological considerations such as connectivity and digitalisation and the inherent potential of using accurate data to inform operational and strategic shifts – that people remain at the centre of their smart factory transformations. In this regard, the right kind of leadership will be critical to navigate the journey. For companies who have already started, it will be important to keep moving forward or even accelerate the pace and for those who have yet to start, it will be important that they do so now.

# Interview with **Daniel Meier**, Vice President Design & Manufacturing at Burckhardt Compression



**Deloitte:** Can you describe what smart factory is for you?

Daniel Meier: Smart factory concepts usually involve a combination of humans and machines, of process knowledge and new manufacturing technologies. Since the picture is changing all the time 'smart' means finding the best combination, at any given point in time, for manufacturing processes. At Burckhardt Compression we do not have a high repetition of processes and are therefore not doing a lot of data simulation or machine learning, by way of example. Despite this, we will still need to master a broad range of technologies and processes to optimise our manufacturing capability.

**Deloitte:** What is your smart factory strategy and vision?

**Daniel Meier:** We recently launched a new five-year initiative at our Swiss manufacturing location, which is driven by two elements, i.e., high productivity and high flexibility. Smart factory initiatives have the potential to promote the manufacturing location Switzerland despite it being a high-cost location. This is made possible by easy access to experts from diverse areas who can help you to make great productivity gains. Our slogan/vision 'Machining 3020' speaks of achieving 30% lead time and 20% cost reduction within the current manufacturing process.

**Deloitte:** Do you have any best practices to share with regard to the smart factory implementation process?

**Daniel Meier:** It is important to be close to the shop floor, start with pilots and enable the organization to realize the transformation on their own.

We have a bottom-up project that has a cell logic and focuses on key value creation areas. Across our 5-6 chosen cells we focus on optimization and lean concepts. There is no one-size-fits-all approach and the depth of automation within each of the cells will

be different. We have also initiated a 'Digital Innovation Unit' that, together with IT, identifies and optimises customer and business process opportunities across all areas.

Our smart factory project has gone very well so far, confirming that our decision to start and invest in such a journey in the manufacturing location Switzerland, was a good one.

The basic transformation is planned for a period of three years, at the end of which we will be able to observe the physical and optical changes and confirm the use case. This will serve as a basis for the next steps. It will also be important to define and integrate a new culture of work in the smart factory environment, as we did whenever we implemented lean concepts.

**Deloitte:** What do you see as the biggest challenges of a smart factory implementation process?

**Daniel Meier:** Currently, the biggest challenge is the consistency of data for an accurate end-to-end view. Good data communication from engineering through to manufacturing or other areas can be tricky in a legacy set-up.

In deciding where it makes sense to make the first changes, it is best to first develop an overall map but then to follow an incremental approach for implementation.

Another challenge is how to deal with the 'accordion effect' – the great initial enthusiasm, followed by a decline in momentum when realising how holistic and huge the transformation will need to be. This can impact project scope and progress. Such setbacks however are part of, and offer some important lessons during, the transformation journey.

**Deloitte:** Do you have the right talent in your company to successfully implement your smart factory plans? What skills and mindset will your employees need in the future smart factory?

**Daniel Meier:** We have skilled and experienced staff. There is a mix of both internal and external experts with application experience who are tasked with implementation.

Job profiles and required skills are continuously changing on the shop floor. In the past, the work preparation – or AVOR, as it is called in Switzerland – included only tools set-up and controls. Nowadays however, AVOR includes production engineering, as well as data integration, capture, simulation and programming amongst others.

**Deloitte:** What do you see as the key smart manufacturing trends for your industry in the coming years?

**Daniel Meier:** So far, we have not identified any 'must-have' technologies, however, the possibility that diverse data can be transformed and combined to create added value for processes holds huge potential. New technologies like sensors and networks can facilitate this but you can only make everything smarter, once a good base is established and you have key data available in a stable format.

With regards to augmented reality – we have made some tests in the production environment, but we believe that AR/AV is better suited for customer applications. On the shop floor we prefer mobile devices like tablets for their ability to present relevant information such as drawings, designs etc.

We are observing the 3D printing/additive manufacturing space and have done some testing. However, currently our casting is still happening traditionally. The biggest barrier to entry remains the size of the components, for example – the size of 3D printing equipment, as well as cost of materials and process times. We believe that for the next 10-15 years the conventional casting method will prevail, but 3D printing could be a game changer, specifically for metallic and composite materials, in 20-30 years from now. This will have a fundamental impact on spare parts and logistics services.

# Interview with **Alberto Martinez**, Chief Digital Officer at Bystronic Group



**Deloitte:** Can you describe what smart factory is for you?

**Alberto Martinez:** Successful smart manufacturing is all about creating value for and embarking on a common journey with our customers. It is about addressing what our customers in the sheet metal processing sector need and tailoring our smart factory solutions accordingly. These solutions need to be scalable with the ability to grow as requirements change. At Bystronic, we focus on improving the end-to-end scenario – connecting and synchronising machines, products and humans – along the entire value chain, to achieve efficiency and flexibility.

Communication with customers is key to share with them and to understand what they need. With this in mind, we actively partner with our customers every step of the way on their smart factory journey.

**Deloitte:** What is your smart factory strategy and vision?

**Alberto Martinez:** The customer is at the heart of our smart factory strategy/vision. We aim to meet all the requirements of the customer value chain. We do this by looking at their core processes – for example – optimizing, measuring, evaluating, manufacturing and planning – as we develop the right solutions for them. Of course, every customer has some kind of differences, so solutions need to be slightly tailored accordingly. Our smart factory vision is always end-to-end and focused on the whole process rather than on only improving some of the areas. At the forefront of innovation leadership, we strive for standardization and interoperability, aspiring to become the universal adapter and enabling true digitalization and near real-time decision-making.

**Deloitte:** Do you have any best practices to share with regard to the smart factory implementation process?

**Alberto Martinez:** It helps to start the smart factory journey by focusing on the main product and developing one solution in support of that. This is key to achieving integration and

connection across many different machines, software, people etc.

Competition across silos such as design, manufacturing or sales, can prove to be challenging and result in a disconnect. To achieve end-to-end connectivity, it is important that everyone shares information and learns from each other. While it is important to acknowledge and learn lessons from the past, you need to embrace a new mindset and intuition to move into the 'new world' of digitalisation. This is especially relevant to be able to extract the right information and insights from available data.

We see the digitalisation journey of a company or smart factory implementation at our customers as scalable. We like to classify our customers as 'starters', 'explorers', 'players', 'challengers' and 'champions'. Many customers are still 'starters', with only a few intelligent machines but they evolve to become 'explorers' by introducing more technology – for example – more robotics and automation. 'Players' are customers who have already mastered their systems integration and 'challengers' are the few who have already implemented process automation. Only a handful of customers are the 'champions' who have fully digitally connected all their processes from end-to-end including different companies, their suppliers and their providers.

In terms of our own smart factory implementation, we are situated somewhere between a 'player' and a 'challenger' – having mastered our systems integration but needing to make greater progress on implementing process automation.

**Deloitte:** What do you see as the biggest challenges of a smart factory implementation process?

**Alberto Martinez:** Three challenges stand out for our customers – achieving homogeneity with their tools and machines to accelerate the production, connecting and integrating isolated areas of their companies to seamless interoperate between them and capturing, standardizing and understanding data to

improve their understanding and transparency in their processes. To solve this, a new ecosystem of tools and platforms needs to be built to scale.

At Bystronic, creating a new mindset and dealing with the complexity of having over 30 different locations globally, initially came with challenges in the smart factory implementation. However, we are managing it very well so far, thanks to having the right people and talents with an agile mindset on board.

There will be many more changes ahead. 5G will speed up everything and cyber security is increasingly a big topic on the customer side that needs to be addressed. Younger generations with their affinity for rapidly evolving technology will also continue to challenge everything in future.

**Deloitte:** What do you see as the key opportunities for your company in smart manufacturing?

**Alberto Martinez:** Bystronic is a pioneer in sheet metal processing, but is increasingly evolving from being just a product manufacturer towards becoming a solutions provider who plays a significant role in digitalising our customers. We want to be a reliable partner in the sheet metal processing sector and actively create value for customers – this is beyond just selling machines. To be true enablers and innovators we will need to differentiate ourselves with our platforms, people and software.

Despite being in a leading position in the sheet metal processing sector, the environment has become increasingly competitive. We make smart investments and consistently innovate to stay relevant for our customers. The risk of not doing anything is much greater. For example, if customers are looking for a new laser cutting system, they are faced with an abundance of choice in either China or Eastern Europe – however if they want a leading solution, there are maybe only two or three companies with a 'gold standard' on the market. This is where we see the most opportunities and where we want to position ourselves.

# Interview with **Guilherme Rocha**, Senior Digital Project Manager at Oerlikon Digital Hub



**Deloitte:** Can you describe what smart factory is for you?

**Guilherme Rocha:** 'Getting smarter' is about understanding better what is going on in the production process and creating greater awareness in order to make more informed decisions. This in turn, through the smart factory, helps to facilitate both flexibility and optimization. Digital tools are enablers in this regard, allowing us to do far more than what could be done in the past.

**Deloitte:** What is your smart factory strategy and vision?

**Guilherme Rocha:** We are currently building strategies for two divisions – the Polymer Processing Solutions division which, given the nature of the business, already has quite a mature view on the topic and the Surface Solutions division (coating centers) where we are initiating the journey. Customer relationships are at the centre of our value proposition and we aim to strengthen the dimensions of speed and quality in our customer offering. Many of our coating centres are small facilities, spread across the globe and located close to our customers.

We have an end-to-end vision to become more connected right across the value chain, with the help of technologies. To achieve this, we are following a step by step approach. Initially, we lay down the basic foundations of standard processes integration, then, we collect data from production sites and supply chains to analyse throughput and understand what is going on. Thereafter, based on use cases that create value to our customers, we introduce more IoT in production to leverage more data from our operations. Finally, we also use automation not only to remove non-value-adding tasks but also to create better information and more accurate data.

**Deloitte:** Do you have any best practices to share with regard to the smart factory implementation process?

**Guilherme Rocha:** Smart factory initiatives/ implementations are always a combination of top-down and bottom-up approaches. While investment decisions need to come from top management, how you build it and when you build follows more of a bottom-up approach and should happen at the edge of the business. Generally, it is easier to set up a new unit and come up with new ideas than to tap into current organisational divisions without disrupting ongoing business. The road from prototypes to business impact is a long one.

**Deloitte:** What do you see as the biggest challenges of a smart factory implementation process?

**Guilherme Rocha:** People and their mindsets are a big challenge. While the Oerlikon Digital Hub tries to provide the right talent to the business divisions, we still need to build our pipeline of talent, skills and new ways of thinking and working, especially in respect of data scientists, IoT specialists and other digital transformation capabilities.

Another challenge is having a decentralised model, which covers our global footprint. We have approximately 110 coating centres spread across different geographies – with some as small as 20 people and others with up to 200 people. Being globally organised yet remaining locally responsive remains a challenge.

Cyber risk/security is another challenge that needs to be addressed. OC Oerlikon has already appointed a CISO (Chief Information Security Officer) whose role also includes overseeing security on the OT (operational technology) side. Even though we are at an early stage of the journey, the more we digitize the greater our vulnerability. With this in mind, data sharing between the participants is of critical importance. There has to be both clear understanding of the value to be shared, as well as confidence in the security aspects of sharing.

Overall, however, the main challenge remains to move away from smart manufacturing pilots to real production applications. While there are many companies out there with interesting smart factory projects, currently there is no company in the world which can say that they are running a full smart factory at scale.

**Deloitte:** What do you see as the key opportunities for your company in smart manufacturing?

**Guilherme Rocha:** There are many opportunities for integration through introducing new technologies. Other opportunities are in demand sensing and visibility and integration within the supply chain. Translating these opportunities into profitable advantage would require improved planning, faster response times and better utilization of existing capacity. Access to more information from downstream and the breaking down of silos would definitely help us to respond in an agile way to these opportunities thus creating a better offering to our customers.

**Deloitte:** What do you see as the key smart manufacturing trends for your industry in the coming years?

**Guilherme Rocha:** The flow and collection of data from equipment is the foundation for everything – better prediction, greater responsiveness and more accurate data for AI. There will be considerable developments in the field of enabling technologies over the next years and IoT infrastructure will also play a big role.

Collaborative automation technologies – for example, cobots – will help to bring automation/robotization to smaller volume productions. A potential game changer is that prices for cobots and AGVs (automated guided vehicles) are decreasing and this may result in a step change in the way we do things.

# Interview with **Thorsten Mathäus**, Global Business Development Manager Logistics at ABB Robotics



**Deloitte:** Can you describe what smart factory is for you?

**Thorsten Mathäus:** Machine automation and robotics are part of the definition of smart factories and will play a key role in factories of the future. New technologies are essential to smart factories – for example, many production processes can be highly automated with the help of AI and machine learning. Digitalization is also key and has changed distribution channels, with many customers now connected directly to the factory floor and able to configure their products/robots online. All our factories are already integrated with SAP ERP.

ABB Robotics uses and produces industrial and collaborative robots to accelerate smart factory initiatives. In fact, in our new robotics factory in Shanghai, robots are already manufacturing robots. While smart factories allow for a greater flexibility and variety of products, this flexibility needs to be consistently mapped to changing customer demand and also applied to supply planning. The smart factory is mainly driven by two factors i.e. efficiency/profitability and quality for both ourselves and our customers.

**Deloitte:** What is your smart factory strategy and vision?

**Thorsten Mathäus:** We are focused on management of the 'cradle-to-grave' life cycle of products. The ultimate goal is an end-to-end digitalization across the supply chain, from manufacturing and operations to customer experience and aftermarket. There are clear customer expectations for this which we need to be able to respond to. A new generation of customers is growing up with their smart phones and tablets. They are used to internet connectivity and want to have the same functionality and user friendliness when interacting with our products.

For example, our ABB Ability® digital platform helps customers with their processes and provides real-time insights for operations

planning and controlling through its connected and cloud-based services. It is a performance management solution that allows remote monitoring, control and services of robots and machinery. Servers for our cloud-based Connected Service comply with the highest standards of IT security and data protection.

**Deloitte:** How do you start your smart factory journey and how long should the journey be?

**Thorsten Mathäus:** Greenfield situations present the best opportunities to start a smart factory journey since they allow you to plan and implement smart factories from scratch. While adapting brownfield or existing factories to IoT and making them smart is also necessary to remain competitive, it can be more challenging to do. The smart factory journey never really ends. Usually, some Lean Six Sigma projects help to start the journey, but digital transformation is a continuous process that demands ongoing change. The implementation of smart technologies often happens in small batches, either on manufacturing islands or, as interfaces to other business areas. A wider roll-out across all factories usually follows later.

**Deloitte:** Do you have the right talent in your company to successfully implement your smart factory plans? What skills and mindset will your employees need in the future smart factory?

**Thorsten Mathäus:** As an employer focused on innovation and digitalization, we constantly strengthen our talent pool with external specialists. Furthermore, we are fortunate to have a strong talent base and skills set internally. Our people have gained extensive experience over decades and our workforce includes generations that are very familiar with new technologies, having grown up with exposure to new trends and topics. While there may be some geographic differences, overall our employees have the right mindset to succeed in a future smart manufacturing environment.

**Deloitte:** What do you see as the key opportunities for your company in smart manufacturing?

**Thorsten Mathäus:** The service business is currently shifting into automation and digitalization as customer requirements are changing and we expect a steep increase in demand. Another key opportunity is the collaboration between humans and robots. Growth in this area has been strong for a couple of years now, even remaining consistent during the Corona crisis. In this context, our truly collaborative robot (or cobot) YuMi has been a game-changer and we are currently introducing the next generation of cobots (GoFa and SWIFTI) into the marketplace.

**Deloitte:** What do you see as the key smart manufacturing trends for your industry in the coming years?

**Thorsten Mathäus:** In future, many smart manufacturing innovations in our industry will be driven by customer expectations. For example – customers want more real-time tracking across the whole product life cycle i.e. knowing where their products are in the production or distribution process. Additionally, trends such as individualised products and lot size 1 (single item quantity for an order) are increasingly being expected by customers and can be facilitated by IoT.

Reacting to such new customer requirements will also require new distribution models and manufacturers will have to act fast and learn from other industries that are leading in this space. There is also a need to digitize and automate the intra-logistics on the customer side. Often, the products that come out of the smart factory are still moved manually. New transport modes and paths ensuring faster and more timely delivery to customers will need to be enabled with the help of IoT.

# Interview with **Yann Ulrich**, Portfolio Manager Digital Enterprise at Siemens Schweiz AG



**Deloitte:** Can you describe what smart factory is for you?

**Yann Ulrich:** Smart factory is the connection of OT (operational technology) with IT (information technology). It allows for a higher degree of automation and creates added value with the help of predictive and adaptive data. There are different models of maturity for smart factories, which are influenced by the production mix.

Our flagship digital factory in Amberg (Germany) allows us to create new digital services for our customers and also provides us with an opportunity to gain in-house experience for the digitalisation of our other factories.

**Deloitte:** What is your smart factory strategy and vision?

**Yann Ulrich:** Our smart factory strategic vision is driven by the Digital Factory Project of Siemens. This is a global community focused on the smart factory topic and responsible for establishing a consistent operating model to advance all factories and develop their people. However, due to the many acquisitions made in recent years, maturity levels across factories can be quite different – for example – there can be technology gaps that require new solutions and also many brownfield scenarios that need to be taken into account. Key performance indicators to be successful include more flexibility, greater resilience (especially during the Corona crisis) and cost efficiencies.

**Deloitte:** Do you have any best practices to share with regard to the smart factory implementation process?

**Yann Ulrich:** In my view and experience there are some specific steps which can be followed:

1. Start with a clear corporate strategy
2. Develop a digital strategy that supports the corporate strategy
3. Be inspired by new technology trends

4. Define the skills that are required to implement the smart factory and the trends that are relevant for the factory floor

5. Decide on a project and define a roadmap

6. Remember that ultimately the goal is to become more efficient and improve profits

Despite the fact that such a digitalisation can be driven completely in-house, external insights are always helpful. Even though the best results are achieved in greenfield situations, we should keep in mind that extensive digitalisation of factories can also happen brownfield, where many opportunities for automation may exist. A top-down approach helps to build a proper infrastructure backbone for the overall smart factory journey, which can then be divided into smaller pieces to focus on. Starting bottom-up with smaller projects risks misalignment and getting stuck.

**Deloitte:** What do you see as the biggest challenges of a smart factory implementation process?

**Yann Ulrich:** One of the biggest challenges in implementation of a smart factory is the migration and mapping of legacy data – for example – transforming the data for a new process flow. Engaging employees during the smart factory journey can also prove difficult since very often job profiles are subject to change during this process. While hardware connectivity is generally not a big issue when it comes to IT/OT integration, there are some manufacturers that are heavily file based (for example, export files) when it comes to data and this will need to be factored in.

However, expanded functionality requires direct connectivity to machinery and mutual data exchange and not all manufacturers are open to this, fearing that machine performance will be impacted when an IoT box is connected to the controls. Cyber security is also an important topic and vulnerabilities need to be addressed before the OT world is merged with the IT world.

**Deloitte:** Do you have the right talent in your company to successfully implement your smart factory plans? What skills and mindset will your employees need in the future smart factory?

**Yann Ulrich:** Finding the right talent is a significant challenge. The number of acquisitions made in the software space means new skills are constantly required. In response to this need we run a dedicated 'growth mindset' campaign at Siemens and life-long learning is consistently emphasised. It is also key that leadership drives the topic of learning and development rather than it being regarded as just an individual responsibility.

Some important new skills and attributes that will be needed for a future smart factory environment include communication with new digital tools and co-creation and innovation in virtual workshops with diverse teams.

**Deloitte:** What do you see as the key smart manufacturing trends for your industry in the coming years?

**Yann Ulrich:** 5G is a key trend allowing for less latency and more performance which is specifically relevant for edge computing. With 5G technologies there are also many more combinations possible allowing for fragmented data from different systems to be newly calculated.

3D printing/additive manufacturing is also an important future trend and the idea of a service technician printing a spare part en route to the repair site is not that far-fetched.

While blockchain is not necessary for a track and trace within companies, if suppliers also need to be controlled then blockchain can make a lot of sense. In the end, companies don't always have to lead every trend. Sometimes it makes more sense to wait a bit with broader adoption, until a trend is more established.

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