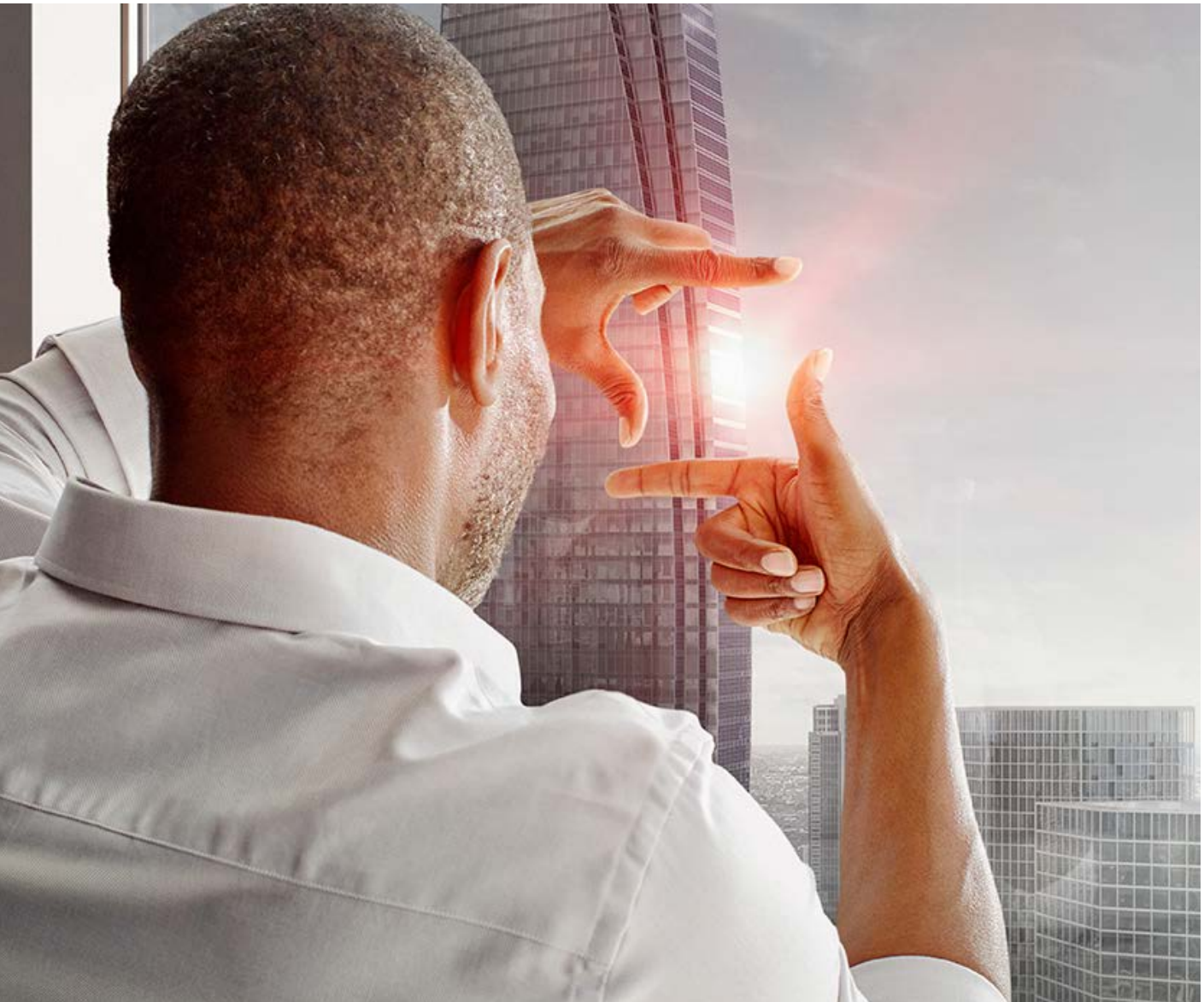
Smart Industry is built on trust and collaboration

Unlock the real value of your business through digital transformation



Technology innovation has been the core mission of ABB for more than 130 years

As the Industrial and Energy Revolutions accelerate, customers are unlocking value through digital innovation by reinventing their business models and processes in radical new ways.

The model of the future will be more modular and decentralized. It requires us to move bits rather than atoms. Connectivity, intelligent systems and autonomous capabilities are all vital to the successful orchestration of the future.

Rajesh Ramachandran,
ABB, Chief Digital Officer - Industrial Automation

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Getting smart about the future

As an industrial leader, you're facing increasingly complex challenges that impact day-to-day responsibilities. Intense pressures to improve efficiency, ROI, safety, sustainability, compliance and innovation all regularly influence your decision making.

Industry 4.0 technologies are key to addressing these challenges, but the focus should not solely be on technology, equally important is the value generated by it.

This report is your guide to realizing Smart Industry's huge potential with a holistic, value-driven approach.

Decision makers need to shift focus from product to value if they want to keep up with the ultimate domain expert: the customer. As the capabilities of Industry 4.0 accelerate, correspondingly, customer expectations continue to rise. This is the age of "Customer 4.0."

To keep up with this new breed of customer, industry requires a new mindset, one of greater openness and willingness to collaborate with partners. Businesses should leverage the strengths of their wider industrial ecosystems to meet Customer 4.0's elevated expectations.

Yet despite digitalization's key role in delivering on this demand, decision makers remain cautious in their approach. But the perceived risks of adoption are heavily outweighed by the commercial risks of not embracing digital.

As we enter a new decade, the rapid pace of technological change means there is pressure to turn digital discussion into digital action. Leaders have a limited time to act and the message is clear: businesses must adapt to compete.

Now's the time to set your business on the road to sustainable success.

Discover more about how you can unlock the real value of your business through digital transformation.

Defining Smart Industry

“Smart Industry means smart people deploying the right technologies against the right challenge”

David Strauss, Digital Technology Lead, Manufacturing Excellence at Nestlé

The Smart Equation

Industry 4.0 + Customer 4.0 = Smart Industry

Industry 4.0

Smart manufacturing solutions are created by connecting every part of the value chain.

Data gathered from R&D, factory logistics and sales will power smart, autonomous technology that will connect to existing industrial processes.

Examples:
- Autonomous robotics
- Artificial Intelligence (AI)
- Industrial Internet of Things (IIoT)
- Digital twins

Customer 4.0

Customer 4.0 expects consumer-level customer service from the industrial world.

This means more value, reduced cost, less environmental impact and faster development.

Customer 4.0 wants:
- A frictionless experience
- Plug-and-play functionality
- Greater product variation
- Personalized and tailored solutions

Smart Industry

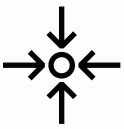
More flexibility. More productivity. More efficiency.

Digital transformation will help optimize and automate processes and factories. It will bring integration and autonomy to whole global value chains revolutionizing entire ecosystems and creating more value for the customer.

Smart Industry means delivering value to your customers with increasingly sophisticated autonomous technology.

Culture and change

- Iterative transformation
- Building positive digital culture



Aligning agility and productivity

- Smaller production runs
- Increased customization & personalization

Moving from automated towards autonomous

- Increasing intelligence capabilities with AI
- Moving from robot to cobot

Balancing optimization and growth

- Improving existing efficiencies
- Seeking new business models

Sustainability

- Improving long-term profitability
- Optimizing resources

The 10 dimensions of Smart Industry

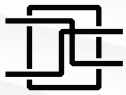
To increase value across the board

Employment and skills

- Redefining workers' roles
- Retaining human expertise digitally

Segmenting risk

- Employing industrial natives' expertise
- Experimentation where practical



End-to-end connectivity

- Integrating logistics & supply chain
- Increasing visibility/responsiveness

Investment

- Retrofitting existing assets
- “Pay as you grow” approach

Data Quality

- Integrating new data models
- Eliminating low-quality data

The smart approach to unlocking value

ABB has a proven history of helping businesses around the world identify and harmonize their disparate data points from across their entire ecosystem. Our process serves to maximize the hidden value in that data and generate tangible, real-world results.

Our step-by-step process

1. Enable
Raw data is collected and checked for integrity, governance and usability.

2. Integrate
Data is contextualized within a defined data architecture.

3. Model
Industry vertical data models are deployed either on-cloud or on-premise.

4. Analyze
Model data is analyzed to provide descriptive, diagnostic and predictive business scenarios.

5. Deliver
Data is packaged for systems, allowing for collaboration amongst stakeholders.

Your real-world results

- Operational Performance Management
- Asset Integrity
- Enterprise Safety & Sustainability
- Business Excellence
- Supply Chain Optimization

What does Smart Industry look like?

ABB's Factories of the Future

Here are some examples of state-of-the-art ABB facilities that use Smart Industry strategies to deliver value for customers around the world.

Safe operations

ABB Robotics Factory
Shanghai, China

Background
Set to open early 2021, this facility will be the most advanced, automated and flexible robotics factory in the world. The latest collaborative technologies will ensure that humans and robots can work safely side by side.

Smart Industry technology
The latest automated and digital manufacturing processes will allow robots much greater customization capabilities than traditional linear production systems.

The factory will be a complete digital manufacturing ecosystem, giving everyone from managers to maintenance teams access to data insights.

Outcome
A hugely agile production process that combines the advantages of robots with the unique capabilities of people. The factory will deliver value to multiple industries, including automotive, electronics, food and beverage, pharmaceuticals, logistics and automation.

Smart

ABB Semiconductor Factory Lenzburg, Switzerland

Background
Winner of the Factory of the Year award in 2018 for "Excellent Location Safeguarding by Digitalization."

Smart Industry technology
A fully connected and digitally optimized semiconductor production line that maps the value creation process by continually collecting and analyzing production data.

Outcome
This optimized process increases productivity, improves quality and flexibility while minimizing downtime, reducing delivery times and driving overall competitiveness.

Sustainable

ABB CO_2-neutral factory Lüdenscheid, Germany

Background
ABB's world-first CO_2 neutral and energy self-sufficient production site uses renewable solar energy that can generate 100% of the plant's power. It delivers around 1,100 MWh of climate-neutral solar power a year, equivalent to the energy needed to power 340 households.

Smart Industry technology
An intelligent system, where all components are digitally networked and controllable. This process enhances everything from energy efficiency to sustainability and resource conservation.

Outcome
ABB's flagship site will save about 630 tonnes of CO_2 a year. This intelligent ecosystem enhances energy efficiency, sustainability and resource conservation to support the clean energy goals of ABB Electrification's Mission to Zero.

Now that you understand the Smart Industry landscape and what transformation looks like in practice, let's share practical guidance on how you can maximize digital value by **thinking**, **working** and **collaborating** the smart way.

Smart demands new ways of thinking

"The techniques and technologies [to build Smart Industries] are all there but they need the right culture to implement and unlock value"

Cecilia Johansson, Project Manager, Mälarenergi

In order to address complex new industry challenges, leaders need to widen their focus and think in terms of an **industry ecosystem**. This is a network of business partners, suppliers, products, services, employees, advisers, factories, logistics, technologies and customers.

This massive shift towards a collaborative mindset and culture requires an openness to working with partners, which is where a lot of companies begin to struggle. So many get stuck in a *pilot trap*, unable to unlock the value of smart technologies or take their new digitalization projects to the next level. But why?

Fear of the unknown

Globally, businesses have yet to reach the tipping point where the necessity of digital is 100% recognized and understood. Additionally, full commitment to digitalization and open collaboration have been hampered by the industry's innate concerns around IP protection, security and how data is shared.

Anxiety towards these issues is often alleviated when the value of data sharing is demonstrated or when assurances like ABB's Data Manifesto 2018 are put in place. This simple document was designed to address and combat the many fears surrounding data and IP security. The key message — **your data will always be your data**.

ABB also champions operational flexibility, allowing for deployment at all levels: on-premises, edge, customer cloud, ABB cloud or any hybrid model required. Customers have the ability to determine exactly where and how their data is stored, on their own terms.

Introducing change, with care

Introducing new technologies and ways of working is a disruptive force for any organization and must be planned and executed with care. This should include an honest appraisal of the business's digital maturity and immediate needs.

Initial work should focus on defining immediate business challenges and involve cross-functional teams in the analysis.

During this analytic process, clarity regarding data, IP security and ownership across the business ecosystem should be established. This will serve to bring a more rational, informed approach to digital risk. It also creates the opportunity for your teams to think big and consider possibilities beyond existing business propositions and applications.

"Who are you going to trust, the data on the screen, or the guy with 40 years of experience?"

Chris Naunheimer, Digital Lead, ABB, Industrial Automation Energy Industries

Building digital trust

Building trust in all aspects of change and transformation is key to breaking down internal barriers. Workers can distrust the accuracy of company data, so a commitment to data quality is essential to aligning all functions and teams to the digital approach.

Paying attention to the usability of internal software has a real impact on confidence and trust in the overall system. A combination of quality data and simple intuitive interfaces, including engaging data visualization, is vital to a positive user experience and ensuring buy-in from your people.

Smart demands new ways of working

With a positive mindset in place, the critical question for many operational decision makers becomes: how do I deploy digital technologies to generate the most value? The answer requires a change in working practices that aligns with the company's new culture of collaboration, communication, openness and transparency.

—

Increased operational flexibility is the gateway to long-term success. It enables greater customer responsiveness, and without it, companies cannot scale.

Enhancing operational flexibility might seem overwhelming to some businesses but the key to achieving your goal is fairly simple. It requires leaders to remain committed to an open and agile mindset, unafraid to create opportunities for experimentation but without compromising efficiency, productivity or safety.

This can be challenging, especially if your changes are significant. This requires a strong sense of future vision from industrial leaders to sustain morale until the process is complete.

Adopting a flexible operational approach will allow you to address multiple concerns at once:

- **Sustainability**
  Through reducing waste and increasing efficiencies
- **Transparency**
  Through end-to-end connectivity and real-time monitoring
- **The fear of being "locked-in" to the wrong technology**
  Through committing to interoperability and open technology
- **Simplifying customer interactions**
  Through intuitive digital interfaces
- **Overall operational value**
  Through enhanced, efficient and agile operations

With the right software solutions in place, your business can access a vast source of shared data, allowing applications like machine learning to optimize operations significantly faster.

This results in smarter, more autonomous systems that allow human workers to focus on more complex tasks. Connected data also enables new business models, recurring revenues and greater customer intimacy.

Smart demands new ways of collaborating

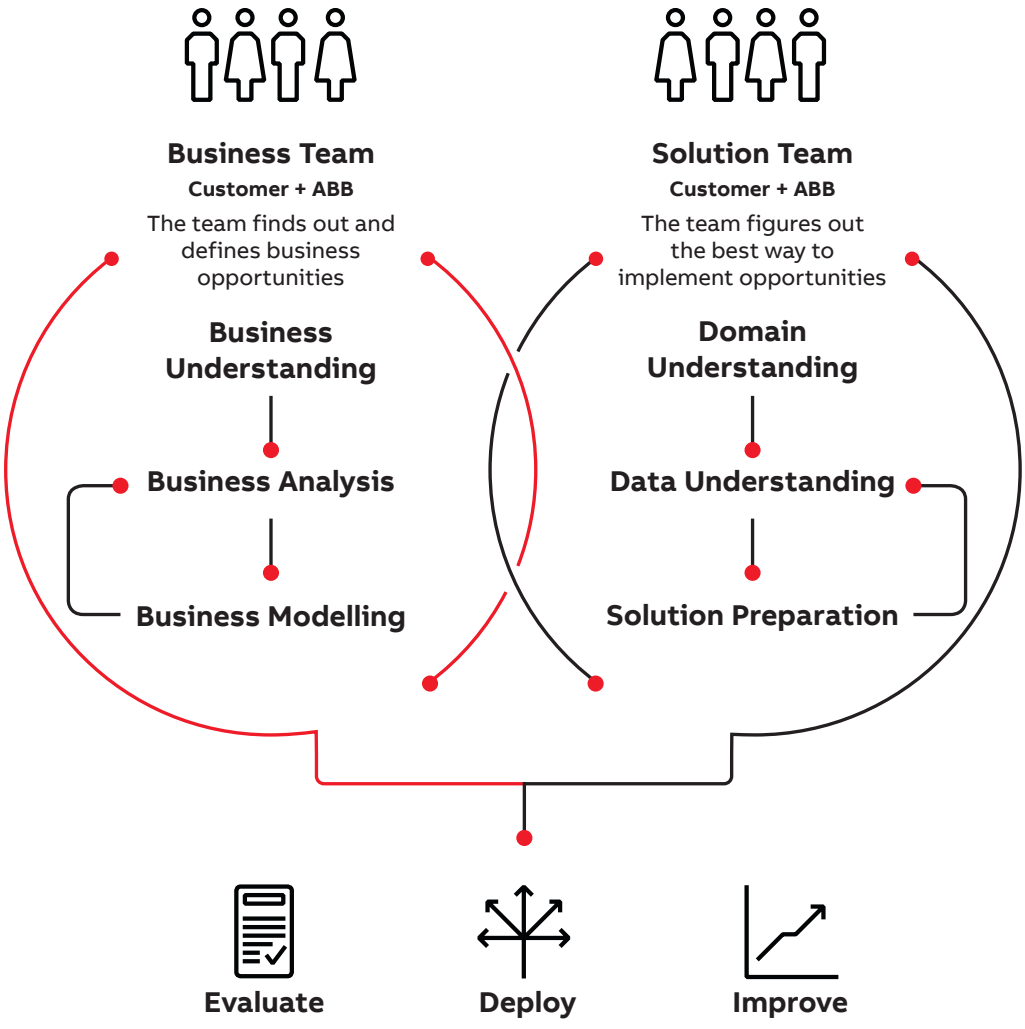
When it comes to digital transformation, the message is clear: **if businesses want to stay competitive, they must learn to collaborate.**

When it comes to collaboration, however, process industries could learn from the standards set by the IT industry. This sector is more advanced in sharing strategic thinking, embracing open-source technologies, and developing common standards and protocols. This results in greater speed and agility when developing digital tools.

The bottom line: success is achieved by working across your ecosystem, using tools from outside your organization and adopting an agile, collaborative working approach.

A framework for agility

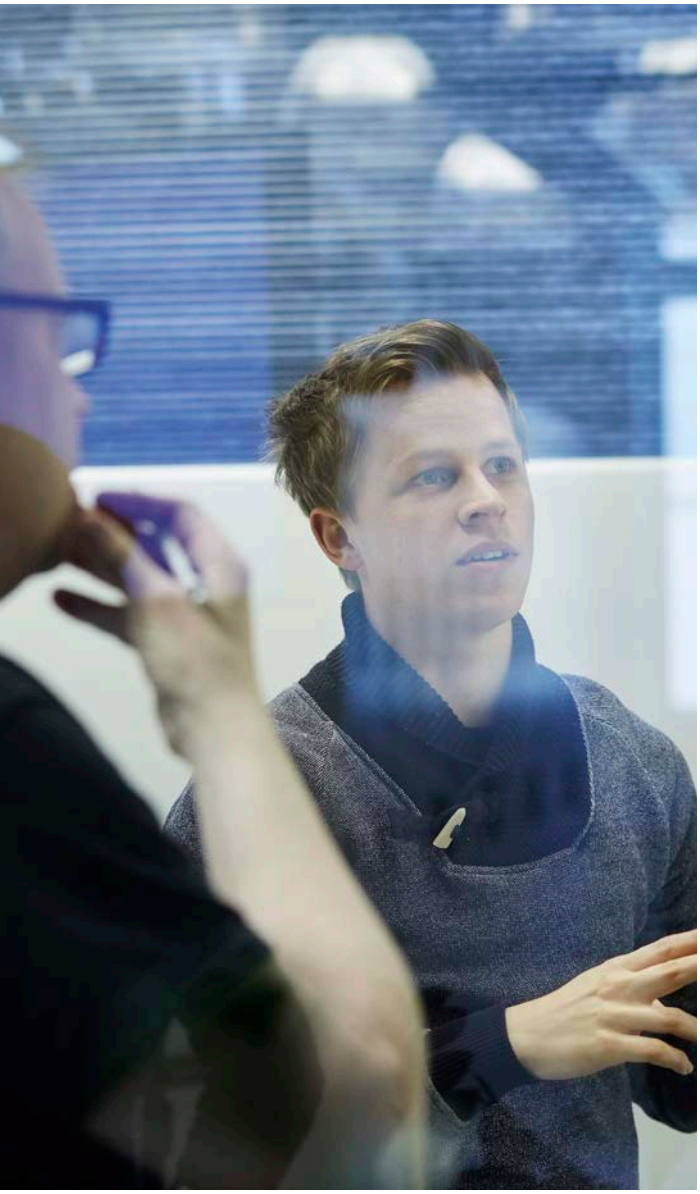
An agile working model divides projects into a series of sprints, allowing for iterative deployment, testing and optimization. If a sprint doesn't generate the desired results, there's flexibility to change course and build from the learnings gained. It is important all parties appreciate the reality that success is never guaranteed. **Even if the outcome is unexpected, experimentation creates a learning opportunity that informs future innovation projects.**



Partnerships and collaboration

As your business evolves towards a smart model, it is unlikely every single area of expertise will be available in-house. Companies should conduct an internal analysis to determine gaps in capabilities, which will define your partner selection criteria. Partnerships are a critical advantage when developing new projects and facilities.

Collaboration is not just about external relationships. **Internal collaboration means ensuring all teams and business functions are represented.** Providing access to shared data across departments ensures everyone from HR to the factory floor can access the same data, creating an integrated approach that eliminates potential siloes.



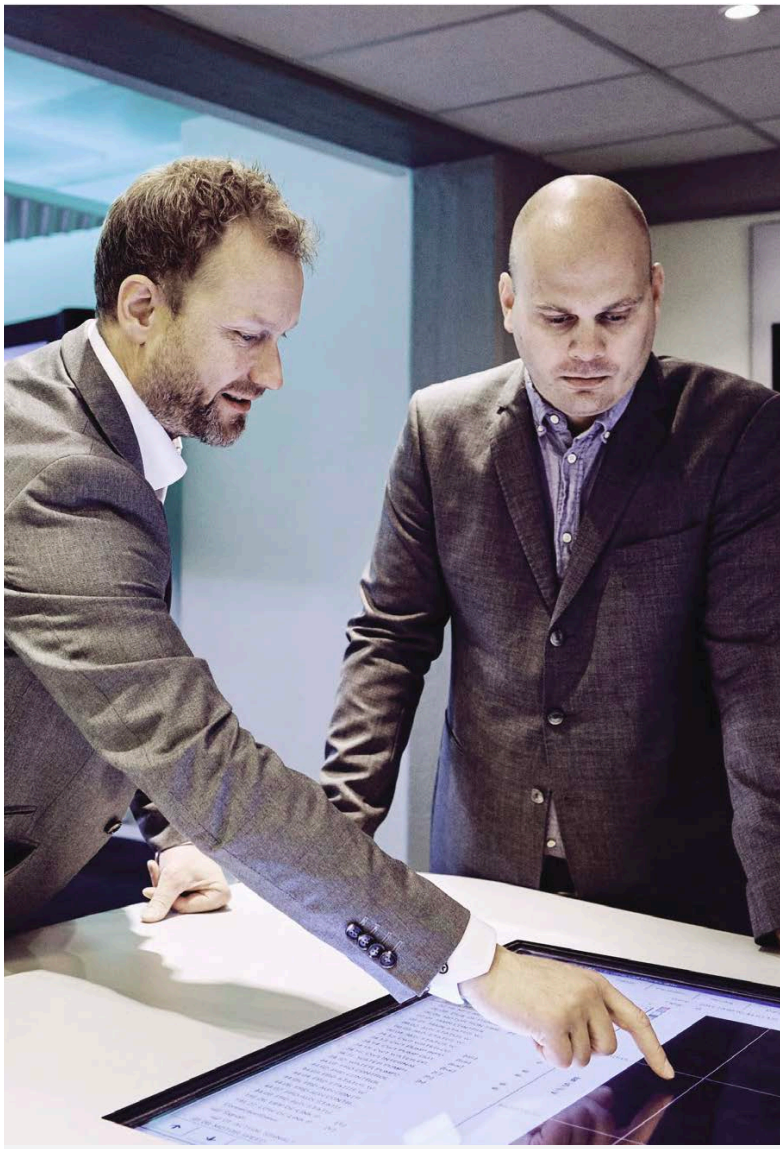


ABB + Microsoft

The **ABB collaboration with Microsoft** is a strong example of a strategic partnership. In this case, ABB teamed up with another world-class technology leader to produce solutions that leverage the best of each partner's expertise. ABB focuses on industrial applications and solutions while Microsoft Azure provides and maintains a world-class platform for ABB technology. The result is the creation of leading data models, algorithms and applications to better support the needs of industry.

This strategy has proved influential. Since the partnership was announced, other players abandoned plans to build their own platforms in favor of following a similar approach. When resources are constrained, it becomes important to target R&D and innovation investments to avoid needless duplication.

Smart demands a foundation of trust

With so many missteps in digital project delivery reported, it is clear that too many digital specialists have underestimated industrial complexity. Industrial leaders are fatigued by the sheer volume of noise in the market. So how does any business cut through this skepticism and build trust in their approach?

Trust is, without question, the foundation of Smart Industry. Without shared objectives there can be little openness or true collaboration. But even more than shared goals, it is imperative that all partners display generosity to one another, taking time to understand business and cultual values. Indeed, empathy is the first element of Microsoft CEO Satya Nadella's formula for sustained trust:

E + SV + SR = Tt

Empathy + Shared Values + Safety and Reliability = Trust over time [1]

The key takeaway from Nadella's equation is that trust is earned, not given. This requires businesses to pursue mutually beneficial projects with partners chosen for their openness, domain expertise and commitment to solutions.

[1] Hit Refresh: The Quest to Rediscover Microsoft's Soul and Imagine a Better Future, Satya Nadella, with Greg Shaw and Jill Tracie Nichols (2017)

Getting started the smart way

“Think big, start small but just get started”

Dr. Visar Krasniqi, VP,
Head Digital Transformation, ABB

It is clear that working towards Smart Industry is no longer optional if you wish to ensure future business growth. No matter how great the relationship, Customer 4.0 will not wait for you to catch up if you cannot meet their changing needs.

But the good news is that digitalization is not all about long-term goals and future vision — there are immediate opportunities for morale-boosting value creation right now.

5 Quick Wins from David Strauss, Digital Lead at Nestlé

1. PRODUCTIVITY – Advanced process control and optimization
2. EFFICIENCY – Automating motion across factories and warehouses
3. SAFETY – Introducing co-bots for repetitive and/or risky manual tasks
4. OPTIMIZATION – Introducing robotics and discrete automation for repetitive back office tasks
5. SUSTAINABILITY – Creating a paperless factory via digitalization

Many legacy businesses seek to protect their investments and maximize the value of existing assets before they can consider new projects. This is based on the assumption that digitalization requires large up-front investment to get started.

This assumption is simply not accurate. Digitalization can (and should) start small and then scale. Businesses can avoid significant up-front costs through using as-a-service enterprises and “pay as they grow.” Enabling technologies, including 5G, are now in place to support the acceleration of the Industrial Internet of Things so there has never been a better time to explore digitalization’s possibilities.

Thinking big

No matter where your business is in its digitalization journey, it's important to remember your big-picture goals. A thorough examination of your business's digital maturity against your long-term strategy will instantly reveal opportunities for improvement.

Operational Performance Management

- Energy efficiencies
- Optimization
- OEE & loss prevention

Asset Integrity

- Performance analytics
- Life assessment
- Condition-based maintenance

Enterprise Safety & Sustainability

- Risk management
- OSHA* compliance
- Process safety management

Business Excellence

- OPEX/CAPEX
- Margin & growth
- Customer loyalty

Supply Chain Optimization

- Logistics
- Procurement
- Inventory management

*Occupational Safety and Health Administration

Getting started

As you begin to tackle your organization's Smart Industry aims and challenges, here are some strategies to consider:

- **Develop a roadmap of projects and priorities, blending optimization with bigger growth projects**
- **Avoid a traditional waterfall project management approach and favor an agile model that lets you completely address as-yet unknown complexities and changes as you go**
- **Focus on whole business integration with the core transformation team, including stakeholders, from all business functions**

Smart partnerships in action

Mälarenergi and ABB

ABB is proud to partner with Mälarenergi, a sustainable power and utilities provider, based in Sweden.

The project

Mälarenergi is focused on transformation, moving from infrastructure to infra-service. The utility's aim is to provide its customers a personalized offer in line with the principles of Customer 4.0.

Why ABB?

The decision to partner with ABB was based on the company's commitment to open collaboration. ABB's vast domain experience was also key as transferable knowledge is a huge asset when meeting the demands of Customer 4.0.

The results

ABB supported Mälarenergi in its vision for step-by-step transformation, delivered through open, collaborative and agile project management. We also helped facilitate Experiment Workshops, enabling Mälarenergi to continue to problem-solve and drive innovative ideas through the organization.

Northvolt and ABB

Founded in 2016, Northvolt is a next generation Swedish-based energy manufacturer with the bold mission of creating the world's greenest battery.

The project

ABB and Northvolt have partnered to build Europe's largest and most advanced lithium-ion battery factory with production set to go live this year. The factory will benefit from a fully integrated automation and smart electrification solution that includes robotics, machine and factory automation, electrification and ABB Ability™.

Why ABB?

Northvolt was attracted to ABB because of our global leadership in industrial control systems, depth of expertise in integrated technology and our ongoing commitment to driving innovation in battery production, performance and application.

The results

A great example of the ABB approach in practice. Here, long-term customer relationships support the orchestration of market-leading products and services into an integrated value-generating solution. Thanks to this cross-industry digital approach, Northvolt's smart facility can scale without compromising on efficiency, quality or yield.

"ABB is at the forefront of electrification, and we are delighted to have them on-board as a strategic partner"

Peter Carlsson, Northvolt CEO

Our partnership with you

The time to accelerate your digital potential is now. With a limited window of opportunity, businesses must recognize the need for new ways of working, increase their understanding of ecosystem dynamics, and look for trusted partners who can deliver and sustain value.

In order to unlock the potential of a smart industrial approach, your people need to be aligned with your business strategy. This requires industrial leaders to inspire and drive commitment to organizational change. In doing so, you need a trusted partner with a deep and pragmatic understanding of the road ahead.

Like you, ABB has worked to build an open, collaborative, solution-oriented approach. As a technology pioneer for 130 years, we have market-leading, deep domain expertise in industrial control and technology integration.

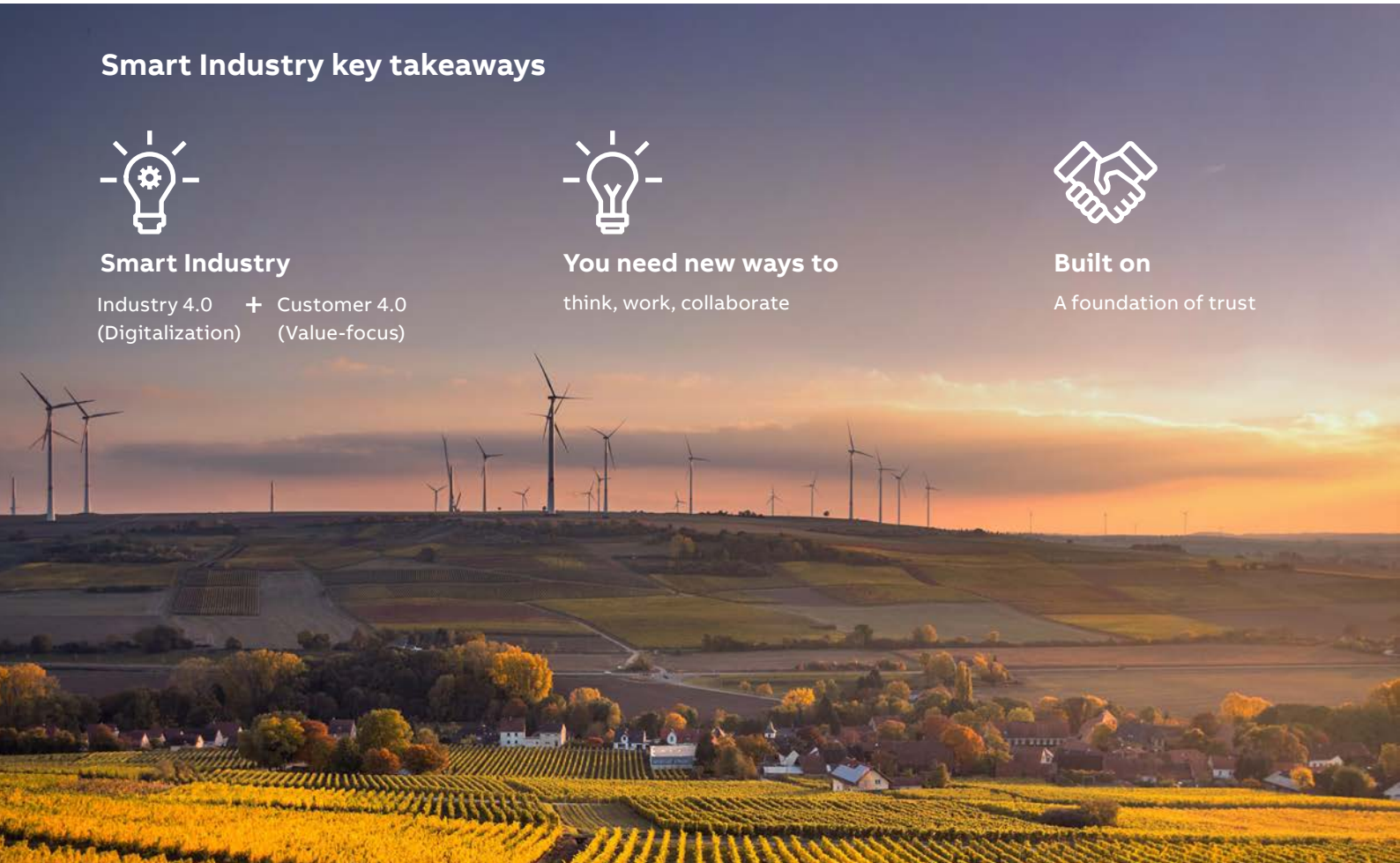
Our consultancy, customer engagement, co-creation and digital acceleration teams have been designed to meet the needs of different customers in different segments, at all stages of digital maturity.

ABB is committed to orchestrating our well-developed partner ecosystem – including IT leaders – to deliver customer solutions. Along with the breadth of the ABB automation offer, ABB Ability™ boasts around 200 digital solutions across industries, each of them the result of collaboration and partnership with our global customer base.

Simply put, our focus is not on selling products. Instead, we deliver value through solutions that speak directly to your business's needs, helping you respond to the evolving demands of Customer 4.0.

The pursuit of transformation is not a destination, it's a journey, with ongoing measurable benefits. So, wherever you are along the road to Smart Industry, ABB has the people, technologies, expertise and approach to accelerate your ambitions, on your terms.

Let's write the future, together.



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