

# THE INTELLIGENT ENTERPRISE FOR THE CHEMICAL INDUSTRY

Mastering future challenges  
and delivering new customer  
experiences through innovative  
products, services, and business  
models





“Chemical companies ride the winds of change of the fourth industrial revolution by developing innovative, outcome-driven, and purpose-driven business models.”

**Thorsten Wenzel**  
Global Vice President  
Chemicals Industry  
SAP SE

# WELCOME

Dear Customers,

As industries reexamine their partners and processes in a critical search for efficiency, chemical businesses are feeling increasing cost and margin pressure. Still, the companies that can adapt new models and automate their processes have an unprecedented opportunity to have an outsized positive impact.

**By adapting to how customers want to acquire, use, and pay for their products and services, chemical companies can empower digital transformation throughout the supply chain – and drive their own profitable growth.**

The path forward requires automating back-end processes as well as creating innovative services and business-outcome-driven revenue models instead of selling products by the ton or volume.

While transformation is technology intensive, the key enablers are human. Chemical companies must undergo a significant cultural change, attract and retain new talent, and earn the trust of those customers to cocreate custom processes and products.

The companies that can make this cultural shift will be positioned to focus on further process optimization (for example, “lights-out manufacturing” or “touchless order fulfillment”), portfolio optimization, co-innovation, and the selling of business value and outcomes instead of just products. And they will deliver entirely new customer and consumer experiences.

The transition is already underway, driven by those companies embracing intelligent technologies to automate their operations and to develop new, outcome-driven business relationships.

**We expect that in 2025, as much as a third of chemical companies’ revenue will come from business models that are based on real-time data sharing and co-innovation with customers on new platforms and in new ecosystems.** These innovations include, for example, sharing data to develop custom products, diagnose and correct production issues as they happen, and be compensated based on value rather than volume.

We have identified four strategic priorities that will keep chemical companies on the path forward:

- Sell business outcomes instead of just products
- Simplify to shrink cycle times
- Compete as an ecosystem
- Adopt strategic agility in response to market dynamics

The companies that lead the way will be those that adopt intelligent technologies that process data, and those that develop the skill sets to fully leverage that data. They will be the most responsive to the demands of individual customers and to the challenges posed by environmental health and safety concerns. Those that cannot adapt will continue to be hampered by commoditization and margin erosion.

This paper takes a deep dive into the trends shaping the chemical business over the next five years and the path to innovation. In it, we propose a set of priorities that will drive transformation and the tools that will make it possible.

The pressures on our industry can seem relentless. The challenges are real. But the biggest risk we face is to stand still as our ecosystem partners remake themselves without us. Do not be left behind.

Sincerely yours,

**Thorsten Wenzel**  
Global Vice President  
Chemicals Industry  
SAP SE

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# OUR PLACE IN THE NEW WORLD

Global megatrends are affecting chemical companies and providing new opportunities for growth.

Resource scarcity, environmental impact, and changing consumer expectations call for innovative business models and platforms in support of a circular economy. Due to its early position in the value chain, sandwiched between energy and feedstock players and consumer industries, chemical companies are predestined to play a pivotal role in this.

In addition, the need for sustainable, reliable, innovative, and trusted products and services requires chemical companies to ensure safety and integrity along the entire value chain and lifecycle of products. Intelligent technologies will support bridging data across the organization, from operational performance data to experience data, and help companies make sound business decisions to improve profitability.



## Chemical companies are being reshaped by four major trends.

- Ongoing commoditization and margin erosion require chemical companies to focus on portfolio optimization, co-innovation, and the selling of business value and outcomes instead of just products, with the ultimate goal to deliver entirely new customer and consumer experiences.
- Digital is the new norm, with technologies such as the Internet of Things (IoT), artificial intelligence (AI), machine learning (ML), blockchain, the cloud, and analytics providing new opportunities for chemical producers to cut costs by automating the back office and running low-touch operations.
- As the playing field is being changed by disrupters coming in from all angles, chemical companies are looking beyond traditional value chains and starting to compete in complex ecosystems.
- In a more and more dynamic world with mergers, acquisitions, and divestitures as key vehicles for portfolio optimization and sustainable growth, strategic, market-driven agility has become an imperative to survive and thrive.

The ability to address these global trends will determine who will be among the winners in the midterm and long-term future. According to Accenture, tomorrow's leading companies are already moving beyond providing products and services.<sup>1</sup> They are applying technology to create deeper, more meaningful relationships with people. They are creating new affiliations with businesses across industries that share their vision and mission. They are using these new partnerships to invent new products and services that meet the goals of their customers and employees and, in doing so, are achieving new levels of growth and differentiation. They are also helping their communities create new economic opportunities and develop new ways of serving and protecting citizens, benefiting society as a whole.

### **Digital strategies are disruptive and are changing the rules for chemical companies.**

[Arkema](#) needed to understand the impact of its digital content and whether its customers were finding what they needed across the company's 37 Web sites. Arkema turned to Experience Management solutions from SAP (Qualtrics) to create customer feedback surveys on both desktop and mobile devices. The company then combined the organizational and experience data to give it a clearer picture of the strengths and weaknesses across its Web sites.

[Siegwerk Druckfarben](#) has transformed HR into a lean, digital organization by replacing manual, paper-based processes with digital workflows. It now benefits from greater transparency and can focus more on strategic planning on a global scale.

# 45%

Of chemical companies are rethinking how humans and machines work together.<sup>2</sup>



# PAVING THE WAY FOR BUSINESS MODEL INNOVATION

By 2025, chemical company revenue will depend on innovative products and services that derive from new business models (see Figure 1).

These new models range from relatively simple after-sales service offerings to complex outcome-as-a-service models and will also include programs to monetize corporate knowledge, intellectual property, and data assets. Increasingly, these new ways of doing business will rely on real-time data sharing and collaboration with customers on new platforms, supported by extended partner ecosystems.

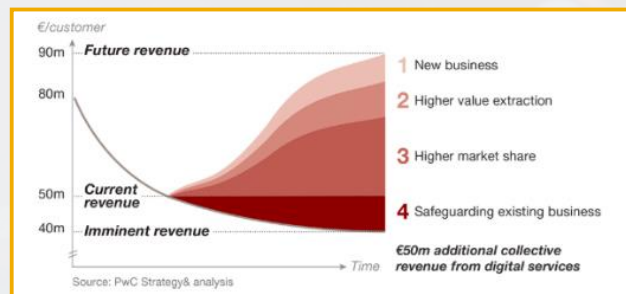
**Customer-centric R&D** will anticipate customer and consumer demand, collaborate with extended ecosystems, simulate product and formulation performance, and design products that minimize environmental impact and support a circular economy.

Applying digital technologies in **operations** will help chemical companies analyze production process variables and asset performance in real time and simulate their impact on product quality, costs, and yield. Predictive analysis will enable chemical companies to anticipate downstream supply chain disruptions and take corrective actions in real time.

Enabling digital twins and IoT connectivity of **assets** will allow chemical companies to continuously monitor asset health, process quality, throughput, waste, and emissions. By combining asset information with predictive analytics, companies can predict the likelihood of asset failures, plan maintenance, and adjust production plans accordingly.

Digital technologies such as blockchain, the IoT, 3D printing, and machine learning provide opportunities to optimize, extend, and even disrupt **supply chain** processes and models. Digitalization benefits supply chain processes – from authentication of raw materials and fair labor practices to automated tank replenishment and fleet management. It helps optimize trading and shipping, additive manufacturing, and product integrity management while minimizing supply chain risk.

**Figure 1: Business Impact of Introducing Digital Services in a Chemical Company<sup>3</sup>**



## 30%

Of manufacturers predicted to use innovation marketplaces by 2022 for on-demand services and software that raise margins by up to five percentage points<sup>4</sup>

## 75%

Of manufacturing organizations will have created new ecosystems by implementing AI- and blockchain-centric platforms, thus automating 50% of processes by 2022<sup>5</sup>

## 90%

Of manufacturers will use real-time equipment and asset performance data to self-diagnose issues in advance and trigger service intervention to avoid unplanned downtime by 2021<sup>6</sup>

## 50%

Of manufacturers are predicted to network related product and asset digital twins into digital twin ecosystems for a systems-level view of their business and 5% reduction in cost of quality by 2024<sup>7</sup>

## 90%

Of large enterprises will generate revenue from data as a service by 2020 – from the sale of raw data, derived metrics, insights, and recommendations – up from nearly 50% in 2017<sup>8</sup>



# FOUR PRIORITIES FOR SUCCESS

We have identified four strategic priorities necessary for chemical companies to transform their business.



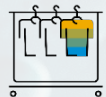
SELL BUSINESS OUTCOMES  
INSTEAD OF JUST PRODUCTS



SIMPLIFY TO SHRINK CYCLE TIMES



COMPETE AS AN ECOSYSTEM



ADOPT STRATEGIC AGILITY IN  
RESPONSE TO MARKET DYNAMICS





# SELL BUSINESS OUTCOMES INSTEAD OF JUST PRODUCTS

Chemical companies have their roots in selling products made from crude oil and inorganics into a variety of downstream industries such as consumer products, life sciences, and automotive, to name just a few.

Finding new molecular structures, scaling them up, and selling them in a business-to-business (B2B) fashion – either as stand-alone products or as part of proprietary formulations into downstream industries – was and still is today's standard business model. Now, however, this business model is being challenged by mass commoditization of products and formulations, global competition, higher demand from consumers for sustainable products and operations, and exponentially increasing regulatory requirements.

## The Vision

By 2025, most chemical companies will move from B2B push models to business-to-business-to-consumer (B2B2C) models. Digital technology and concepts such as the "segment of one" will be leveraged to deliver sustainable, co-developed applications, services, and business outcomes. Companies that have identified an experience gap will gain competitive advantage by engaging more closely with their customers and ecosystem partners. This engagement will enable them to deliver outcome-driven services and address customer expectations. This experience, along with developing customer relationships based on trust and shared values and risks, will be the new paradigm.

## The Journey

Chemical companies will start toward this goal with personalization of the customer experience, marrying customer sentiment analysis with buying behavior analysis across channels to understand each customer's needs and generate tailored customer interactions.

They will establish searchable intellectual-property databases to access relevant scientific information to create co-innovated products and solutions. Having established this foundation, they will extend into properties prediction and performance of new formulations to significantly shorten the development process and time to market while monitoring product and formulation compliance along the entire lifecycle. Furthermore, they will extend into their customers' value chain, monitor process parameters, and allow in situ quality control in real time through sensors at customer operations. In terms of logistics, they will track and trace material flow and product integrity along the entire value chain.

Finally, they will collaborate on open innovation platforms, turn data into value-based services, and establish transformative business outcome-driven and customer-centric revenue models to improve quality and reduce costs and risks for customers.



Driven by demand for product personalization, **50%** of manufacturers will have integrated simulation and configuration tools with customer profile data by 2024, thus achieving up to 2% gains in revenue.<sup>9</sup>

**BASE** teamed up with SAP and spent just 12 weeks developing the Smart Wine Shelf. When a customer takes a bottle of wine from the shelf, details of the wine's vintage and flavor appear on a screen. Using prototypes such as this, **BASF** is increasing the focus it directs at the service concept in its core business to gain an edge over its competitors.



# SELL BUSINESS OUTCOMES INSTEAD OF JUST PRODUCTS

## OUTCOME-BASED CO-INNOVATION

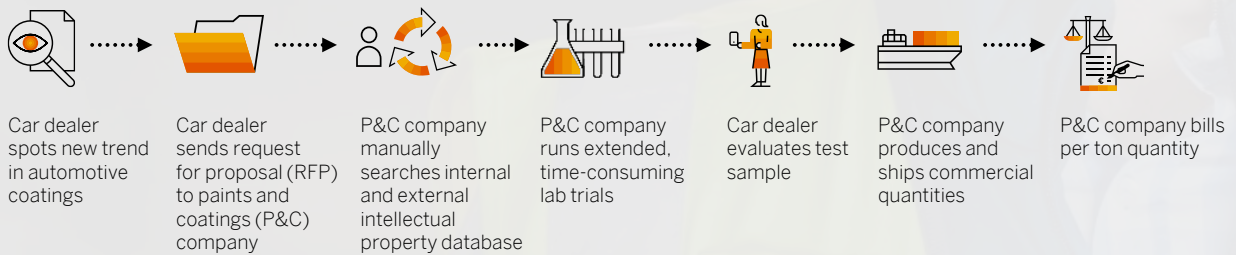
### IN CHEMICAL COMPANIES

Traditionally, chemical companies have developed products in response to market needs and driven by downstream industry sectors such as consumer products, pharmaceuticals, engineering, and construction.

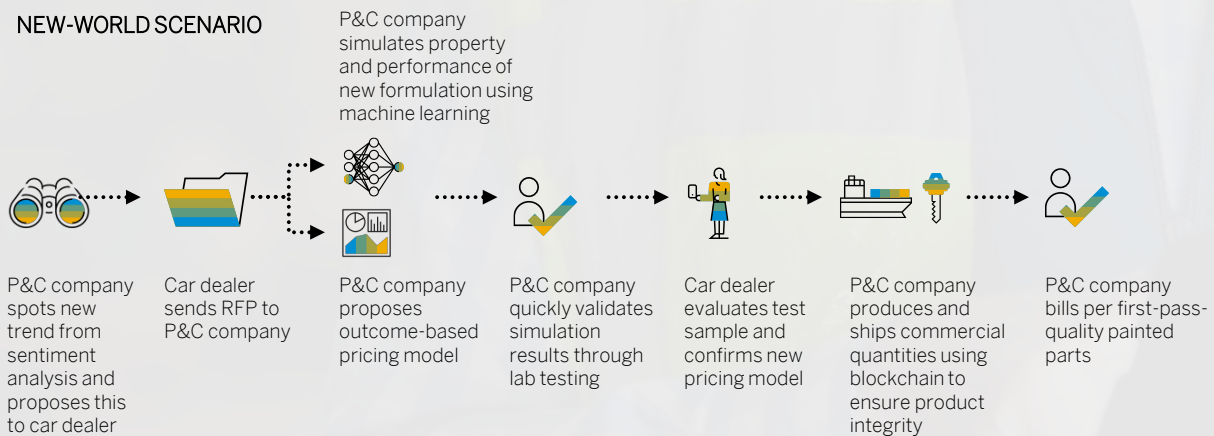
In the future, chemical companies will strive for unprecedented levels of customer experience, anticipating market trends and needs, developing and manufacturing corresponding formulations rapidly, and selling those based on business outcome, such as first-pass-quality semifinished parts or goods, instead of selling by quantity. These innovative processes are enabled by innovative technologies such as machine learning, the IoT, artificial intelligence, and blockchain.

#### TRADITIONAL SCENARIO

A cumbersome, multistep development process and traditional, product quantity-based revenue model delay time to market and time to value.



#### NEW-WORLD SCENARIO



#### TOP VALUE DRIVERS

**Faster** time to market   **Increased** quality   **Higher** customer satisfaction   **Reduced** costs and waste   **Increased** brand recognition



# SIMPLIFY TO SHRINK CYCLE TIMES

Safe, compliant, and sustainable operations are at the top of the CEO agenda and, therefore, have a high priority in any transformational efforts.

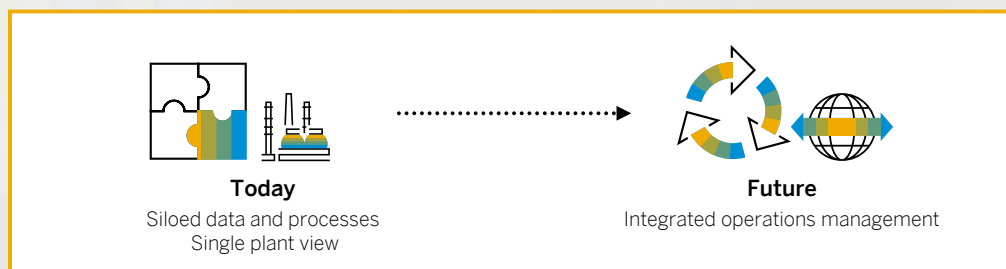
Even though a high level of safety and automation has already been achieved over the last decades, in particular through distributed control systems on the shop floor, many chemical companies still suffer from siloed data and lack of integration in manufacturing and supply chain, which prevents them from further automating processes in those key business functions.

## The Vision

By 2025, chemical companies will be able to automate major components of their back-end systems by using machine learning technology, artificial intelligence, and predictive models to enable scenarios such as lights-out manufacturing or touchless order fulfillment, which will bring them closer to the overall vision of the autonomous enterprise.

## The Journey

In a first step, companies will reduce processing time, increase first-pass yields through predictive quality, and improve overall equipment effectiveness by fully integrating the IoT, machine learning, and digital twins throughout operations. Next, companies will extend into connecting and collaborating with customers, suppliers, and service partners upstream and downstream, for example, through an asset intelligence network and using predictive models and experience management to better forecast demand and balance it with supply in real time. Furthermore, they will be able to anticipate possible disruptions and simulate and implement contingency plans on an ad hoc basis to mitigate risks along the entire supply chain. Finally, they will get close to the vision of the autonomous enterprise by fully automating standard operations with machine learning.



By 2022, digital technologies will have enabled the automation of repetitive operational tasks, leading to **50%** less planner intervention and "touchless" sales and operations planning.<sup>10</sup>

[Cargill](#) improved safety for drivers at plants by building an intuitive application on top of its back-end SAP® Transportation Management application with the SAP Cloud Platform SDK for iOS.



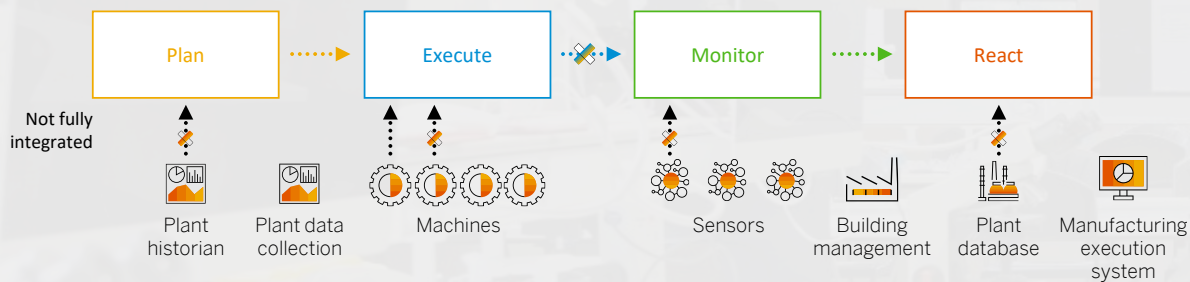
# SIMPLIFY TO SHRINK CYCLE TIMES

# INTEGRATED OPERATIONS MANAGEMENT IN CHEMICAL COMPANIES

The ability to operate safely and effectively is essential to chemical companies. For years, they have been trying to reduce cycle times and improve first-pass yields to operate more effectively with special emphasis on individual inefficiencies, such as movement of material or equipment efficiency. Modern chemical companies, in their attempt to reduce cycle times, are looking at the fully integrated operations of the company. Realizing that changes in one area can impact further downstream operations, they are looking at the total process, end to end, to reduce cycle times. By providing this integrated operational view, solutions such as SAP S/4HANA\* and technologies such as the digital twin allow companies to operate more reliably and efficiently while providing valuable insights into operations to improve problem resolution and business outcomes.

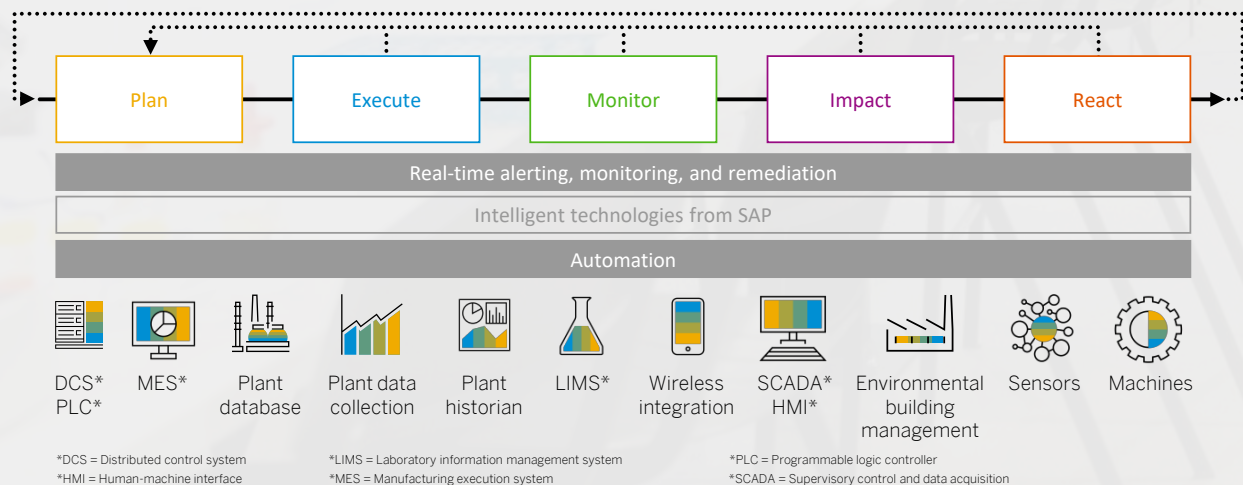
## TRADITIONAL SCENARIO

- Inability to understand the potential impact of an event on one or multiple downstream processes
- Inability to choose the best solution to a problem due to missing functionality to completely model multiple solutions
- Minimal integration between operation and management systems



## NEW-WORLD SCENARIO

- A digital representation of the operational world deals with the interrelated data from facilities, operations, human resources, logistics, and the environment, with shop-floor integration fully supported by intelligent technologies from SAP on top of SAP Cloud Platform.
- As events that have potential to impact operational continuity occur, they are processed, presented, and analyzed for impact, and remedial actions are proposed. Then, a new corrective action plan or reaction is executed.
- The ability to learn what data needs to be acted upon is essential to modern operations.



## TOP VALUE DRIVERS

**Reduced** process cycle times

**Faster** response time

**Reduced** cost and waste

**Support** for new business processes



# COMPETE AS AN ECOSYSTEM

Today, most chemical companies operate within their traditional boundaries. Innovation is primarily driven by an inside-out view, capitalizing on existing products, internal know-how, and established relationships with suppliers, partners, and customers.

However, with growing competition, ongoing globalization, and the advent of megatrends such as precision farming and the circular economy, industry boundaries are blurring. And established business models and practices based upon linear value chains are no longer sustainable.

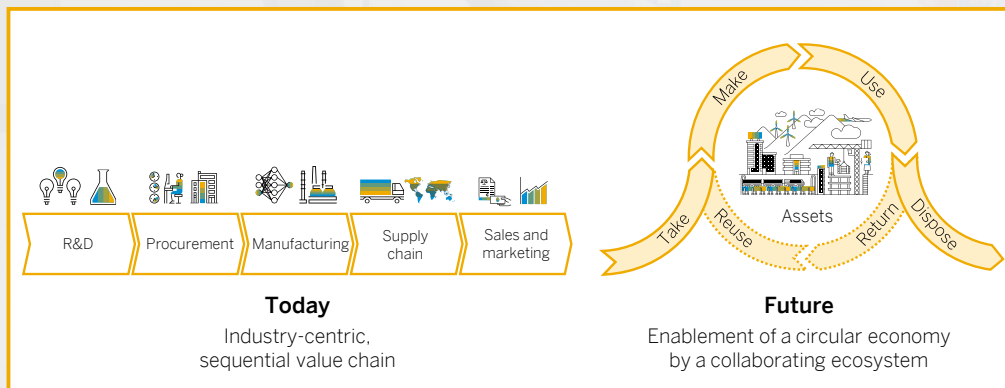
## The Vision

By 2025, many chemical companies will have gone beyond the boundaries of their current product-based value chain. Together with a network of partners (for example, service providers, universities, research institutions, toll manufacturers, and technology providers), chemical producers will be able to work on customer-specific solutions and applications in consumer industries (for example, automotive, high tech, aerospace and defense, and consumer products) in a segment-of-one relationship, delivering outcome-oriented applications and services. They will adopt the capability to flexibly

redesign their network and relationships in line with market dynamics and ongoing portfolio optimization.

## The Journey

In a first step, chemical companies will capitalize on structured and unstructured data (both operational and experience) from an open network or ecosystem to understand market needs. Subsequently, they will connect with and orchestrate an extended network of external stakeholders to respond rapidly to market needs and establish a common platform for collaboration. Ultimately, based on the operational and experience data and intelligent insights from the ecosystem, they will develop differentiating, innovative services, such as benchmarking or proprietary recipes, or business models that support a higher purpose, such as precision farming, circular economy, and open innovation.



By 2022, driven by rising customer expectations and competition from the platform economy, **25%** of manufacturers will be engaged in cross-industry collaboration, resulting in a **10%** revenue increase.<sup>11</sup>

A leading provider of industrial gas production pioneered industrial-scale green hydrogen production. It uses artificial intelligence capabilities from SAP to forecast the availability and price of excess renewable energy and uses predictive models, based on artificial intelligence, to optimize maintenance schedules for plant equipment.

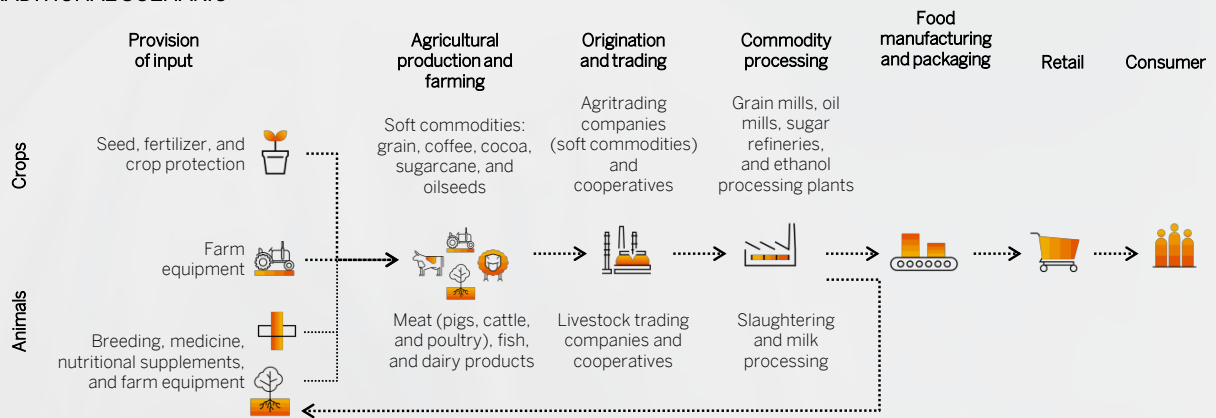


## COMPETE AS AN ECOSYSTEM

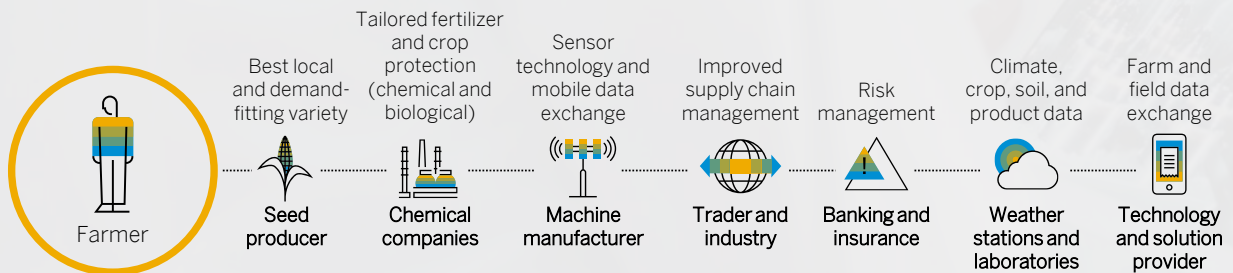
# DIGITAL FARMING: FROM TRADITIONAL VALUE CHAIN TO BUSINESS NETWORK COLLABORATION

Increasingly, agrichemical companies struggle to differentiate themselves in a marketplace plagued by low commodity prices and highly price-sensitive customers. Yesterday's hot GMO seed and its companion crop protection chemical has to compete today with similar offerings from global competitors. In this environment, companies are moving toward direct sales to farmers, with product sales supported by companion product and service offerings provided by business partners. The winners in this market are those with broad partner ecosystems who bundle agricultural products with items such as customized crop insurance, financing, weather services, agronomic advice, equipment maintenance services, and even planting and application services – all of which may come from partner companies. Competing as an ecosystem requires a new mindset and close collaboration among business partners facilitated by supply chain collaboration, business networks, and close customer engagement.

### TRADITIONAL SCENARIO



### NEW-WORLD SCENARIO



### TOP VALUE DRIVERS

**Improved** yield   **Greater** share of customer wallet   **Stronger** customer loyalty   **Increased** brand recognition for the entire ecosystem



# ADOPT STRATEGIC AGILITY IN RESPONSE TO MARKET DYNAMICS

In today's highly dynamic world, growing organically is no longer the only, or even the primary, recipe for success.

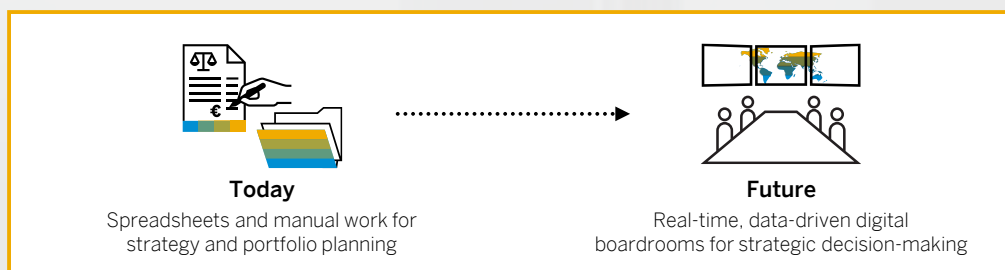
To survive and thrive in such an environment, more and more companies are turning to mergers, acquisitions, and divestitures to expedite portfolio adjustments and diversify into promising new markets or segments. However, many of such initiatives fail, as it takes too long to realize the expected synergies and embed the acquired entities into existing portfolios.

## The Vision

By 2025, chemical companies' overall performance, profitability, growth, and competitive position will be based on enhanced speed and agility to adjust their strategy and their product and service portfolios, to grow into new markets or segments, and to realize synergies of mergers, acquisitions, and spin-offs. This goes far beyond the product and manufacturing expertise chemical companies have shown in the past. It requires the flexibility to apply business-to-consumer (B2C) sales and product management capabilities and the ability to manage diversified product and application portfolios, frequently in a segment-of-one relationship.

## The Journey

First and foremost, chemical companies will reduce cycle times for dynamic analysis of their product and service portfolios, based on better availability and visibility into internal and external operational and experience data. In a follow-on step, they will start embedding external market and company data into ad hoc simulations on strategic scenarios, such as mergers, acquisitions, and divestitures, and will be able to assess the overall impact on corporate KPIs and company performance. Also, they will proactively address customer and market concerns from mergers and acquisitions by collecting and acting on stakeholder sentiment. In the final, transformative stage, companies will co-innovate with customers and embed business and technology innovations into their applications and services portfolio for diversification, differentiation, and profitable growth based on the feedback provided by customers.



By 2020, to increase speed, agility, efficiency, and innovation, **80%** of manufacturers will need to extensively restructure, placing data at the center of their processes.<sup>12</sup>

A leading global chemical company established a "Data in Hub" solution, which enabled simulations, provided faster time to value in building an analytical platform, and reduced time to load data – all with minimal technical requirements. A significant productivity enhancement – at least 25% to 30% – was achieved for teams working with reporting and analytics.



# ADOPT STRATEGIC AGILITY IN RESPONSE TO MARKET DYNAMICS ENABLE MERGERS AND ACQUISITIONS FOR RAPID DIFFERENTIATION AND DIVERSIFICATION

Enhanced speed and agility will be required to adjust company strategies and refocus product and service portfolios on an ongoing basis. This needs to go beyond the classical B2B scenarios well established in the chemicals industry. Sales and product management capabilities for B2B2C and even B2C scenarios need to be acquired and implemented, frequently down to a segment-of-one relationship, especially when performing co-innovation projects and joint development with customers.

## TRADITIONAL SCENARIO

Traditional core functionality of SAP software limited to postmerger integration



**Acquisition integration**  
(preconfigured models, integration frameworks, and technology)



**Monitoring of synergies**  
(executive oversight and key value driver analysis)

## NEW-WORLD SCENARIO

Closed-loop, end-to-end process to cover mergers, acquisitions, and divestitures in their full scope, from predeal evaluation to postmerger integration and divestitures



Target screening  
(white space analysis and risk profiles)



Opportunity development  
(scenario simulation, methodology, and templates)



Estimated cost of integration  
(platform planning, assumptions, and metrics)



Acquisition integration  
(preconfigured models, integration frameworks, and technology)



Monitoring of synergies (executive oversight and key value driver analysis)



Divestitures  
(carve-outs, impact simulation, and value to market)

## TOP VALUE DRIVERS

**Increased** market share

**Realized** synergies

**Increased** revenue growth





# KEY TECHNOLOGIES

The current pace of technological advancements has the most profound impact on enabling how chemical manufacturers transform themselves to respond to market trends and deliver an entirely new customer experience.

Intelligent technologies promise to bring great benefits such as productivity and efficiency gains, enabling innovative new business models and new revenue streams. The following intelligent technologies are instrumental in helping chemical companies respond to market trends.

#### **Artificial Intelligence and Machine Learning**

Machine learning enables algorithms to “learn” from existing data and achieve the best possible outcomes without being explicitly programmed. Once the algorithm is trained, it can then predict future outcomes based on new data. Businesses can use these capabilities, for example, in cash management to boost automatic matching rates and free up finance professionals to focus on strategy and service quality or in HR to automate the talent screening process and identify the candidates with the best skills and education match for a specific job description.

#### **The Internet of Things**

Advances in ubiquitous connectivity and edge computing are driving a step change in business productivity. This connectivity, coupled with artificial intelligence and machine learning, can analyze petabytes of data and affect business outcomes. Although manufacturers have been using the Internet of Things for some time, now the entire value chain can be connected from development to production to supply chain. Data-driven insights can drive customer-centric innovation, lower material costs, and reduce risk. Remote condition monitoring of assets provides real-time data from machines to predict maintenance needs and identify potential quality problems in manufacturing processes before they occur. Assets can be jointly managed as digital twins by manufacturers, customers, and partners, thereby improving asset data and modeling.



### Advanced Analytics

The integration of advanced analytics capabilities, including situational awareness, into applications enables business users to analyze data on the fly and drives better decision-making. Empowered users, benefiting from embedded analytics in business processes, can get real-time visibility into their changing environment, simulate the impact of business decisions, mitigate risk, and achieve better customer outcomes.

### Blockchain

A relatively recent breakthrough technology, blockchain is revolutionizing the movement and storage of value by creating a chain of unaltered transactional data. The blockchain model of trust, through massively distributed digital consensus, could reshape supply chains and commerce across the entire digital economy, for example, by digitalizing the bill of lading document as part of the international ocean shipping process.

### Virtual and Augmented Reality

Virtual reality – the use of digital technology to create immersive

simulations – was once the stuff of science fiction. So was augmented reality, which lets users interact with digital content that's overlaid on the real world. Already in use to help workers with difficult or infrequent maintenance activities, this will become even more critical to attract and retain new talent.

### Conversational AI

Advances in machine learning are enabling algorithms to become highly accurate in natural-language understanding and in image and speech recognition, especially useful in after-service and call-center activities. Voice interface will be the go-to technology for the next generation of applications, allowing for greater simplicity, mobility, and efficiency while increasing worker productivity and reducing the need for training.

### Data Platform to Manage Experience

Leaders are connecting operational data from companies' business systems (what is happening) with the experience data coming from customers and employees (why it is happening) to get 360-degree views and actionable insights, so they can deliver better experiences.



## ~50%

Of new mobile apps use voice as a primary interface, and 50% of the consumer-facing G2000 will use biometric sensors to personalize experiences by 2020<sup>13</sup>

## 30%

Of manufacturers will use blockchain services as a foundation for digital trust at scale<sup>14</sup>

## 50%

Of new industrial robots will leverage AI by 2019<sup>15</sup>

## 57%

Increase, on average, of the contribution of machines and algorithms to specific tasks by 2022<sup>16</sup>

## US\$1 trillion

Internet of Things spending in 2022<sup>17</sup>

## 75%

Of manufacturers will provide their service teams with access to searchable video content through mobility and wearables by 2021<sup>18</sup>

## 37%

Of digital transformation initiatives will use AI services<sup>19</sup>



# GETTING THERE: A PHASED APPROACH

Companies will become intelligent enterprises on three distinct tracks as they evolve their strategic priorities to match their company's vision.



**1. Optimize** what they already do by implementing a stable and scalable digital core to make processes more transparent and integrated



**2. Extend** their current processes by connecting them to the real world using IoT technologies



**3. Transform** their business using a constant stream of data enabling new service-driven business models (see Figure 2)

**Figure 2: Strategic Priorities and Major Themes for Chemical Companies**





# SAP'S FRAMEWORK FOR THE INTELLIGENT ENTERPRISE

Most organizations understand what is happening in their business, but they may not always know why.

They know what's happening because they have systems that capture operational data (O-data) – about their customer transactions, supply chain, manufacturing, spending, and the activities of their workforce. They can see that data through reports and dashboards. They can see trends and predict what will happen next.

But to influence what happens next, companies need data about the interactions people have with their products and their business. Experience data (X-data) captures beliefs, emotions, opinions, and perceptions – “why” something is happening. And when companies know why something is happening, they can make an informed decision about the best way to respond.

To win in this experience economy, intelligent enterprises connect experiences with operations. They use both X-data and O-data to guide their business decisions. Intelligent enterprises collect insights from customers, employees, products, and brands at every touch point. They use powerful technologies to automate and integrate their data, processes, and applications, enabling them to sense risks, trends, and opportunities. And they act on this intelligence across every part of their business (see Figure 8).

Only SAP has the strategy, expertise, and solutions to deliver on this vision, enabling intelligent enterprises to turn insight into action.

**Figure 8: SAP® Intelligent Enterprise Framework**





# HOW TO PLAN YOUR PATH TO THE INTELLIGENT ENTERPRISE

In the digital economy, intelligent technologies and integrated business processes are now driving digital transformation.

To do this effectively requires an end-to-end plan for becoming an intelligent enterprise. This includes creating an intelligent enterprise road map and implementation plan with proven best practices and deployment options that optimize for continuous innovation with a focus on intelligent outcomes.

## The End-to-End Journey to Becoming an Intelligent Enterprise



**Plan**  
well to manage expectations

**Simplify and innovate**

- Reimagined business models, business processes, and work
- SAP Intelligent Enterprise Framework methodology as a guide for digital transformation
- Value-based innovation road maps

**Build and launch**  
with proven best practices

**Standardize and innovate**

- Model-company approach to accelerate adoption with model industry solutions
- Design thinking and rapid, tangible prototypes
- Coengineered industry innovations delivered with agility

**Run**  
all deployment models

**Run with one global support**

- One global, consistent experience
- End-to-end support – on premise, in the cloud, or with a hybrid approach

**Optimize**  
for continuous innovation

**Optimize to realize value**

Continuously captured and realized benefits of digital transformation

To move forward with speed and agility, it helps to focus on live digital data and combine solution know-how and industry-specific process expertise with data analytics so that the right digital reference architecture is defined and delivered. In that context, a model-company approach is aimed at simplifying and increasing the speed of the digital transformation journey. Model companies represent the ideal form of standardization for a specific line of business or industry. They are built on preconfigured SAP solutions based on best practices supported by SAP, along with the business content that encompasses our experience and expertise relevant for the industry. They provide a comprehensive baseline and come with the accelerators to jump-start digital transformation projects.



# COMPREHENSIVE SAP ECOSYSTEM: ORCHESTRATING THE PARTNER ECOSYSTEM TO DELIVER VALUE FASTER

Our comprehensive ecosystem for the chemicals industry offers:

- The Intelligent Enterprise as the overarching strategy to meet future requirements, providing:
  - SAP S/4HANA co-development programs for customers and partners
  - Industry co-innovation programs for industry-specific use cases
  - Delivery of enterprise-to-enterprise industry clouds
  - Thought leadership, evangelism, and enablement by industry through events, councils, and regular customer exchange
- Integration into a wide range of business services (OEMs, suppliers, key vendors, and more)
- Open architecture, with a choice of hardware and software specifically designed to meet requirements
- Complementary and innovative third-party solutions to provide leading-edge and state-of-the-art technology

Our partner ecosystem includes, among others:





# SAP IS COMMITTED TO INNOVATION



## 10-Year Innovation Vision

SAP delivers fully intelligent business solutions and networks that span across company boundaries and promote purpose-driven businesses. These solutions will be the most empathic symbiosis between machine intelligence and human ingenuity.

- Self-running enterprise systems
- Self-organizing business ecosystems
- New markets and business models



## Comprehensive Industry Coverage

SAP enables comprehensive coverage of the complete chemicals value chain across the enterprise. With its clear industry road map, SAP is the partner of choice for chemical companies.

- More than 7.000 chemical manufacturers in 97 countries innovate with SAP solutions
- 95% of the chemical companies in the Forbes Global 2000 are SAP customers
- All lines of business are supported on a single platform



## Proven Services Offering

By bringing together world-class innovators, industry and emerging technology expertise, proven use cases, and design thinking methods, we help chemical companies develop innovations that deliver impact at scale.

- Proven methodologies to drive innovation, from reimagining customer experiences to enhancing operations
- Innovation that is fueled through a managed innovation ecosystem from SAP
- Ability to build your own innovation capability and culture

SAP supports chemical companies in becoming intelligent enterprises – providing integrated business applications that use intelligent technologies and can be extended on SAP Cloud Platform to deliver breakthrough business value.



Learn more

- [SAP for Chemicals](#)
- [SAP Services and Support](#)



# RESOURCES

Listed below is external research that was used as supporting material for this paper.

1. "[Technology Vision 2018: Intelligent Enterprise Unleashed](#)," Accenture, 2018.
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3. "[Chemical Trends 2018–19: A Tipping Point of Profitability](#)," PwC, 2018.
4. "[IDC FutureScape: Worldwide Manufacturing Product and Service Innovation 2019 Predictions](#)," Doc. #US43135918, IDC, October 2018.
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8. "[IDC FutureScape: Worldwide IT Industry 2018 Predictions](#)," Doc. #US43171317, IDC, October 2017.
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17. "[IDC Forecasts Worldwide Spending on the Internet of Things to Reach \\$745 Billion in 2019. Led by the Manufacturing, Consumer, Transportation, and Utilities Sectors](#)," IDC, January 3, 2019.
18. "[IDC FutureScape: Worldwide Manufacturing Product and Service Innovation 2019 Predictions](#)," Doc. #US43135918, IDC, October 2018.
19. "[Worldwide Spending on Cognitive and Artificial Intelligence Systems Will Grow to \\$77.6 Billion in 2022. According to New IDC Spending Guide](#)," IDC, September 19, 2018.

**Note:** All sources cited as "SAP" or "SAP Performance Benchmarking" are based on our research with customers through our benchmarking program and other direct interactions with customers.





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