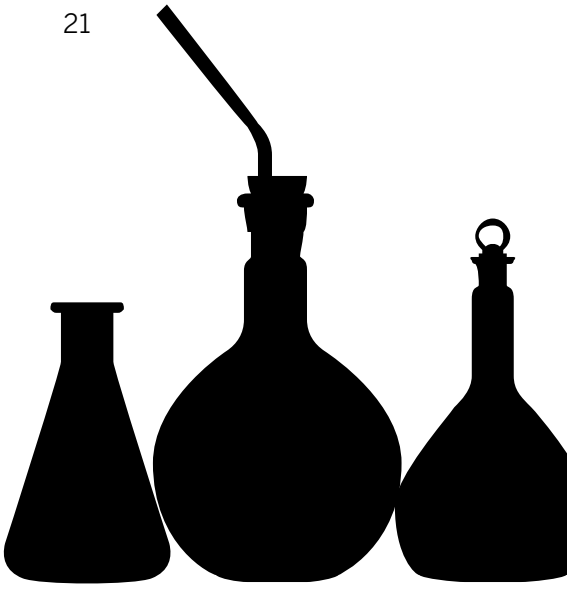
Digital Transformation in the Chemicals Industry

Inspire and shape

a digital world to fuel profitable growth; safely deliver innovative chemicals, applications, and services; and build customer intimacy like never before

SAP Run Simple

TABLE OF CONTENTS



THORSTEN'S POINT OF VIEW

The face of the chemical industry is changing with a constant stream of mergers and divestitures. New digital leaders are emerging by leveraging innovation and embracing technology in every aspect of their business.

Thorsten Wenzel, PhD
Vice President and
Global Head of Chemicals,
Industry Business Solutions
SAP SE

Dear Colleagues,

Globalization, major regional shifts of demand and supply base, geopolitical risks, increased competition, and exponentially growing regulatory requirements threaten established strategic models in the chemical industry. Company leaders are faced with new challenges that keep them up at night. How do we quickly integrate acquisitions to release promised synergies and onboard new revenue sources? How do we reduce complexity, integrate across silos, and streamline workflows across our entire global value chain? How do we resist commoditization by embedding ourselves more intimately within our customers' innovation and operations cycles? How do we rapidly enter, differentiate, and win in new markets?

Tackling these challenges requires more than doing what's always been done; instead, it requires doing it better, faster, cheaper, and smarter. It requires a reimagining of entire business models, business processes, and the very nature of work itself.

Leading companies are positioning themselves to transform their business models to:
- **Compete on outcomes,** delivering tangible customer results versus selling increasingly commoditized chemical products
- **Compete as an ecosystem,** integrating with both customer and supplier supply chains to unlock superior value

Business processes are being reengineered to:
- **Slash cycle times,** enabling real-time sense and response and massively simplifying operations
- **Maximize uptime,** leveraging IT/OT integration and predictive maintenance and quality management

And work is being reengineered to enable:
- **The perfect work process,** empowering workers to optimize profitability at the transactional level
- **Extended workforce engagement,** incorporating simulations, scoring, and performance-based approaches that engage, empower, and excite the entire workforce

SAP's approach to enabling this digital transformation is to provide the digital-ready platform, the high-performance applications, and the connected business networks necessary to rapidly and securely execute new business models, extend value chains, and engage with customers, employees, and partners like never before.

Our vision is to help the global chemical industry digitally transform in order to drive profitable growth, safely deliver innovative chemicals, and build customer intimacy. This document offers our point of view on where the industry must go and how SAP can help drive the digital transformation in chemicals.

Thank you for your interest, and I look forward to your feedback.

Thorsten Wenzel, PhD

THE DIGITAL ECONOMY

The Big Picture: What Got Us Here Won't Get Us There

Digital Technology as a Game Changer for Chemicals

Digitalization has reached every aspect of today's life, and it is here to stay. With the **Internet of Things** (IoT), the intelligence of the external world is brought to chemical manufacturers, enabling them to create new value or enhance value from within the countless connections all around. **Artificial intelligence and machine learning** are fast becoming the new normal, allowing chemical manufacturers to employ autonomous equipment on top of data, making processes smarter and transactions faster and freeing up resources for more strategic activities. By integrating and enriching the user's environment with digital information in real time, **augmented reality** is having a profound impact on chemical companies. It differs from virtual reality, which creates a totally artificial environment.

Why is digital transformation important to chemicals?
Our conversations with over 150 chemical companies and leaders highlight a common imperative: grow the bottom line profitably by improving agility, productivity, and innovation. The chemical industry is evolving in new and unexpected ways, yet many companies still struggle to recognize and understand how the digital economy will create opportunities and risks. Early evidence, however, is compelling. Significant value will be created by embracing new digital technologies across the chemical industry. The digital economy is real, and it's here to stay.

Early adopters of new technologies are emerging and are winning in chemicals by focusing on digital innovations and/or optimizing business processes. By rethinking their strategy and operations, companies have leveraged new digital technologies to transform and deliver impressive results. Examples include:

- **Redefining their value propositions** and **delivering more tangible customer results** (what value to chemical companies deliver and sell to customers) enabled by the IoT and real-time digital platforms that sense and integrate end-user consumption patterns with order management and supply chain activities. Monetizing information and creating new services to complement product sales
- **Accelerating innovation** by bringing a new level of analytics and collaboration to research and development
- **Achieving strategic agility and operational excellence** using predictive models and what-if simulations based on a single platform and single set of data

Our point of view
SAP believes that the emerging digital economy is very relevant to chemical companies. New technologies and capabilities will transform business models, processes, and work. However, this digital transformation requires a clear strategy, a robust platform, and a significant change management effort.

Access more information on the latest technology trends here.

Digital business models are disruptive. The rules have changed.

- **Asian Paints** reimagined its business model and overall customer experience from selling paints to selling a consumer experience and helping people to beautify their homes through extending into a network of 45,000 retailers.[1]
- **Nippon Paint China** developed an innovative analytics platform that pulls together customer and market-relevant information, structured and unstructured, from peripheral sources. The resulting 360-degree view of customer behavior helped the company anticipate market trends, support designers and deliver products that more accurately match client needs.[2]
- **Eastman Chemical** reimagined the entire strategic planning process through enabling real-time visibility and decision making via a digital boardroom, based on a single set of data.[3]

THE DIGITAL ECONOMY

The Future: Priorities for Chemical Companies

Reimagining

Market dynamics threaten established strategic models in the chemical industry. Proven differentiating strategies are facing an acid test: markets are going east, customer loyalty is eroding, and new, low-cost competitors are emerging. Shale gas in the United States and coal-to-chemicals technology in China change the game and threaten incumbents. Hence, customer and feedstock proximity, intellectual property, and technology know-how may soon no longer secure a sustainable competitive advantage.

Recent advancements in digital technology offer unprecedented levels of connectivity, granularity, and speed in accessing, processing, and analyzing huge amounts of data. Early adopters have the unique opportunity to master the market challenges and act as game changers or digital disruptors.

But how do you prepare for digital transformation, and what are the key strategic priorities you want to enable by it? The starting point of the digital journey is the ability to completely reimagine your business together with customers. That means reimagining your business models, your products, your business processes, and your work. The potential is huge.

Strategic Priorities for Chemical Companies

The digital economy is disruptive. The rules have changed and businesses must be reimagined to:

- **Deliver tangible customer results**
  Connect to and collaborate with your customers, understand and become part of their value chains, and leverage digital technology to deliver innovative services and business outcomes instead of selling products
- **Simplify to slash cycle times**
  Run simulations and predictive models, enable real-time sense and response, and leverage IT/OT integration and the IoT to reduce time to market, streamline operations, maximize asset performance, and minimize rework
- **Integrate with ecosystems to unlock superior value**
  Capitalize upon open innovation, leverage extended manufacturing networks, go beyond the boundaries of your existing value chain, and understand your customer's customers needs. Adopt the capability to flexibly redesign your network and relationships in line with market dynamics.
- **Adopt strategic agility in response to market dynamics**
  Adjust strategy and portfolio dynamically in response to market opportunities and needs, grow rapidly into new markets or segments, and capitalize on mergers, acquisitions, and spin-offs to secure continued growth in a challenging global environment

Successfully embracing the opportunities from new technologies and consequently leveraging them as enablers for these four strategic priorities will be the foundation of successful digitalization and staying ahead of the innovation curve.

€25 billion
Of new value per year driven by digital transformation in Europe alone for chemical companies[4]

58%
Of chemical companies are embracing digital to gain competitive advantage over industry peers[5]

94%
Of chemical executives expect to increase investment in digital capabilities in the next three years[6]

87%
Of chemical executives believe that companies failing to embrace digital face extinction[7]

REIMAGINING

THE DIGITAL ECONOMY OFFERS INFINITE NEW OPPORTUNITIES

In a connected world where every chemical company is becoming a technology company, outcome-based business models; end-to-end process automation, integration, and collaboration with extended ecosystems; and strategic agility in response to market opportunities and needs will become the new paradigms for a sustainable future.

REIMAGINE BUSINESS MODELS

Energy and raw-material price volatility, global shift of demand and supply centers, rapid product commoditization, and increasing regulatory requirements are here to stay and create a climate of uncertainty for the chemical industry. But they also offer new opportunities for digital leaders.

Deliver Tangible Customer Results

With customers getting more demanding, product lifecycles shrinking, new competitors entering the market, and sustainability becoming a strategic differentiator, just selling products is not enough anymore. Instead, chemical companies need to look into selling outcomes and results.

Top performers are bundling products with value-adding services that differentiate their offerings, increasing customer loyalty and grabbing a larger share of the customer wallet. We see chemical companies:

- Moving closer to customers and tying product properties into application performance through niche product development
- Gaining insight into their customers' value chains to better understand demand patterns without point-of-sale information
- Combining sensor technology with closed-loop, cradle-to-cradle concepts to measure outcome-related parameters while minimizing waste and rework
- Establishing leasing models that provide, for example, industrial surface cleaning as a service instead of just selling the chemicals
- Supporting customers with the application of chemical products such as field prescriptions for digital farming to achieve higher yields

Integrate with Ecosystems to Unlock Superior Value

The chemical industry is a capital-intensive industry, and a high return on assets is one of the most important key performance indicators. However, making capital commitments in today's climate of uncertainty bears a high risk. In the face of this risk, new business models are emerging where traditional line of business outsourcing models (such as IT, HR, or logistics) are expanding to include actual plant process orchestration, virtually eliminating the need for working capital.

- Chemical companies are emerging with no manufacturing footprint – the manufacturing process itself is not a core competency and can be outsourced to low-cost manufacturers close to sources of demand
- Companies are virtualizing their entire business by orchestrating resources on demand to meet innovation and market needs
- Leaders are establishing highly agile digital networks in which collaboration with a variety of partners – R&D institutes, toll manufacturers, 4PLs, or environmental service providers – provides specific know-how and services to perfectly meet their customers' needs

Hagleitner differentiated itself from the competition by transforming its business model from selling commodity sanitizers, soaps, and towels to delivering a clean washroom technology. Leveraging smart sensors, the Internet of Things, and advanced real-time data, Hagleitner increased service levels and customer satisfaction while reducing its costs and carbon footprint.[8]

REIMAGINE BUSINESS PROCESSES

Digital technology has opened the door to a new realm of business process reengineering. The objective of profitable growth remains the same, but this evolution is slashing cycle times throughout all business processes with a keen focus on maximizing uptimes in an asset-intensive industry.

Simplify to Slash Cycle Times

Digital chemistry

Driving sustainable growth and innovation is one of the most critical success factors for chemical companies, and digitalization provides unprecedented opportunities for accelerating the product development process. Examples include:

- Knowledge hub concepts supporting predictive analytics during experimental design, driven by consolidation of data from databases, devices, and machines
- Smart labs that design, execute, and capture experiments in closed-loop processes while leveraging lab data history
- Predicting technical properties of new formulations

Digital plant

Leveraging digital technology to maximize uptime and optimize asset utilization in manufacturing processes represents a huge opportunity for chemical companies.

- Step changes in performance are possible through event-driven adjustments of production plans and schedules
- Predictive models are optimized for asset maintenance and product quality, and through data-driven decision support based on real-time insights

No-touch order to delivery

In today's highly dynamic, global world, meeting customer demands through agile and responsive fulfillment is pivotal to success.

- Digitalized order to delivery provides big opportunities to chemical companies to reduce cycle times while increasing customer satisfaction and loyalty.
- Companies capture demand in real time using sensors and run ad hoc simulations in sales and operations planning to respond in real time to changed customer or market needs.
- Deliveries are automatically created along with required regulatory and logistics documentation, following safe and sustainable practices and minimizing risk of supply chain disruption.

Dynamic pricing and real-time margin management

Ongoing volatility in raw material and energy prices, as well as in customer demand, provides a big challenge to chemical companies in terms of meeting their margin goals.

- Digitalization allows chemical companies to simulate the effect of price changes on margin anytime, anywhere, and at any level of granularity.
- Chemical companies develop real-time pricing quotes for customers and prospects and integrate this information with available-to-promise or capable-to-deliver commitments.
- Through integration with extended networks, companies can now instantly collaborate with suppliers to combat price and supply volatility in real time.

"Our high-performance compliance-determination engine powered by SAP HANA and built in collaboration with SAP Custom Development and SAP Consulting is critical to our business and solidifies our position as the leading innovator in our industry."
Yves Courtot, Compliance and EHS Portfolio Manager, IT Demand, Givaudan SA[10]

REIMAGINE WORK

The U.S. chemicals industry has shed 30% of its workforce despite doubling its output.[11] In leaner workforces, the way people do their daily work fundamentally changes to management by exception, driven by alert notifications, rapid decision making with simulations, reaction-based response mechanisms, and advanced analytics for control.[11] All employees must be engaged with the ability to follow perfect work processes.

The Perfect Work Process

All workers must strive to optimize profitability at the core transactional level. Every employee must understand how their respective job impacts corporate strategy at every level of the organization.

- Back-office processes will be fully digitalized. Previously manually intensive steps in procurement, HR, inventory management, and invoicing are replaced by collaborative transactions with access to real-time analytics that support role-based decision making.
- Shop floor operating instructions are now supported and/or controlled by predictive and self-learning systems that interact with plant equipment and business processes.

The Engaged Employee

Digital employees expect a seamless and mobile-enabled work experience. Employee turnover will remain high if they are not actively engaged in the entire work experience with a sense of ownership and pride. In addition, the aging workforce poses a big challenge for chemical companies.

- Predictive models and simulations must drive insight to action for all employees, without forcing them to jump to different applications or seek approvals.
- To preserve enterprise knowledge, such as 40 years of operator experience, rapid knowledge transfer to new employees and continuous training and education are pivotal to success.

People continue to be key assets in transforming the chemical industry. Their roles will change, but their value to each partner in the network will grow.

Givaudan drove productivity and creatively engaged its workforce while migrating to the SAP® Environment, Health, and Safety Management (SAP EHS Management) application and the SAP HANA® platform. The company built a robust determination engine for chemical compliance that can evaluate products in seconds, saving employees valuable time while improving consumer safety and satisfaction.[10]

SAP® DIGITAL TRANSFORMATION FRAMEWORK

A SIMPLE AND PROVEN APPROACH TO VALUE CREATION THROUGH DIGITALIZATION

Every company requires a simple approach to build a pragmatic and executable vision of its digital strategy.

SAP DIGITAL TRANSFORMATION FRAMEWORK

Every company needs to think about the five pillars of a digital strategy

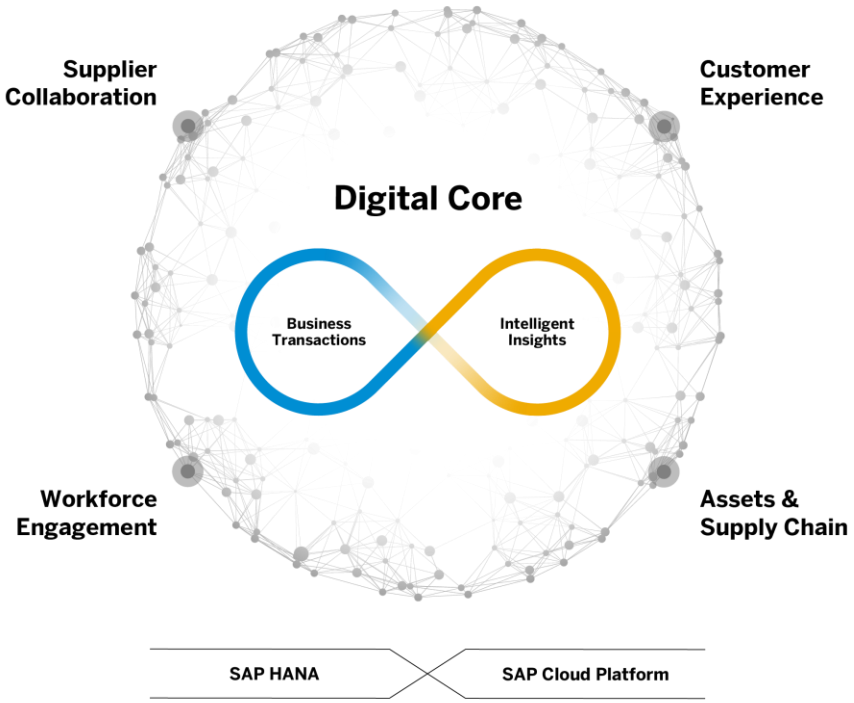
We have looked at the five strategic priorities that chemical companies are pursuing and how they have to reimagine their business models, products, processes, and work to do that.

Let's now look at how SAP can help enable them do this by providing the following architecture.

As companies are reimagining their entire business, they need an IT architecture that provides both stability and long-term reliability for the core enterprise processes, and at the same time allows for flexibility in areas where change is happening on a constant basis.

This concept, which is often referred to as "bimodal IT," is brought to life through the SAP® Digital Transformation Framework graphic, pictured below.

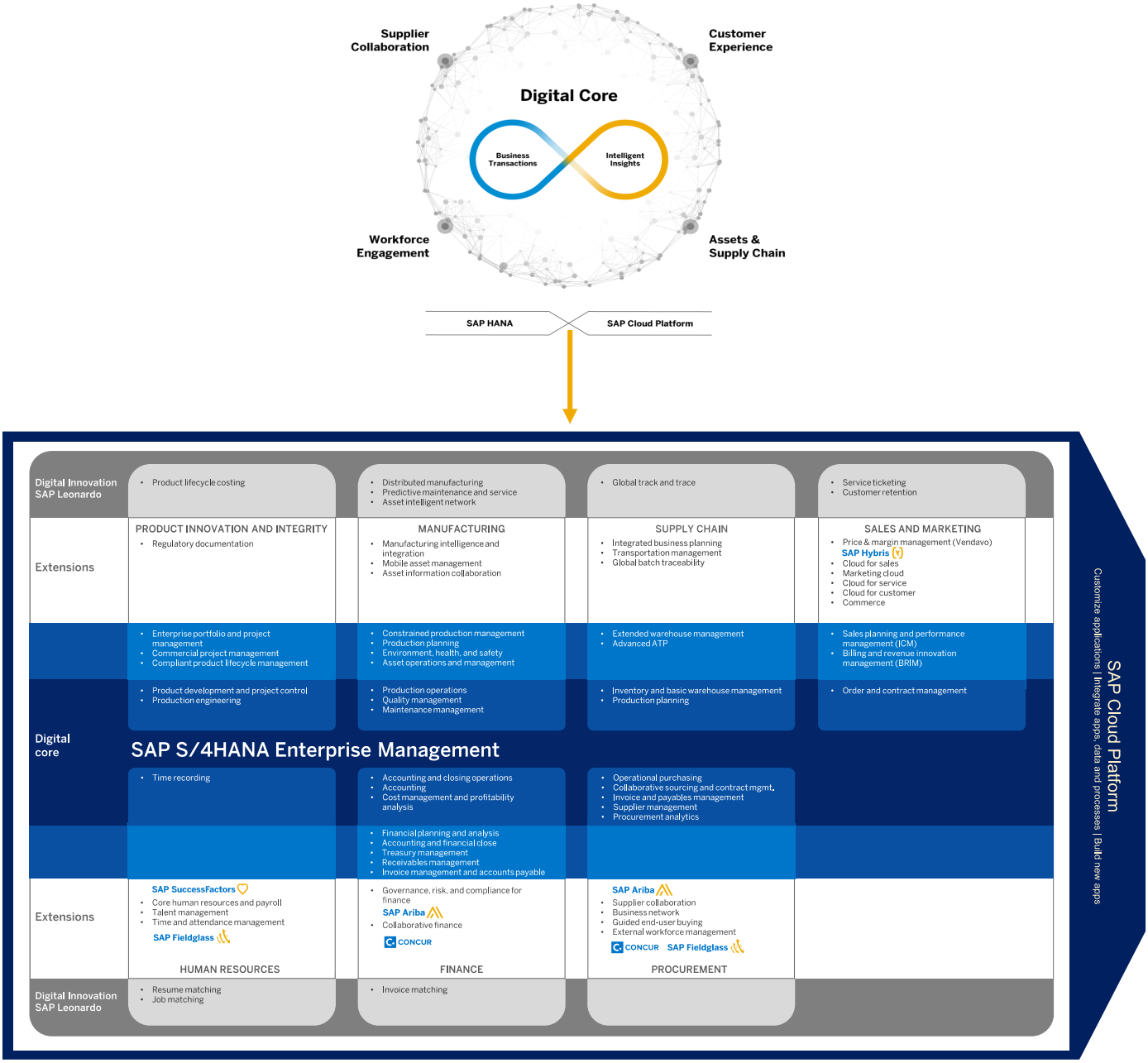
- The **digital core** is the foundation for the core enterprise processes, which need to run consistently and uninterrupted. It provides real-time transactions and analytics, the ability to work with Big Data, and connectivity to the four outside pillars of the framework.
- Your **customers** require flexibility in the way they interact with you through multiple channels. Moreover, deeper customer collaboration should enable outcome based business models.
- Harness the **Internet of Things** to connect equipment and machinery on your own factory floor to your digital core and allow for real-time insights and new business models..
- A lot of flexibility is required when building and maintaining an agile **workforce**.
- And finally, flexibility and adaptability in working with **suppliers and partners** are key in order to onboard new suppliers quickly and shift supply to alternates.



SAP PORTOFLIO WITH S/4HANA® AND SAP LEONARDO

SAP has innovated its portfolio to provide both for a stable digital core as well as flexible line-of-business (LoB) extensions.

In the digital economy, simplification and business innovation matter more than ever. To do this effectively, it's important to cover the end-to-end digital transformation journey, ranging from planning a digital innovation road map and implementation plan with proven best practices to the ability to run all deployment options and ultimately optimize for continuous innovation with a focus on outcomes.



- Digital core: Core solution capabilities delivered as part of SAP S/4HANA Enterprise Management
- Digital Core: Solution capabilities that are also part of SAP S/4HANA Enterprise Management, but added/purchased as needed.
- Extensions: Cloud-based (LoB) solution extensions that are *fully integrated* with SAP S/4HANA Enterprise Management, but added/purchased as needed.
- Leonardo: Solution capabilities that are powered by a Leonardo technology and included in the Leonardo suite and how to add/purchase is not shown on this diagram.

They are pursuing **four key initiatives** that require **new business capabilities** along the value chain.

Chemical companies need to transform their business and process models **now** to pave the way for a sustainable future.

1. Market dynamics threaten established strategic models.

2. To deliver sustainable growth, performance, and innovation, chemical companies must inspire and shape a digital chemical world.

	Product Innovation and Integrity	Manufacturing	Supply Chain	Sales and Marketing	Human Resources	Finance	Procurement
Deliver customer outcomes, not products	• Gain live insights into customer needs and market opportunities • Simulate product and service portfolio performance at any stage	• Monitor process parameters and allow in situ quality control in real time through sensors at customer operations	• Track and trace material flow and product integrity along the entire value chain • Establish vendor-managed inventory leveraging the Internet of Things (for example, telemetry)	• Define services and contracts focusing on delivering business outcomes instead of products • Drive customer segmentation and prioritization along those services	• Create flexible, service-oriented contracts with customers • Enable social collaboration among interdisciplinary teams	• Establish outcome-based financial models • Enable financial controlling of performance- and outcome-based service contracts	• Augment the workforce with the efficient integration of a contingent (service-oriented) workforce
Simplify to shrink cycle time	• Maximize access to and reuse of intellectual property and patent information • Use predictive models to forecast product and formulation properties	• Use predictive models, digital twins and augmented reality to maximize asset lifecycle performance • Minimize production disruptions via the SAP Asset Intelligence Network • Minimize cycle times for shutdowns, turnarounds and outages (STO)	• Enable real-time decision support for order fulfillment with an MRP cockpit	• Automatically processes customer inquiries to deliver best-in-class customer service • Anticipate behavior and build customer loyalty through proactive retention	• Identify the best candidates for jobs without bias via intelligent resume matching • Find a list of recommended jobs for job seekers matching his skills and qualifications via intelligent job matching	• Enable intelligent invoice matching and automatically clear payments via machine learning	• Automate and simplify the integration of material suppliers • Onboard alternative suppliers in a flexible fashion
Compete as an ecosystem	• Collaborate internally and externally through a single platform • Capitalize on structured and unstructured data from an open innovation network or ecosystem	• Orchestrate an extended network of external manufacturers to rapidly respond to market needs • Embed new technologies like 3D Printing farms into your network	• Enable deep and real-time collaboration with suppliers and customers • Mitigate supply chain risks through real-time event and alert management	• Access and analyze structured and unstructured data from multiple channels • Optimize engagement along the customer buying journey	• Manage external contractors in a flexible manner, enable flexible work teams • Manage complex services	• Optimize working capital • Manage increased financial risks associated with highly flexible supply chains and manufacturing operations	• Contract and enable global supply chains with multitier supplier management • Enforce compliant purchasing taking advantage of contracted discounts.
Increase market-driven strategic agility	• Perform multilevel what-if simulations for better portfolio decisions • Integrate and validate global compliance requirements across the entire product lifecycle	• Leverage a fleet of internal and external assets in response to market needs • Gain access to diverse production technologies, rapidly onboard new technologies and assets as needed	• Rapidly run what if simulations in response to changed demand and supply scenarios • Easily line up a variety of stakeholders in support of innovative concepts (for example, precision agriculture)	• Establish multiple channels to support diverse customer needs and services • Drive real-time price and margin management across all channels	• Develop strong in-house skills and organizational entities to manage strategic decisions at an ongoing basis • Establish strong collaboration and education platform to support organizational and cultural change	• Rapidly evaluate impact of strategic portfolio decisions on your financial performance • Visualize and manage corporate risks based on a single source of data	• Leverage extended procurement networks to rapidly onboard new suppliers at minimum risk
Typical business benefits*	▪ New product revenue: +10%–20% ▪ Time to market: -10%–55% ▪ R&D expenses: -20%–30%	▪ Manufacturing cycle time: Up to -10% ▪ Manufacturing costs: Up to -10% ▪ Unplanned asset downtime: -5%–10%	▪ Days in inventory: -10 %–12% ▪ Total logistics costs: -10%–12% ▪ Supply chain planning costs: -3%–5%	▪ On-time delivery: +20%–30% ▪ Customer satisfaction: +10%–20% ▪ Productivity of order management full-time equivalents: +10%–15%	▪ Lower costs for time and attendance ▪ HR full-time equivalents: -44%	▪ Budgeting and forecasting costs: -25%–50% ▪ Annual time to close books: -40%–50% ▪ Days sales outstanding: -5%–10%	▪ Procurement function costs: -15%–20% ▪ Accounts payable errors: -5%–6%

Digital Innovation SAP® Leonardo

Internet of Things | Machine Learning | Analytics | Blockchain | Big Data

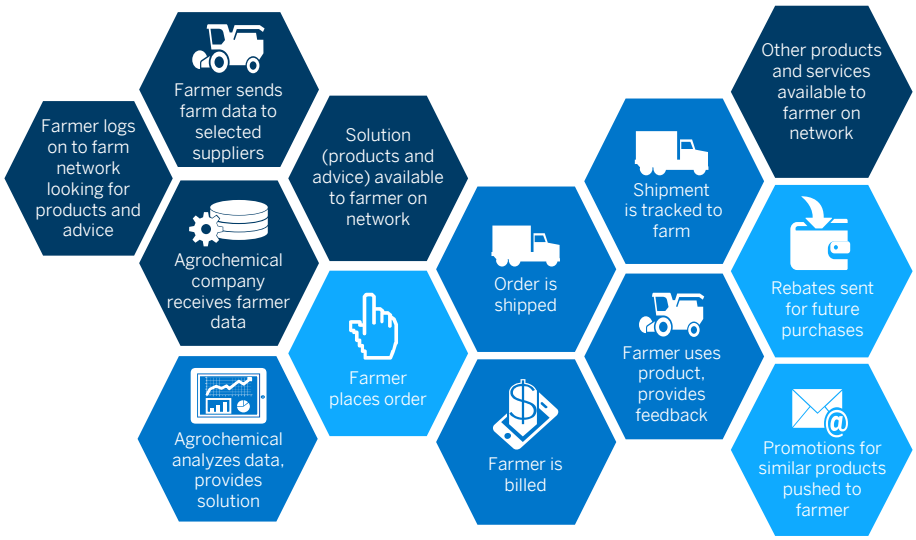
SAP Cloud Platform | Analytics Services | UX Services | Mobile Services | Security Services | Collaboration Services

	Product Innovation and Integrity	Manufacturing	Supply Chain	Sales and Marketing	Human Resources	Finance	Procurement
Extensions	▪ Product lifecycle costing ▪ Regulatory documentation	▪ Distributed manufacturing ▪ Predictive maintenance and service ▪ Asset intelligent network ▪ Manufacturing intelligence and integration ▪ Mobile asset management ▪ Asset information collaboration	▪ Global track and trace ▪ Integrated business planning ▪ Transportation management ▪ Global batch traceability	▪ Service ticketing ▪ Customer retention ▪ Price and margin management (Vendavo) SAP Hybris ▪ Cloud for sales ▪ Marketing cloud ▪ Cloud for service ▪ Cloud for customer ▪ Commerce	▪ Resume matching ▪ Job matching SAP SuccessFactors ▪ Core human resources and payroll ▪ Talent management ▪ Time and attendance management SAP Fieldglass	▪ Invoice matching ▪ Governance, risk, and compliance for finance SAP Ariba ▪ Collaborative finance CONCUR	SAP Ariba ▪ Supplier collaboration ▪ Business network ▪ Guided end-user buying ▪ External workforce management CONCUR SAP Fieldglass
Digital Core SAP S/4HANA®	▪ Enterprise portfolio and project management ▪ Commercial project management ▪ Compliant product lifecycle management ▪ Product development and project control ▪ Production engineering	▪ Constrained production planning ▪ Production planning ▪ Environment, health, and safety ▪ Asset operations and maintenance ▪ Production operations ▪ Quality management ▪ Maintenance management	▪ Extended warehouse management ▪ Advanced ATP ▪ Inventory and basic warehouse management ▪ Production planning	▪ Sales planning and performance management (ICM) ▪ Billing and revenue innovation management (BRIM) ▪ Order and contract management	▪ Time recording	▪ Financial planning and analysis ▪ Accounting and financial close ▪ Treasury management ▪ Receivables management ▪ Invoice management and accounts payable ▪ Accounting and closing operations ▪ Accounting ▪ Cost management and profitability analysis	▪ Operational purchasing ▪ Collaborative sourcing and contract mgmt. ▪ Invoice and payables management ▪ Supplier management ▪ Procurement analytics

*Benefits are based on early adopters of SAP S/4HANA or conservative outside-in benefits due to moving from a traditional enterprise resource planning system to enhanced capabilities of SAP S/4HANA, as well as line-of-business and cloud solutions.

HOW DOES IT ALL COME TOGETHER? EXAMPLE: DIGITAL FARMING

While each part of the digital business framework delivers significant value as a standalone technology, the ultimate goal is to design the next generation of business processes that will take advantage of the entire digital framework. The agribusiness ecosystem provides the perfect example of an environment in which all business partners (farmers, the companies who sell to them, and the companies who buy from them) need to be connected through a business network to share large amounts of IoT data in order to provide an enhanced customer experience **and deliver tangible customer results, hence turning selling products into selling business outcomes**.



Supplier collaboration
Business networks

Customer experience
Omnichannel

Assets and the
Internet of Things

Digital core

1. First, the farmer logs on to the network and asks for advice
2. Then he sends his farm data to selected suppliers
3. The agrochemical company receives farm data
4. The agrochemical company uses proprietary algorithms to calculate a prescription that is geared toward maximizing the yield for farmer's land
5. The prescription with a pricing proposal is then sent to the farmer
6. The farmer can then confirm and place the order
7. Packaging and shipment of the order will be arranged by the agrochemical company
8. The whole process of order fulfilment and logistics can be monitored, using SAP track and trace functionality, hence, ensuring product quality and integrity at any time during shipment until getting to the final destination
9. Having received the shipment, the farmer confirms goods received, and now bar-code scanning allows monitoring the level of consumption at any time. This not only helps the agrochemical supplier to plan on new shipments but also allows it to send promotions for upcoming shipments and inform the farmer on bonus points earned for future purchases
10. Using the collaboration hub, the farmer can access additional information such as weather forecasts, status of his farm equipment, or pricing at trade markets

The expected benefits of this scenario are significant for all stakeholders, including:

- Higher yields and margins for the farmer
- Increased revenues for suppliers of agrochemicals due to better service
- Reduced cost of service for manufacturers of farm equipment
- Reduced operating costs for all stakeholders from connectivity and process automation through a collaboration hub

The **International Food and Policy Research Institute** estimates that, by 2050, we will see a 67% increase in global crop yields from agricultural technologies.[11]

Watch a video illustrating the scenario here.

FROM YOUR CURRENT STATE TO DIGITAL

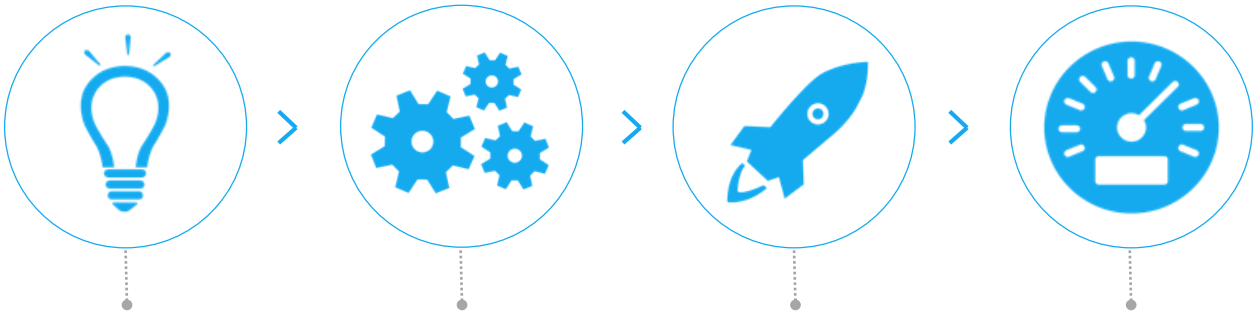
THE JOURNEY TO BECOMING A DIGITAL CHEMICAL COMPANY BEGINS WITH PLANNING A DIGITAL TRANSFORMATION ROAD MAP

TRANSFORMING FROM YOUR CURRENT STATE TO DIGITAL

The keys to success

In the digital economy, simplification and business innovation matter more than ever. To do this effectively, it's important to cover the end-to-end digital transformation journey, ranging from planning a digital innovation road map and implementation plan with proven best practices to the ability to run all deployment options and ultimately optimize for continuous innovation with a focus on outcomes.

The end-to-end digital transformation journey



PLAN
well to manage expectations

Simplify and innovate
- Reimagined business models, business processes, and work
- Digital business framework as a guide for digital transformation
- Value-based innovation road maps

BUILD/LAUNCH
with proven best practices

Standardize and innovate
- Model company approach to accelerate adoption with model industry solutions
- Design thinking and rapid tangible prototypes
- Co-engineered industry innovations delivered with agility

RUN
all deployment models

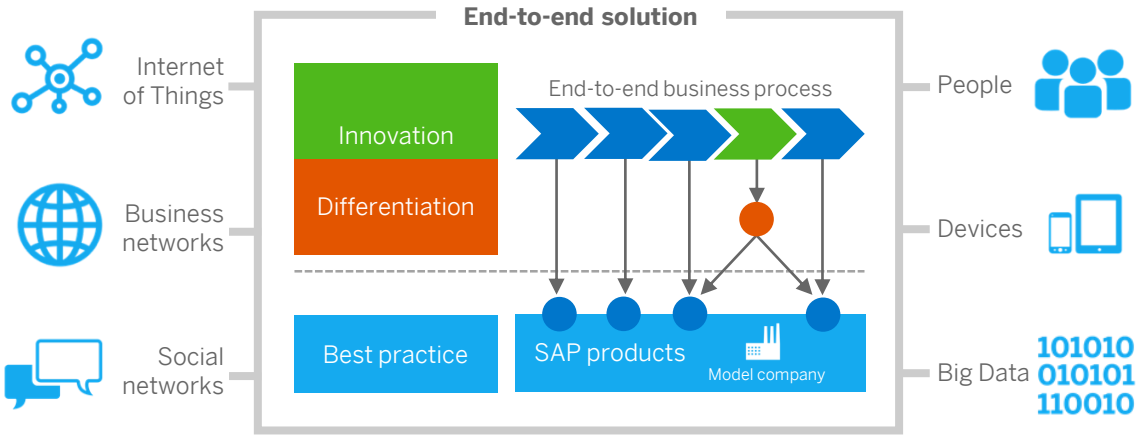
Run with one global support
- One global, consistent experience
- End-to-end support – on premise, cloud, hybrid

OPTIMIZE
for continuous innovation

Optimize to realize value
Continuously capture and realize benefits of digital transformation

And to move forward with speed and agility, it helps to focus on live digital data, instead of Big 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, we believe that a model company approach is very relevant to enable you to transition from your current state to digital. Model companies represent the ideal form of standardization for a specific line of business or industry. They are built on existing SAP solutions using best-practice content, rapid prototyping solution packages, and additional content from customer projects. They provide a comprehensive baseline for rapid, customer-specific prototypes, cloud demos, and quick-start implementations.

Model Company Approach



SAP DIGITAL BUSINESS SERVICES

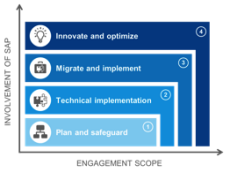
Enabling your success in digital transformation

SAP has a broad range of services to cover the end-to-end digital transformation journey, ranging from advising on a digital innovation road map and implementation plan with proven best practices to the ability to run all deployment options and ultimately optimize for continuous innovation. We provide both choice and value within our service offerings, allowing you to tailor the proper approach based on your specific company expectations and industry requirements.

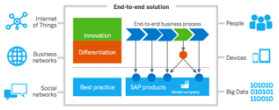
- 25,000 professionals in 70 countries
- Serving customers in 130 countries
- Outcomes delivered as one team in one contract
- Projects connected in real time to global network of support functions through SAP Mission Control Center
- SAP MaxAttention™ and SAP ActiveEmbedded services to safeguard investment
- Consistent experience – on premise, cloud, or hybrid
- Standardized adoption of processes and tools
- Streamlined onboarding and ramp-up of stakeholders

From proposing a comprehensive digitalization proposal to realizing and running it, SAP delivers on the digital transformation promise to its customers, on time, on budget, and on value.

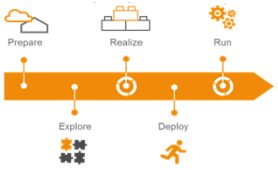
SAP value delivery relies on unique differentiating assets:



Exhaustive service portfolio



SAP's model company



SAP Activate methodology

SAP Solution Manager

SAP Mission Control Center

Expert organization

Global reach

Partner ecosystem

Industry expertise

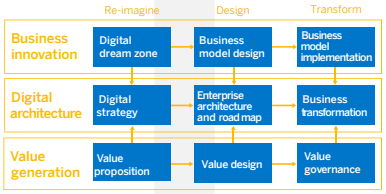
Focus on business outcome

Co-innovation

SAP Digital Business Services deliver digital innovation with simplification and accelerated implementation, which is key to adoption and value realization. Continuous improvement is supported through ongoing assessment of real-life data insights and joint governance with customers.

SAP value delivery focuses on the following deliverables:

Digital Business Foundation



- Digital business model
- Flexible, scalable enterprise architecture
- Platform for the digital future
- People and culture transformation

Business Insights

- Digital boardroom
- Predictive customer insights
- Value realization dashboard
- Agile decision making and execution support

Continuous Improvement

- Joint value governance
- Sustainable engagement model
- Innovation without disruption
- Simplification

SAP COMPREHENSIVE ECOSYSTEM

Orchestrating the world to deliver faster value

Our comprehensive ecosystem for the chemicals industry offers:

- A wide range of business services (OEM suppliers, banks, and key vendors)
- Special technology services with focus on IT/OT convergence, geospatial integration, asset health management, and so on
- Open architecture: choice of hardware and software
- Complementary and innovative third-party solutions
- Reach with partners to serve businesses of any size, anywhere in the world
- Forum for influence and knowledge
- A large pool of industry experts with broad and deep skill sets

Our partner ecosystem includes, among others:

accenture, EY, iCD., Infosys, pwc, Atos, Greenlight, NEXTLABS, NTT DATA, FUJITSU, enowa, ROLTA, utopia, intrigo, HITACHI, BEYONDigital, Qnovate, vendavo, IBM, Vesta, itelligence, OSIsoft, Capgemini, OPENTEXT, WIPRO

BUSINESS NETWORK

- 1.9 million suppliers
- 200 major travel partners (air, hotel, and car)
- 50,000 service and contingent labor providers

INFLUENCE FORUMS AND EDUCATION

- 32 user groups across all regions
- 4>0 industry councils
- SAP community has >24 million unique visitors per year
- 1,800 members of SAP University Alliances programs

IMPLEMENTATION SERVICES

- >110 partner companies
- 3,200 services partners
- Delivering chemical-specific solutions

INNOVATION

- >1,900 OEM solution partners to extend SAP solutions
- 2,000 startups developing applications that integrate with SAP HANA

PLATFORM AND INFRASTRUCTURE

- 1,400 cloud partners overall
- >1,500 platform partners

CHANNEL AND SME

- >860 utilities channel partners
- 4,800 overall channel partners

WHY SAP

SAP has the vision, the solutions, and the commitment to go with you all the way, from defining your digital strategy to delivering the right solutions to running your digital backbone in the cloud.

SAP IS COMMITTED TO INNOVATION

Vision	Help the world run better and improve people's lives
Mission	Help our customers run at their best
Strategy	Become the cloud company powered by SAP HANA

- **82,400 employees** representing 130 nationalities
- **335,000 customers**
- SAP operates in **190 countries**

- Solutions for **25 industries and 12 LoBs**
- **98% of most valued brands** are our customers
- **76% of the world's transactions** managed on SAP software

- **120 million** business cloud users
- **1.9 million** connected businesses
- **>$800 billion** in B2B commerce
- **>99% of mobile devices** connected with SAP messaging

- 2011: **SAP HANA** launched
- 2012: **SAP Cloud solutions** launched
- 2014: **SAP business networks** are the largest marketplace in the world
- 2015: **SAP Cloud Platform**
- 2015: **SAP S/4HANA®** next-generation business suite

- **97 of the top 100** global chemical companies run SAP software
- **Over 6,000 chemical companies** are SAP customers
- **100 preconfigured scenarios** in the SAP Best Practices for Chemicals package

MAKING SOUND AND FAST DECISIONS IN R&D WITH SAP HANA

BASF makes **80 million documents** readily available to **10,000 employees** for more-efficient use in research and development.[12]

HELPING FARMERS PROSPER WITH SAP S/4HANA

Ballance Agri-Nutrients makes **75% faster key business decisions** and reduces time for real-time insight into years of data to **<1 second**.[13]

LAYING FOUNDATION FOR CONTINUOUS GROWTH AND INNOVATING MANAGEMENT PROCESS WITH SAP S/4HANA

Fertimig frees up **50% more time** for strategic tasks and achieves a **50% faster financial closing** process.[14]

ADDITIONAL RESOURCES

Outlined below is additional external research that was used as supporting material for this white paper.

1. Asian Paints
   SAP Customer Journey
2. Nippon Paint China
   SAP Business Transformation Study
3. Eastman Chemical
   SAP Customer Testimonial Video
4. "The Digital Transformation of Industry," a European Study commissioned by the Federation of German industries (BDI) and conducted by Roland Berger GmbH strategy consultants at
   www.rolandberger.com/publications/publication_pdf/roland_berger_digital_transformation_of_industry_20150315.pdf
5. "The Chemicals Industry: Getting Ready for Next-Generation B2B," Accenture, 2015, at
   www.accenture.com/t20150722T022833__w__/il-en/_acnmedia/Accenture/Conversion-Assets/DotCom/Documents/Global/PDF/Dualpub_1/Accenture-Chemicals-Industry-Getting-Ready-Next-Generation-B2B.pdf
6. "Accenture Global Digital Chemicals Survey," Accenture, 2014, at
   www.accenture.com/us-en/~/media/Accenture/Conversion-Assets/DotCom/Documents/Global/PDF/Dualpub_6/Accenture-Insight-Digital-Chemical-Survey-Infographic.pdf
7. "Digital future for B2B interactions in chemicals industry," Accenture, 2015, at
   http://transform-accenture.com/digital-future-b2b-interactions-chemicals-industry/#.VdLX_Pmqqko
8. HAGLEITNER senseMANAGEMENT, August 2014, at
   www.youtube.com/watch?v=kFuyzLF5Vew
9. "Navigate the Future of Customer Service," Forrester Research Inc., February 2013, at
   http://resources.moxiesoft.com/rs/moxiesoft/images/Navigate_Future_Of_CS%20(2).pdf
10. "Givaudan: Streamlining Safety and Innovation with SAP EHS Management and SAP HANA," SAP Customer Success Stories at
    https://dam.sap.com/mac/download/ad/mmxOj.htm
11. Mark Rosegrant et al., "Food Security in a World of Natural Resource Scarcity: The Role of Agricultural Technologies," 2014
12. BASF
    SAP Business Transformation Study
13. Ballance Agri-Nutrients
    SAP Business Transformation Study
14. Fertimig
    SAP Business Transformation Study

Note: All sources sited as "SAP" or "SAP benchmarking" are based on our research with customers through our benchmarking program or other direct interactions with customers.

Note: Some images used under license from Shutterstock.com

www.sap.com/contactsap

SAP Statement of Confidentiality and Exceptions

The information in this presentation is confidential and proprietary to SAP and may not be disclosed without the permission of SAP. This presentation is not subject to your license agreement or any other service or subscription agreement with SAP. SAP has no obligation to pursue any course of business outlined in this document or any related presentation, or to develop or release any functionality mentioned therein. This document, or any related presentation and SAP's strategy and possible future developments, products and or platforms directions and functionality are all subject to change and may be changed by SAP at any time for any reason without notice. The information in this document is not a commitment, promise or legal obligation to deliver any material, code or functionality. This document is provided without a warranty of any kind, either express or implied, including but not limited to, the implied warranties of merchantability, fitness for a particular purpose, or non-infringement. This document is for informational purposes and may not be incorporated into a contract. SAP provides this information as guidance only to illustrate estimated costs and benefits of the predicted delivery project. These materials may be based upon information provided by you, information provided by other companies and assumptions that are subject to change. These materials present illustrations of potential performance and cost savings, and do not guaranty future results, performance or cost savings. SAP assumes no responsibility for errors or omissions in this document, except if such damages were caused by SAP´s willful misconduct or gross negligence.

All forward-looking statements are subject to various risks and uncertainties that could cause actual results to differ materially from expectations. Readers are cautioned not to place undue reliance on these forward-looking statements, which speak only as of their dates, and they should not be relied upon in making purchasing decisions.

SAP

Run Simple