



The Digital Building Products Company

Inspire and Shape

a digital world that
reinvents customer
experience and
productivity



Run Simple

ECKHARDT'S & FOLKERT'S POINT OF VIEW



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Dear Industry Professional,

There are massive global changes impacting companies in the building products industries. Standards of living are increasing, and the urban population and middle-class are both growing. This creates **an enormous demand for building products** in developing countries. In North America and Europe, low interest rates and migration are revitalizing the renovation and home building sectors. Global construction output is expected to grow in the range of 70% from 2014-2020, creating a \$12 trillion marketplace worldwide by the end of this timeframe.¹

As end consumers and homeowners are increasingly involved in the purchase decision or even taking on do-it-yourself projects, they conduct more online research on building products and solutions. Often they rely on information from their network in social media channels and online stores. These **new buying behaviors** are also happening in the business-to-business channels.

Sustainability remains an important factor globally. Demand for "green buildings" is not a trend localized to one part of the world or to developed countries.² **Smart products enabled by the Internet of Things (IoT) for connected homes and buildings** can help improve energy and labor efficiency and security for homes and buildings. These solutions have the potential to change complete business models and entice new entrants into the mix. For example, players from the telecommunications industry are challenging the home automation providers by providing solutions for the connected home. So where do manufactures of smart building products fit?

Construction companies are looking for possibilities to **gain efficiencies in construction projects through pre-fabrication, 3D printing, and building information modelling**. Creating a "digital twin" of a facility can speed up and optimize the design and construction phase. Using this digital twin with sensors and other technologies to track the actual operation and maintenance of the building can also increase efficiency, reduce costs, and improve tenant satisfaction. Suppliers of products and materials to this industry will need to understand how to adapt to this new world.

There are tremendous opportunities for the industry. Thought-leading companies are transitioning from pure manufacturers of products to technology and innovative solution providers for living and the environment. However, new approaches are also creating challenges for organizations to fully transform and compete within the new rules of the game. Information technology can help dramatically – in areas even some of the early movers haven't yet thought of.

Leading companies are reevaluating their processes, assets, and customer relationships to:

- **Reimagine business models to find new revenue and profit sources**
- **Reimagine business processes and use digital technology to optimize business outcomes**
- **Reimagine** the role and structure of their workforce to support their future business

This "reimagining" requires collaboration and common understanding of market dynamics between IT and all lines of business, including R&D, production, sourcing, sales, marketing, supply chain, finance, and HR. Collectively, they can explore how digitization not only supports but is a crucial enabler to reimagining their business.

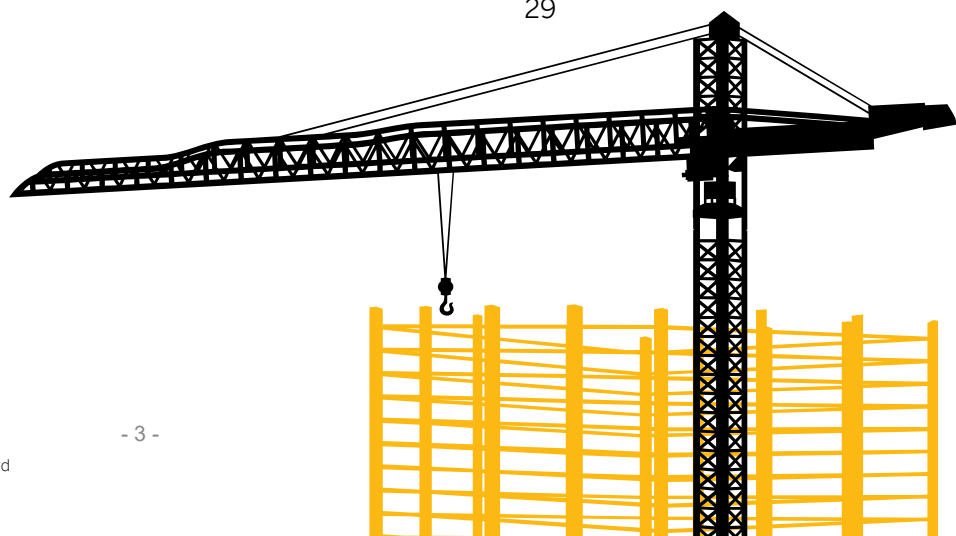
This document offers our perspective on where the industry will go and how SAP can help in the evolution of the digital building product business. Thank you for your interest, and we are looking forward to your feedback.

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EXECUTIVE SUMMARY

Big picture: The digital economy is real and will continue to transform business

The Digital Economy

Three main forces are driving the digital economy: consumer pull, technology push, and business benefits.³ In the next 10 years, 40% of the S&P 500 will no longer exist⁴ if they do not keep up with technology trends, like cloud computing and digital manufacturing.

Information consumers

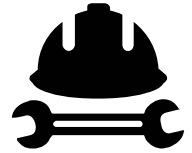
Employees, customers, and suppliers all expect the same digital experience they have in their private lives to also be used in their professional lives. This covers not only how the information is being presented, but also being able to readily access the information when and where needed, for example, having all the right pricing and product availability information at a client visit to discuss and plan a new bathroom. Customers want the same approach with an online store. In a B2C scenario, this could mean supporting customers to install the products for their renovation work using complementary 3D visuals, “how-to” videos, and consumer feedback. For a B2B business, it could mean having access to detailed product data, market trends, and order status at the retailer or contractor to review recent business and discuss new opportunities. Workers in manufacturing or logistics could save time by receiving work orders or status alerts via mobile applications.

Technology as commodity in every region of the world

Cloud computing, smartphone, and other mobile devices, including wearables, are part of daily life to a growing number of the world's population. Smart products and 3D printing are gaining traction in some regions, with potential use spreading widely across the globe as common technology. Electronically controlled showers or faucets and R&D projects using 3D printing might sound exotic for some people, but this is all reality. Sensors, IoT, and Big Data will soon become essential for everyone in the building products industry and will come to dominate our homes, offices, factories, and cities.⁵

New business models, redefined processes

Real-time supply chains are already a reality in some industries, such as consumer products, that incorporate everything from raw materials suppliers to POS data. Omnichannel commerce and social media marketing are new ways of doing business that have already been adopted by a few players in the building products industry. Instead of having only a few specific products, the trend is for companies to offer one-stop shops for customers. They offer complete solutions with all materials, services, and know-how in one package as well as highly individualized versions of the same offering. “Creating greater differentiation that protects and elevates the brand, as well as changing business models to align with customers' needs will define the industry's leaders going forward, while those that choose to commoditize will trail the pack.”⁶



Digital business models are disruptive. The rules have changed.

- **Villeroy & Boch** is equipping retail stores with a tablet-based sales assistant to combine stationary and online retail.⁷
- **Wienerberger** offered a one-stop shop for roofs that includes all materials and installation.⁸
- **Nest** is not just a thermostat company; it is orchestrating an ecosystem of home automation partners to empower consumers to optimize their home environments.⁹
- **L.E.K. Consulting** comments that a new level of depth is required to address the emerging voice of the homeowner and create a viable presence in other market access points, including digital channels.⁶
- **Winsun Global**, a leader in the 3D printing of buildings, is involved in a project to print the first office building. Even the furniture and interior will be 3D printed. This new technique will have significant impact on business models in the building products industry.¹⁰

WHAT DOES THIS TELL US?

The road map to relevance is to reimagine business models and proactively evolve before new digital competitors emerge.

Every business is now a technology business

EXECUTIVE SUMMARY

Road map to the digital building products business: Steps to digitize your business

REIMAGINING

Do you have the right strategy? The starting point of the transformation journey is to reimagine your business with business outcomes and customers at the center.



REIMAGINE BUSINESS MODELS

Digitization, regulations, and globalization will make established business models that do not have a clear digital road map obsolete. Alternative business models, such as developing sustainable products or 3D printing of products and entire buildings, will gain traction, but some innovative models will become more profitable through digitization.

- Social selling
- Individual products at small lot sizes
- Smart products and home automation
- Vertical and horizontal integration of the product/solution portfolio
- Full-service providers including engineering and construction value chain



REIMAGINE BUSINESS PROCESSES

Changing business models and digital technology drive business process efficiency and innovation that inspire new business approaches and accelerate implementation of breakthrough technology.

- Innovation through internal and external collaborations models
- Customer experience
- Demand sensing and real-time supply chains
- Shop floor operations using real-time sensor data and predictive algorithms



REIMAGINE WORK

The digital transformation of the building products industry is profoundly changing what people do, how they learn, interact, engage, and grow. Many tasks will become automated, but people will be an even greater asset while better collaborating within internal and external teams, accessing real-time data without restrictions of data silos, and shaping the customer experience.

PLATFORM

Do you have the right platform?

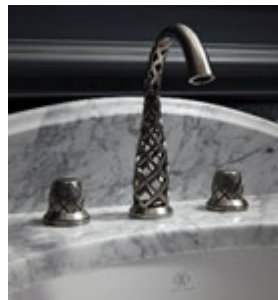
Leaders are investing in digital capabilities that are congruent with their strategy. The digital building products business will provide all participants with the right platform to develop and accelerate in new business models and drive efficiency.

We ensure solutions align to desired outcomes. SAP's digital business framework is based on the five key pillars of a digital strategy:

1. **Customer experience** across all channels
2. **Supplier collaboration** across all spend categories (maintenance, repair, services, and expenses)
3. **Core business processes** (finance, procurement, supply chain, and work management)
4. **Workforce engagement**, including employees and contractors
5. **Assets and the Internet of Things** to drive real-time insights and new business models

ROI drives this significant phase of the transition to digital. It's not about any one of the above five pillars, but rather how they all interconnect to achieve business outcomes.

We apply **Design Thinking** as our key approach during the reimagining phase. Design Thinking can be described as a discipline that uses the designer's sensibility and methods to match business needs with what is technologically feasible and what a viable business strategy can convert into customer value and market opportunity.



- "3D printing will have a major disruptive effect on the design and construction industry..." ¹¹
- 3D printed faucets from DXV by **American Standard**
(Picture courtesy of American Standard)

EXECUTIVE SUMMARY

Fundamental changes: Five technology trends changing everything

We are witnessing an unmatched era of true business innovation. Breakthrough technologies have matured and hit scale together, enabling five defining technology trends:

HYPERCONNECTIVITY

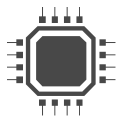
1



Every person, every asset, every home, every building, every smart building product is connected, disrupting all the established rules around business operations. Connectivity drives digital building products organizations with collaboration between customer, supplier, information, assets, and the workforce.

SUPER COMPUTING

2



The limits of 20th century computing power are gone. The digital building products business, powered by real-time in-memory computing, creates infinite opportunities.

CLOUD COMPUTING

3



Technology adoption and process innovation are moving faster than ever. Technology infrastructure is based on new cloud collaboration platforms, enabling building products companies to launch new business practices in a matter of days.

SMARTER WORLD

4



Sensors, robotics, 3D printing, and artificial intelligence are the new normal. Building products companies will monitor assets remotely, predict quality, print products, and track building products through the lifecycle.

CYBER SECURITY

5



Digital building products companies are prime targets for digital attacks and sabotage. Trust remains the ultimate currency, making cybersecurity a top priority in the design and operation of the digital building products business.



REIMAGINING

THE DIGITAL ECONOMY OFFERS INFINITE NEW OPPORTUNITIES

In a connected world where every company is becoming a technology company, smarter products and services will refocus commerce on business outcomes and blur industry lines

DIGITAL INNOVATION IS REAL IN BUILDING PRODUCTS

Companies reimagine their entire business to become – or remain – successful players in the digital building products economy. This requires a new approach to business models and processes and the work itself.



REIMAGINE BUSINESS MODELS

Leading building products companies are expanding from being from pure manufacturers. They are evolving their business models to capture new sources of value:

- **Social selling:** Take advantage of the social networks in B2B and B2C and create a new world of opportunities from lead generation to sales closure
- **Individualized and specialized products:** Manage custom or specific products in small lot sizes through technologies like 3D printing, and target lucrative market segments with highly specialized products
- **Home automation/smart products:** Add new generations of smart products and IoT capabilities for energy saving, security, and greater comfort for end consumers and commercial customers
- **Vertical and horizontal integration:** Companies will increasingly look up, down, and across their value chains to expand into additional markets
- **One-stop shop:** Be the “go-to” place for your customers, where they satisfy all their needs, from products to services, for a specific application or to fulfill a certain project



REIMAGINE BUSINESS PROCESSES

As end consumers and homeowners become more influential in the buying process, processes for developing, buying, selling, fulfilling, and servicing will be reinvented

- **Innovation:** Drive collaborative and innovative product development within the company and across enterprise borders to meet constantly changing demand
- **Customer experience:** Provide your customers with an exceptional and consistent buying experience, independent of which channel they use
- **Demand sensing:** Utilize detailed demand signals to ensure product availability and optimize the supply and distribution network
- **Shop floor operations:** Capture and analyze shop floor data to drive higher automation and better product quality; handle mass production and lot-size-one production efficiently



REIMAGINE WORK

Reimagined business models and processes need an adaptive workforce with new skills.

- **Build knowledge workers:** Transform employees into “knowledge workers” by eliminating manual handling of transactions, freeing them up for “exception handling. This will expand their ability to think and act strategically and expand their contribution to the business.
- **Predictive software:** Improve machine-to-machine collaboration and attract people who can orchestrate complex systems
- **Interactive technologies:** Improve user acceptance and experiences and deliver the right visual, textual, and audio information on demand
- **Flexible business-to-people relationships:** Create adaptive businesses that value the specialists who build and run the digital enterprise of the future



REIMAGINE BUSINESS MODELS

Increasing globalization, including the emergence of new competitors, building regulations, and digitization, is upending established business models in building products industries. We expect that companies will explore four major areas to develop new business models.

Social selling

The use of social media for all aspects of marketing and selling becomes a key pillar at building products companies as they deal in B2B and B2C with many different types of decision makers, from architects, to builders, to home owners, and commercial real estate companies. Using social media to sense demand, generate leads, and take follow-up actions is something completely new but should be integrated into overall sales and marketing activities. The power of social selling is clear once customers become your best salespeople – their high ratings and positive interactions shared with others help improve your reputation. Customer satisfaction can increase through advanced automation in responding to customer demands and social media posts. Some companies are already tracking and responding to customer tweets in real time, closing transactions in minutes and driving new revenue (see quote below).

Individualized and specialized products

Technology is enabling building products companies to respond to specific customer demands and produce individualized products at reasonable costs but with higher margins than standardized products. This value-add can be realized with 3D printing and other modern production and planning processes and is helping building products companies to differentiate in a rather commoditized market. This move changes not only where and how products are produced, but it also requires new, integrated processes, from order taking to passing the information down the supply chain, to suppliers and how distribution networks are managed and designed in the future.

Home automation/smart products

Automation itself is not a new topic, and there are many players in that market already. But the game is changing, and building products companies are equipping their products with sensors and built-in intelligence. Customers and consumers of those building products will also expect IoT-enabled services for energy saving, security aspects, and greater comfort. For the building products producers, this signals a need to bring together both worlds of facilities automation and smart products.

Vertical and horizontal integration and the one-stop shop

One-stop shopping offers customers the convenience of satisfying multiple needs in one location, such as design services, direct access to product information, option to buy supplemental products, installation services, and much more. This doesn't necessarily mean that a building products company is offering each and every service directly. Being connected with suppliers and service providers via a business network enables digital building products companies to act as an intermediary to facilitate the one-stop shop model. LIXIL is one of many building products companies expanding through strategic acquisitions and partnerships to accelerate its growth in foreign markets and provide a complete bathroom solution.¹²



"If I told you 12 months ago that we could monitor somebody tweeting about a rug, and close the transaction in two minutes, nobody would have believed me. That is what I call innovation."¹³

Jana Kanyadan, SVP & CIO, Mohawk Industries, Inc.



REIMAGINE BUSINESS PROCESSES

The traditional building products value chain is transforming at breakneck speed. This is the result of changes in profitability within business segments, connected value chain partners, and highly interactive processes that are now executed in near real time.

Innovation

Customers demand constant innovation and want to keep up with the latest trends. For example, many are willing to pay higher prices for green products made from renewable sources in an environmentally friendly manner that are also easy to recycle. But organizations must also comply with changing regulations while satisfying their customers. Building professionals are looking for solutions that enable them build easier, faster, stronger while also meeting the ever-changing regulatory requirements. Being a leader in product innovation can equate to increased market share.

Customer experience

Supply chain partners in the distribution network as well as end consumers are connected and expect access to information via the channel and device of their choice. Providing tailored information based on user roles, needs, and interests across all touch points is critical to strengthen the relationship and boost revenue. Remote sensing of product health and status opens up new after-sales revenue streams, while at the same time contributing to an improved consumer experience.

Demand sensing

A tightly connected supply chain from suppliers to POS enables building products companies to make smarter inventory decisions and improve demand management. This is accomplished by using predictive analytics to help determine demand according to item, location, or customer segment so companies can improve product availability and reduce expediting costs. With real-time information from trucks, warehouses, and traffic conditions, the whole supply network can be optimized, even when the goods are already on their way.

Shop floor operations

Capturing and analyzing data from machines, vehicles, or products allows for better predictions, simulations, and decisions. Automation and connectivity across the plant floor help reduce error rates, add speed, cut operating costs, and significantly change the way manufacturing personnel act on the plant floor. Having access to up to date and accurate information gives employees more data and analysis to think and act with confidence and support more successful outcomes. This predictive aspect of products and asset maintenance is far superior to the reactive models many companies use today.



"We use SAP Predictive Analytics to find out which products might fail. This not only helps from a cost-saving perspective, but it also enables us to let our customers know we might have an issue and, more important, explain how we can fix that issue. It's about creating a better customer experience."¹⁴

Anders Reinhardt, Global Head of Business Intelligence, VELUX A/S



"SAP Hybris Cloud for Sales will position us to walk in with powerful information when we sit down with the customer. It significantly improves the effectiveness of our sales force. Customers are now going to be recipients of integrated information in the moment of need on any device, anywhere, and this is critical to the organization."¹⁵

Tom Coleman, Chief Information and Process Officer, Sloan Global Holdings

REIMAGINE EVERYTHING



REIMAGINE WORK

The digital transformation of the building products industry profoundly changes what people do and how they learn, interact, and grow.

Build a team of knowledge workers by using digital business processes to replace manually executed transactions in procurement, production data collection, inventory management, sales, and many other areas. Digital processes access real-time data and provide instant analytics to support rule-based decision making, limiting manual intervention to exception handling. Automating non-value add transactions frees employees to spend more time contributing strategically to the business.

Predictive software analyzes a data set from a machine network, enriched with additional data like quality requirements, and triggers actions based on the predictive analysis of the data in manufacturing. This requires employees who understand the complex rules, can maintain them, and be responsible for orchestrating the highly complex automated system.

Interactive technologies reflect the transition of people's roles from transaction workers to exception workers who engage when the digital rulebook needs human creativity and ingenuity. These technologies provide a personalized, responsive, and simple user experience across devices and deployment options to meet end users' expectations.

Flexible business-to-people relationships. The transformation to a digital building products company creates hundreds of millions of new people interactions: between customers and service teams, between the core and the extended workforce, and with the public over social and broadcasting networks. Real-time digital information on the right devices is critical to advance the business agenda through interaction between people.

People continue to be key assets in digital building products organizations. Their roles will change and become more strategic.



Geberit is using digital innovations from SAP to vastly improve how its employees work, including speeding company reactions to new business requirements.¹⁶

SAP HANA: THE GREAT SIMPLIFIER

Building products companies today are under tremendous pressure as customers expect omnichannel experiences. Leading building products companies are already executing on this today with a focus on two key concepts: **simplification and innovation**.

Simplification is all about doing what we are already doing, but better, faster, and cheaper.

Innovation is all about reimagining building products business models and customer engagement by leveraging the technology trends discussed earlier.

The diagram below is at the heart of the digital building products business. The idea is very simple, but it took years to make it a reality: bringing together transactions and analytics on the same platform.

In-memory computing is a concept brought to life by the breakthrough SAP HANA platform. While relatively young by commercial standards, the rapid adoption of SAP HANA across the building products industry validates its massive potential for digital businesses.

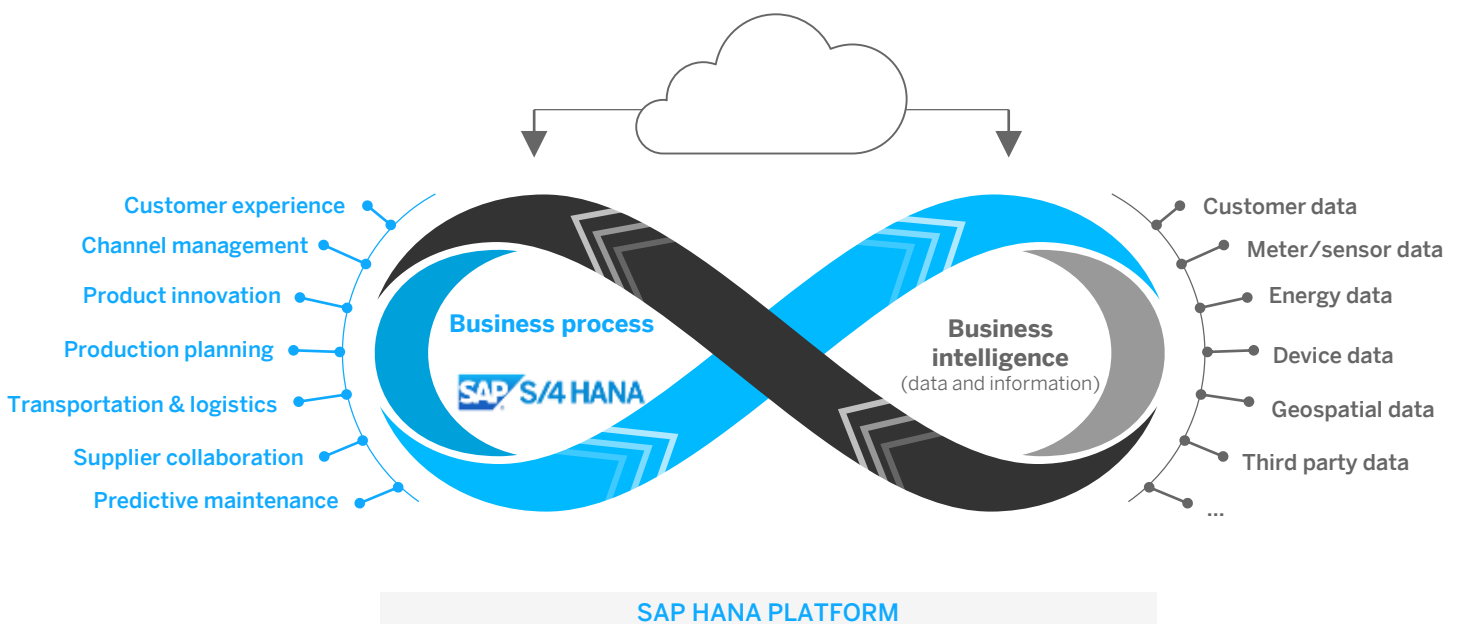
With in-memory computing, we can now finally:

- **Leverage Big Data** from meters, sensors, weather, social, and geospatial sources. Bringing all data signals together leads to optimal decision making, which can be instantly acted upon in transactional systems via human and machine-to-machine interfaces
- **Extend the business process** to interoperate with business partners in near real time via advanced cloud-based business networks
- **Modernize business processes** from finance to supply chain, enterprise asset management and meter-to-cash, running them in real time with no data replication and no batch programs

These capabilities open infinite new ways to optimize business, drive business digitization, simplify everything, reduce cost, and provide the agility required in a rapidly changing world.

SAP constructed an innovation road map designed to bring in-memory computing together with cloud computing and mobility. This strategy has been embraced by early adopters who are leading the transition to digital.

SMARTER DECISIONS + SMARTER TRANSACTIONS = SMARTER BUSINESS





DIGITAL BUSINESS FRAMEWORK

A SIMPLE AND PROVEN APPROACH TO VALUE CREATION THROUGH DIGITIZATION

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

DIGITAL BUSINESS FRAMEWORK

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

SAP understands the five pillars of digitization, and we also understand that the continuously changing requirements pose big challenges for businesses. The method of reimagining business models, business processes, and work helps develop the digitization road map.

We have built the digital business framework to support building products companies in developing and executing on their enterprise strategy to become transformers that fully leverage digital opportunities.

Building products companies must digitize to grow profits and reduce costs by simplifying their operations. The value of the digital economy is based on how to serve the customer. Value creation often comes from edge solutions which are based on and coordinated by the digital core solutions. It is the platform for innovation and business process optimization, connecting the workforce, the Internet of Things, the supply network, and customers.

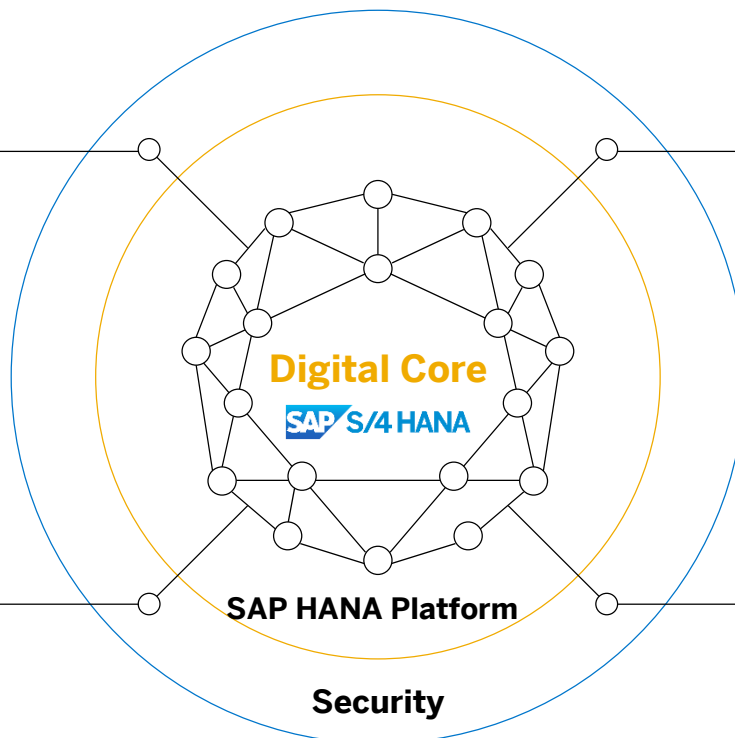
1. Outcome-based **customer** experience
2. Re-platform **core business processes** and bring together transactions and analytics in real time to be smarter, faster, and simpler
3. Smarter and engaged **workforce** across all employees and contractors
4. **Supplier** collaboration to accelerate growth innovation
5. Harness **assets** and the **Internet of Things** to drive real-time insights and new business models

**Suppliers
& networks**

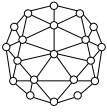
**Customer
experience**

**Workforce
engagement**

**IoT
& big data**



THE DIGITAL CORE FOR THE DIGITAL BUILDING PRODUCTS BUSINESS



A new generation of ERP solution, **running in real time, integrating predictive, Big Data, and mobile**, will change how companies work, how the business is run, and how information is consumed: the **future is here**.

Advanced in-memory computing signals an end to running the business in batch mode and eliminates complex workarounds for selling, planning, manufacturing, and distribution. You can Run Simple and use the full power of the digital building products business.

Real time

Real-time optimization of business-based changes will have a massive implication for how we work, how we do business, and how we organize.

Power of prediction and simulation

Every employee can gain real business insights with the help of simulation and predictive tools to drive smarter decisions, improve reliability, and reduce scrap.

Agility

The ability to rapidly enter new markets, acquire and onboard new building products business models, or reflect an organizational change in one-tenth of the time it takes with today's systems will yield the agility required in the digital economy.

Deployment choice and lower TCO

Accessing solutions to run the core has to be simple. Building products companies now have the choice to deploy in-house or in the cloud. In-memory computing also has a significant impact on TCO, and it will free up funds for infrastructure investment.

Consumer-grade user experience

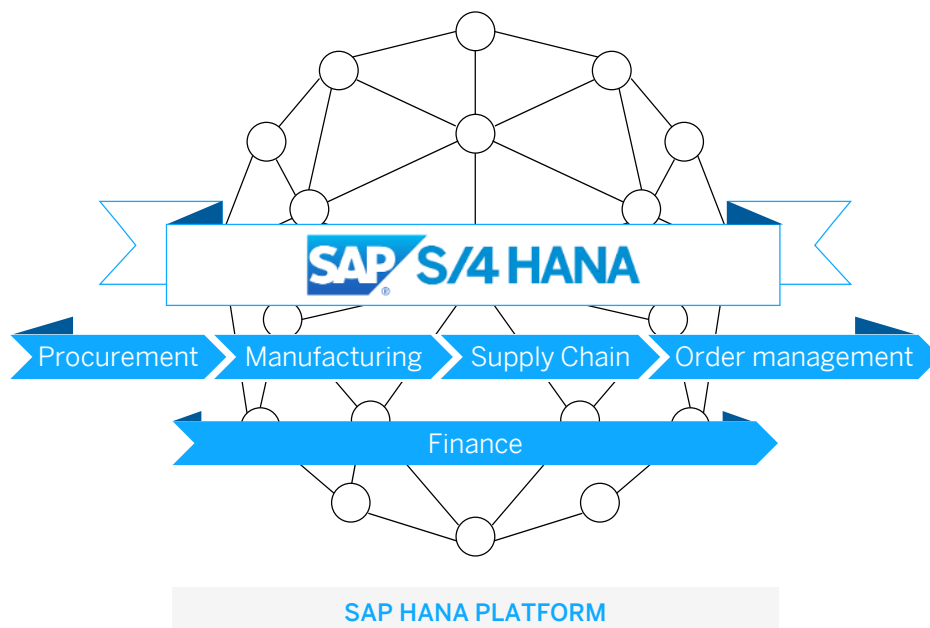
User experience is key to accepting digital change. It drives adoption, user engagement, and people productivity.

Simplify with SAP

SAP S/4HANA is the only end-to-end solution that covers all business processes and runs in-memory. It helps building products companies run in real time for fundamentally better performance. For instance:

- Single, real-time view of plant and business performance with real-time analysis of asset performance
- Real-time POS and inventory data to optimize the supply chain, distribution, and production planning
- 360-degree view of the customer to improve the overall customer experience

In addition, the SAP HANA Cloud Platform can be the single enterprise data source for SAP S/4HANA and the rest of your solution landscape



CUSTOMER EXPERIENCE



Digital technology has **changed the game**. But, customers **changed the rules**. Customers demand simple, seamless, personalized experiences across any channel, **anytime, anywhere, and on any device**.

Three key trends are reshaping the customer experience:

Outcome economy:

The outcome economy requires a deep change in the business model and new organizational and business process capabilities. It also requires a much different approach to product design and TCO across the lifecycle. Customers want products that enable them to achieve value. Managing a holistic offering around this outcome will open new revenue sources.

Customer journey:

Customers choose their own journey in multiple channels at their convenience – the pattern that emerges is not linear, as in the past. Only 12% of companies surveyed can provide a seamless handoff between channels.¹⁷ The increasing variety of players in the building products markets make shaping the customer journey the top priority for building products sales.

Big Data and marketing in near real time:

Big Data allows companies to sense and respond to customers' needs in real time to set the next engagement points. With the integration of POS and connected sensors in the logistics network, the data volume is expanding by orders of magnitude, giving rise to new business opportunities.

60%

Of consumers intended to conduct a business transaction or make a purchase, but decided not to due to a poor service experience.¹⁸

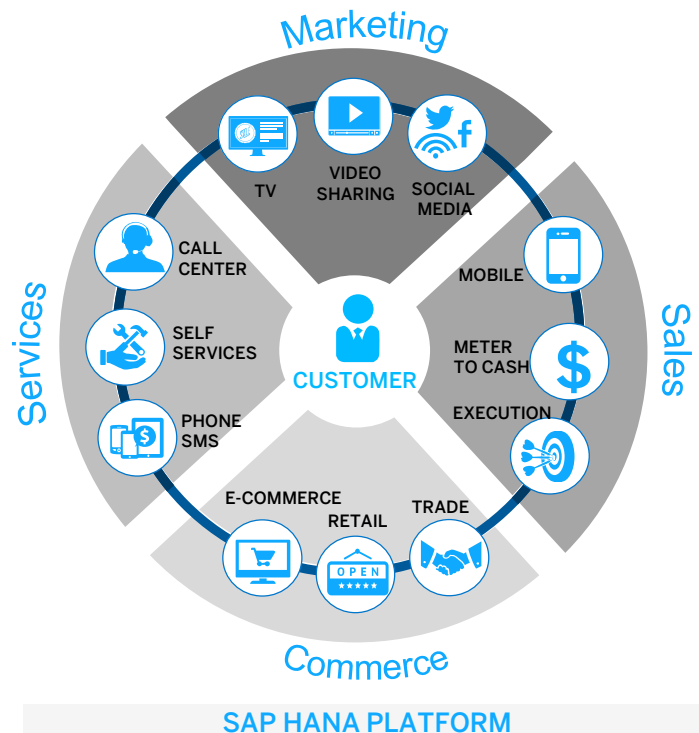
68%

Of customers are willing to pay more for a better customer experience.¹⁸

Digitize your end-to-end customer experience with SAP

A single platform that brings together marketing, sales, services, and commerce (including the SAP Hybris omnichannel commerce solutions) to ensure seamless digitization of the entire customer experience. SAP solutions for customer engagement and commerce powered by the SAP HANA platform enable a 360-degree view of your customer, real-time interaction, and sophisticated, predictive analytics, fully integrated to the core transactional system.

- Orchestrate business processes across marketing, commerce, sales, and service
- Deliver personalized experiences in context with each interaction
- Create a single, harmonized experience for your customer while reducing the burden on employees
- Be prepared to engage your customers on the channels they choose at any moment in their journey
- Achieve full integration with your core business processes to provide a unique platform for omnichannel customer engagement and commerce



WORKFORCE ENGAGEMENT



The world is getting **smarter** in the digital economy. But **complexity** is overwhelming the workforce in this pursuit.

Complexity is the enemy of workforce engagement. People are working harder than ever but are not necessarily accomplishing more. They do not have access to smart, consumer-grade technology to work faster, better, and more efficiently. Organizational complexity is driving costs up and slowing down progress. Four forces need to be addressed:

Changing of the guard

Over 50% of the workforce will be from the millennial generation by 2020.¹⁹ Companies have to devise a workforce strategy to make work in the building products industry attractive for the digital generation.

Contingent labor is on the rise

Companies are turning more to contractors and service providers to drive agility and lower fixed costs. Companies can outsource work, but not the responsibility for safe and compliant operations. The contingent workforce must be digitally integrated in all business processes.

Constant reorganization

Reorganizing to adjust to the new reality is becoming a constant, but it can't be allowed to disrupt efficient operations.

Complexity is on the rise

Companies do business in more countries across many more channels. Products and services are becoming more complex. Regulations are changing by the day. Layer upon layer of management is hindering speed and agility.

41%

Increase in contingent workforce spending in the past five years²⁰

30%

Of executives say their companies give special attention to the particular wants and needs of millennials²¹

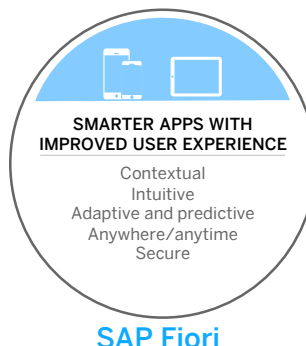
99.7%

Engagement in formal HR processes, up from 50%, using SAP SuccessFactors solutions at Vallourec²²

Improve your total workforce productivity: Simplify with SAP

Digitize your workforce with SAP: SAP S/4HANA + SAP SuccessFactors solutions + SAP Fieldglass solutions + SAP Fiori provide the tools for total workforce engagement and advanced analytics.

- Recruit and onboard the best workforce, simplify their work, and ensure that regulatory and compliance requirements are met
- Manage the total workforce lifecycle from recruiting to onboarding, performance, compensation, and learning – all in one place
- Enable the workforce to easily access the right information across any device and through smarter apps and a dramatically simplified user experience



BUSINESS NETWORKS AND SUPPLIER COLLABORATION



Trillions of dollars of commerce moving in silos + millions of companies attempting to innovate on their own = **lost opportunity** to improve the lives of billions of end users.

Collaboration across all spend categories will change the nature of how building products companies acquire products and services, outsource, and how they drive value creation across the entire value chain. Several trends are redefining the game:

Business connectivity at scale

When suppliers, small and large, are connected in the millions, the transactional platform becomes the de facto standard. This is already a reality (examples: Ariba, Concur, Alibaba)

B2B collaboration by category

Acquiring products and services or managing expenses requires a set of open standards and a different community of suppliers. Those standards are now set and operational.

User experience

Without a better user experience at work (with UX similar to Amazon, Travelocity, Google), employees will find ways around the system, negating the value of negotiated contracts and driving maverick spending.

Network of networks

An open network serving a single market (travel, suppliers, labor) is valuable to its ecosystem. But a vertical network that connects to other vertical networks in real time is revolutionary and can only be accomplished through a shared set of cloud-based services built on top of the SAP HANA Cloud Platform.

80%

Spend managed with automated processes to drive contract spending and compliance²³

50%

Highly networked enterprises are 50% more likely to experience market share gains and higher profit margins than their un-networked peers.²⁴

50–75%

Faster transaction cycles are being achieved with the Ariba Network²⁵

Simplify supplier collaboration with SAP Business Networks

SAP S/4HANA provides incredible capabilities to digitize processes across your business – and the connectivity to the business network allows you to extend those processes beyond the four walls of your business.

- Solution already at scale and covers all spend categories (direct and indirect material, labor and services, travel and expenses)
- Business networks operate on a global basis, meet data security standards, and achieve near zero downtime
- Extensive offering by leveraging services from many partners, such as supply chain, financing, payment, supplier certification, etc.



ASSETS AND THE INTERNET OF THINGS



The most **dramatic change** in the digital economy will be driven by hyperconnectivity and Big Data science. These will **transform nearly every building products business model**.

Companies are finally understanding the full potential of the interlock between physical and digital assets and the Internet of Things. We are witnessing new use cases with breathtaking results. Below are some key trends:

Smart products drive new business models

Suppliers are embedding sensors in their products and processes. As a result, they are becoming technology companies that rethink the value delivered by their products and that hire hardware and software engineers to implement their ideas.

Data-driven business models

The transformation in the building products industry is enabled by Big Data technology and the computing power to process massive amounts of data in real time.

Technology-driven customer engagement and engineering

Customer sales, services, and engineering are spending more and more on Big Data and sensor technologies, as their functions are the most transformed by these new technologies.

New alliances

Seamless collaboration is now possible around new business models involving partnerships that may not have made sense few years back. Examples include partnerships between engineering and construction companies, between Google and appliance makers, and many others.

4 billion

Mobile Internet users and an expected 30-50 billion connected devices by the year 2020^{26,27,28}

80%

Of companies that invested in IoT increased revenues²⁹

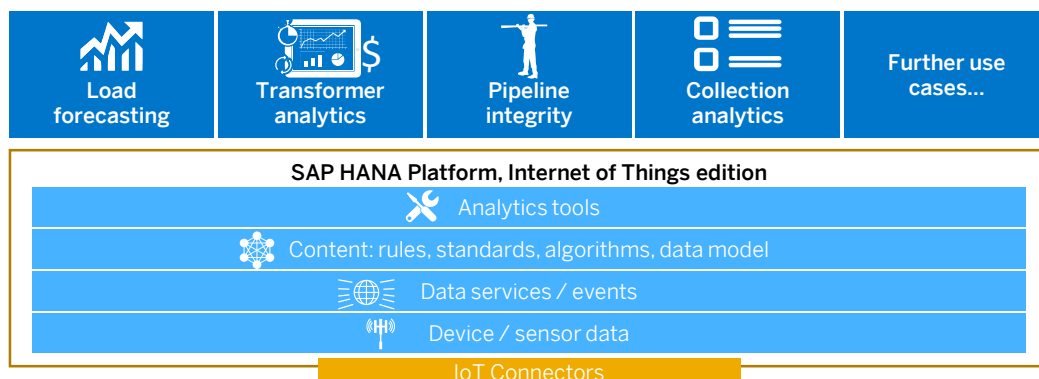
16 times faster

Early-stage detection rate for defects and equipment failures at Severstal³⁰

Connect, transform, and reimagine with SAP

With SAP HANA, Internet of Things edition, organizations can now take embedded device data, analyze this data into information in real time, and apply this information across the value chain to drive business insights and create new business models.

The Internet of Things platform provides extensive connectivity to OT systems by integrating with industry software from vendors such as OSIsoft. The data is stored and processed in the platform, which provides basic functions like data services (such as operations on time series), predictive analytics, and others. Applications are developed by SAP, partners, and customers and enable use cases like load forecasting or transformer analytics.



SAP HANA PLATFORM – A NEW COMPUTING PARADIGM

SAP HANA is the ultimate simplifier and the platform for innovation and digital business

Dream, develop, and deliver with SAP HANA Cloud Platform

SAP HANA Cloud Platform gives you the mobile, collaboration, integration, and analytics capabilities you need to dream big, develop fast, and deliver everywhere, with the following capabilities

Application extensions

Extend your current cloud and on-premise solutions for additional customization, enhanced business flows, and more.

Real-time analytics

Engage customers, optimize business processes, and unleash new revenues with real-time analytics apps, powered by SAP HANA.

New cloud apps

Quickly build innovative consumer-grade and industry apps for today's always-on, mobile, social, and data-driven world.

Extended storage capabilities

Holistically manage all structured, unstructured, and infinite data streams with flexible combinations of data stream processing, in-memory technology, disk-based columnar storage, and Hadoop-based storage solutions.

Data footprint reduction

Significantly reduce memory footprint and TCO. In ERP systems, we have seen ~6x reduction by SAP HANA's dictionary compression. Removing aggregates and actual and historical data separation further reduces the footprint up to ~10x.

Chicago Faucet

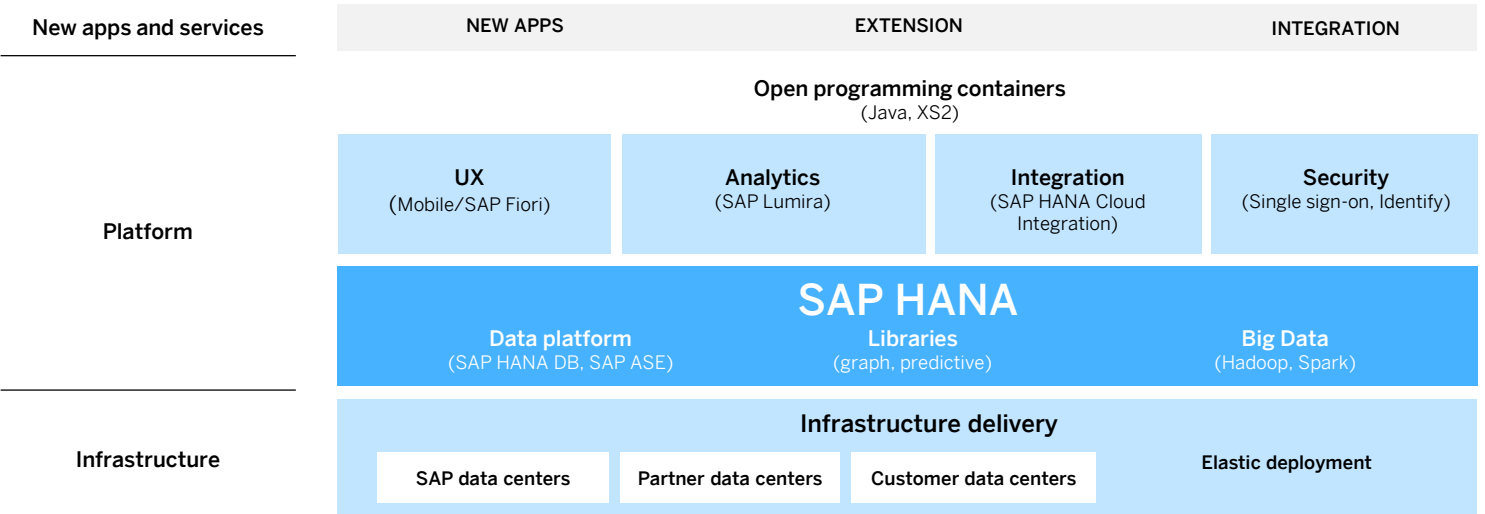
"Our vision is to simplify ... and [be] fit for the future, so we decided to run all of our SAP solutions on an innovative, agile and safe database solution [SAP HANA] to be prepared for the challenges ahead of big data. And we choose to go with SAP Simple Finance to solve the problem of closing speed." ³¹

Schott AG

"(SAP CRM powered by SAP HANA)...enhanced sales processes and faster access to comprehensive information enable us to become more customer driven and systematically exploit market opportunities." ³²

The SAP HANA platform is...

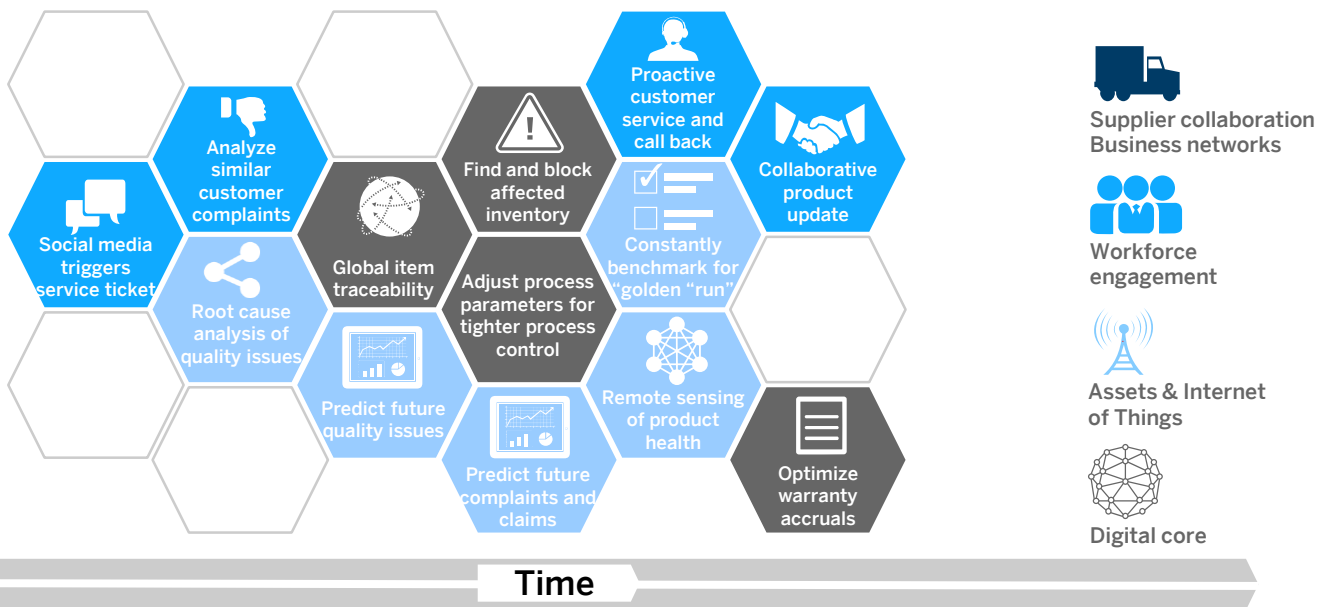
Real-time, in-memory platform • 10x data footprint reduction for ERP • Extended storage, including Hadoop • Open architecture • Developer-friendly • Embeds mobile and analytics • Secure • Cloud-ready



HOW DOES IT ALL COME TOGETHER? – EXAMPLE

Delivering bottom-line results in manufacturing by focusing on inventory reduction, efficient operations, and shorter lead times has traditionally been the main focus of building products companies. But this is changing. While the five digital business pillars deliver significant value as stand-alone capabilities, the ultimate goal is to design the next generation of business processes that will span across all the digital pillars.

EXAMPLE DIGITAL BUSINESS SCENARIO: PREDICTIVE QUALITY AND COMPLAINTS



Quality defects can cause significant costs for a building products company. The later in the manufacturing process that defects are detected, the higher the remediation costs. Worst case scenario: the product is delivered to the customer and installed before failure occurs. In this situation, there is not only significant effort required to fix the problem, but this can also hurt corporate reputation and branding. You need to act fast before the bad news spreads and affects your sales revenue. Typical sectors include plumbing supplies, windows & doors, and other common consumer items.

The scenario above shows how the digital building products company detects and analyzes complaints and causes of quality defects in order to fix the current situation and prevent recurrence.

Companies can listen to or "sense" the social media for the issues consumers are reporting and combine this with internal data of known issues in order to perform extensive root-cause analysis. They can then trace affected products back to the source and apply corrective measures to the process. Companies can also predict quality issues of other potentially impacted products.

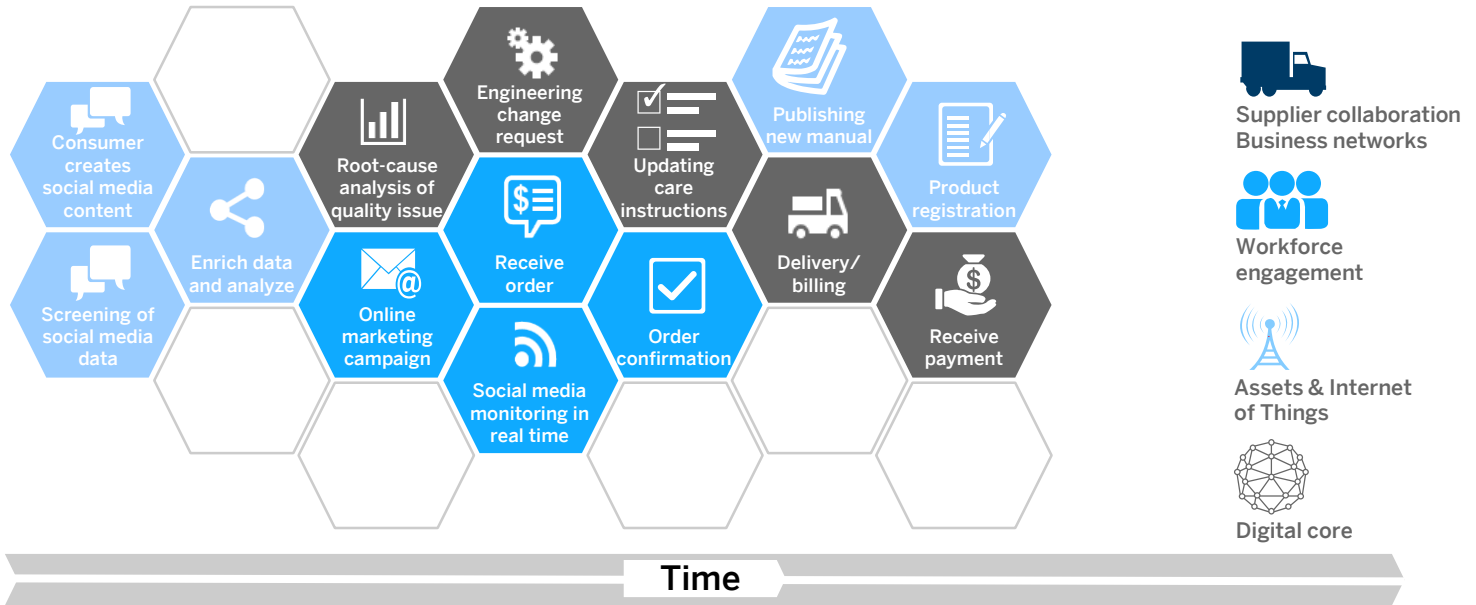
Companies can then block products that are still in-house to prevent further shipment and analyze product quantities already shipped to understand the scope of potential future quality complaints. They can proactively limit exposure to upcoming complaints by providing customers with proactive solutions to solve the issue. They can also predict future required accruals to cover claims. Benchmarking the effectiveness of the "golden run" parameters can help companies reach an optimum quality-to-cost ratio. Sensor technology can be used to monitor product health and status at the customer site. Lastly, companies can investigate with the customer potential changes in product design, installation and operation manuals to prevent future defects.

"Our initiative, our lingo was 'zero defect line,' zero, not 'kind of good defect line' – zero!"³³

Mike Livermore, Director, U.S. Operations Systems, Moen, Inc.

HOW DOES IT ALL COME TOGETHER? – EXAMPLE

EXAMPLE DIGITAL BUSINESS SCENARIO: SOCIAL ENGAGEMENT



The process flow shown on this page portrays how leaders in building products businesses can better incorporate social media, quality management, traceability, and targeted marketing to increase customer satisfaction and reduce warranty costs.

In the first step end-consumers connect via mobile and social. A variety of valuable data is left behind on the Web, ready to be analyzed and turned into action.

Next, the building products company screens the social networks and consumer rating of its products. Structured and unstructured data are considered, and data from other sources supplement the data pool. Big Data analysis reveals three major areas which seem to be dominant on the Web: a quality issue, missing product features, and happy customers.

The data about the quality issue is sent over to the engineering and quality management department for further investigation of the issue. As a result, an engineering change request with high priority is issued. The user manual is updated to more explicitly tell the end consumer about the correct usage of the product. This new manual is published via various channels.

The marketing and sales department looks into requested product features and the significant number of happy customers.

A targeted marketing campaign using social media is triggered to reach end consumers. At the same time, retailers are incited with a special campaign that focuses on end consumers' high rating of the product.

Going forward, social media is monitored on a real-time basis to respond in a more timely manner to relevant social media activities. The campaigns have a really good outcome; orders pour in over the various online channels.

The tight integration into production planning and inventory levels allows for an exact delivery date determination, which is part of the order confirmation. Transportation planning is triggered, and a multi-stop shipment is created considering constraints like trailer size or given unloading time windows. Delivery notifications including tracking options are sent out.

Finally, billing documents are issued. B2B retail customers send electronic payments. For those orders that were received directly from end customers (B2C) via the online shop, the credit card payment is processed. Once the products are at the end consumer, online product registration delivers valuable data about the end consumer.



HOW TO START

THE JOURNEY TO THE DIGITAL
BUILDING PRODUCTS BUSINESS
BEGINS WITH A CAPABILITY
ANALYSIS THAT RESULTS IN THE
TRANSFORMATION AGENDA

HOW TO START

THE JOURNEY TO THE DIGITAL BUILDING PRODUCTS BUSINESS

The journey to define future business models capitalizing on the digital building products business involves all disciplines of a modern building products company and requires a systematic approach to identify and capture business opportunities.

THE COLLABORATIVE VALUE AND INNOVATION FRAMEWORK

Building products companies embarking on the transformation journey to the digital business typically start to reimagine their business with a focus on outcomes and customers. Answering the key questions, “What role will we play in the building products value chain?” and, “How will we make money?” will provide direction for reimagining your business processes and operational model.

For innovation today, a new level of collaboration is required. As a result, we have developed a framework that will be a continuous and holistic partnership model designed to drive true collaboration and engagement. Outlined below are the five steps of [SAP’s collaborative value and innovation framework](#):



1. **Strategy alignment:** Understand company and SAP strategic direction and identify initiatives
2. **Opportunity assessment:** Opportunity deep-dive based on strategic initiatives and prioritization based on value
3. **Solution road map and ROI:** Document end-state solution and business case including benefits, TCO, ROI, and strategic road map
4. **Value realization:** Deliver transformation on time, on budget, and on value
5. **Governance:** Maximize investments and accelerate value creation with governance based on executive engagement, value delivery, and continuous innovation



WHY SAP?

SAP ENABLES THE DIGITAL
BUILDING PRODUCTS COMPANY
WITH A DIGITAL CORE, BUSINESS
NETWORKS, SUPPLY CHAINS,
AND THE INTERNET OF THINGS

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

GLOBAL PRESENCE AND RELEVANCE

- **78K employees** representing 120 nationalities
- **310K customers**
- SAP operates in **191 countries**

INDUSTRY AND LOB FOCUS

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

DIGITAL ECONOMY - READY

- **110 million** business cloud users
- **2.1 million connected** businesses
- **\$800 billion+** in B2B commerce
- **99%+ of mobile devices** connected with SAP messaging

INNOVATION LEADER

- 2011 **SAP HANA** launched
- 2012 **SAP Cloud** launched
- 2014 **SAP business networks** are the largest marketplace in the world
- 2015 **SAP HANA Cloud Platform**
- 2015 **SAP S/4HANA**: Most modern ERP system

DIGITAL BUILDING PRODUCTS ENABLED BY SAP

- **15 of the 20 top cement producing companies** in the world run SAP
- **92% of the construction materials producers** in the Forbes Global 2000 are SAP customers
- **2,200+ building materials companies** in **91 countries** use SAP

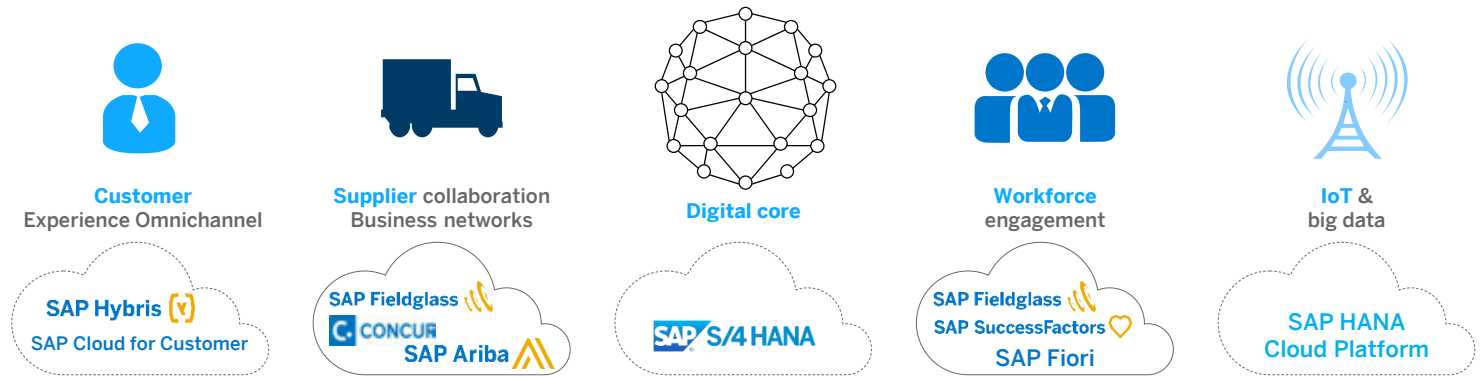
15% FASTER PRODUCTION LEAD TIME AND 3% DECREASE IN SCRAP

With SAP, top management at **Joris de Ide Group** has **immediate insight into manufacturing key performance** indicators.³⁴

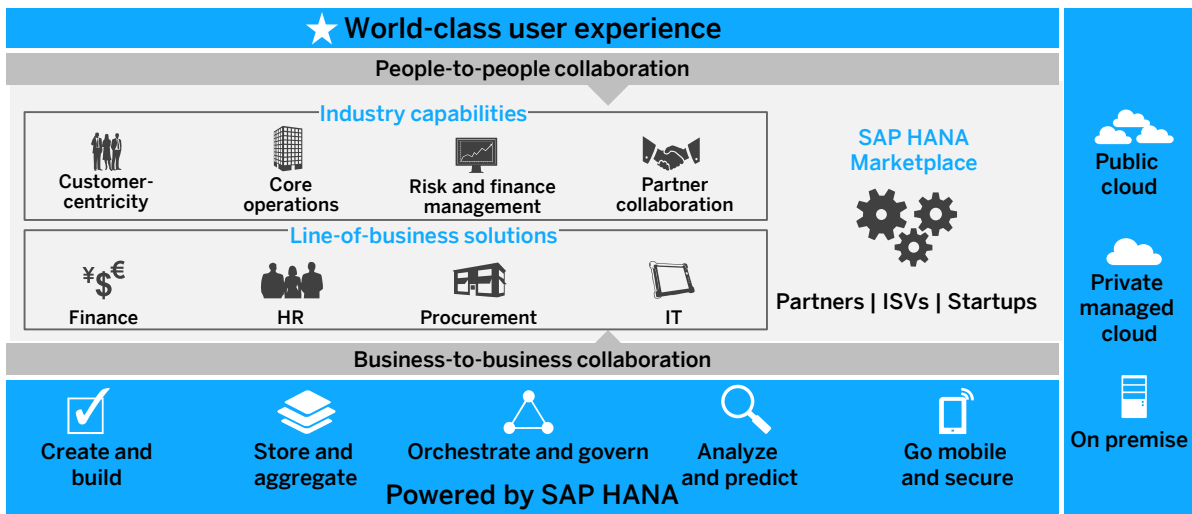
FROM ZERO TO MOBILE IN JUST 10 WEEKS WITH MOBILE SOLUTIONS FROM SAP

Using mobility solutions from SAP and partners, **Woodgrain Millwork** has eliminated handwritten paperwork and manual quality tracking. Now, product innovation, **improved quality**, and **higher sales** are increasing customer satisfaction.³⁵

CREATE COMPETITIVE ADVANTAGE THROUGH INNOVATION



SAP will bring simplification, innovation, and acceleration required to support the development of your digital business strategy. These capabilities will be leveraged throughout SAP's collaborative value and innovation framework.



SIMPLIFY

Simplify transaction processing, account management, and customer service while enhancing building products operations.

- Deliver superior customer service and connect to customers via a single view enabled by the SAP HANA platform
- Give customers a smooth experience across all channels, such as storefront, Internet, telephone, e-mail, Web chat, and social media
- Provide agility with SAP HANA Enterprise Cloud. Get fast access to the latest SAP innovations, allowing for faster response to business needs

INNOVATE

Use SAP HANA Cloud Platform to enable producers, suppliers, and customers to connect and collaborate.

- Connect mobile users to enterprise data on customers, accounts, and services, giving access to the information they need
- Process and optimize data on customers and assets across all plants and legal entities with SAP HANA in the cloud
- Adopt and apply analytics solutions through the cloud to enhance visibility into product demand

ACCELERATE

Predict and respond to opportunities and risks with predictive analytics solutions powered by SAP HANA.

- Address unplanned maintenance shut-down more quickly
- Take new products and services to market more quickly and respond to customers on the platforms they prefer
- Balance demand and supply with predictive modeling and accurate and timely analytics using SAP HANA
- Accelerate initial deployment of your SAP HANA and SAP S/4HANA projects with SAP HANA Enterprise Cloud

SAP GLOBAL SERVICES AND SUPPORT TO DRIVE YOUR SUCCESS

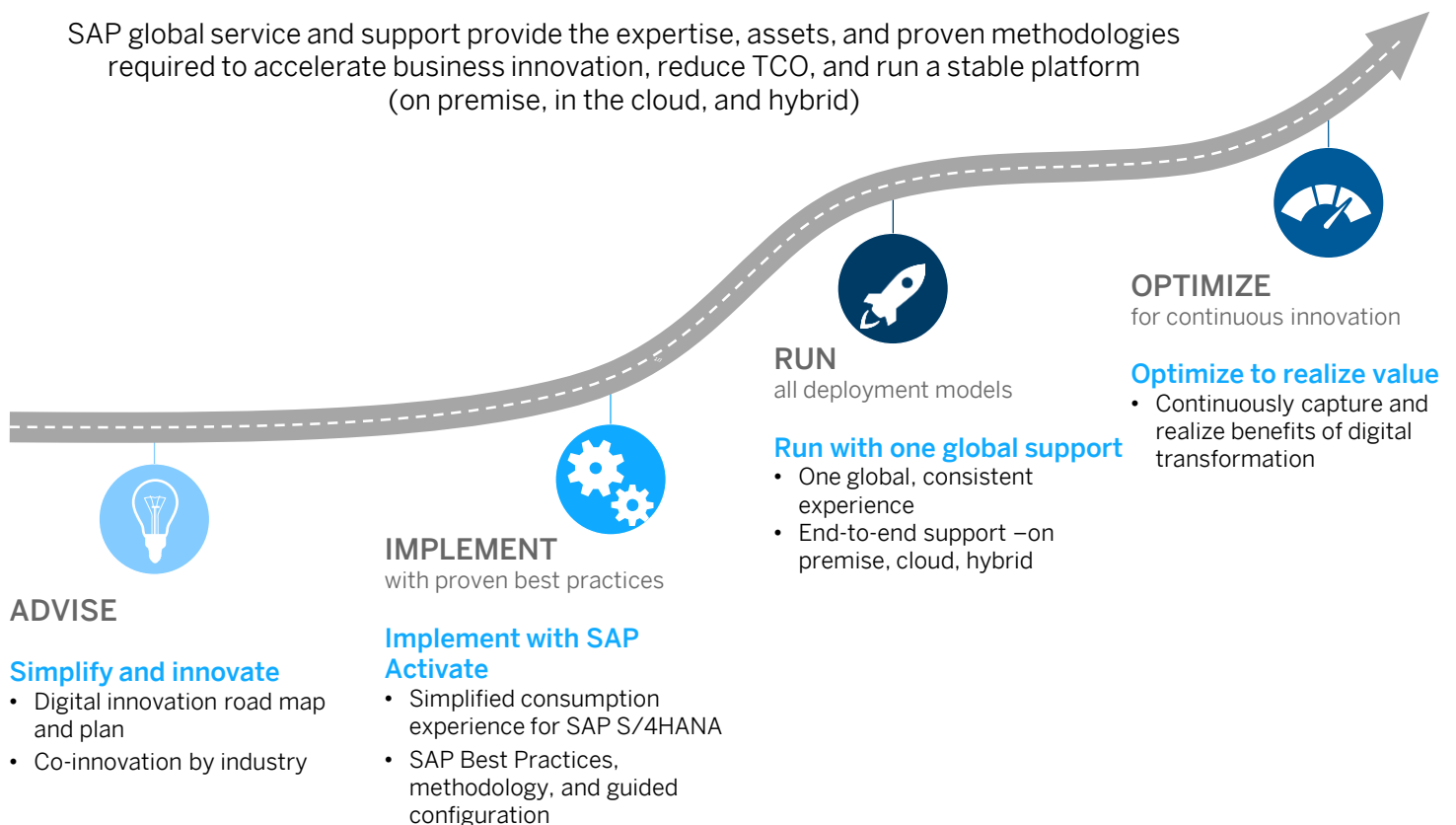
In the digital economy, simplification and business innovation matter more than ever. SAP has a broad range of services to cover the end-to-end digital transformation journey, ranging from advising on a digital innovation road map and plan, to implementing with proven best practices, to the ability to run across all deployment models, and ultimately optimize for continuous innovation across your digital journey. SAP provides both choice and value within our services, allowing you to tailor the proper approach based on your needs.

Turn to the 30,000 consultants and support professionals who can bring your digital strategy to life. SAP's global service and support model provides a consistent experience – on premise, cloud, or hybrid. SAP's global service and support provide the expertise, assets, and the proven methodologies required to accelerate business innovation, reduce TCO, and run a stable platform (on premise or in the cloud).

SAP Activate is a new, simplified consumption experience introduced for SAP S/4HANA and cloud adoption. It offers a combination of SAP Best Practices, methodology, and guided configuration. In addition, we provide leadership in learning to drive quick time to value realization and a solid engagement foundation with SAP MaxAttention, SAP ActiveEmbedded and SAP Value Partnership across the end-to-end customer lifecycle.

SAP HANA Enterprise Cloud is the optimal springboard to the cloud for customers. It offers an attractive option for organizations that are eager to leverage SAP's latest innovations such as SAP S4/HANA, with the peace of mind that SAP is in the driver's seat.

SAP global service and support provide the expertise, assets, and proven methodologies required to accelerate business innovation, reduce TCO, and run a stable platform (on premise, in the cloud, and hybrid)



Learn | Extend / Innovate | Engagement Foundation | Support

SAP COMPREHENSIVE ECOSYSTEM

Orchestrating the world to deliver faster value

Our comprehensive ecosystem for building products offers:

- A wide range of business services (banking, travel, etc.)
- Open architecture: choice of hardware and software
- Complementary and innovative third-party solutions like 3D configuration or production scheduling
- Reach – partners to serve your business 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:



BUSINESS NETWORK

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

INFLUENCE FORUMS AND EDUCATION

- 32 user groups across all regions
- 40+ industry councils
- SAP community >24 million unique visitors per
- 2,650 SAP University Alliances

INNOVATION

- 1,900+ OEM solution partners to extend SAP solutions
- 3,200 startups developing SAP HANA apps

CHANNEL AND SME

- 4,800 channel partners

IMPLEMENTATION SERVICES

- 13,000 partner companies
- 3,200 service partners
- Delivering 1,300+ industry-specific solutions

PLATFORM AND INFRASTRUCTURE

- 1,400 cloud partners
- 1,500+ platform partners



ADDITIONAL RESOURCES

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

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