THE INTELLIGENT ENTERPRISE FOR BUILDING PRODUCTS COMPANIES

Helping to create superior customer experiences through tailor-made solutions for the living space
Dear Customers,

The world is facing huge social, economic, and environmental challenges, and every person and company has a role to play in creating a sustainable future for all of us.

Massive global changes are impacting building products companies. Standards of living are improving, and the overall urban population and middle class are growing. This creates an enormous demand for building products in developing countries. In developed regions, low interest rates and migration are revitalizing renovation and home building. Major shifts in behavior, attitudes, and technologies are also impacting the market.

I predict that, by 2025, many building products companies will transform from purely selling products to delivering new, differentiating, customer-centric solutions and business outcomes. Companies will be more flexible and efficient, which will enable them to respond to uncertain and changing conditions profitably while adhering to governmental regulations and meeting societal expectations. Classical borders and task assignments between companies in the value chain will disappear, and the traditional supplier-customer relationship will morph into deeper cooperation models.

Building products companies will focus on five strategic priorities:
- Achieving customer centricity
- Offering small lot sizes and individualization
- Running smart factories and digital networks
- Supporting value-added services and new business models
- Operating for purpose

To execute on these strategic priorities and achieve the 2025 vision, companies will change the way they operate. They will adopt innovative technologies and obtain an abundance of real-time information from customers, suppliers, and the world at large that will support more-collaborative customer relationships. They will then learn from this information to make decisions that enable them to react much more quickly to changing situations and to solve customer and societal problems in novel ways. Additionally, winning and keeping business will be based on providing great experiences across all interactions.

Building products companies will use extensive automation and robotics not only on the operational side but also in the back office through robotic process automation. By shifting routine tasks from humans to business systems enabled by machine learning and artificial intelligence, these companies will create smart factories and distribution channels that more easily support changing customer demands and the pursuit of transformation of business models.

With the SAP® Intelligent Enterprise Framework methodology, SAP provides the integrated suite of applications, the intelligent technologies, and the digital platform that companies need to pursue this shift. We have the vision, the solutions, and the commitment to go with you all the way from defining your transformation strategy and delivering the right solutions to running your digital backbone in the cloud.

Sincerely yours,

Ursula Grün
Global Industry Lead for Building Products
SAP SE
# TABLE OF CONTENTS

3  Welcome

5  Our Place in the New World

7  Paving the Way for Business Model Innovation

9  Five Priorities for Success

10  Achieving Customer Centricity

12  Offering Small Lot Sizes and Individualization

14  Running Smart Factories and Digital Networks

16  Supporting Value-Added Services and New Business Models

18  Operating for Purpose

20  Key Technologies

22  Getting There: Phased Approach

23  Early Digital Adopters Lead the Way

24  SAP’s Framework for the Intelligent Enterprise

25  How to Plan Your Path to the Intelligent Enterprise

26  Comprehensive SAP Ecosystem Orchestrating the World to Deliver Value Faster

27  SAP Is Committed to Innovation

28  Resources

---

YOUR FEEDBACK MATTERS TO US!

Please let us know how you rate this document.

[Click here]
Urbanization
Urban expansion combined with the overall growth of the world’s population will continue to drive significant demand for construction and building products companies beyond 2025. This growth comes with important environmental challenges, such as how to sustainably use limited space, how to provide infrastructure for increased traffic, and how to satisfy increased water and electricity consumption.

Globalization and Right Shoring
Increasing customer expectations as well as continuing geopolitical uncertainties add risk along the entire supply chain – from procuring raw materials to production and delivery. Companies will need the ability to shift resources, production, and financial funds around the globe in a flexible way to make the best use of regulatory and location advantages and to best meet customers’ changing requirements.

Circular Economy
A mind shift is happening among consumers, employees, suppliers, and investors, resulting in businesses needing to consider purpose and sustainability. A circular economy requires a change in the complete supply and production processes from a take-make-use-dispose flow to a circular approach that considers reuse and zero waste.

Global “megathemes” are affecting building products companies and providing new opportunities for growth.
The building products sector is being reshaped by three major trends.

- **Changing end-customer behavior:** This is driven both by how the customer consumes information and makes decisions using multiple channels as well as by individual likes and dislikes, wishes and dreams, and motivations and inclinations. Different demographic groups will further develop significant differences in their preferences, which need to be understood and addressed by the building products sector. Winning and keeping relationships will be based on providing great experiences across all customer interactions.

- **Automated intelligent supply chain:** Companies will collaborate within their own borders and along the entire value chain, enabled by digital technologies to form an “outcome network.” The way companies run and maintain assets, operate the shop floor, and deliver goods will dramatically change.

- **Digitalization of construction:** The construction sector urgently needs to overcome a lack of productivity and a shortage of skilled workers. Digital technology will redefine this industry area and its entire ecosystem. The way building products companies will act as suppliers and important partners in the business-to-business (B2B) environment will be redefined by 2025.

Being able to address these global megathemes and the associated industry challenges will determine who will be among the winners over the next 10 years. Successful business model innovation, process optimization, and customer centricity are directly linked to delivering great customer and employee experiences. The best-performing companies are pulling away from the rest, widening the performance gap and creating a landscape where digital leaders are the most profitable because they successfully adopt new technologies and deliver winning products and services more efficiently.

**80%**

Of innovative industrial manufacturing companies have started or completed their digital transformation, compared to **54%** of other companies.¹

---

**Mohawk Industries Inc.**

“We touch every aspect of the supply chain; therefore, it is essential that we are the absolute best when it comes to quality cost control. We depend on a heavily integrated and automated supply chain. Warehouse automation, for example, means that when orders come in for a carpet, nothing stops. The dollar gets processed, the inventory gets assigned, and the carpet roll gets picked up and loaded into a truck within 35 minutes. Our SAP software platform lets us achieve that full supply chain integration from planning to production to fulfillment. Every aspect is integrated, and it’s our number-one priority.”

– Jana Kanyadan, Senior Vice President and CIO, Mohawk Industries Inc.

**Cera Sanitaryware Limited** optimized the customer experience using customer-facing solutions from SAP to create one source of truth for all sales activities, allowing employees to access customer data anytime, anywhere, on any device. The company has increased transparency with systematic approvals and automated tracking of sales orders, resulting in greater customer satisfaction and enabling complete customer lifecycle tracking, from lead to sales order.

**Severstal** is using the Internet of Things (IoT) and SAP Leonardo Machine Learning capabilities (now SAP Leonardo Artificial Intelligence capabilities) to minimize energy costs and combat electricity fraud by monitoring real-time energy use and analyzing energy consumption disparities.

**Hilti AG** is using SAP Leonardo IoT capabilities to connect equipment on customer sites. Based on that, Hilti offers new services to its customers, enabling them to manage this equipment more effectively.

**KAESER KOMPRESSOREN** optimizes equipment sales and service processes using SAP Leonardo IoT capabilities, predictive analytics and service, machine learning, and the management of digital twins.
In 2025 intelligent enterprises in the building products sector will be highly connected with the construction sector (B2B) and the end consumer based on the segment they are selling to (see Figure 1).

They will offer solutions and services targeting specific market segments through a significantly stronger and more consistent omnichannel presence. The use of social media, targeted marketing campaigns, and analysis of customer data will complement and extend communication with the customer.

In 2025 building products companies will deliver personalized solutions at scale and as a service. Most of the revenue will come from products and services based on highly customized, individualized solutions, which will address very specific requirements and serve the “segment of one.” Some will be based on new business models, specifically around the capability to effectively share data within the network of construction professionals, to the benefit of all participants.

Companies will be more flexible and efficient in responding to uncertain and changing conditions profitably while meeting governmental regulations and societal expectations. This will be achieved by eliminating data silos, increasing process automation, and closely collaborating across business networks with other players in the ecosystem.
Solutions and services will be available throughout the product lifecycle, starting with the development of a product through delivery, use, decommissioning, and reuse. Classical borders and task assignments between the companies in the value chain will disappear, and the traditional supplier-customer relationship will morph into an extended cooperation model.

Building products companies will put significantly more focus on making products and servicing customers in a sustainable way and purposefully making a positive contribution to society. Companies will offer an increasing number of products containing more sustainable materials. They will support recycling, establish lower energy requirements, and reduce material consumption. They will also strive for fair labor conditions and will better engage with local communities.

By 2020, 90% of large enterprises will generate revenue from data as a service – from the sale of raw data, derived metrics, insights, and recommendations – up from nearly 50% in 2017.²

Figure 1: The Intelligent Enterprise in the Building Products Sector

FROM: OPTIMIZE

TO: EXTEND

TO: TRANSFORM

- Connecting customers closely
- Offering personalized solutions
- Responding to changing conditions
- Providing complete solutions and services
- Offering solutions built with purpose

Solutions and services will be available throughout the product lifecycle, starting with the development of a product through delivery, use, decommissioning, and reuse. Classical borders and task assignments between the companies in the value chain will disappear, and the traditional supplier-customer relationship will morph into an extended cooperation model.

Building products companies will put significantly more focus on making products and servicing customers in a sustainable way and purposefully making a positive contribution to society. Companies will offer an increasing number of products containing more sustainable materials. They will support recycling, establish lower energy requirements, and reduce material consumption. They will also strive for fair labor conditions and will better engage with local communities.

By 2020, 90% of large enterprises will generate revenue from data as a service – from the sale of raw data, derived metrics, insights, and recommendations – up from nearly 50% in 2017.²

30% Of manufacturers are predicted to use innovation marketplaces by 2022 for on-demand services and software that raise margins by up to five percentage points³

90% Of manufacturers will leverage real-time equipment and asset performance data to self-diagnose issues in advance and trigger a service intervention to avoid unplanned downtime by 2021⁴

35% Of manufacturing organizations will have created new ecosystems by implementing AI- and blockchain-centric platforms, thus automating 50% of processes by 2022⁵

50% Of manufacturers are predicted to network related product and asset digital twins into digital twin ecosystems for a systems-level view of their business and a 5% reduction in cost of quality by 2024⁶
FIVE PRIORITIES FOR SUCCESS

We have identified five strategic priorities necessary for Building products companies to transform their business.

- Achieving Customer Centricity
- Offering small lot sizes and individualization
- Running smart factories and digital networks
- Supporting value-added services and new business models
- Operating for purpose
ACHIEVING CUSTOMER CENTRICITY

Changing consumer buying experiences for business-to-consumer (B2C) enterprises will also impact B2B businesses.

All B2B businesses today must understand how their customers are making buying decisions and how they are using products to be able to deliver value — all the way to the end consumer. True customer centricity means understanding the ultimate end consumer, how their behaviors are changing, and then making every business decision based on this insight.

The Vision
In 2025 building products companies will play a significant role in point-of-sale interactions with end consumers — today the domain of retail and wholesalers. In some cases, they will even own the point of sale and interact directly with the end consumer, bypassing third parties. They will be able to maintain “customer-for-life” relationships with a focus on long-term value supported by a 360-degree understanding of customers (see Figure 2). This includes a detailed understanding of requirements and needs and also collection and analysis of the ongoing knowledge of how consumers use the products in their daily operations. They will interact with their customers seamlessly on a consistent basis through multiple channels from Web to direct and including IoT connectivity. And they will communicate regularly with consumers tracking their own goods throughout the entire ecosystem.

The Journey
Building products companies will start toward this goal by evolving their current routes to customer into a true omnichannel model. This means that their customers can be served seamlessly, even if they change the channels by which they interact. This situation will then be extended by targeting specific profitable markets with laser-sharp marketing campaigns and individualized product offerings specific to the customer group. Social customer interactions and sentiment analysis will be important to help understand how the market is perceiving services and product offerings. In addition, this end-to-end knowledge will function as a knowledge base to guide customers during the purchase process using product configuration suggestions enabled by machine learning.

Figure 2: Establishing a Customer for Life

30% of manufacturers will provide personalized dashboards for customers to schedule service, learn about products, and collaborate by 2023. 

“The front door of our store is no longer at the front door of our store. It’s truly in our customers’ pocket, it’s on the job site, it’s when they’re sitting on their couch. The shopping experience in most categories starts in the digital world, even if it finishes in the physical world now.”

– CEO of a big-box retailer

© 2019 SAP SE or an SAP affiliate company. All rights reserved.
Putting the customer’s point of view at the center of every decision is a key prerequisite for building products companies. It encompasses what to market, sell, and produce; what services are offered; and where products and services are delivered. Providing relevant information, independent of the channel used, contributes to a positive customer experience. Including the end consumer in business-to-consumer go-to-market activities is mandatory.

360-Degree Customer Order Support

Customer order processing software from SAP helps organizations streamline the order-to-customer cycle, including order fulfillment and after-sales service, with real-time data and fully integrated and automated workflows.

### TRADITIONAL SCENARIO

Disparate information and data silos are hindering the ability to have a clear picture of customer orders and order status.

- Achieving consistent product configuration in the area of building products can require significant effort.
- Production, costing structures, price, and more need to be calculated based on product specification.
- Changes to customer orders will impact many different levels and departments, leading to lack of visibility.
- In the case of claims, many departments need to be consulted to understand the situation and provide appropriate assistance to the customer.

### NEW-WORLD SCENARIO

Put customer success at the center of all activities:

- Single point of truth
- One single document that covers all products or services requested
- 360-degree view of past and current customer activities, leading to better decisions
- Ability to react quickly to late order changes
- Ability to track goods and delivery
- Instant service on claims and warranty cases

When a customer requests unique product features, machine learning can support product configuration. Products and services are captured in one central place.

- All dependent processes can be adapted based on custom requirements.
- Change requests to orders can take effect immediately, and decisions can be communicated to customers in a timely manner.
- A high level of integration across sales order processing allows for total visibility of cost drivers at all stages. Knowing transportation details helps avoid delays and find alternatives. Product status and origin can be tracked across all material levels.
- Transparency of customer history and activities improves decision-making. Machine learning can automatically define the right reaction for speedy claim resolution.
- High customer satisfaction is achieved through individually configured products delivered on time. Value-adding services, such as installation services or supplemental products, provide a complete solution for customers. Claims and warranty cases can be more easily addressed.

### TOP VALUE DRIVERS

- **Increase** revenue growth
- **Increase** customer satisfaction
- **Reduce** sales and service cost

Source: SAP Performance Benchmarking
OFFERING SMALL LOT SIZES AND INDIVIDUALIZATION

Both end consumers and B2B customers are interested in products and solutions that are built exactly to meet their requirements.

The need to meet these requirements forces building products manufacturers to move from large lot sizes, which can serve many customer orders at low cost, to smaller lot sizes. As customers are not willing to pay more than for a standard solution, manufacturers have to control the costs of manufacturing and distribution to stay competitive and profitable.

The Vision
In 2025 building products companies will deliver completely customized products, services, and solutions that precisely fit the needs of an individual customer (see Figure 3). Companies will offer customers much more flexibility on product features where specific application requirements will have to be met for features such as cut-to-size boards, sidings, and tubes to reduce installation effort on the job site. Another example could be offering special colors to match an existing color scheme. The customer will also require multiple options for payment (cash, card, account) and delivery (expedited shipping, warehouse pick up, direct to job site) – all while still ensuring appropriate levels of profit. Digital technologies will help recommend the best product configuration for a specific purpose and the best way to fulfill production and distribution. There will be a seamless connection between the execution layer and the business application layer where information about requirements, for example, is passed down and execution status information is passed up for easy consumption by the customer.

The Journey
Building products companies will start toward this goal by providing supply chain transparency across the enterprise, as well as shop-floor to top-floor connectivity, breaking down data silos for increased real-time visibility. They will evolve by analyzing what product configuration really sells and optimizing product offerings to better meet market demand. At the same time, they will optimize planning and execution of the portfolio for higher flexibility and better response times. Finally, digital technology such as machine learning will support customers and sales with recommended product configurations and will suggest the best way to fulfill the demand with an eye toward key constraints such as profit, availability, energy use, and other factors.

Figure 3: Configuring Products for a Single Customer

Today

Future

Segmentation

Single Customer

50% of manufacturers will have integrated simulation and configuration tools with customer profile data by 2024, thus achieving up to 2% gains in revenue.8

MAN Diesel and Turbo (now MAN Energy Solutions) has changed its focus drastically over the past few years. It has gone from a company focused on the product to one where customers are at the heart of everything. The company is working with SAP Customer Experience solutions to support its main aim – to achieve transparency in terms of what it does with customers. For example, the solutions are supporting MAN Diesel by providing live data when a sales rep is about to visit a customer, so they can know exactly what the situation is with that customer in the moment.
Providing solutions that precisely fit the needs of one single customer has been commonplace in traditional make-to-order environments. Now, the ability to capture customer requirements effectively and drive mass customization is the key to giving customers exactly what they want. Critical for this transformation is the ability to manage the specifics of each order in every aspect of the industrial value chain, in a consistent way, and at nearly the cost of a standard order. To do this, all product and process information must be kept in a single place, and all business processes – from initial engineering through after-sales service – must be effectively executed and closely monitored.

**Manufacture Individual Products**

With SAP software at their digital core, building products companies can provide their customers with individualized products faster and at a lower cost.

**Offering Small Lot Sizes and Individualization**

**Manufacture and deliver exactly what every customer wants – profitably**

There is an inability to design, market, and profitably sell individualized products. Special requests or changes are difficult to manage, time-consuming, and cut into margins.

**Top Value Drivers**

- **Faster** time to market
- **Lower** R&D costs
- **Increase** in revenue from new products

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>10%–12%</td>
<td>Reduction in total logistics costs</td>
</tr>
<tr>
<td>10%–20%</td>
<td>Increase in on-time deliveries</td>
</tr>
<tr>
<td>Up to 10%</td>
<td>Reduction in total manufacturing costs</td>
</tr>
</tbody>
</table>

*Results are based on customer benchmarking conducted by SAP. Results may vary.*
RUNNING SMART FACTORIES AND DIGITAL NETWORKS

Supply chains and manufacturing networks must be completely modular and flexible to react to short-term changes.

At the same time, they must execute seamlessly for quick order completion and respond directly to demand signals and changing customer orders. Fulfilling higher customer expectations at competitive cost will require increased automation throughout all processes, not just on the shop floor. This will include the use of new technologies such as bots, augmented reality, and machine learning to increase efficiency and be able to promise and deliver orders on time as expected.

The Vision
In 2025 the supply chains and manufacturing networks of building products companies will allow the seamless execution of producing and shipping the right product at the right time in the most profitable way. Process integration will be achieved beyond a company’s own borders to form the “network of outcome.” Repetitive tasks will be automated, processes will be managed by exception only, and even complex decisions (for example, in maintenance: repair, replace, or retire) will be calculated on the fly for the most profitable, least risky solution.

The Journey
Building products manufacturers will start their journey by analyzing Big Data (usually from within the company), enriching themselves with business data, and understanding the dependencies or predicted outcomes. Subsequent steps will increase machine-to-machine connectivity and collaboration, allowing autonomous decisions based on sensor data and machine learning algorithms. Intelligently connecting manufacturing, logistics, and supply chains will allow companies to quickly address short-term demand impulses, supply fluctuations, and changes to customer orders, enabling true modular production processes. These businesses will be connected with the digital network and run fully automated processes beyond their own company borders, for example, enabling machines to order the parts they need directly (see Figure 4).

Figure 4: Enabling Flexible Production

Collaboration Platform and Digital Twins

Point-to-Point Interaction

AB SKF does not see maximum efficiency as just a goal. It’s the only way to go. SKF used SAP Leonardo technologies to provide a systematic approach to digital innovation — improving the efficiency of the shop floor operators.
RUNNING SMART FACTORIES AND DIGITAL NETWORKS
BUILD SMART FACTORIES AND DIGITAL NETWORKS

Transform your supply chain into a responsive network. Companies everywhere face volatile customer demand and heightened expectations of responsiveness. Innovative technologies can help meet these higher expectations by providing vital business information across the network, improving real-time analysis, and enabling better collaboration across departments and trading partners, making the supply chain more responsive.

Manage a Smart Factory and the Ecosystem
With help from SAP, build a responsive digital network with real-time analysis that allows better collaboration across departments and trading partners.

TRADITIONAL SCENARIO

- Disconnected departments and limited access to the business network, prohibiting responsive business
- Plans not consistently created and shared, so information cannot flow quickly
- R&D, sourcing, sales, manufacturing, and planning not aligned – wasting time and money
- Reliance on and manual communication with even just a few supply chain partners, resulting in limited visibility and collaboration difficulties, which make delays inevitable and the risk of error high

NEW-WORLD SCENARIO

- Digital technology in plants and in the supply chain, intelligently connecting manufacturing operations and supply chain networks to the rest of the enterprise, while technologies such as predictive quality and maintenance can help dramatically change the way products are created, sold, and delivered
- Linear supply chains transforming into digital supply networks through simultaneous collaboration of all relevant stakeholders
- Alignment of procurement, sales, manufacturing, and delivery, improving customer satisfaction
- Connected enterprise that can quickly act on any sudden change within the network
- Your company at the center

TOP VALUE DRIVERS

**Higher** overall equipment efficiency  **Better** real-time decisions  **Optimized** inventory and supply

Source: SAP Performance Benchmarking
SUPPORTING VALUE-ADDED SERVICES AND NEW BUSINESS MODELS

To fulfill the segment of one, supply chains and manufacturing networks must be completely modular and flexible.

Construction projects and home remodeling projects are difficult to manage. Building products companies can ease this by providing additional services beyond the traditional products. The supplier-to-customer relationship will convert to a partnership where the building products company helps its customers excel in their business.

The Vision
Services will have moved from being sporadic “add-ons” to becoming offerings in their own right, even sometimes with separate business models. These services are offered throughout the lifecycle of a product from development to decommissioning, including design support; prefabrication; installation; offerings around various financing models, such as leasing or renting; after-sales services including maintenance, disassembling, recycling; and more. It will be difficult for one company alone to meet all the new customer expectations (see Figure 5). Thus, solutions will not be restricted to the companies’ own products but, rather, evolve into multibrand services and solutions. These will include partners from the ecosystem delivering a variety of services, with the building products company orchestrating the seamless execution.

The Journey
Companies will start toward this goal by moving to a digitalized project infrastructure, such as building information modeling (BIM). This will allow them to collaborate with architects, engineers, and construction companies throughout the entire lifecycle of a construction project from RFP, awarding contracts, managing projects, progressing them, and billing them. Additionally, companies will provide an e-commerce platform with additional services such as order tracking and history and flexible payment and fulfillment options. This will be extended with further products and services from external partners not part of the company’s own product portfolio or traditional offering, but necessary to complete a construction project.

Figure 5: Creating New Products and Services with the IoT

Selling Products

Future

Selling Outcomes

By 2021, at least 50% of global GDP will be digitalized, with growth in every industry driven by digitally enhanced offerings, operations, and relationships. By 2020, investors will use platform, data value, and customer engagement metrics as valuation factors for all enterprises.10
Digitalization or interconnection of products and services can create additional value. Some examples are leasing and use-based selling and including maintenance or take-back services. Construction and remodeling projects can be cumbersome to manage, so offering outcome-based services can increase both customer satisfaction and revenue potential. Many companies are looking past current value chains to expand into new ecosystems.

**One Stop Shopping**
SAP supports you in becoming the go-to partner when it comes to home projects such as construction or remodeling.

**TOP VALUE DRIVERS**

- Greater competitive edge
- Increase in customer satisfaction
- Increase in revenue

**SUPPORTING VALUE-ADDED SERVICES AND NEW BUSINESS MODELS**

BE THE “GO-TO” PARTNER FOR HOME PROJECTS OR REMODELING

Customers are required to manage all their needs to run a home improvement project by themselves. The parties involved are not connected to each other, which leads to increased administration costs and delays in project delivery.

**NEW-WORLD SCENARIO**

Become the go-to partner when it comes to home projects such as construction or remodeling. Provide all products to complete a project – not only those the building products company produces but also third-party products required for the project – and deliver those to the job site. Include design, installation, and maintenance services in the offering.
- Unified business systems and standardized data to support orchestration of one-stop shopping across multiple acquired product lines
- Business networks connecting with other manufacturers and traders that can supplement your own offerings to enable a complete solution
- End-to-end management of customer needs to open up new revenue streams and increase customer retention

**Source:** SAP Performance Benchmarking

© 2019 SAP SE or an SAP affiliate company. All rights reserved.
We are moving toward a purpose-driven economy globally. A mind shift is happening across consumers, employees, suppliers, and investors that is incentivizing companies to more strongly define and deliver on their purpose.

To succeed in the future, building products companies will, of course, still need to deliver financial performance, but they will also have to show how they are making a positive contribution to society, preserving the planet and natural habitat, and working to solve some of the world’s greatest challenges (see Figure 6). With natural resources being limited on this planet, there is increased awareness of the ecological footprint of a product. Examples include carpeting and furniture made from 100% recycled materials, modular housing that can be set up on-site quickly and affordably, use of plastic tubes to support drip irrigation, and clean and reliable water supplies for poor schools and neighborhoods. Companies will strive for fair labor conditions and minimize waste and their consumption of raw material, water, and energy. Advanced product performance and ease of use will be paired with low environmental impact throughout the product lifecycle. Worker safety will also continue to be a strong focus.

The Vision
In 2025 building products companies will be able to offer best-in-class worker safety, even in remote locations. They will avoid using material such as wood from illegal logging, and they will be able to prove the origin of their products at all stages. Companies will be able to replace some products with environmentally friendly material, and they will reduce the amount of material required to fulfill a certain purpose. Recycling rates will approach 100% of all material employed.

The Journey
Manufacturers will start toward this goal by improving production processes so that they have lower energy consumption, reduced waste, and improved labor conditions and worker safety. This will be achieved through process insight based on sensor data, real-time analytics, and IoT concepts. Another step is to collaborate with business partners to lower transportation effort, and then decide to produce locally to lower transportation volumes. Companies will take additional transformational steps to produce for purpose in the areas of avoiding illegal logging and modern slavery, replacing products with environmentally friendly material, and increasing their operational focus on zero waste.

“Today, as the world’s largest flooring company, we also assess our performance by the significant and positive impact we make through all aspects of our business. Our sustainability practices reflect the commitment of our company and the passion of our people. We continue to push the boundaries of sustainability with innovative new products and processes because we believe in – and are willing to invest in – a better tomorrow.”
Jeff Lorberbaum, Chairman and CEO, Mohawk

“Society is demanding that companies, both public and private, serve a social purpose. To prosper over time, every company must not only deliver financial performance but also show how it makes a positive contribution to society.”
Laurence Fink, Chairman and CEO, BlackRock Inc.
Building products companies want to address growing expectations from customers, investors, employees, and society. Offering a safe, attractive, and purpose-driven business increases brand recognition and attracts talent, investors, and customers alike. Products that are designed and built with sustainability in mind can drive purchase decisions and employee engagement. Efficient production and logistics contribute to lower emissions and energy use, which are increasingly important criteria for suppliers. Reuse of materials is the future, as part of closed-loop material circulation.

Ensure Worker Safety On the Spot in Real Time
SAP helps organizations keep employees safer and mitigate environment, health, and safety (EHS) risks by providing the functionality to perform risk assessments, efficiently measure and report emissions, manage incidents, and communicate safe work practices to all employees.

TRADITIONAL SCENARIO

Health and safety administrators with limited insight into root causes of incidents and their implications, and into organization-level compliance for EHS

Out-of-the-box applications to analyze incident data

Analytics disconnected from real-time incident data

Multiple reports to monitor and analyze environmental compliance across the organization

No easy way to identify risks for location and to define risks

Incident reporting

NEW-WORLD SCENARIO

Health and safety administrators supported by advanced analytics, simplified EHS processes, and dedicated applications to act in the moment

Sophisticated analytics to analyze incidents, near misses, and other safety information, including asset, spatial, weather, and other IoT data

Monitoring of environmental data records graphically for different compliance scenarios with applicable compliance limits

Approval, replacement, or invalidation of the recorded values of environmental data records

Dedicated application to manage chemicals with all relevant details

Simplified process to identify risks and assign relevant safety measures for risk mitigation

Proactive warnings to workers to avoid incidents using IoT technology

TOP VALUE DRIVERS

Increased safety

Less time and money loss

Increased employee satisfaction and engagement

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

**Artificial Intelligence and Machine Learning**

Artificial intelligence (AI) and machine learning (ML) enable algorithms to “learn” from existing data and achieve the best possible outcomes without being explicitly programmed. Once the algorithm is trained, it can then predict future outcomes based on new data. Businesses can use these capabilities to eliminate repetitive manual tasks, such as service ticket management, automatically determining classifications and responses. The right spare parts for complex assets can be identified simply by using your mobile phone camera.

**The Internet of Things**

Advances in ubiquitous connectivity and edge computing are driving a step change in business productivity. This connectivity, coupled with AI and ML, can analyze petabytes of data and effect real business outcomes. Although companies have used the IoT for some time, now the entire value chain can be connected: from design to production to supply chain. Data-driven insights of customer preferences can drive better design, lower material costs, and reduce risk. Insights into machine (sensor) data can predict production quality and help prevent the process from running out of the allowed quality interval. Real-time analysis of machine temperature, pressure, and other sensor data can predict maintenance needs before assets break down.
Advanced Analytics
Business users need to be able to make the right decision at the right moment. Therefore, analytical capabilities with situational awareness are key. For example, empowered users, benefiting from embedded analytics in business processes, can get real-time visibility into sales history, profitability, customer payment behavior, and claims ratios, which provides an instant snapshot of a customer and helps companies offer the right product.

Virtual and Augmented Reality
Virtual reality (VR) – the use of digital technology to create immersive simulations – was once the stuff of science fiction. So was augmented reality (AR), which lets users interact with digital content that is overlaid on the real world. Already in use to help workers with difficult or infrequent maintenance activities, VR and AR technology can give customers a better idea of how new tiles in a bathroom or blinds on the window will look in their own house, therefore driving sales decisions.

Data Platform to Manage Experiences
In the digital economy, the cycle time to sense, analyze, and respond is a big competitive differentiator. Leaders are interlocking the operational performance data from business systems, which explains what is happening, with the experience data coming in the moment from customers and employees, which explains why it is happening.

Blockchain
A relatively recent breakthrough technology, blockchain is revolutionizing the movement and storage of information by creating a chain of unaltered transactional data. The blockchain model of trust, through massively distributed digital consensus, can reshape supply chains across the entire digital economy. For example, it can be used to digitalize the bill of lading document as part of the international ocean shipping process or in verifying the origin of raw materials, such as identifying lumber produced in sustainable, managed forests.

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

Key Technologies
© 2019 SAP SE or an SAP affiliate company. All rights reserved.
Companies will become intelligent enterprises on three distinct tracks as they evolve their strategic priorities to match their company’s vision. They will:

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

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

3. **Transform** their business using a constant stream of data enabling new service-driven business models. (See Figure 7.)

**Figure 7: Strategic Priorities Across Lines of Business**

- **Customer centricity**
- **Small lot sizes and individualization**
- **Small factories and digital networks**
- **Value-added services and new business models**

- **Intelligent customer order support**
- **Intelligent procurement**
- **Intelligent supply chain for assets**
- **Intelligent quality**
- **Intelligent maintenance and service**
- **Intelligent trading and shipping**
- **Intelligent cash application**
- **Intelligent service ticketing**

- **Today Data in many places**
- **Future 360-degree view of customer**
- **Today Many iterations**
- **Future Machine matching**
- **Today Downtime, unreliability**
- **Future Intelligent maintenance, production plan**
- **Today Time, money meeting thresholds**
- **Future Meeting expectations at lowest cost**
- **Today Difficulty verifying and authenticating**
- **Future Blockchain authenticating origin, status**
- **Today Manual matching**
- **Future Machine matching**
- **Today Slow resolution**
- **Future Intelligent responses**

- **Listen, Sell, Plan, and Source**
- **Produce Safely and Sustainably**
- **Deliver, Track, and Trace**
- **Service, Take Back, and Up-Sell**

- **Today Disconnected spreadsheets**
- **Future Collaborative planning, profitable decisions**
- **Today Monitoring, consumption prediction**
- **Future Optimized energy mix, use**
- **Today Hazardous environments**
- **Future Tracking of environment, warnings to workers**
- **Today No knowledge of vehicle location or situation**
- **Future Real time monitoring for optimized safety and performance**
- **Today No insight on attrition**
- **Future Instant insights preventing attrition**

**Producing for Purpose Streams ➔ New Business Models & Revenue**

© 2019 SAP SE or an SAP affiliate company. All rights reserved.
How do you achieve these strategic priorities?

Start with reimagining your business together with your customers. Then build a path for even more optimization and intelligent automation to simplify your business and free up resources to invest in even more digital transformation programs and find new business models and revenue streams.

According to a July 2018 study by Forrester Consulting that was commissioned by SAP, innovative companies focus on digital priorities to help them achieve digital transformation more than others companies (See Figure 8.)

**Figure 8: Innovators Focus More on Digital Priorities Than Others**

<table>
<thead>
<tr>
<th>Category</th>
<th>Innovators</th>
<th>Others</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smart factories</td>
<td>97%</td>
<td>63%</td>
<td>34%</td>
</tr>
<tr>
<td>New business models and networks</td>
<td>97%</td>
<td>76%</td>
<td>21%</td>
</tr>
<tr>
<td>Digital supply networks</td>
<td>96%</td>
<td>70%</td>
<td>26%</td>
</tr>
<tr>
<td>Connected products</td>
<td>95%</td>
<td>67%</td>
<td>28%</td>
</tr>
<tr>
<td>Customer experience</td>
<td>92%</td>
<td>70%</td>
<td>22%</td>
</tr>
</tbody>
</table>
SAP’s Framework for the Intelligent Enterprise

SAP Intelligent Enterprise Framework is a suite of intelligent business applications that use intelligent technologies and can be extended on a digital platform. This enables next-generation business processes to deliver breakthrough business value on our customers’ journey to becoming intelligent enterprises.

Figure 9: SAP Intelligent Enterprise Framework

Intelligent Suite
Our intelligent, integration-ready applications can help you manage customers, supply chains, networks, employees, and core processes. They are easily extensible and offer a consistent and intuitive user experience.

Intelligent Technologies
Drive rapid and continuous innovation with SAP Leonardo – a guided approach to digital transformation that combines intelligent technologies and services.

Digital Platform
Manage data from any source, in any format, and rapidly develop, integrate, and extend business applications – with an open digital platform.
HOW TO PLAN YOUR PATH TO THE INTELLIGENT ENTERPRISE

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

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

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

- **Plan**
  - Well to manage expectations

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

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

- **Build and launch**
  - With proven best practices

- **Run**
  - All deployment models
  - Run with one global support
    - One global, consistent experience
    - End-to-end support – on premise, in the cloud, or with a hybrid approach

- **Optimize**
  - For continuous innovation
  - Optimize to realize value
    - Continuously captured and realized benefits of digital transformation

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

© 2019 SAP SE or an SAP affiliate company. All rights reserved.
Our comprehensive building products ecosystem offers integration into:

- A wide range of business services (supply chain, analytics, omnichannel, and so on)
- Open architecture: choice of hardware and software
- Complementary and innovative third-party solutions
- Reach – partners to serve your business of any size anywhere in the world
- Forum for influence and knowledge
- Large skill sets

Our partner ecosystem includes, among others:
SAP supports building products companies in becoming intelligent enterprises – providing integrated business applications that use intelligent technologies and can be extended on SAP Cloud Platform to deliver breakthrough business value.

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

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

Comprehensive Industry Coverage
SAP enables comprehensive coverage of the complete building products value chain across the enterprise. With its clear industry road map, SAP is the partner of choice for the building products sector.

- More than 2,300 building materials companies run SAP software
- 4,900 forest product, furniture, and textile companies are SAP customers
- All lines of business are supported on a single platform

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

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

SAP is committed to innovation

Learn more
- SAP.com for Building Products
- SAP Leonardo
- SAP Digital Business Services
- SAP Design Thinking
Outlined below is external research that was used as supporting material for this paper.


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