



# Empowering the Chemical Industry

How digital transformation  
creates new opportunities

## Introduction

Technology is playing an increasing role in everything we – and our customers – do, shaping growth, disrupting industry landscapes, and providing the catalyst for transformation. In the chemical industry, digital technology provides actionable solutions to challenges and groundbreaking opportunities for innovation. It is imperative that industry players explore the possibilities presented by digital transformation.

In this whitepaper we will highlight overall business trends in the chemical industry and how digital transformation presents new opportunities for business leaders to harness the disruptive force of technology to be more agile, drive efficiency, and ultimately help shape their destiny.

## Challenges in the Chemical Industry

**Demands for greater efficiency** – Shrinking margins, higher competition, scarce natural resources, and customer expectation of sustainable products demand operational transformation. Chemical companies are attempting to address this issue by making their manufacturing, production, and business processes more efficient. That means they are seeking ways to increase end product yield, reduce waste, and lower energy and water usage, while maintaining world-class performance.

**New markets and collaborative business models** – As emerging markets move toward a more consumption-led economy, the demand for high-end sophisticated products and advanced materials will rise, resulting in the growth of specialty and high-end chemical segments. As a response, companies are launching R&D hubs in emerging markets. As research becomes more open and collaborative, businesses must also find ways to protect intellectual property without impeding progress. This also requires new investments in infrastructure that support changing business models, particularly in emerging markets.

**Faster innovation in order to stay ahead** – Staying competitive requires diversifying product portfolios and investing in developing new, differentiated products, such as responsive materials for clothing or sporting equipment. With rapidly changing trends and elevated customer expectations, staying ahead and standing out from the competition requires making nimble, data-driven decisions in order to quickly respond and innovate faster than ever before.

**Increasing security concerns** – Security is a broad concern in the chemicals industry. The potentially dangerous effects of certain chemicals or substances being misused in the environment or the risk of theft and possible terrorist attack have heightened security concerns. Security of critical intellectual property and assets against incidents of economic espionage and theft remain a major threat and may cost billions in lost revenue.

Dow Chemical to Invest  
**\$1 Billion** in Two New Plants in  
Louisiana

*IndustryWeek, August 2013*

Evonik Buys **\$3.8 Billion**  
Chemical Unit From Air Products

*Bloomberg, May 2016*

BASF Steps Up Investment  
in U.S.

*Wall Street Journal, December 2013*

Capital Expenditure Will Boost  
Future Organic Growth

*BASF Factbook 2015*

**Changing demographics** – With a median employee age of 48<sup>1</sup>, the chemical industry in particular is undergoing the challenges of an aging workforce. As baby boomers retire, the industry is struggling to fill empty positions, and the average knowledge experience is dropping dramatically. It is imperative that manufacturing companies use modern technology to retain critical knowledge and adopt a digital workplace to attract and retain the new gen-X/millennials who prefer social and collaborative workstyles over hierarchy.

## The promise of digital transformation

In order to improve efficiency and accelerate innovation while coping with growing pressures, leading chemical firms are investing in technology solutions that enable them to change how they do business and position themselves for long-term growth. This includes technologies designed to capture and process data from a variety of sources, empower better collaboration, deliver more accurate predictions, and more. In the chemical industry, investment in next-generation, digital technologies and services will rise approximately 13% in 2016, while spending allocated to legacy platforms and applications will be close to flat and may even decline<sup>2</sup>.

At forward-thinking organizations, these technology investments are not simply incremental upgrades—they are investments in digital transformation. Digital transformation requires that you rethink how your business operates. It is a new way of thinking that starts with the way you help your customers interact with you, establishing connections with them that extend well beyond the purchase of a product. At its core, digital transformation requires systems of intelligence – digital feedback loops that enable you to draw better insight out of data, and convert that data into intelligent decisions and action.

*“Helping society move forward is deeply grounded in Microsoft’s mission of empowering every person and every organization on the planet to achieve more. For business that means a digital transformation.”*

**Satya Nadella**  
CEO, Microsoft

*“Offerings based on digital innovation will finally allow you to achieve a goal many chemicals companies have been desperately targeting for decades: becoming a true solutions provider and partner to customers instead of a mere supplier or vendor.”*

**PwC’s Strategy & team**

And it isn’t simply about technology....systems of intelligence represent the combination of technology, people, and process that enable these feedback loops, and define an organization’s competitiveness and ability to change the entire industry landscape. It’s about seizing the opportunity to change the products and services you offer and to expand into new business models.

Chemical firms that digitally transform the way they operate will be better positioned to meet long-term goals. Bulk chemical firms that transform will achieve

more efficient production. Specialty chemical manufacturers with access to cutting-edge market trend analytics will be empowered to create new and innovative products. Chemical firms with an eye toward sustainability will have a greater capacity to help farmers and other customers to manage resources more efficiently.

# Capitalize on digital transformation opportunities with Microsoft

As one of only a handful of technology providers with an end-to-end portfolio, decades of industry experience, a comprehensive partner ecosystem, and highly-scalable cloud infrastructure, **Microsoft is in a unique position to help chemical firms digitally transform.** Microsoft's strategy is to build products and services based on a mobile-first, cloud-first approach, and to deliver a flexible platform of integrated offerings.

Microsoft delivers business value with:

- **Big data and advanced analytics tools** to interpret real-time data
- **Greater mobility** for field sales personnel
- **Trusted cloud services** to aggregate and process data sets in a secure manner
- **Enhanced productivity and collaboration tools** that connect personnel with their work anywhere, anytime, on any device

Chemical firms must keep innovating to stay ahead, while also driving efficiency. That means the future of the chemical industry lies in digital transformation, with systems of intelligence that include cloud computing, big data platforms, Internet of Things (IoT), predictive analytics and other new capabilities.

Digital transformation involves taking advantage of these technologies to better engage your customers, empower your employees, optimize your operations, and transform your products and services. In the next section, we'll look at how Microsoft solutions support each of these imperatives, as well as Microsoft customers that are seeing meaningful results.





# Engage your customers

Transform your company's marketing, sales, and customer service organizations to manage customer engagement from end to end.

Customers are better informed, more demanding and expect superior experiences at every contact point. Microsoft provides a holistic set of solutions from social listening, advanced analytics, multi-channel marketing, to patient/client engagement, helping to optimize brand awareness and sentiment, recruit new customers, provide new digital services and revenue streams, and increase marketing effectiveness.

Some of the benefits of using Microsoft technologies include:

## Engage customers effectively through a multichannel strategy and new digital experiences.

Microsoft solutions enable a flexible, insight-driven, fully mobile, location based, and personalized marketing experience that allows you to connect with customers through all channels.

## Gain greater visibility and insight into customer buying patterns and preferences.

Drive marketing efforts and promotional strategies with more focus. Empower end-users to extract insights from enterprise data (big data) and share it with others using intuitive self-service BI tools.

## Improve customer-centric productivity across the enterprise.

Microsoft offers familiar, highly connected and easy to use tools, helping to drive adoption. Provide role-based tools and dashboards that give each employee access to customer information and processes in the context of their job.



### Case Study: Ecolab

By 2030, the demand for fresh water is projected to outpace supply by almost 40 percent. Ecolab, a leading global provider of water, hygiene, and energy technologies and services, is helping companies worldwide operate more sustainably with the Microsoft cloud—including Azure and Dynamics CRM Online. Connected to thousands of sensors in their customers' facilities worldwide, the platform collects and analyzes real-time water usage data to improve efficiency and cut water, energy, and operational costs. [Learn More.](#)

*"Microsoft Azure and Azure IoT Suite have helped us get much closer to our ambition to help customers operate at water-neutral. To get there, we need to collect and analyze massive amounts of information. Now, we can identify opportunities and gaps, provide the right solutions, and most importantly, manage our customers' processes so that they can get closer to net-zero water usage."*

#### Christophe Beck

President, Nalco Water, (an Ecolab company)



*"Becoming more engaged with customers includes predicting what customers want before they know they want it, based on data intelligence, and offering it to customers in a way that's natural."*

#### Satya Nadella

CEO, Microsoft



**Embrace customer centricity.**

Take advantage of new sources of revenue by developing and implementing new customer-centric business models. Build brand awareness and customer loyalty by delivering rich and consistent experiences across multiple devices.

**Identify and deliver value-added products and services that are aligned to customer preferences.**

Microsoft solutions help you increase profitability by using complete customer knowledge and market information. Identify trends and discover market insights to help you zero in on your most profitable offerings and services and to identify and exploit emerging opportunities. Social Engagement allows you to measure digital asset management effectiveness, Brand Affinity and satisfaction and engage directly with customers based on interest or concerns.



# Empower your employees

Create an agile, mobile, always connected work environment that opens the door to global collaboration and improves business productivity while maintaining security and regulatory compliance.

As supply chains and compliance regulations become increasingly complex, manufacturers need productivity solutions that can empower their employees to become more agile and responsive to customer needs. Microsoft solutions support end-to-end business workflows across the enterprise, that work seamlessly with existing disparate line-of-business systems, helping you accelerate business transformation with fast adoption.

Some of the benefits of using Microsoft technologies include:

## Gain insight into all levels of production and sales.

Microsoft cloud-enabled big data hubs drive multi-tier visibility across supplier and customer networks.

## Deploy flexible, scalable sales and service platforms via the cloud.

Microsoft cloud services provide anywhere access to familiar Office applications, email, calendar, video conferencing, enterprise social networking, and up-to-date documents, all optimized to give workers the best experience across devices—from PCs to smartphones to tablets.

## Increase productivity and simplify internal tasks such as training, routing schedules, and territory management.

Microsoft products offer a consistent, connected, and seamless experience across applications and devices for all personal preferences. Microsoft cloud services provide better cross-team coordination and collaboration through integrated communication, IM, email, virtual meetings, augmented reality, and social networks.



The Chemical Company

### Case Study: BASF

To support their business processes optimally and enhance productivity, BASF uses the Microsoft cloud and Office 365 as an integrated platform to connect phones, tablets and traditional computers. Staff members benefit from a working environment that enables them to access their emails and documents from anywhere. At the same time, the intuitive graphical user interface of Office ensures that they work productively. [Learn More.](#)

*"The goal of the global implementation of Microsoft Office 365 is to establish an efficient and user-friendly IT solution which supports our business processes optimally - and works independent of the device our staff members use."*

#### Wiebe van der Horst

Senior Vice President Global Process & Enterprise Architecture, BASF Group Information Services & Supply Chain Operation



*"It's serendipity at work when you discover someone who has the solution to a problem that stumps you. You don't need to rely on serendipity to get that result. All that knowledge and insight exists inside your infrastructure - in your email, your documents, your line of business applications - it's just waiting to be found using organizational analytics, and provide insight to what is going on."*

#### Satya Nadella

CEO, Microsoft



### **Enhance productivity with tools that are intuitive to use and familiar.**

Microsoft provides familiar, consistent, and natural user interfaces on any device, from plant floor to boardroom, allowing for higher productivity for both mobile and office workers.

### **Enable sales teams with comprehensive lead management via role-based applications.**

Product information such as product lists, efficacy studies, brochures, and research papers are automatically saved to the cloud, and personal settings like custom dictionary, background, and lists of most recently used files now roam with the sales rep.

### **Share information across geographic and organizational boundaries.**

Microsoft provides collaboration tools from the cloud along with identity and access management services that ensure collaboration can occur securely according to the needs and of the organization, its partners, and its customers.



# Optimize your operations

Increase your agility and margins through streamlined processes, enabling staff to work more productively, by extracting the right insights from the right data to drive better-informed, faster decision making.

Process manufacturing is an engineering-intensive business where people, facilities, and processes must interact flawlessly every day. Microsoft provides a platform and productivity tools to enable manufacturing organizations to collect data from a wealth of internal and external sources, contextualize, analyze, and visualize it, as well as collaborate efficiently for optimal and actionable insight.

Some of the benefits of using Microsoft technologies include:

## Improve productivity with better, faster insights.

Microsoft business intelligence solutions deliver cost-effective self-service BI, enabling staff to access enterprise data sources, find new insights, and use them to drive business performance. Gain insight into all levels of production, operations, and sales. Microsoft cloud-enabled big data hubs drive multi-tier visibility across supplier and customer networks.

## Improve transparency and operational efficiency.

Provide role-based access and real-time visibility into manufacturing applications, including manufacturing execution systems (MES), enterprise resource planning (ERP), human resource management (HRM), and maintenance, repair, and operations (MRO).

## Differentiate through business process agility.

Microsoft offers a modern and agile business platform that can augment or replace legacy enterprise applications, and keep pace with new product/service introductions, joint ventures, acquisitions, and divestures.



### Case Study: The Dow Chemical Company

Self-described as an “over 100-year-old-startup,” The Dow Chemical Company (Dow) hasn’t lost its entrepreneurial spirit. Instead of positioning itself as just a maker of chemical products, today Dow is all about harnessing science and technology to drive innovation. Dow pursues close collaboration with select researchers, customers, and suppliers worldwide, driving the need for access to data anytime, anywhere. For example, to create specialized agriculture products that maximize crop yields in local conditions, Dow needed real-time access to corporate data, as well as the ability to work closely onsite with customers. So the company turned to the Microsoft Cloud, giving Dow team members access to specialized apps and data from anywhere—even farmers’ fields. [Learn More.](#)

*“We wanted to be able to take advantage of various trends including social media, big data and analytics, the Internet of Things, and certainly mobile technologies. And from that, comes the overarching question of how to deploy and create advantage from cloud capabilities.”*

#### Fareed Mohammed

Chief Architect, Dow Chemical Company

## Drive secure process and regulatory compliance.

Microsoft solutions can empower manufacturers to enhance document review and approval processes, meet regulatory requirements, and reduce violations of data governance and protection policies. Integrated with the familiar Office platform, Microsoft solutions for document management can be used to publish highly formatted and interactive reports that make data easily accessible to a large number of people, while maintaining high security for sensitive or private data.

## Reduce costs and enhance flexibility with the cloud.

Microsoft Azure provides an open and flexible cloud platform with virtually unlimited compute and storage scale that enables you to quickly build, deploy, and manage applications across a global network of Microsoft-managed data centers. Invest in a platform that can cost-effectively support long-term growth while enabling you to respond quickly to changes in the business and market with collaboration, productivity, and mobility solutions that span on-premises and cloud infrastructures.



*"It's not enough to know what's happening now in your business – you have to anticipate what will happen, then be prepared to capitalize on that insight."*

**Satya Nadella**  
CEO, Microsoft





# Transform your products and services

Manage a pipeline of ideas and align them with strategic priorities to bring new and innovative products and services to market rapidly and effectively, increasing competitiveness and customer value while generating new revenue streams.

In order to succeed in a competitive environment, manufacturing organizations must continually deliver new products, improve processes, and find new ways to deliver value to customers. Microsoft can help you foster a culture of innovation by making it easier for people to connect, share information, and work together across organizational and geographical boundaries.

Some of the benefits of using Microsoft technologies include:

## Engage in collaborative, social thinking to solve problems rapidly, identify high value ideas, and put them into action.

Microsoft provides solutions for every stage of the product development and launch process—from research and development to engineering, through manufacturing, and out to the consumer—to help manufacturers innovate and bring products to market faster.

## Create innovative products and services.

Manage a pipeline of ideas and align them with strategic priorities to bring new and innovative products and services to market quickly and effectively, increasing competitiveness and customer value. Rapidly model, cost, and release new products to production and procurement, facilitated by guided experiences and workspaces that address process, discrete, lean, and mixed-mode manufacturing and replenishment models.

## Enable deep insights to improve decision making.

With a balance of control and flexibility, Microsoft tools foster collaborative innovation by helping keep business leaders informed about project work, schedules, financial decisions, and the fast-paced changes that can occur during the innovation process.

**CHR HANSEN**

### Case Study: Chr. Hansen

Chr. Hansen, a leading developer of natural ingredients for several industries, wanted better access to data from multiple sources, including automated laboratory equipment, sensors, and databases. The company implemented a hybrid cloud solution based on Microsoft Azure HDInsight Service and can now collect and process data from 100 times more trials than before. By extending its infrastructure to the cloud, the company implemented an Apache Hadoop cluster and gained flexibility with minimal infrastructure investment. [Learn More.](#)

*“By taking advantage of HDInsight Service, we can easily collect and process data from 100 times more trials, and look at more detailed information as a result, including chemical composition, physical properties, and sensor data.”*

**Morten Meldgaard**

Project Director, Chr. Hansen



*“All companies everywhere are becoming data companies – from farming to finance, from New York to New Delhi – businesses are using data to connect everything from cars to cows.”*

**Satya Nadella**

CEO, Microsoft



### **Intelligent order fulfillment.**

With global visibility of inventory, manufacturing, and distribution, and a role-based workspace accessed anywhere, any time, on any device, your sales and service representatives can proactively explore production, storage/warehouse, and transportation remediation options for your customers.

### **Track and trace raw materials and products across the end-to-end supply chain.**

Use Internet of Things (IoT) and connected devices to monitor everything from inventory/storage locations to production and transport/distribution processes. Track back batch or serial numbers for quality issues, and register and monitor batch attributes, expiry, and shelf life dates.

### **Engage customers in new ways with innovative technologies.**

Change products or product positioning with more accurate analysis of customer behavior and intent. Develop new services models by taking advantage of connected product data. Provide superior connected experiences for the customer by utilizing connected consumer devices as a service deployment platform. Create differentiated products and services by capitalizing on customer usage and insights from connected devices.

### **Bring products to market quickly through shortened design cycles.**

Test a greater volume of ideas through less expensive iterations. Reduce product costs with better insights into performance.

## Why Microsoft

Microsoft has a track record of helping manufacturing organizations realize the business value of digital transformation. That's because Microsoft's holistic platform and advanced technologies, open and flexible approach, enterprise-grade solutions, and partner ecosystem build on your existing technology investments and deliver results quickly and cost-effectively. Working with Microsoft brings a distinct set of business advantages that no other provider offers:

**A trusted, flexible, and open cloud platform.** Today, the Microsoft cloud infrastructure supports over 1 billion customers in more than 140 countries. With this unique experience and scale, Microsoft cloud services can achieve higher levels of security, privacy and compliance than most customers can on their own. Microsoft Azure has received more compliance certifications than any other cloud provider today, including major global, national, regional and industry standards and regulations. Microsoft's extensive global datacenter footprint covers more regions than any other provider, to better meet data sovereignty requirements. Azure is the only platform that supports a fully hybrid architecture, giving you complete flexibility and control of data and applications delivered between public and private clouds. The Microsoft cloud works with any operating system, database, middleware, and application framework, enabling you to use the tools and platforms of your choice.

**Comprehensive, enterprise-ready solutions.** Microsoft solutions span the full spectrum of business needs from data access, high performance computing, advanced analytics, visualization and business process automation. Windows 10 offers unprecedented universal application capability across devices, including innovative devices like Surface, Surface Hub and HoloLens. Individual and enterprise productivity is increased by ensuring that the right information is provided to the right people at the right time for actionable insights and decisions. This is accomplished through a holistic suite of collaboration, knowledge management, work process, mobility, business insights, and advanced analytics capabilities.

**Advanced technologies designed for ease of use.** By building technologies such as Power BI, Cortana Analytics, and Azure IoT Suite for users with wide-ranging skills, Microsoft helps enterprises apply advanced technologies to business challenges once deemed too costly or complex to solve. For example, Microsoft's Industrial IoT capabilities enable organizations to ingest data from any source, in any format; apply machine learning models and data visualization; and integrate those results into collaboration and work process solutions. This drives informed actions, as individuals take advantage of tailored, actionable insights to make better business decisions and deliver better business outcomes.

**Largest ecosystem of industry-leading partners.** Microsoft has a broad ecosystem of prominent systems integrators and independent software vendors. This ecosystem leverages existing technology investments and offers the flexibility to select the best solutions for each business. Our partners design and deploy innovative, industry-focused solutions built on a Microsoft foundation, so you get best-in-class technology coupled with deep industry expertise.

No other technology provider offers a comparable end-to-end portfolio as well as an open and flexible approach. Together, it's this unique perspective that helps Microsoft drive digital transformation across all aspects of an organization and change the way it engages with customers, optimizes operations, empowers employees, and transforms products and services.

# Call to Action

Get started today. Work with Microsoft to extend and develop solutions that will transform your business today. Use our knowledge and expertise in a business outcome workshop, deeper solution session, private preview, or customer focus group—or develop a proof of concept or pilot to drive the right implementations and solutions for your business.

For more information on business solutions and case studies, please visit the [Process Manufacturing & Resources Solutions webpage](#).



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<sup>1</sup> US Bureau of Labor Statistics, 2012

<sup>2</sup> Internal Microsoft messaging