



Empowering the Oil & Gas and Mining Industry

How digital transformation
creates new opportunities

Introduction

While oil, gas and mining companies rank among the largest and most influential organizations in the world, they also face monumental challenges that threaten their stability. At the same time, innovations in digital technologies offer powerful tools to that can revolutionize how the oil, gas and mining industry operates. It is imperative that forward-thinking industry players explore the transformative opportunities presented to them by today's technology advances.

In this whitepaper we will highlight overall business trends and how the industry is facing enormous pressures and challenges that are driving technological revolution and the need for transformative solutions. Then we will showcase several examples of how Microsoft's technology is enabling the oil, gas and mining industry to become thriving digital businesses that sustainably provide energy, metals, minerals and raw materials that fuel economic prosperity.

A rapidly changing landscape

Cost overruns, delays, and fluctuations in oil prices have plagued the major global oil producers, resulting in losses of over \$67B in 2015¹. Prices have dropped and become volatile, so addressing costs and delays is now at the forefront of every producer's mind.

Although oil prices will rise again, no one knows when and to what value. Excessive spending habits during production booms have come to an abrupt end. In response to the changing industry landscape, oil, gas and mining companies need to adopt a new operational paradigm – lean and highly efficient production lifecycles.



"In the 1980s and 1990s, we were very close to the projects and controlled costs and execution. In the 2000s, when we became rich, we became less cost-efficient."

Claudio Descalzi

CEO of Italy's ENI,

One of the oil industry's major producers.



Industry Challenges

Pricing volatility and competitive pressure – The industry delivers completely fungible commodity products where the market, prices and even profitability are at the mercy of complex geopolitical forces. Companies are looking to technological advancement to accelerate innovation and increase operational efficiencies to maximize margins and drive competitive advantage.

Limited resources – Cost consolidation demands are resulting in strategies spanning from significant headcount reductions to reduced spending on goods and services. More focus is being placed on leveraging technology to create a lean production environment, capable of rapid scalability when demand and prices return to cyclical highs.

Increased focus on sustainability – Climate change is accelerating social pressure, with governments and investors demanding optimized carbon footprints and new sources of renewable energy. Social responsibility, safety, sustainable energy and environmental impact are increasingly important in the public's eye, and therefore high on CEOs' agendas.

Security – The distributed and hazardous nature of industry facilities and systems creates unique vulnerabilities, making them targets for cyber and terrorist attacks. Technological advances in big data analytics, video surveillance and cloud computing are driving innovative security measures and better peace of mind.

Aging assets – With steady resource demand, while prices remaining relatively low, operators continue to utilize older assets in an effort to cut costs and maximize efficiency. This may increase risk of malfunction or accident, which could have significant adverse consequences for all. Investment in advanced data analytics and the Internet of Things (IoT) not only drive greater equipment uptime, lower costs, and optimize efficiency but increase safety and monitoring capabilities.

The promise of digital transformation

Large segments of the oil, gas and mining industry invested in digital operational technologies (SCADA, HMI, MES) in the 1970s, 1980s and 1990s. As a result, there is a tremendous volume of historical data, as well as millions of sensors in operation today, often isolated in disparate systems and/or not being stored due to volume and velocity constraints. Recently, the VP of Analysis and Business Improvement for one of the largest global mining companies, stated they had 6M sensors but were using less than 1% of the data². This is a lost opportunity, where significant operational improvements and efficiencies can be realized if companies could harness this data as actionable insight.

Today, the industry is undergoing another transformation. Companies investing in new technologies are realizing returns in the form of greater equipment uptime and remote monitoring, as well as more efficient and accurate exploration operations. According to IDC, IT spend in oil and gas will increase to \$45.3B in 2016, growing rapidly to \$51.3B by 2019. IT spend in the mining industry will grow to \$7.5B in 2016 and reach \$7.9B by 2019³. Oil, gas and mining firms that capitalize on the potential of technologies such as the Internet of Things (IoT), big data and cloud computing to transform their operations will be well-positioned to address resource challenges, and competitive at and environmental pressures moving forward.

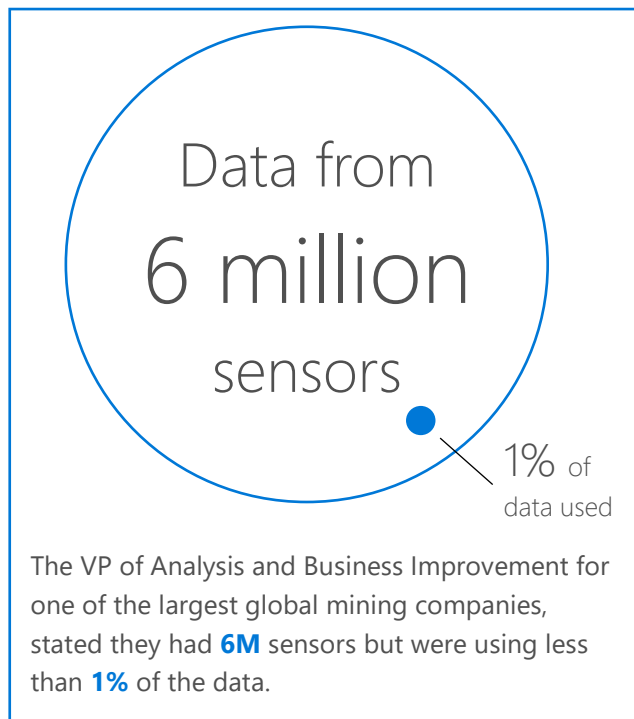
Within organizations that focus on innovation, these technology investments are not simply incremental upgrades –they're investments in digital transformation. Digital transformation requires that you rethink how

"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

your business operates and how it generates value. The new thinking often 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.

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 optimize your operations, to change the products and services you offer and to expand into new business models.

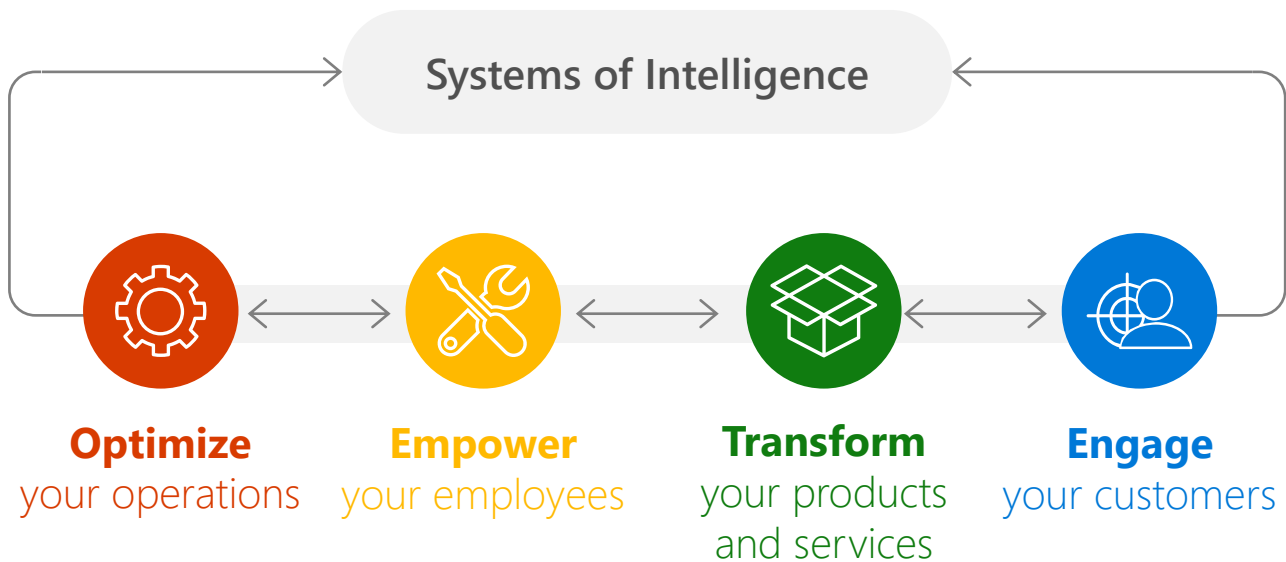


Capitalize on digital transformation opportunities with Microsoft

To cope with growing pressures, oil, gas and mining companies are investing in advanced technology that helps them optimize operations, reduce expenditures and support sustainability measures. According to IDC, 50% of oil and gas companies will utilize advanced analytics in 2016. Additionally, 65% of top manufacturers will enable better decisions through investments in operational intelligence, and 69% of mining companies globally are looking at remote operation and monitoring centers. By 2017, 25% of all mining companies will utilize predictive analytics⁴.

Microsoft's strategy to build products and services based on a mobile-first, cloud-first approach, provides customers a flexible platform of integrated products and services, alongside a comprehensive partner ecosystem that can lead companies through a journey of digital transformation to create innovative products and services, execute with excellence, and improve customer engagement. As one of only a handful of firms with hyper-scale cloud infrastructure, Microsoft is in a unique position to help customers leverage digital transformation and invest in technologies that will create more operational efficiencies and better engagements with customers, suppliers, and partners in order to transform their business and capture opportunities in the near term. For example, innovative industry solutions and techniques like 4D seismic analysis require scalable modern technology, such as advanced analytics, Internet of Things (IoT) capabilities and high-performance computing.

Microsoft's vision for your industry is to enable oil, gas and mining companies to become thriving digital businesses which sustainably provide energy, metals, minerals and raw materials that fuel economic prosperity. To accomplish this goal, the following examples demonstrate how you can take advantage of technology advances to optimize your operations, empower your employees, transform your products and services, and engage your 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 a complex business where people, facilities, and processes must interact flawlessly every day. Microsoft provides a platform and tools to enable manufacturing organizations to collect data from a wealth of internal and external sources, and contextualize, analyze, and visualize it, as well as collaborate efficiently for optimal and actionable insight.

Data-Driven Operations & Supply Chain Optimization

Foster a culture of excellence and drive efficiency, safety, and corporate responsibility. Microsoft solutions enable a truly data-driven approach to operational excellence by collecting, storing, and analyzing huge volumes of operational data in real time and using it to drive positive outcomes and behaviors. Gain a deeper level of understanding of your global operations across the field, the plant, and the supply chain.

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), maintenance, repair, and operations (MRO).

Rockwell Automation

Case Study: Rockwell Automation

Like other major companies worldwide, Rockwell Automation needs better, faster, and cheaper ways to manage and analyze ever-larger amounts of data. It has taken major steps forward in meeting that need with a comprehensive data approach based on Microsoft Azure technologies. The company's data strategy is paying off with solutions that come to market faster, cost less to build and maintain, and enable the company to build its business and to serve its customers in entirely new ways. [Learn more.](#)

"We plan to deploy Microsoft Azure technologies across all of our monitoring applications, because they enable us to orchestrate data more effectively in increasingly complex environments."

Doug Weber

Business Manager, Remote Application Monitoring, Rockwell Automation

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.

Drive secure process and regulatory compliance.

Microsoft solutions 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, flexible cloud platform with virtually unlimited compute and storage, enabling 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 private and public 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





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.

Optimized Oilfield and Mining Operations

Optimize production, maintain safety, and maximize the petroleum recovery of reserves by delivering tactical, operational, and strategic insights to everyone in the organization based on their job role and decision making processes. Microsoft's Connected Operations solutions for oil, gas and mining create a more intelligent organization by using data streamed from connected sensors and devices, as well as other relevant data sources, analyzing them with machine learning for predictive and actionable analytics to help optimize production, improve maintenance, and drive higher profitability.

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.



Case Study: Fortescue Metals Group

In 2003, Fortescue Metals Group was formed in Perth, Australia, and has established itself as one of the world's largest iron ore producers. Faced with issues from its on-premises messaging server environment—which was not built to handle the company's accelerated growth—the IT staff decided to move from Microsoft Exchange Server 2007 to Microsoft Office 365, which includes Microsoft Exchange Online, Microsoft Lync Online, and Microsoft SharePoint Online [Learn More](#).

"With Office 365, we have enabled our existing IT staff to step out of their traditional IT silos and provide more strategic services to the business."

Vito Forte

Chief Information Officer,
Fortescue Metals Group

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 can ensure collaboration can occur securely according to the needs and of the organization, its partners, and its customers.



"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





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.

Elastic Storage for Advanced Analytics & Business Simulation

Provide a flexible, performant, and scalable storage and processing platform for large volume, complex structured data such as seismic data and digital imaging. Capabilities include PByte-scale storage and indexing; applications to process, visualize, and interpret geological or geographical data; as well as providing innovative capabilities such as continuous reservoir modelling, in the case of oil and gas.

Some of the benefits of using Microsoft technologies include:

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.



"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



Case Study: CGG

Needing to be more productive while reducing costs at the same time, CGG, a leader in geoscience, selected Microsoft Azure as its new platform in order to lower cost and more flexible data storage and management services. The new platform offers significant benefits including reliable security, faster response and greater flexibility in order to adapt to the industry's volatile business cycles. [Learn more.](#)

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.



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.

Social Listening and Customer/Product Analytics

Engage internal teams, partners, suppliers, and customers in collaborative social thinking to rapidly solve problems and identify high value ideas. Social innovation solutions from Microsoft provide enterprise tools to help you foster a culture of innovation by making it easy to connect and share information across organizational and geographical boundaries

Fuel Retail Mobile Commerce and Modern POS

Grow revenue and maximize profitability while capturing new customers and increasing wallet share of existing customers. Microsoft solutions for retail fuel, mobile commerce, and modern point of sales are designed to help increase customer satisfaction and loyalty by providing superior customer experiences at the pump and the convenience store. Targeted customer analytics, marketing, and promotions provide additional consumer incentive to increase purchase of convenience store goods.

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.



Case Study: Calfrac Well Services

Calfrac Well Services is an oilfield services company based in Calgary, Alberta with operations spanning North America, Russia and Latin America. Founded in 1999, it's one of North America's most experienced, trusted, and successful pressure pumping companies. It chose Microsoft Dynamics CRM Online as the platform to streamline the documentation and management of customer contacts as well as to improve tracking of the sales pipeline. [Learn More.](#)

"We used to go into what we called our 'war room' with a calculator to fight over crews and equipment. Soon we'll be able to use touch screen technology and our new platform to make decisions about allocating resources in a much more informed and sophisticated way."

Chad Leier

Vice President of Sales and Operations, Calfrac

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.

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.

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 to measure digital asset management effectiveness, brand affinity and satisfaction, and engage directly with customers based on their interest or concerns.



"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



Case Study: Kwik Chek

Kwik Check is a Texas-based convenience store chain taking advantage of the Internet of Things to create a new connected and personalized experience for its customers that can redefine the convenience industry. By increasing convenience with personalized digital offers, cutting time at the fuel pump by up to 40%, and improving safety with cashless payment, Kwik Chek has heightened customer engagement and loyalty, resulting in exceptional business value. [Learn More.](#)

"Today, as an industry average, approximately 70 percent of our fuel customers never come inside the store. These offers are bringing more of them in, resulting in increased in-store sales from formerly fuel-only customers. It's a big advantage for customers, too, who save money on things they're likely to buy anyway."

Kevin Smartt
CEO, Kwik Chek

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. Azure has received more compliance certifications than any other cloud provider, 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 optimizes operations, empowers employees, transforms products and services, and engages with customers.

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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¹ CNN, April 2016

² Microsoft Internal Customer Research

³ IDC, April 2016

⁴ IDC, April 2016