EMPOWERING PROCESS MANUFACTURING

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Microsoft

Achieving enterprise excellence across the value chain with digital innovation

DIGITAL TRANSFORMATION

"Every business will become a software business, build applications, use advanced analytics and provide SaaS services."

- Satya Nadella

- Engage your customers
- Empower your employees
- Optimize your operations
- Transform your products

95% Top 100 enterprise software companies will integrate cognitive technology into their products by 2020

Deloitte, 2016

55% Average gross margin among organizations with leading data and analytics capabilities

Keystone Strategy, 2016

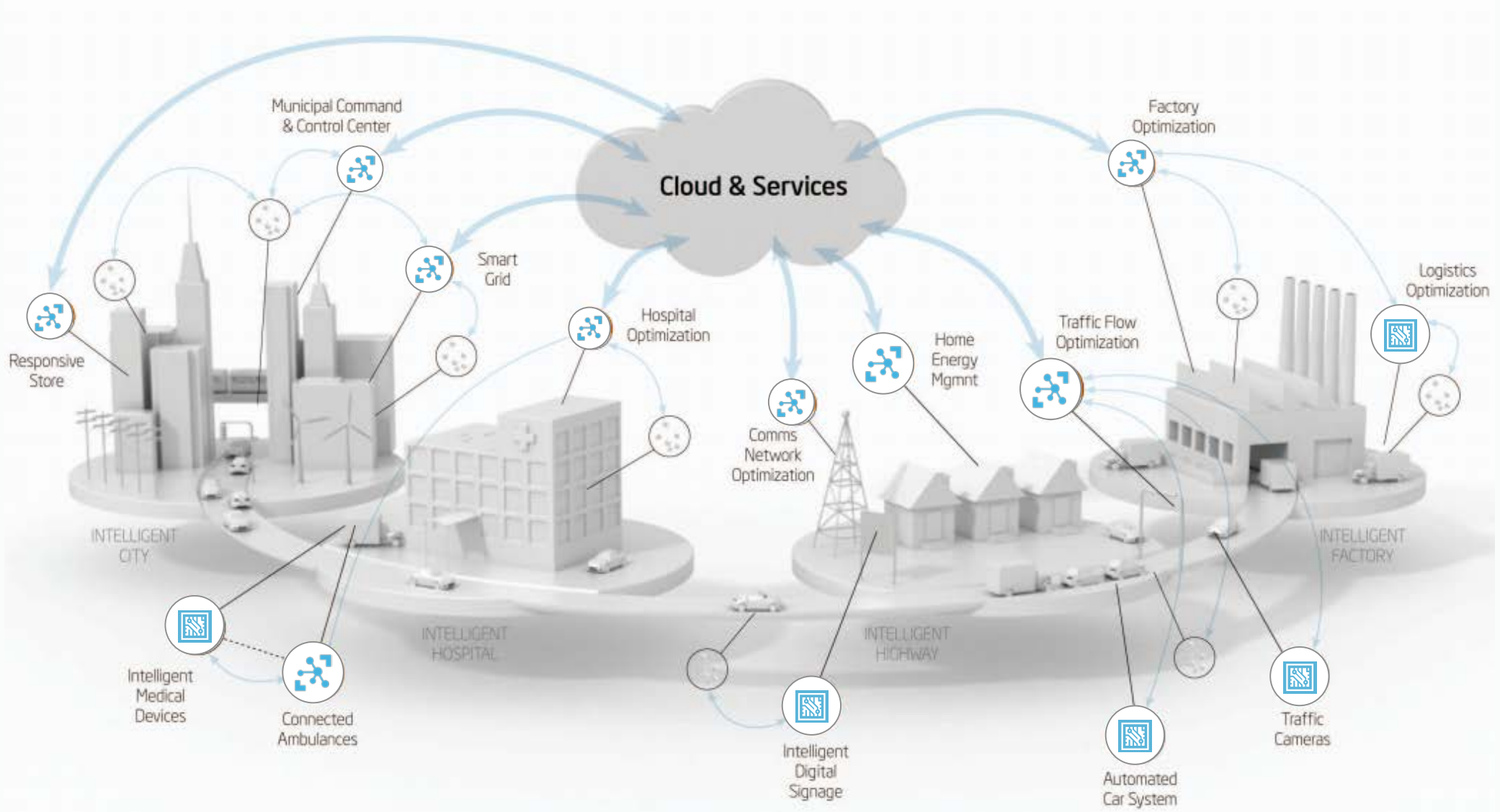
80% Margin driven by apps, analytics, and services in 2020

McKinsey & Company

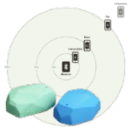
$100M Average increase in operating income among the most digitally transformed enterprises

Keystone Strategy, 2016

IOT & INTELLIGENT INFRASTRUCTURE

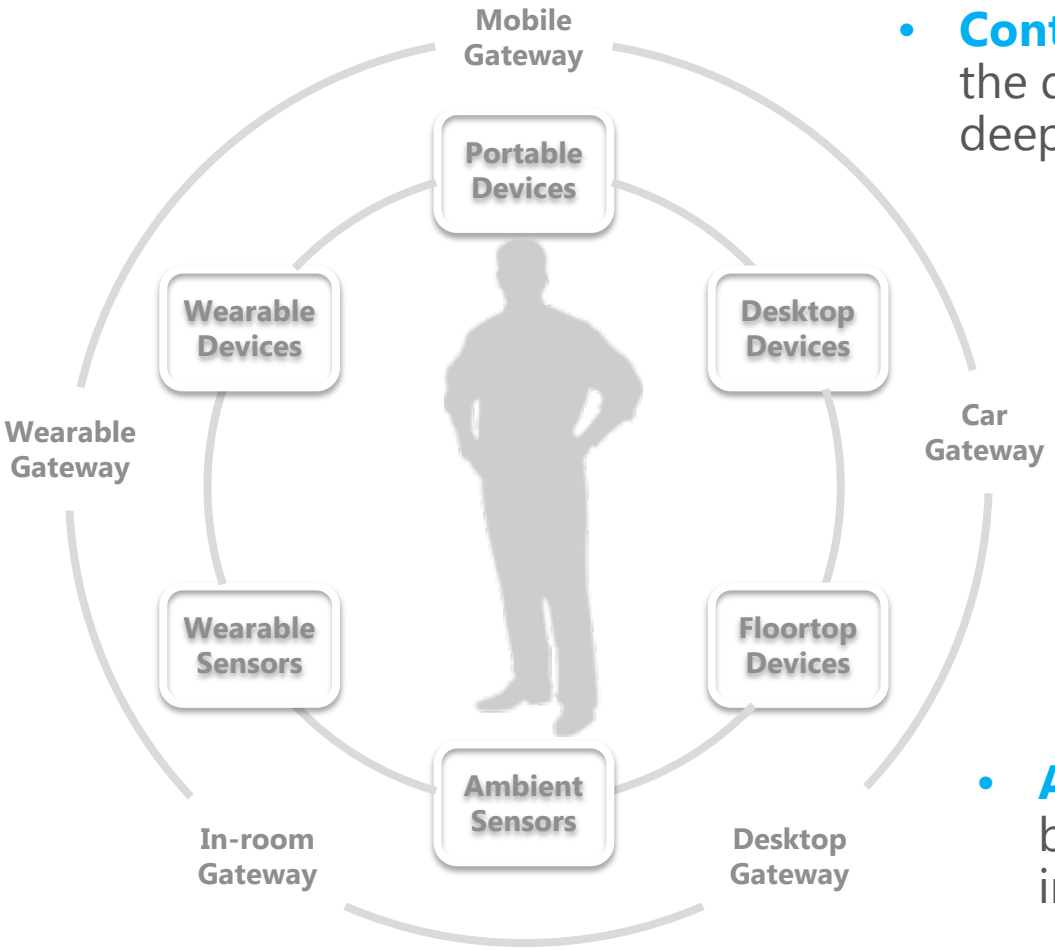


IOT & HUMAN DESIRES

Omniscience: the desire to know (and control) it all	 Nest	 Jawbone UP3	 Notion	 Smart Appliances	 CubeSensors	 Home Automation	 Edyn	 Vessyl	 TellSpec
Telepathy: the desire for human connection	 Live!y	 Sense	 Little Riot	 ActvContent	 Goodnight Lamp	 NexBand	 The Touch	 Evermind	 Ritmo
Safekeeping: to protect and be protected	 iSmartAlarm	 Mimo	 Tagg	 Tile	 Lockitron	 PlantLink	 SkyLock	 Ring	 Nest Smoke Detector
Immortality: to be healthy and vital	 Omron Blood Pressure Monitor	 FitBit	 Babolat	 Kolibree	 Hello Sense	 Darma	 Sprite	 Lifescan Blood Glucose Monitors	 Vital GlowCaps
Teleportation: to move effortlessly	 Estimote Beacons	 Whill	 Automatic	 Copenhagen Wheel	Lechal haptic navigation	IsoWalk	Helios	FutureShape	Nixie
Expression: to create, make and play	Narrative	Kapture	Kurv	LittleBits	Neo smartpen	Soundbrenner	Gameband	Adidas	Codie

‘THINGS’ - THE DIGITAL SHADOW OF A PERSON

The most interesting aspect of the Internet of things is the world of humans that use it.



- **Context** - Each “thing” or connected device is part of the digital shadow of a person, essential to enable deeply contextualized services.
  - **Knowledge & Insight** - From the data streams that implement the “digital shadow”, we can use **predictive analytics** to **understand people’s needs and behaviors** better than ever before.
  - **Understanding Intent** - Every new dimension of data increases predictive power, enabling an **agent** or **chat bot** to contextually answer the question: **“What does the human want?”**
- **Assistance & Task Completion** - This informs business operations and services as much as it informs an individual’s engagement and behavior.

IOT … A KEY PARADIGM SHIFT

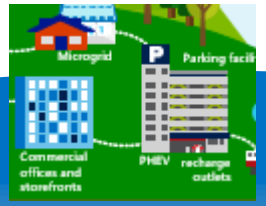
	COMPUTING ERA	Mainframe	PC	Smartphone	Things
DISRUTPION VECTORS	Form Factor	 Room	 Desk	 Pocket	 Everywhere
	Compute Paradigm	Local	Client-Server	Mobile First-Cloud First	Cognitive Computing
	Connectivity	-	IP	Wireless/Cellular	Internet of Things
	UI Breakthroughs	Mechanic (punch card > tape > disk)	Haptic (keyboard & mouse)	Touch (swipe & gestures)	Natural Language (conversation as a platform)
	Design & UX	I/O & Data Processing (CLI)	WYSIWYG (skeuomorphism)	Simplicity & Design (flat design)	Ambient Intelligence (More Personal Computing)
	Killer App	Raw Data Processing	Productivity (Microsoft Office)	Social Networking (Facebook)	Artificial Intelligence (Agents & Bots)
	Business Model	"Real Estate" / Leasing	OS/SW Licensing HW Sales	Advertisement (SW) HW Sales	3rd level monetization, freemium, many
	Sales/Distribution	Direct Sales	OEM/Retail/Direct	App Store (SW) Retail (HW) - BYOD	'You name it' … as a Service

IoT is already delivering tangible results

Energy Continuum

Managing for Efficiency and Excellence at Home and Work

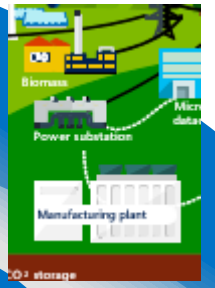
Smart Grid



Smart Buildings

Industrial Services

Connected Operations



Smart Factories

Capabilities for Management Excellence

Energy

Maintenance

Quality

Performance

Challenges for digital transformation

Cost of Change

- Capital intensive facilities operate 24/7
- Cyclical market conditions increase challenges to make large investments in change

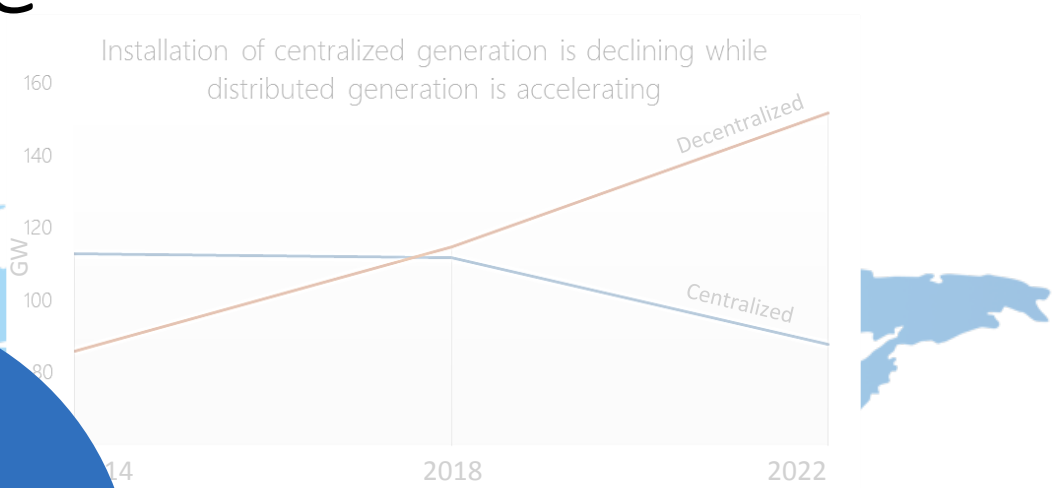
Regulation and Compliance

- New technologies must be proven to meet regulatory compliance across industries and geographies

Organizational Inertia

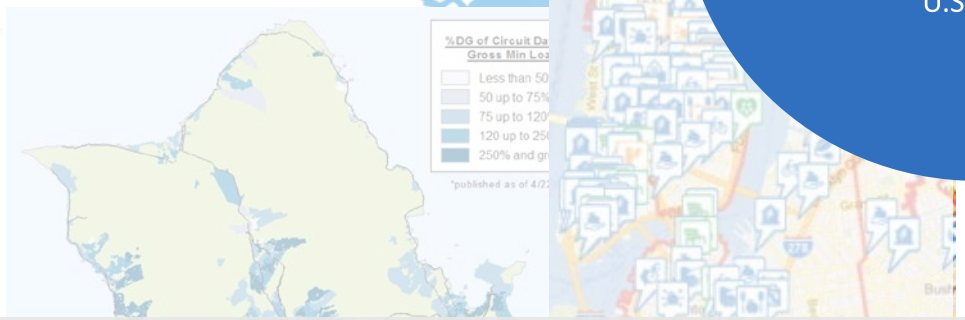
- After years of success, organizations are structurally resistant to disruptive change

Microsoft Energy Perspective



$16T

Projected global spend on electricity infrastructure through 2035- $2T in the U.S (IEA)



What does this mean for Microsoft, our partners, and our customers?

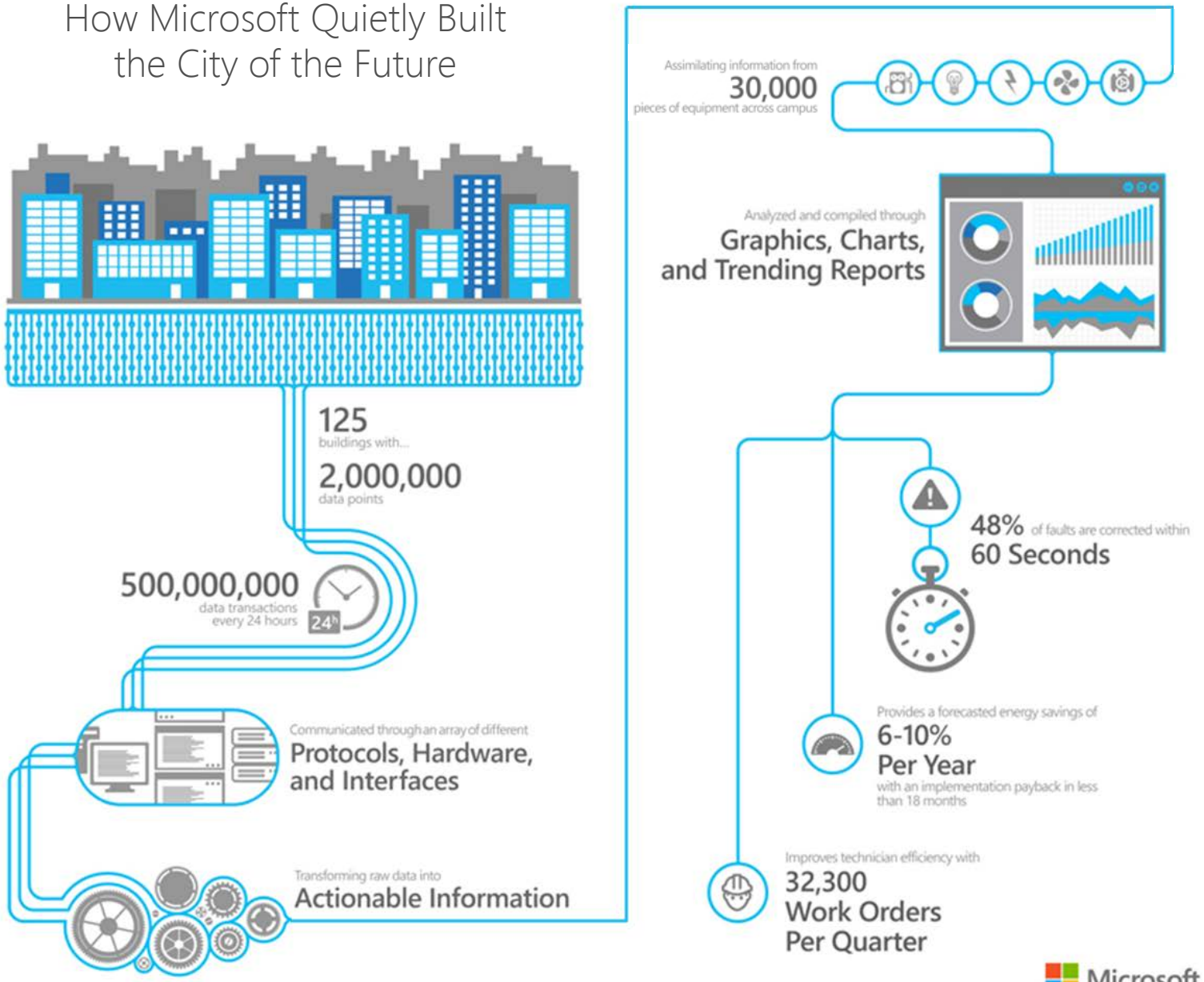
- New business models will emerge where *cloud-based analytics and intelligence unlocks value from grid connected devices*. In some cases, software will lower the tremendous need for big hardware investment ($16T) to modernize our grid infrastructure.
- *Massive amounts of data will result* from distributed energy resources and connected devices, requiring analysis and insights.
- Microsoft's intelligent cloud solutions can power solutions that manage the grid and distributed resources in new ways.

88 ACRES

ENERGY SMART BUILDINGS

https://www.microsoft.com/en-us/stories/88acres/

How Microsoft Quietly Built the City of the Future



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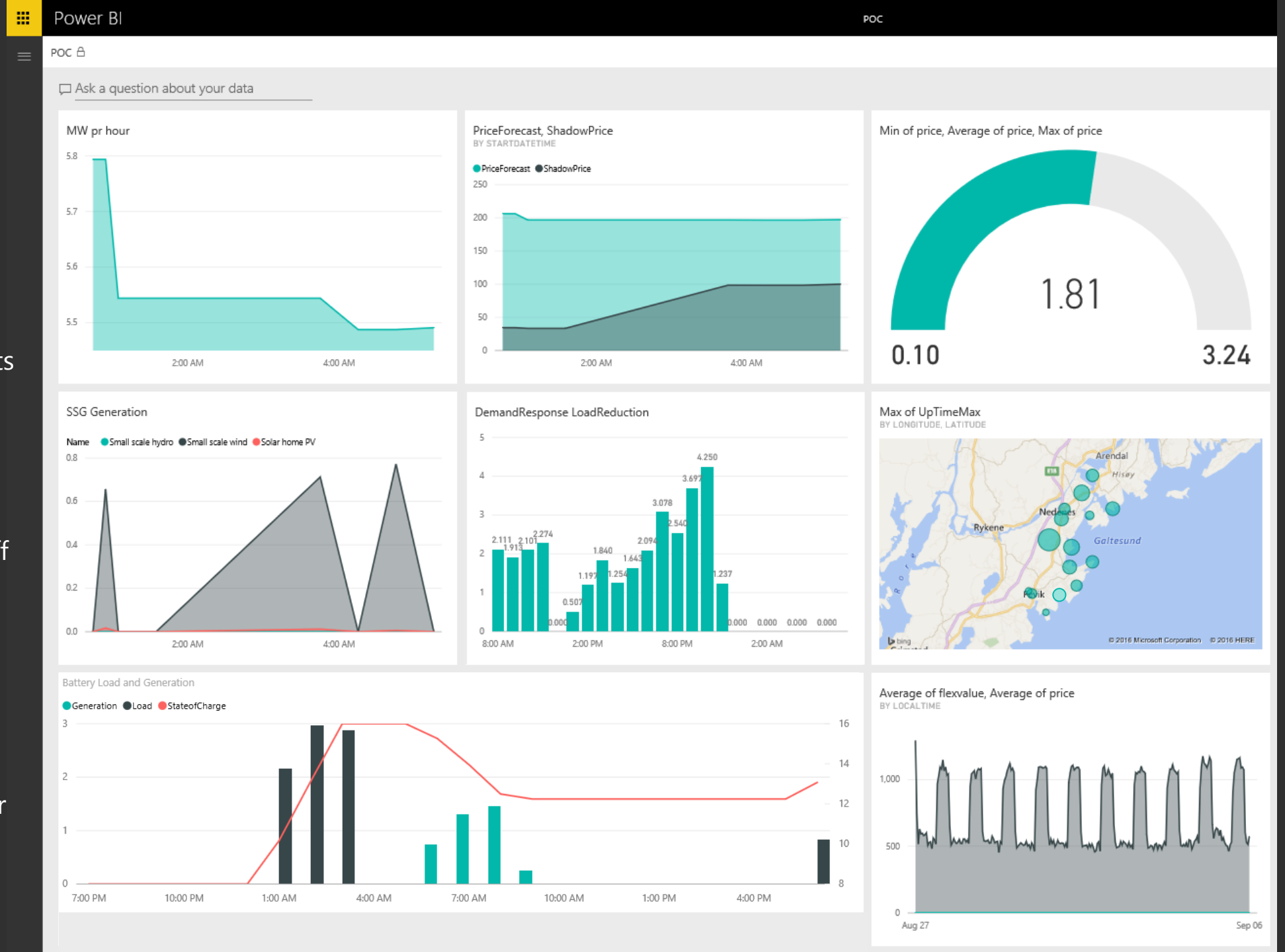
Agder Energi

Key Functionality

- ✓ Model a set of DER devices and grid constraints to demonstrate cost- and reliability-based optimization respecting feasibility & price constraints
- ✓ Forecast demand on substation, DR availability, battery availability/SOC, solar, wind and small hydro production
- ✓ Provide grid operations staff with hourly schedule for optimal DER dispatch
- ✓ Multi-period timeframes with cross-temporal optimization
- ✓ Effectuate dispatch automatically
- ✓ Generate a shadow price for local flexibility based on device bids



Supporting Agder Energi's Digital Transformation

Agder foresees that energy will be transformed by IoT

- Industry being transformed by changing technology, regulatory pressures, business models
- Smart customer devices will be integrated over time into energy IoT grid
- Huge operational challenge & business model opportunity

Customer Problem & Use Case

- Primary problem: Strain on the grid due to growing load which overloads substation and requires maintenance, expensive capital expenditures
- Solution: Use a network of local DERs to supply energy or reduce demand to meet overall demand forecast within tolerable operational bounds
- Additional use cases: Renewable energy balancing, microgrid balancing on campuses, improved energy trading

Agder Energi Project

- Goal: Defer substation capital investment valued at NOK 30-50M per substation
- Scalability: Many substations on Agder grid. EUR 17B investment in Norwegian grid infrastructure required
- Strategy: Cloud software rather than grid hardware
- Tactic: Software controls activation of distributed resources owned by customers
- How: Optimize demand and supply forecasts to dispatch supply and reduce demand
- Progress: POC Completed and customer "very very satisfied"

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Empowerment through systems of intelligence

ENGAGE YOUR CUSTOMERS

by transforming marketing, sales, and customer service

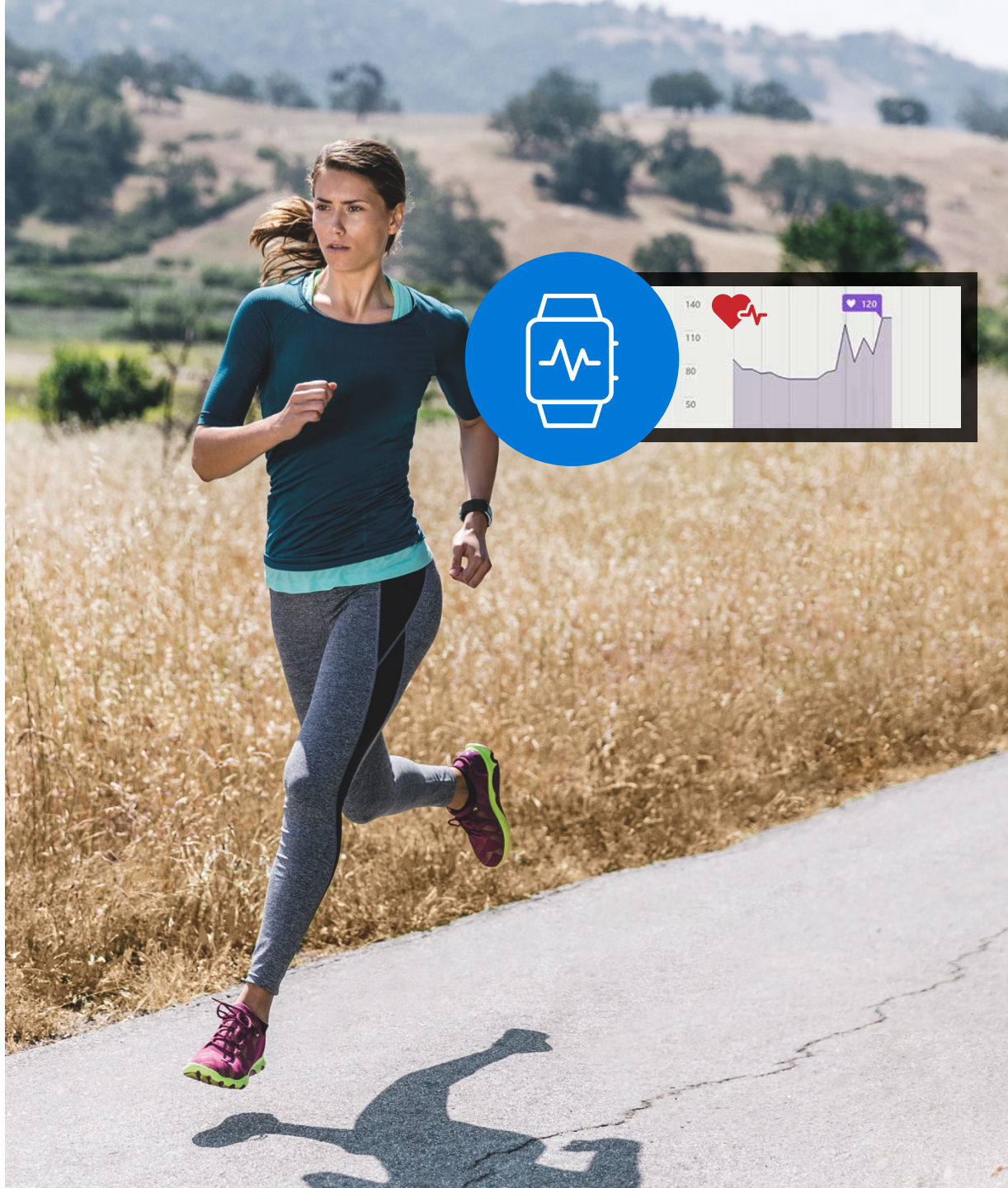
CONNECT
through a multichannel strategy and new digital experiences

GAIN
greater visibility and insight into customer patterns/preferences

IMPROVE
customer-centric productivity across the enterprise

REACT
faster to equipment downtime and supply chain disruption

ALIGN
value-added products and services to customer preferences



Engage your customers

Assess the progression of a disease

Microsoft and **Novartis** are using Kinect, machine learning and data analytics to help ensure that MS patients are evaluated consistently through the passage of their disease

Streamline management of customer contacts and improve tracking of the sales pipeline.

CalFrac uses Dynamics CRM online to improve contact management, capture and share customer insights, and capture and manage jobs scheduled for the field.

Learn how RWE Effizienz developed solutions to help customers

RWE Effizienz developed RWE SmartHome to help customers save energy by automatically managing heating and electrical appliances. RWE SmartHome made it to market with a high level of quality.

EMPOWER YOUR EMPLOYEES

while maintaining security and regulatory compliance

GAIN
insight into all levels of production and sales

DEPLOY
flexible, scalable sales and service platforms

SIMPLIFY
internal tasks such as routing schedules and territory management

PROVIDE
tools that are intuitive to use and familiar

ENABLE
sales teams with comprehensive lead management

SHARE
information across geographic and organizational boundaries

Empower your employees

Build a collaborative ecosystem of teams and partners

Moderna Therapeutics create documents on laptops tablets and smartphones, and share them online inside the company and with trusted academic and business partners using SharePoint online and Azure Active Directory to enable Multifactor Authentication

Retain knowledge from employees leaving the workforce

As employees at Kennametal leave the workforce, they record knowledge and experience in Skype and store it in a dedicated video channel for each function.

Enable group collaboration in highly regulated industries

GE deploys Office 365 in a hybrid model, enabling multi-user editing of documents in real time, and integrating with other critical business tools that reside on premises and in the public cloud.

OPTIMIZE YOUR OPERATIONS

and increase your agility and operating margins

IMPROVE
business decisions with better, faster insights

INCREASE
transparency and operational efficiency

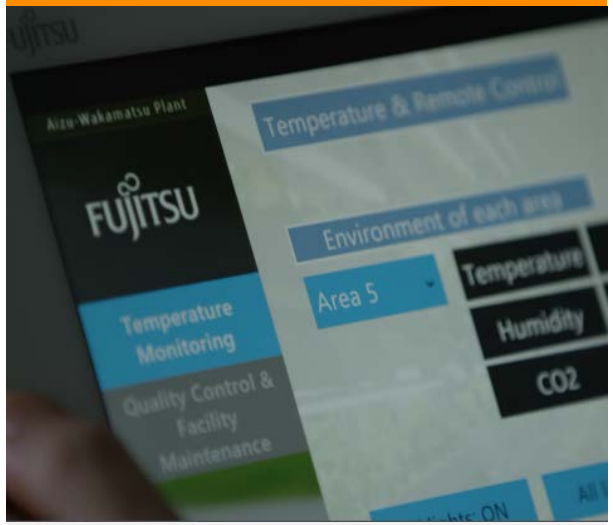
REDUCE
disruptions and increase equipment utilization

DRIVE
secure processes and regulatory compliance

ENHANCE
productivity with intuitive and familiar tools

Optimize your operations

Create the intelligent factory with the internet of things and people



Fujitsu is using the cloud, advanced analytics, and natural user interfaces for its Eco-Management Dashboard to manage quality, efficiency, performance, & energy costs.

Discover how eSmart is making cloud

Discover how eSmart is making cloud technologies the brain of the modern smart grid

Enable broader, faster big data business solutions

Rockwell Automation is using HDInsight, Azure Data Factory, Azure SQL and Power BI to store and analyze more data than ever before. Rockwell estimate that the data insights gained will lead to savings of as much as 90% in reduced maintenance and support.

TRANSFORM YOUR PRODUCTS

by managing a pipeline of ideas and aligning them with strategic priorities

IDENTIFY
high value ideas and put them into action

IMPROVE
decision making with deep insights

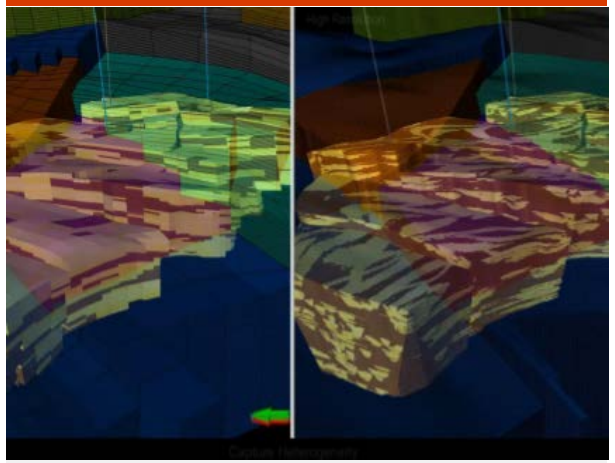
ACCELERATE
time to market

DRIVE
secure process and regulatory compliance

REDUCE
costs with virtual, collaborative teams

Transform your products and services

Perform advanced analytics on seismic surveys and digital imaging



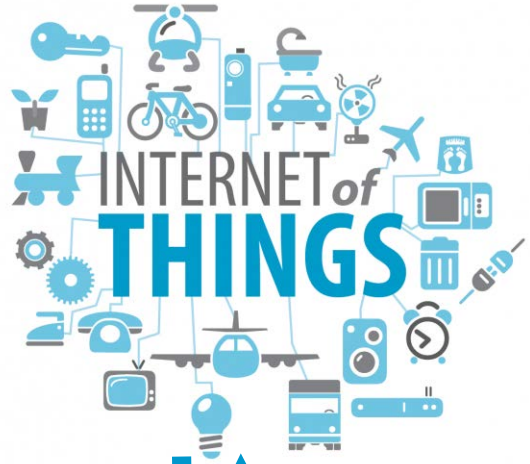
Schlumberger is using cloud-based high performance computing to process, visualize and interpret data from activities such as continuous reservoir modelling and simulation. Using Azure allows Schlumberger to derive unique insights and out-innovate the competition, while saving 40-60% on storage costs.

Real-time access to create specialized agriculture products

Dow needed real-time access to create specialized agriculture products that maximize crop yields in local conditions
Dow Streamlining access to apps and data through the cloud to have specialized apps and data from anywhere—even farmers' fields

IOT - FUSING PHYSICAL AND DIGITAL

PHYSICAL WORLD



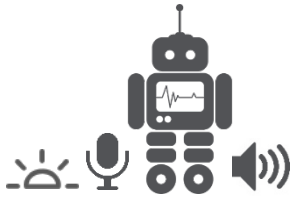
Data

Control

Wearable Devices & Environmental Sensors

Workforce

Ambient Bot & Agent Things



FLOWS

ENTERPRISE KNOWLEDGE

Intent, Context

Assistance, Task completion

High scale, richer, more innovative business results

DIGITAL WORLD

Measure

Insight, optimization

Quantified Enterprise

Measure

Insight, optimization

Quantified Self

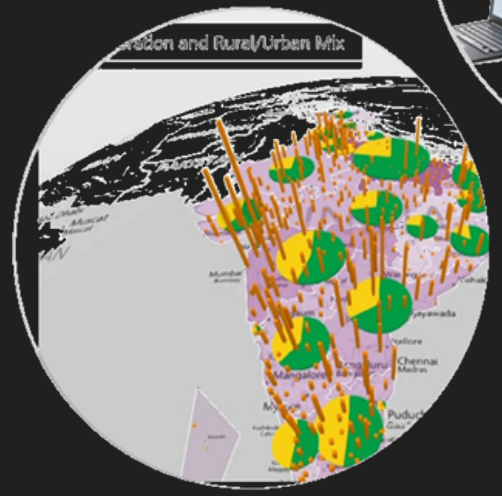
Cognitive Services

Bot Framework

Cortana

Power and utilities embrace a new digital age

Systems Of Intelligence Can Bring It All Together for Higher Personal & Enterprise Productivity



BI

"By 2017, most business users and analysts in organizations will have access to self-service tools to prepare data for analysis."
- Gartner, 2015

PRODUCTIVITY

"By 2017, 45% of utilities' new investment in analytics will be used in operations and maintenance of plant and network infrastructure.
-IDC, 2014

IOT

"Manufacturing, utilities and transportation will be the top 3 verticals using IoT in 2015 – they will have 736 million connected things in use."
- Gartner, 2014

INTELLIGENT CLOUD

"By 2018, cloud services will make up half of the IT portfolio for over 60% of utilities as these companies seek to reduce costs.."
- IDC, 2014

MOBILITY

"Capitalizing on the consumer mobility wave, in 2015, of the top 3 priority actions, 60% of utilities will focus on transitioning enterprise mobility to the next generation."
- IDC, 2014


Microsoft