

PHARMAprocess

High performance. Delivered.

Manufacturing in Pharma Industry
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Traditional pharma is changing

BECOMING A DIGITAL COMPANY IS A STRATEGIC LEVER TO OVERCOME CHALLENGES

Industry Challenges & Strategic Levers

INDUSTRY CHALLENGES



Market Changes due to an aging world population and emerging markets gaining more market share



New Economic Reality due to the patent cliff and outcome-based reimbursements



Product Changes due to scientific breakthroughs and the rise of generics and personalized medicine



Consumer Empowerment in the healthcare industry, due to digitally native customers and consumerization of healthcare



Business Model Disruptions due to the convergence of industries and an increased focus on the patient



STRATEGIC LEVERS

Participate in market growth

Invest in inorganic growth

Achieve operational excellence



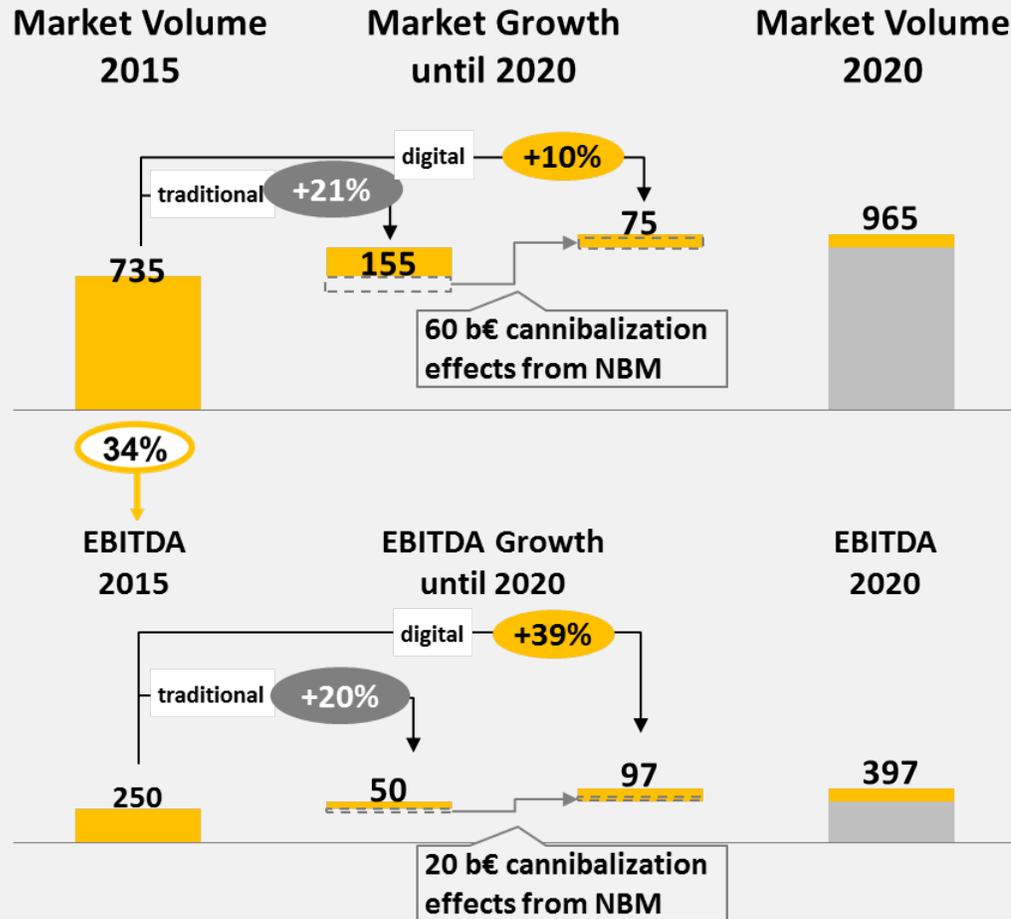
Become digital

Pharma Industry

The impact of Digital on the Pharmaceutical industry

AND ITS EBITDA GROWTH UNTIL 2020 IS EXPECTED TO BE MASSIVE

Pharmaceutical Industry 2015-2020 in b€



NOTES:

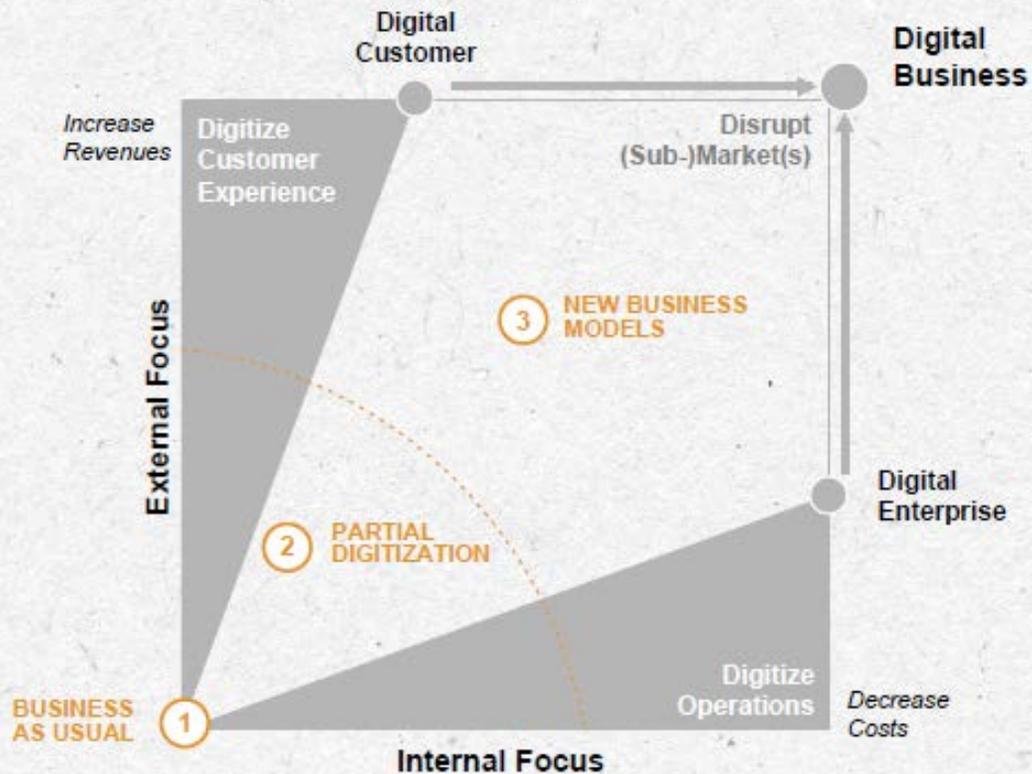
- ▶ Global Pharma market volume 2015 of 735 b€ with an EBITDA margin of 34% (250 b€)
- ▶ 21% (155 b€) traditional (non) digital market growth and 20% (50 b€) EBITDA growth until 2020
- ▶ 10% digital market growth from New (Digital) Business Models until 2020; there of 8%-points (60 b€) cannibalization from current business
- ▶ 39% (97 b€) digital EBITDA growth as a combination of:
 - Partial Digitization of current business models (within value chain and support functions) yields 68b€, and...
 - New Digital Business Models yield 29 b€; thereof 20 b€ EBITDA from cannibalization of current business

NOTE: CONTAINS ONLY RX PHARMACEUTICALS, EXCLUDES OTC AND GENERICS ; NBM – NEW BUSINESS MODEL(S)
 SOURCE: ACCENTURE STRATEGY; EVALUATEPHARMA

Pharma should consider three strategic options

THAT UNLOCK VALUE BY APPLYING DIGITAL TECHNOLOGIES

Digital Strategy Framework



STRATEGIC OPTIONS

Business as Usual: Manage the risks for existing business model(s) through digital activities of competitors

Partial Digitization: Realization of EBITDA opportunities through digitization of existing value chain

New Business Models: Realization of EBITDA opportunities through development of new revenue streams enabled by a new value chain

VALUE AREAS

Digital Consumer: Apply digital technology to address customers in a more sophisticated way

Digital Enterprise: Apply digital technology to the existing value chain (e.g. R&D) as well as support functions (e.g. HR) to decrease costs

Digital Business: Digitize your current business model or develop new business models generating profits based on digital technology

SOURCE: ACCENTURE

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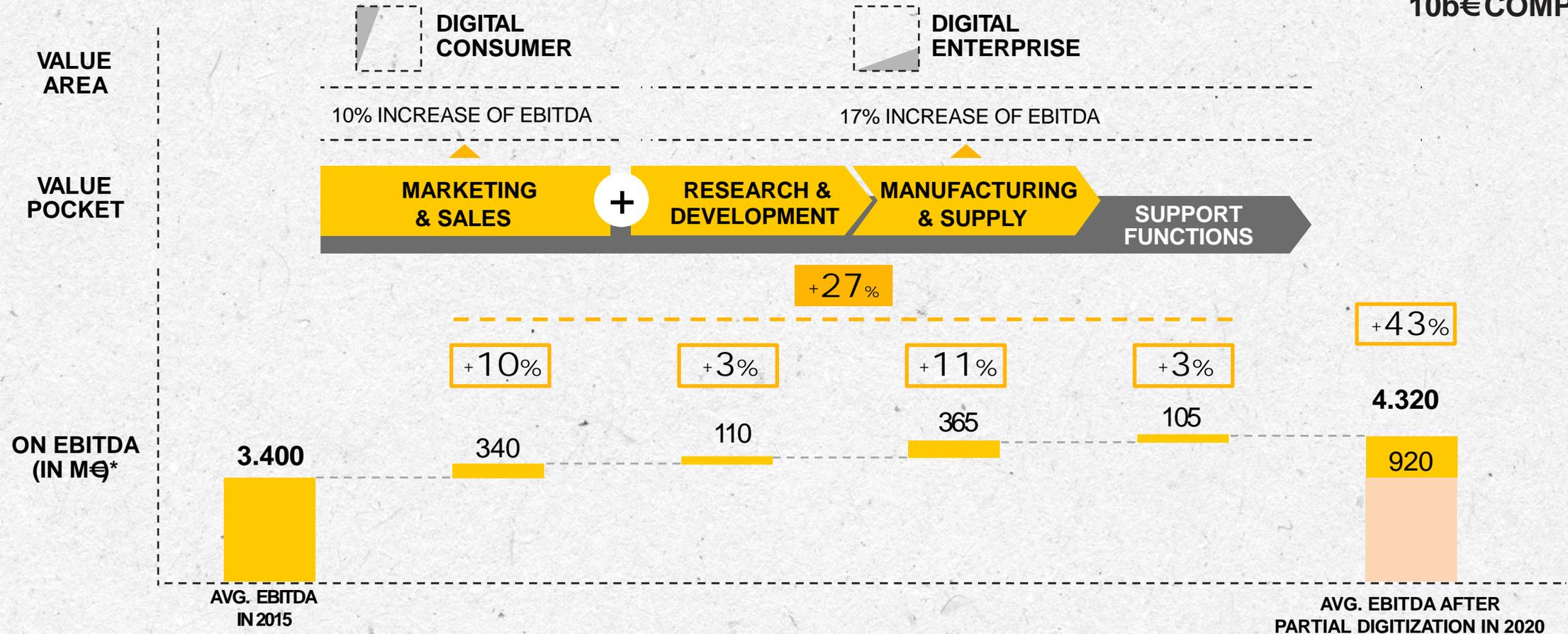
Pharma can grow their EBITDA by more than 27%

(+920 M€) THROUGH PARTIAL DIGITIZATION



Partial Digitization Strategy – EBITDA Potentials per Value Pocket

10b€ COMPANY



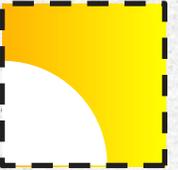
NOTE: INVESTMENTS IN DIGITIZATION NOT YET INCLUDED
SOURCE: ACCENTURE STRATEGY

LEGEND: XX% EBITDA MARGIN

• EXPENSES/REVENUE IN PHARMA: R&D (20%), MARKETING & SALES (20%), MANUFACTURE & SUPPLY (20%) AND SUPPORT FUNCTIONS (6%)
• MARGIN: 34%

Emerging New Business Models

WILL BE ESTABLISHED BY DIFFERENT EXISTING AND NEW COMPETITORS



New Business Model Strategy – Business Model Examples

	NEW BUSINESS MODEL	DESCRIPTION	EXPECTED PLAYERS
Traditional Business	 Personalized Health Care	Drugs and medical treatments tailored to the individual needs of a patient	<ul style="list-style-type: none"> • Pharmaceuticals • Healthcare Equipment • Healthcare Professionals • Insurance Companies
	 Predictive Health Care	Sensor-based early warnings send to doctor or end customer via wearables or mobile devices to take action to prevent getting sick(er)	<ul style="list-style-type: none"> • Google / Apple • Software Companies • Insurance Companies • Pharmaceuticals
Convergent Business	 Forever Young	Diets, supplements, hormone treatments, anti-aging drugs, genetic modifications, cryonics, cloning and body part replacements	<ul style="list-style-type: none"> • Pharmaceuticals & Healthcare Equipment • Healthcare Professionals • Consumer Goods • Insurance
	 Live Healthy	Continuous end customer education on how to stay fit and healthy – right food, right exercises, less stress, etc. – via wearables or other devices	<ul style="list-style-type: none"> • Google / Apple • Retailers • Consumer Goods • Pharmaceuticals
Enabling Business	 Innovation Services	Insights and experience in R&D/innovation provided to other industries as well as within the industry to non-competitors	<ul style="list-style-type: none"> • Pharmaceuticals • Chemical Companies • Other Industries with Strong R&D-Capabilities
	 Data Commercialization	Collected data on e.g. patient clusters or doctors sold to interested players like Insurance companies	<ul style="list-style-type: none"> • Google / Apple / Facebook / SAP • Pharmaceuticals • Healthcare Equipment

SOURCE: ACCENTURE STRATEGY

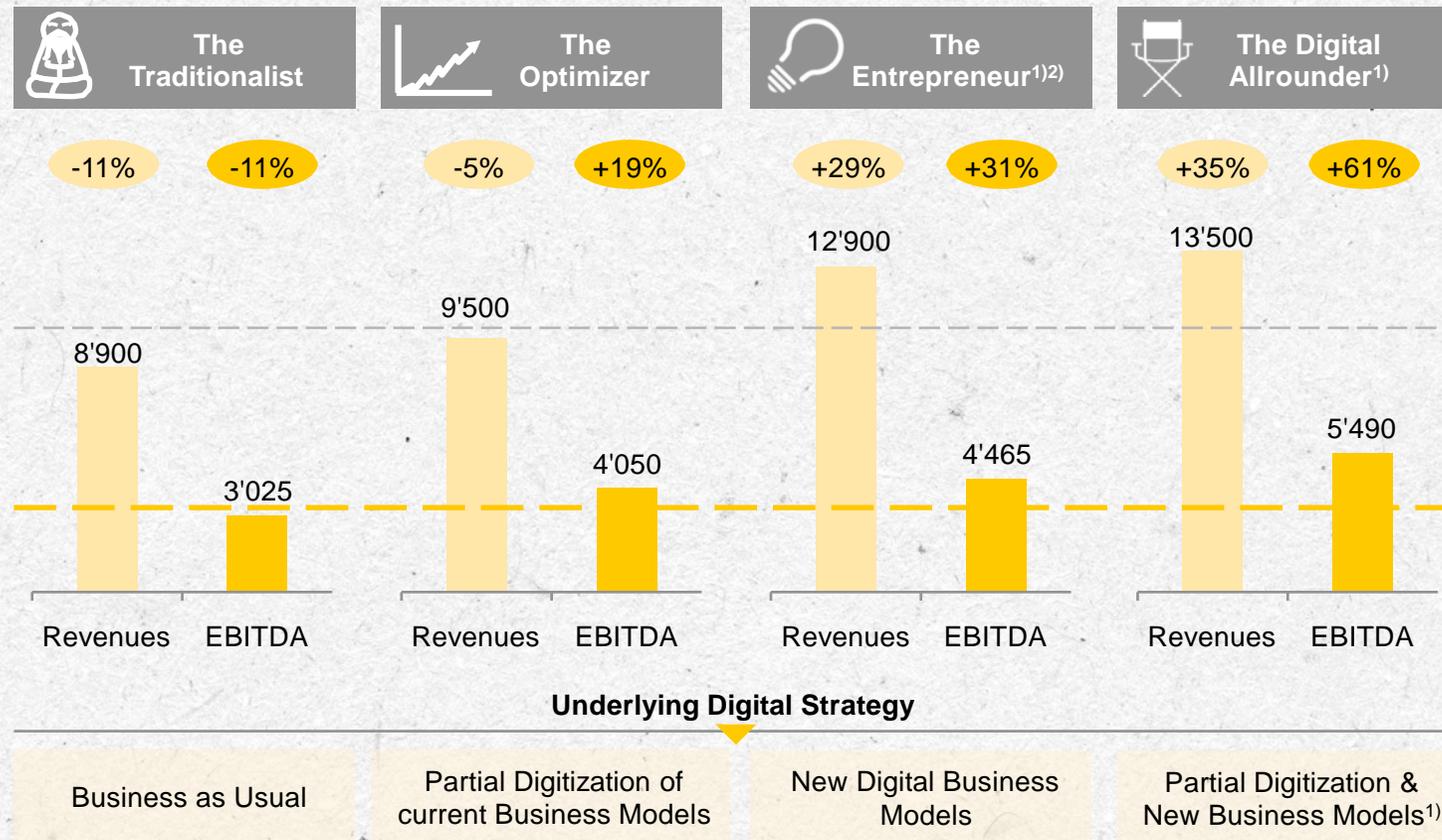
Digital Strategy will have a big impact

ON FUTURE PERFORMANCE



Digital Outlook – Digital Strategy Outcomes in 2020 in m€

10b€ COMPANY

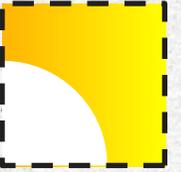


1) THE 4'000 M€ IN ADDITIONAL REVENUES AND 1'440 M€ OF ADDITIONAL EBITDA THAT NEW BUSINESS MODELS (NBM) CAN UNLOCK DO NOT SCALE WITH REGARDS TO THE SIZE OF THE COMPANY.
 2) NBM EBITDA WILL ONLY BE REAPED BY EARLY INNOVATORS AND GROW EXPONENTIALLY.

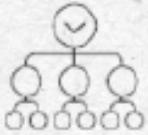
NOTE: INVESTMENTS IN DIGITIZATION ARE NOT YET INCLUDED. OVERVIEW EXCLUDES TRADITIONAL NON-DIGITAL RELATED MARKET GROWTH OF UP TO 21%.
 SOURCE: ACCENTURE STRATEGY

Positioning to win in the outcomes

THE TIME TO START IS NOW

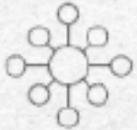


Key consideration to drive digital success



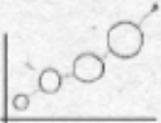
PROVIDE CLEAR GUIDANCE FROM THE TOP

Digital is here to stay. It needs the same top management attention as any other strategic initiative. Every executive needs to make digital a priority and act as an obstacle solver.



ADDRESS THE MARKET AS A WHOLE

Seek to create value for the entire health ecosystem – from prevention and care in core markets, to offerings for others.



LOOK FOR MARKET GROWTH

If you target the right markets, profitability will be your reward. But think disruptively. Make a completely new attempt to drive success, even if you don't yet have the performance metrics to prove its worth.



LEARN, SHARE AND PARTNER TO CREATE NEW BUSINESS OPPORTUNITIES

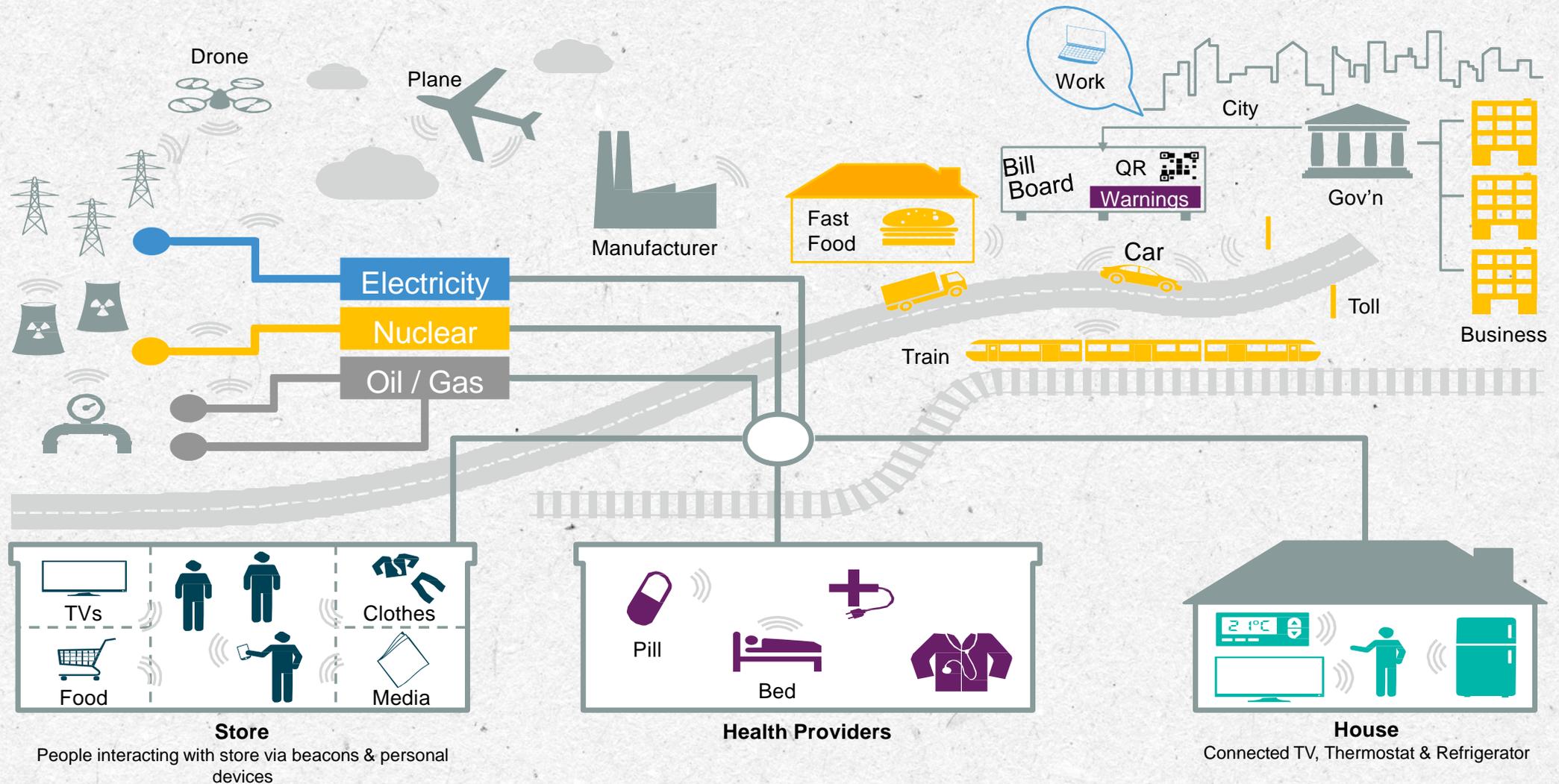
With the right partner you will develop a wider value orientation. Identify partners outside of your core business and look for synergies or industry convergence.



FOSTER A DIGITAL CULTURE AND MIND-SET AND BUILD REQUIRED SKILLS

Sales experience, not digital experience, currently sets the agenda for most pharmaceutical players. That needs to change. So find ways of making life sciences attractive to talent with proven digital skills.

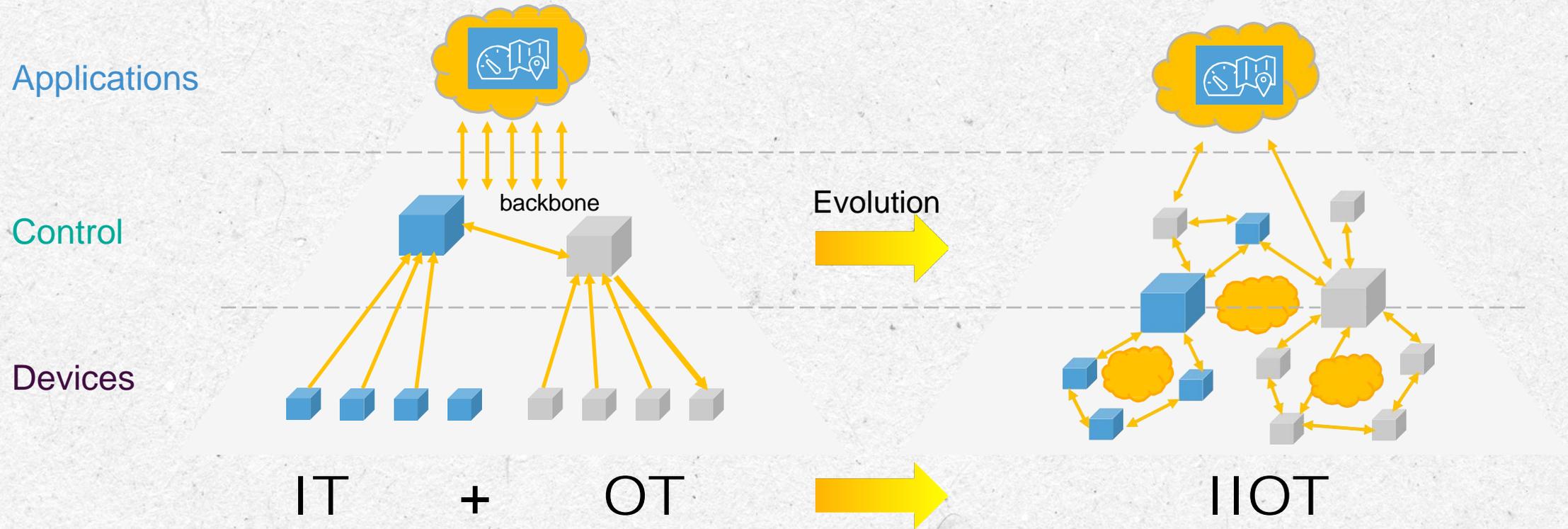
Everyday physical objects are becoming uniquely identifiable AND EMBEDDED WITH THE ABILITY TO CONNECT TO OTHER DEVICES OR NETWORKS



IIoT bridges the divide between IT and OT assets

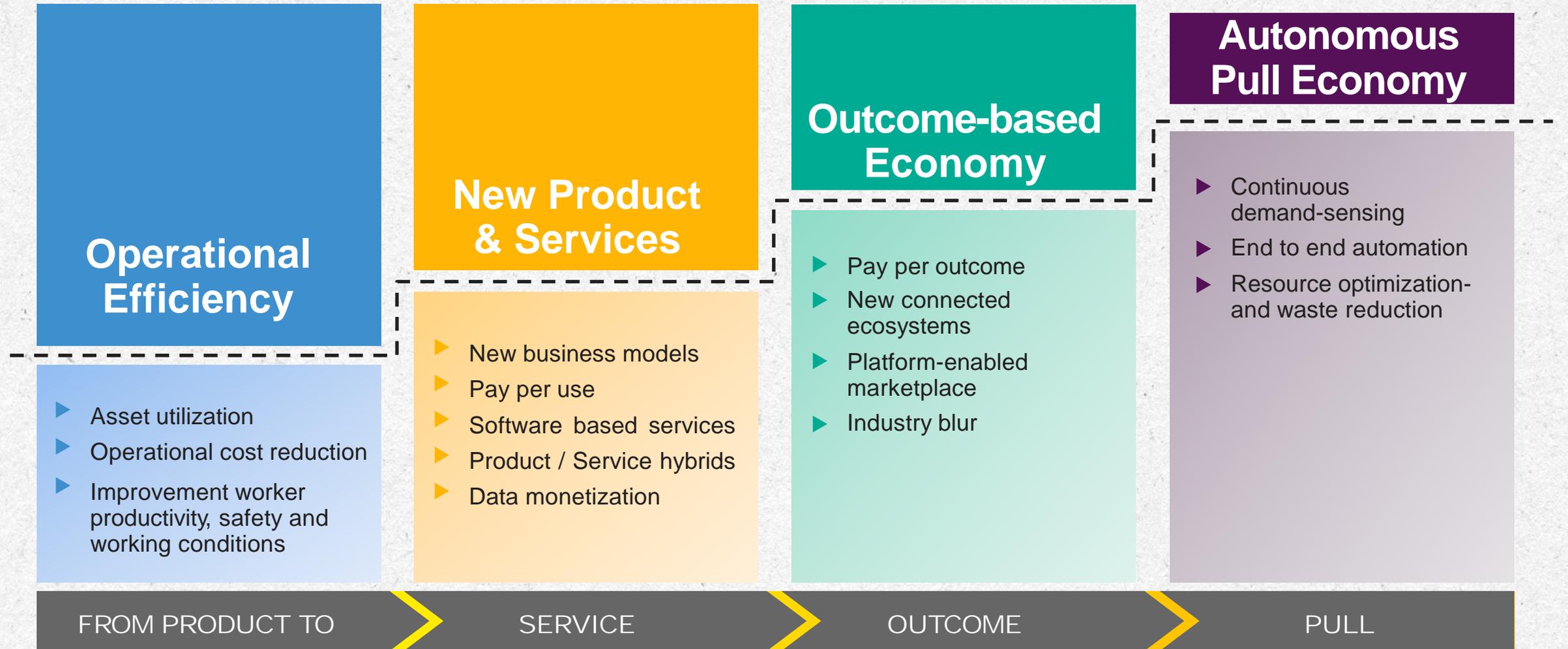
**TRADITIONAL, CENTRALIZED
CONTROL APPLICATIONS**

**“INTERNET OF THINGS”
MODEL**

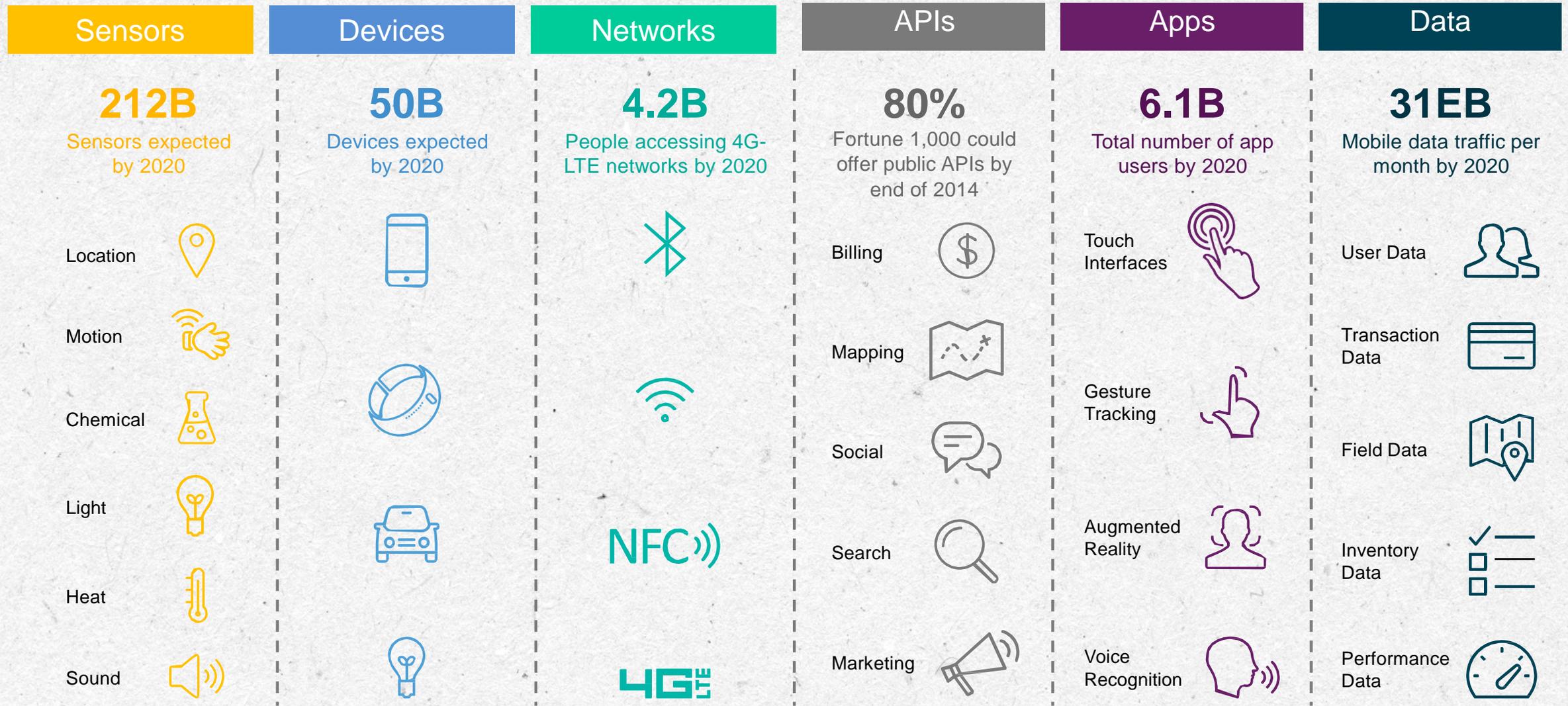


IoT adds incremental value in the near term

AND IS TRANSFORMATIVE OVER THE LONG-TERM



IoT is a complex ecosystem



IoT in Smart Production

1

A MORE PRODUCTIVE AND SAFE WORKFORCE

Accenture Life Safety Solution – is a wireless-enabled multi-gas detection system that helps protect workers in potentially hazardous environments.

Making physical objects talk is fundamental. Economical, energy-efficient communication is needed for sensor-type data

Machines augmenting humans

Wearable technology will enable a Smart Field Worker, GPS navigation is an early example.

Tracking and tracing resources

Camera on headset
GPS/RTLS receiver
Voice headset on helmet
Personal gas-monitor
Touchpad LifeMonitor
Belt Battery-pack
Utility Belt:

- Temperature
- Vibration
- RHD
- Camera

Adaptive and Collaborative Robots

Robots like Rethink Robotics Sawyer are becoming helpful co-workers that are adaptable allowing them to perform just-in-time tasks

Workforce & Schedule Optimization

Preliminary pilots in the utilities industry suggest that plant workers can gain 1.5 hours/day in work time using mobility-enabled, electronic work packages, boosting productivity by up to 25 percent.

Dynamic human/robot scheduling and task management

What does Enterprise Resources Planning look like when robots are part of the workforce?

Autonomous operations

At this mining company operators sit in a remote command center and work side-by-side with data analysts and engineers to orchestrate the actions of huge drills and excavators.

2

HIGHER PERFORMING EQUIPMENT AND PLANTS

Instrumentation and condition-based monitoring

Quickly pull data from devices

Break/Fix

Predictive maintenance of assets reduces costs up to 30% and eliminates breakdowns up to 70%.
What's the Value Opportunity?

Analyze and predict

In a matter of seconds, data visualization technology at this water utility can detect the indications of a leak across a vast and complex network of assets.

Machine-driven optimization

80% to 90% of companies see big data analytics as a top priority.

Business process change management

Innovations like high velocity operations help synchronize manufacturing networks, offering real-time visibility and control over the business processes performed by plants and suppliers.

Dynamic re-planning of equipment and plant operations to optimize production capacity

New types of edge computing solutions are needed to reschedule operations on the fly, adjusting to equipment failures, scheduling problems, constraints on operations, and human errors.

3

3 OPTIMIZED AND DYNAMIC PROCESSES

Remote monitoring

Remote Operating Center in action: Monitoring of 7 mines and 2 port operations from one central location.

Manufacturing Execution Systems

Engineering to Digital Plant Transformation is a closed feedback loop between Engineering and manufacturing that accelerates the ramp up of production and change management with consistent data

Continuous quality assurance

Real time intelligence from manufacturing data – camera's, sensors, automation systems- support application such as visual inspections, traceability and OEE reports.

Industrial Security

Raising confidence in IIoT will be achieved through: Greater OT+IT threat visibility and distributed security controls designed from connected operations.

Materials and Inventory Optimization

Advanced planning and scheduling of material supply to production plants; intelligent warehouse management systems and ultra-postponement techniques.

Prescriptive production optimization

Generic Models based on statistics or Neuronal Networks, i.e. GE Smart Signal.

How do you retrofit and proect decades-old equipment that's now connected?

BY 2030 THE INDUSTRIAL INTERNET OF THINGS COULD BE WORTH (US DOLLARS)

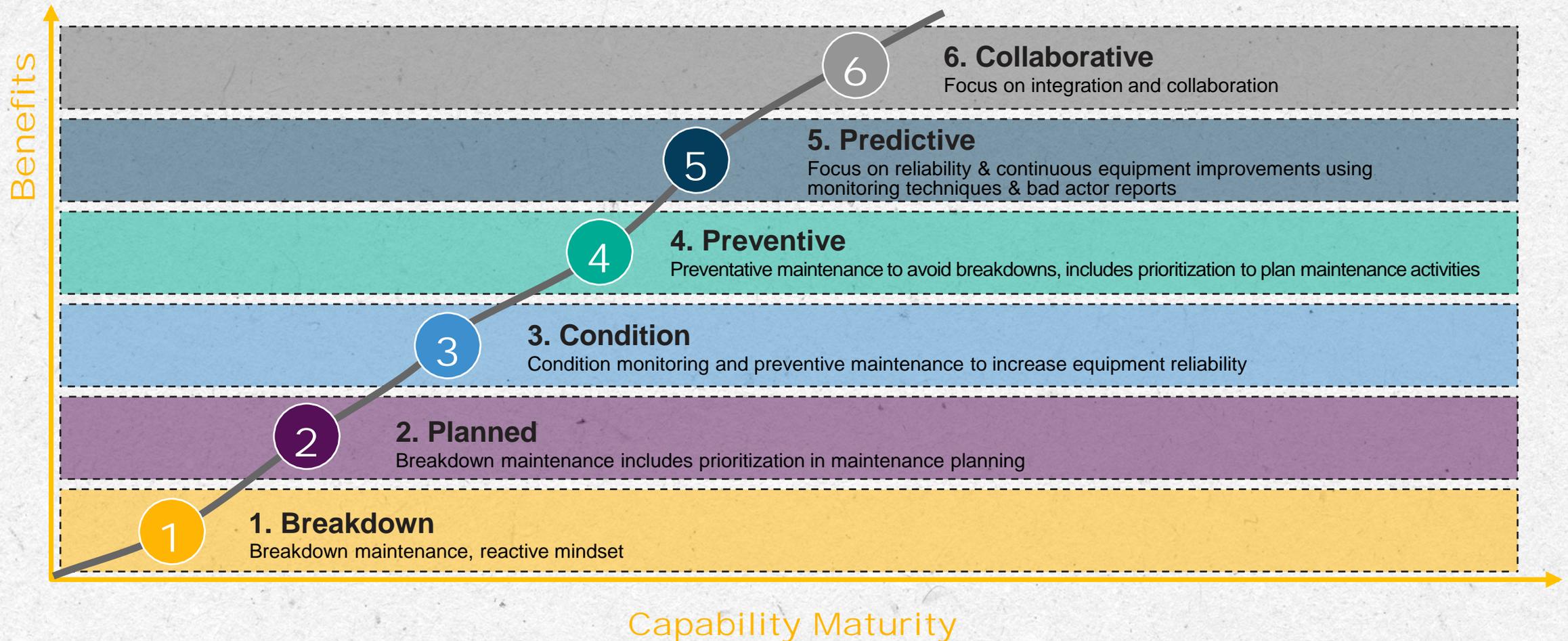
\$ 7.1	\$ 1.8	\$ 700	\$ 531
TRILLION TO THE UNITED STATE	TRILLION TO CHINA	BILLION TO GERMANY	BILLION TO THE UNITED KINGDOM

Demand-driven production

SELF ORGANIZING, DYNAMIC, DEMAND-DRIVEN

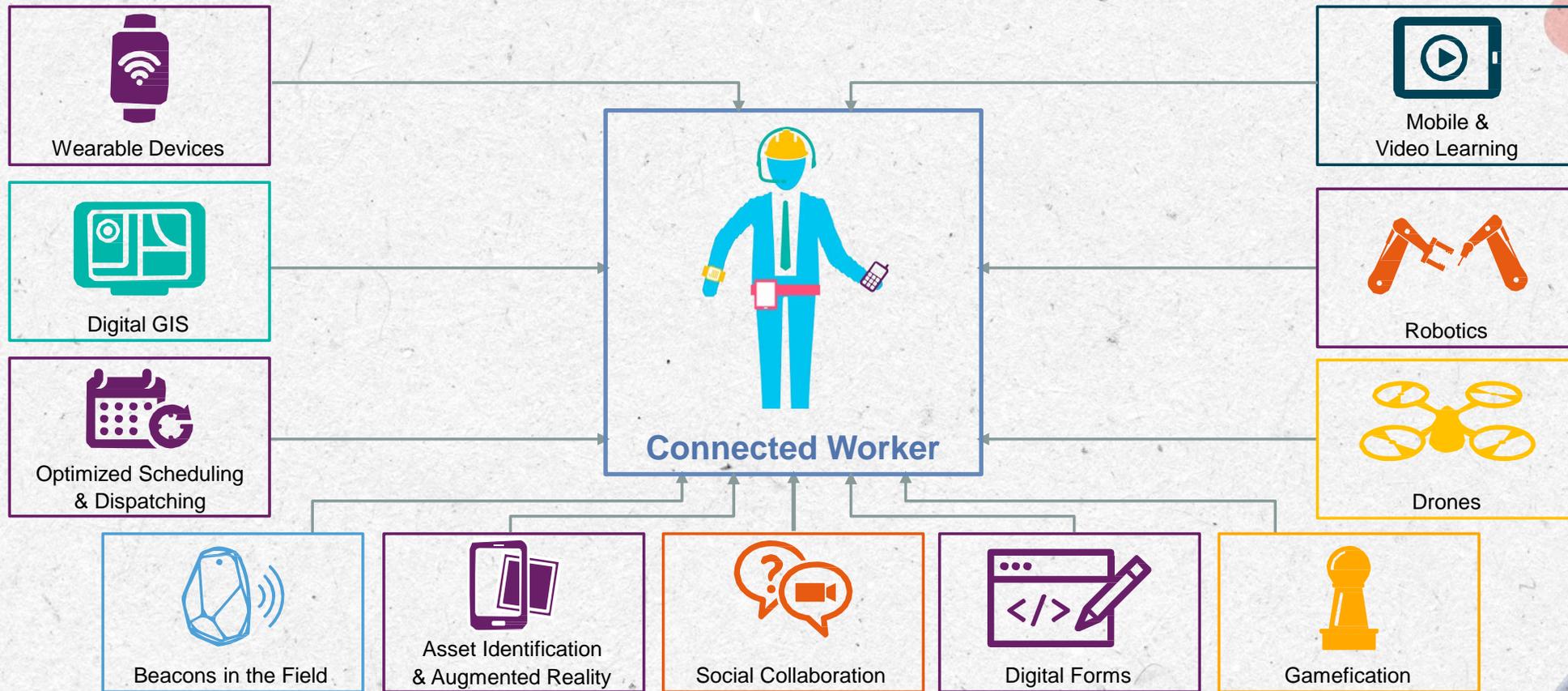
Connected asset management

Intelligent Industrial Products, Processes and Services



The Connected Worker Driven by Timely Information

The **Connected Worker** is at the core of this new ecosystem through leveraging technologies such as wearables, analytics, smart devices, mobile, cloud computing, and social media to **provide insight, take action, and produce outcomes** that were not previously achievable

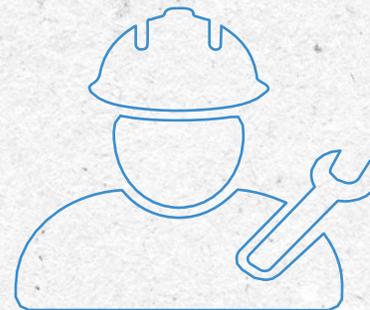


Increase the value proposition

WHEN COMBINING CONNECTED WORKER WITH CONNECTED ASSET MANAGEMENT

Capabilities that IoT Enables and Enhances

Asset Management	Connectivity
	Complex Event Processing and Visualization
	Predictive Analytics
	Remote Operations
	Asset Performance and Health Monitoring
	Operational Dashboard
	Work Order Integration and Worker Dispatch
Connected Industrial Worker	People Tracking
	Mobile Workflows
	Identity Management
	Remote Worker Collaboration
	Remote Content Access
	Remote Data Capture
	Worker Safety



Connected Asset Management

- Worker dispatch based from alerts and events from equipment sensors
- Asset health displayed on worker devices
- Recommended corrective actions (analytics based) pushed to worker devices
- Other integration scenarios enabled by devices, gateways, and IoT platform

Connected Manufacturing Worker

Industrial Wearables driving efficiency

ON THE PRODUCTION LINE

Production line change-overs at global food producer

Operating efficiency

Real-time production and instruction updates

Faster collection of change-over parts & supplies due to indoor navigation

More efficient & compliant change-overs by providing step-by-step instructions

Less trouble shooting due to availability of frequent issues & 2nd line support

Less downtime due to optimized maintenance planning & execution

Continuous improvement due to performance measurement & analysis



Wearables can bring new efficiencies

TO THE MANUFACTURING FLOOR

Google glass in the manufacturing floor (03:25)





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