SAP Leonardo Industry Innovations: Industrial Machinery and Components and HT Industry

Gary Nelson, NA Industry Lead, Industrial Machinery & Components, SAP
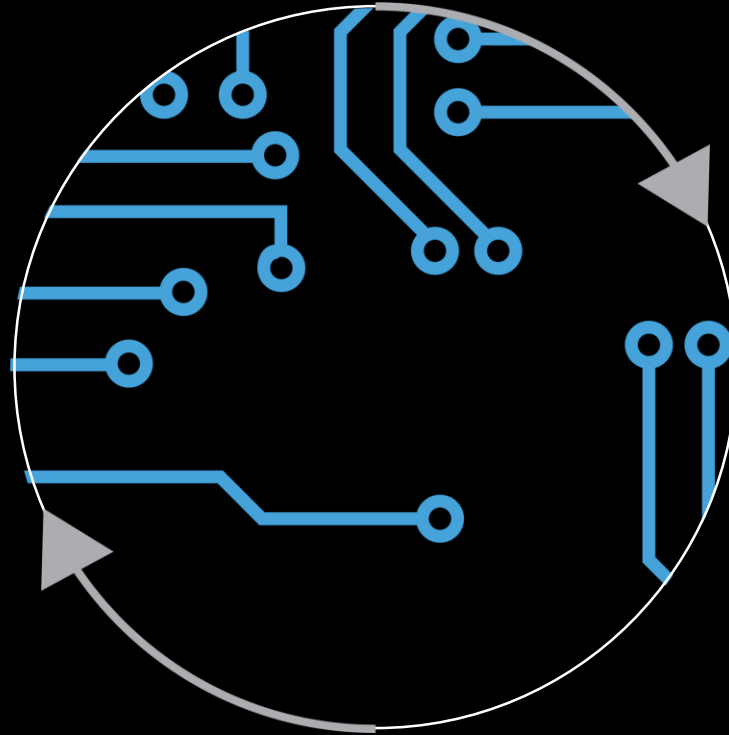
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High tech and industrial machinery and components (IM&C) companies are facing similar **trends** …

Instant availability

Disruptive technologies

Time to volume rules

Software is everywhere and everything

From products to capabilities
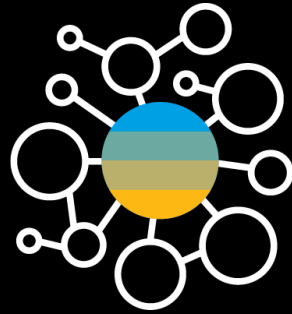
… and challenges in their ability to **innovate** faster …

What "smart features" do customers actually care about?

How do we maximize the value of our Big Data?

Which emerging technologies will deliver the most value?
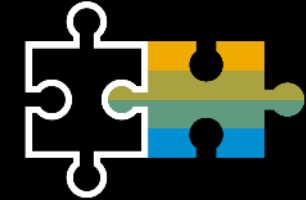
How can we turn technologies into actual differentiators?

…and confront similar questions on the size, scope, and outcomes of innovation projects

Where do we start?

Do we need to make a large up-front investment?

How can we integrate digital with everything we already do?

How soon can we expect to see real outcomes?

How can we scale our innovations across our businesses?

Digital leaders in IM&C experience unforeseen technology barriers that inhibit innovation

Technological innovation — Emerging, disruptive technologies and processes

- Smart products
- Remote service management
- Connected manufacturing
- Predictive maintenance
- Connected logistics

ERP — ERP and back-office business systems

Enterprise assets — Enterprise assets and OEM equipment at customer sites

Business risks caused by innovation gap

73%
of industrial manufacturers' C-level execs were convinced that the IoT would change their industry, **but just 20% had a thought-through strategy for harnessing it.***

Only
35%
of U.S. manufacturers are currently collecting and using data generated by smart sensors to enhance manufacturing/operating processes.**

Only
38%
currently embed sensors in products that enable end-users/customers to collect sensor-generated data.
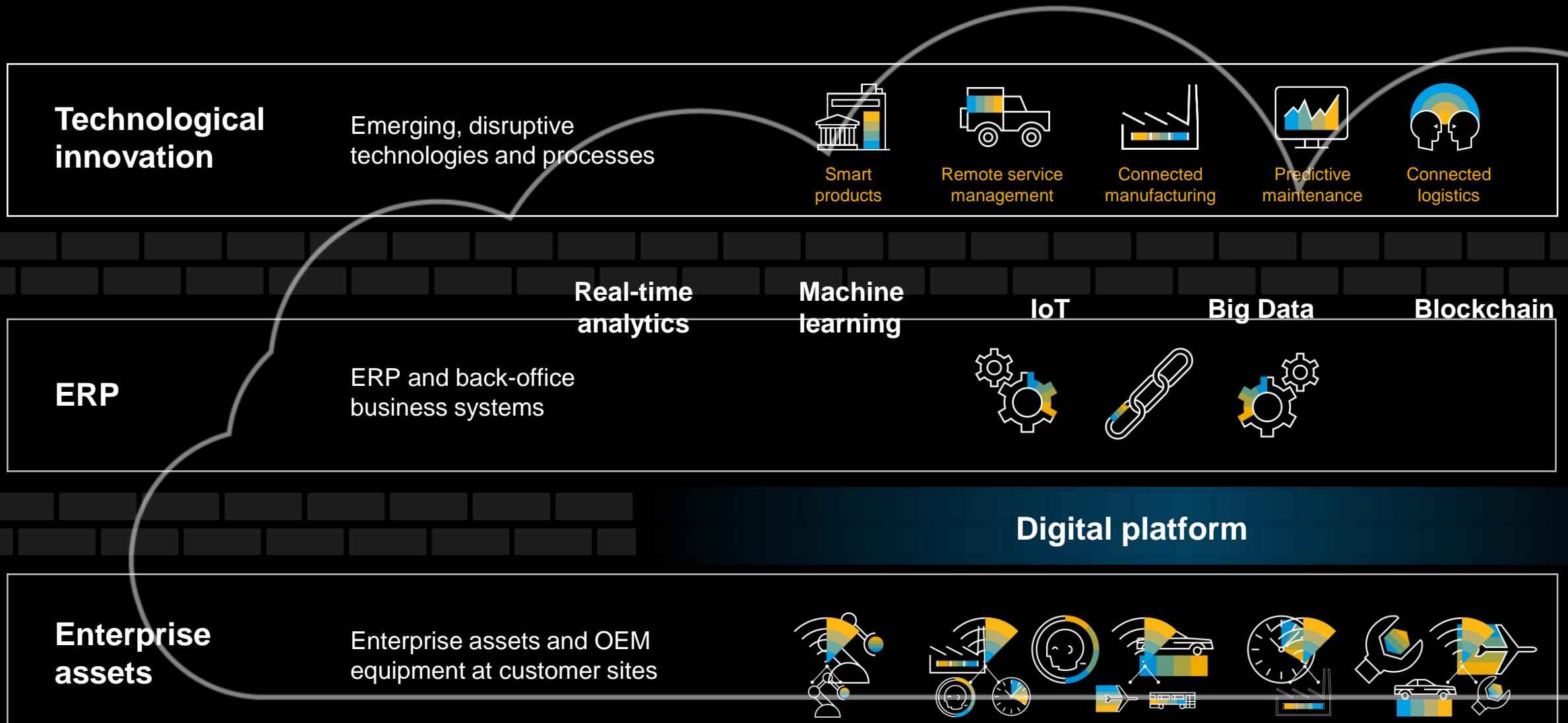
Only
15%
of organizations have been able to move from reactive to predictive business by combining data from assets and sensors, with internal data.***

Source: *Research conducted by Accenture for the World Economic Forum, April 2017.   **PwC survey of U.S. manufacturers   ***SAP Performance Benchmarking

Digitalization for IM&C companies:

Removing barriers to intelligently connect people, things, and businesses

Go from unrecognized technological barriers inhibiting innovation to …

Technological innovation

Emerging, disruptive technologies and processes

Smart products

Remote service management

Connected manufacturing

Predictive maintenance

Connected logistics

Real-time analytics

Machine learning

IoT

Big Data

Blockchain

ERP

ERP and back-office business systems

Digital platform

Enterprise assets

Enterprise assets and OEM equipment at customer sites

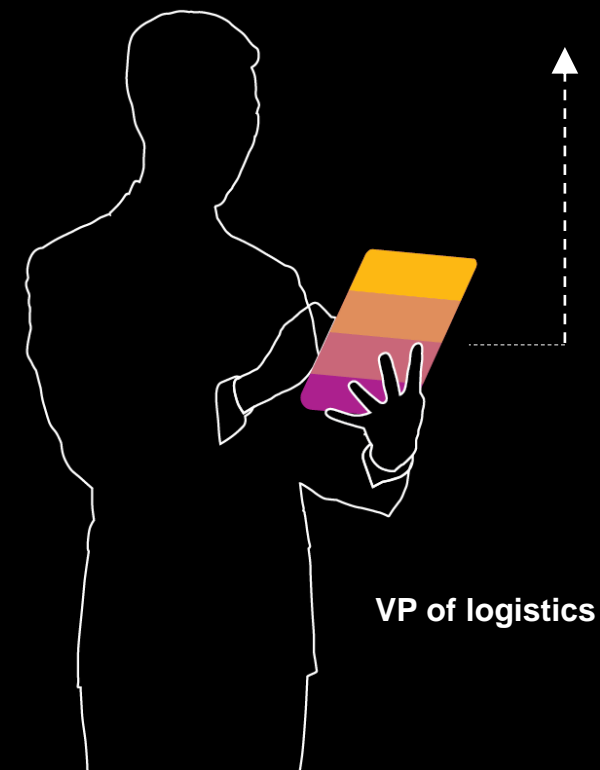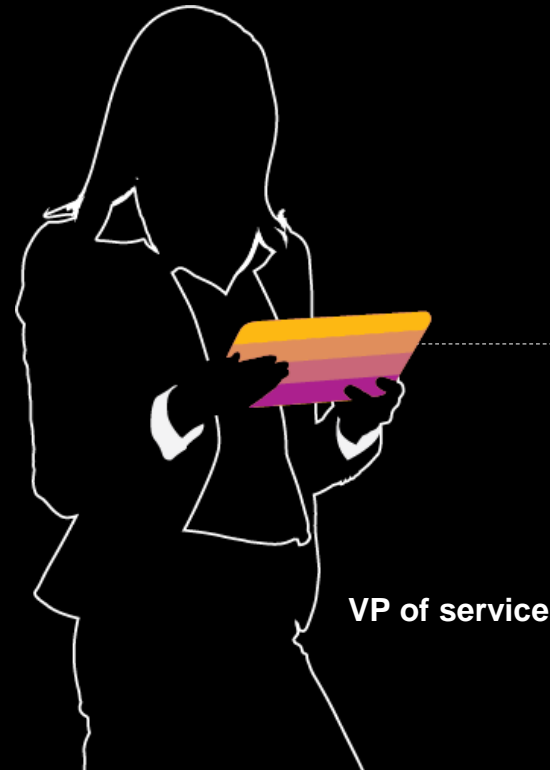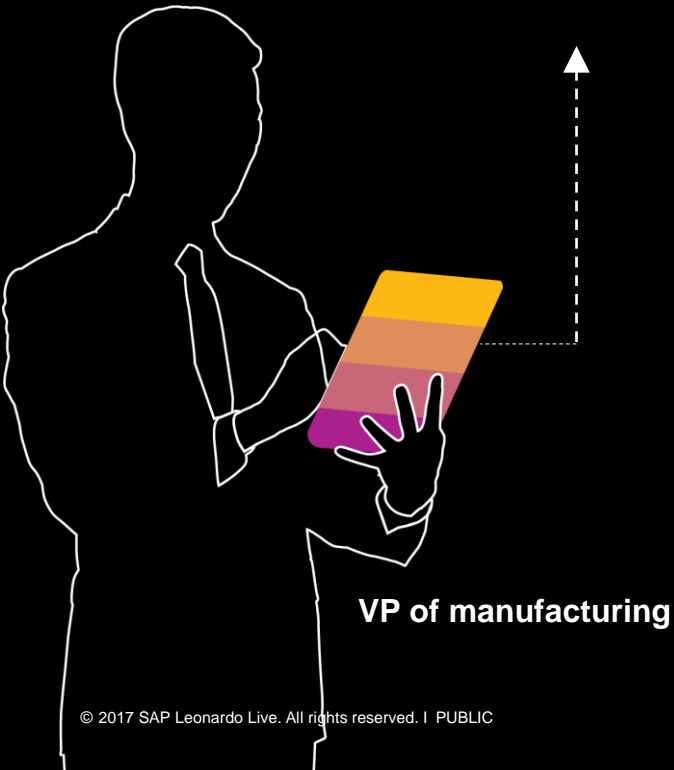# Value of intelligently connecting people, things, and businesses
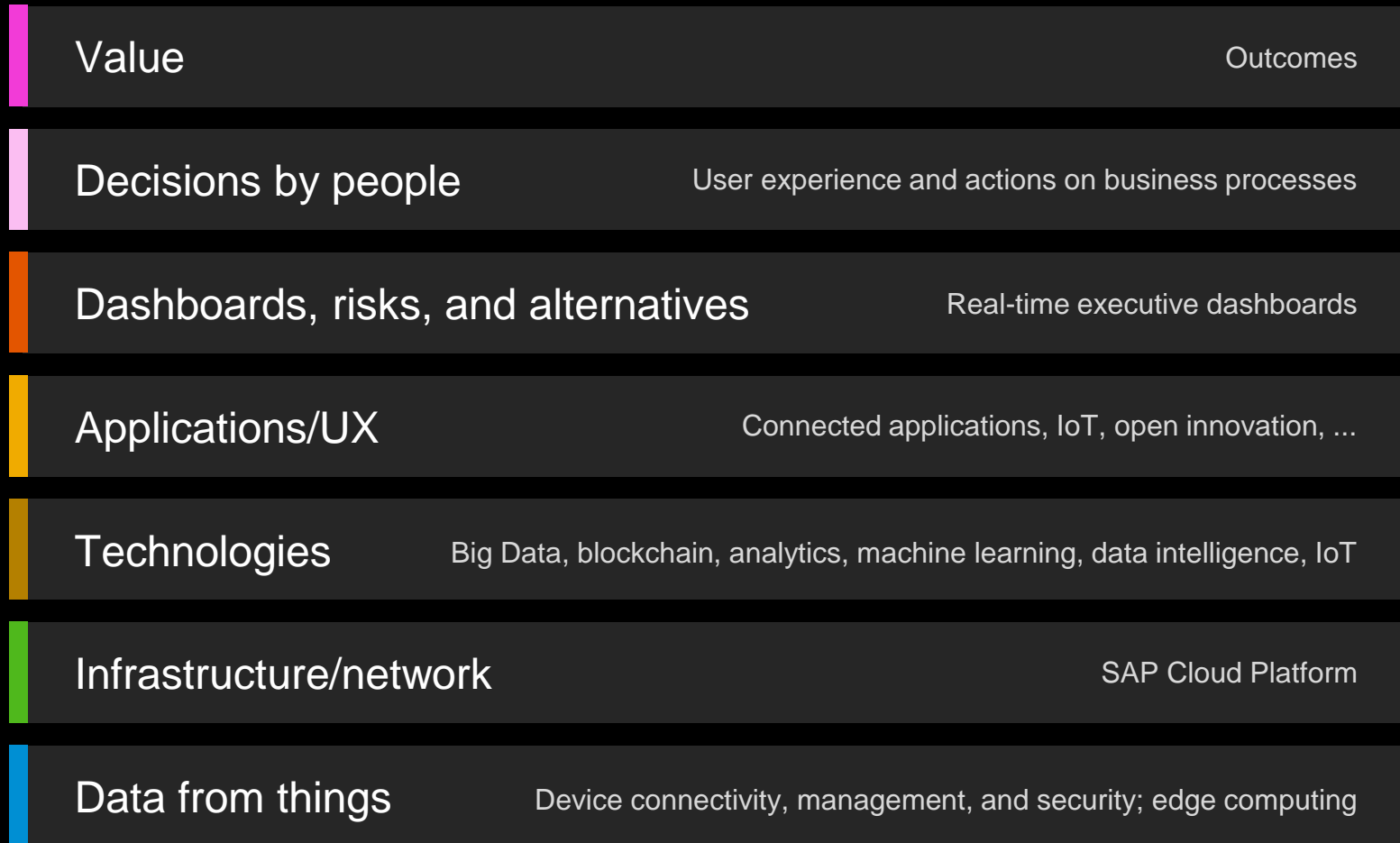
What if I could manage the health of all our complex manufacturing assets – automatically?

What if I could manage the health of my customers' assets – automatically?

What if I could know the exact whereabouts of any order – from any supplier, to any customer – right now?

VP of manufacturing

VP of service

VP of logistics

SAP Leonardo digital innovation system – from things to value

Businesses

People

Things

Value	Outcomes
Decisions by people	User experience and actions on business processes
Dashboards, risks, and alternatives	Real-time executive dashboards
Applications/UX	Connected applications, IoT, open innovation, ...
Technologies	Big Data, blockchain, analytics, machine learning, data intelligence, IoT
Infrastructure/network	SAP Cloud Platform
Data from things	Device connectivity, management, and security; edge computing

SAP Leonardo applied – managing assets automatically

Everything you need to know about your asset via the asset's "digital twin" in the cloud

Maintenance instructions

Download the right maintenance instructions

Applications/UX

Infrastructure/ network

Technologies

Easy info sharing between the asset, manufacturer, service partners, and suppliers

Prevent failure

Alert: Check C series AC servo drive

Real-time alerts predict failures

Consolidate info 24/7 from all machines in one dashboard

Decisions by people

Proactively service the right asset

Value

Data from things

Dashboards, risks and alternatives

SAP Leonardo – high-tech manufacturing use cases

SAP Leonardo for Discrete Manufacturing, logistics option

Improve transparency and optimize production and delivery logistics with real-time data from connected logistics equipment

**SAP Leonardo for Discrete Manufacturing, assets option**

Optimize performance and uptime of connected production and logistics assets, and prevent equipment failures before they occur

SAP Leonardo for Discrete Manufacturing, service option

Develop and deliver added-value services for your customers based on live sensor data, providing them an even better return on their assets

SAP Leonardo for Discrete Manufacturing, spare parts option

Efficiently integrate additive manufacturing processes into the supply and delivery chain of spare parts with on-demand 3D printing
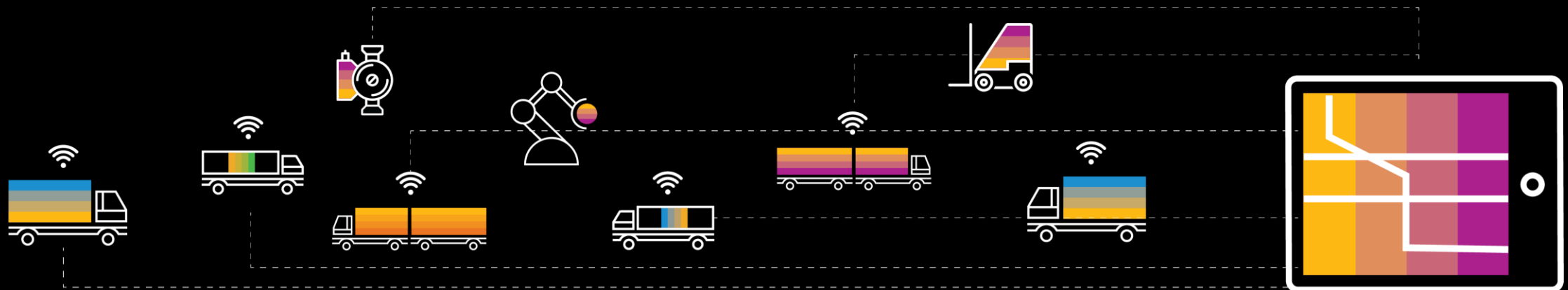
SAP Leonardo creates an **innovation environment without boundaries**
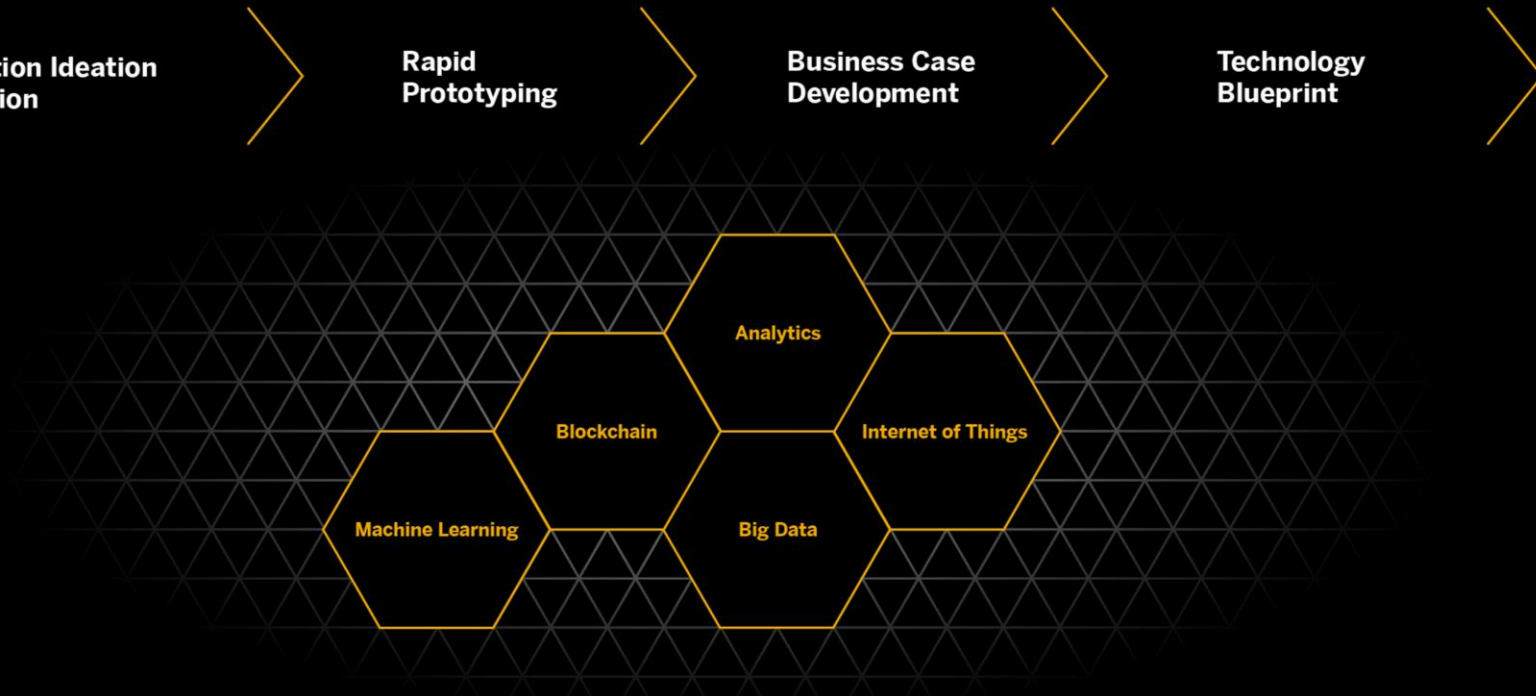
Design Thinking Services

Solution Ideation & Vision ❯ Rapid Prototyping ❯ Business Case Development ❯ Technology Blueprint ❯

SAP Leonardo Capabilities

- Analytics
- Blockchain
- Internet of Things
- Machine Learning
- Big Data

SAP Cloud Platform

Microservices | Open APIs | Flexible Runtimes | Integration

Multi-Cloud Infrastructure

SAP Data Center   Google Cloud Platform   Microsoft Azure   amazon web services

Introducing Dynamic and Predictive Maintenance with **SAP® Solutions**

Trenitalia
Rome, Italy
www.trenitalia.com

Industry
Travel and transportation

Products and Services
Local, national, and international passenger transport services

Employees
28,000

Revenue
€5.5 billion

SAP® Solutions
SAP® Predictive Maintenance and Service solution, the SAP HANA® platform, and SAP IQ software

Trenitalia ensures its customers can rely on it to get them wherever they need to go with efficient and reliable services that run on time. By using the SAP Predictive Maintenance and Service solution, Trenitalia has created a dynamic asset system that allows it to make better decisions based on real-time information and error forecasting.

Before: Challenges and Opportunities
- Significantly increase maintenance efficiency and reduce operational costs by avoiding unnecessary maintenance activities
- Systematically plan in advance for any intervention, ensuring availability of spare parts, facilities, tools, and resources
- Prevent breakdowns while trains are in operation
- Avoid downtime due to unforeseen activities

Why SAP
- Innovative solutions and technology to improve maintenance processes based on the SAP HANA platform and Big Data analysis
- Implemented the SAP Predictive Maintenance and Service solution to support real-time monitoring of the train fleet
- Used algorithmic predictions and indicators for dynamic planning

After: Value-Driven Results
- Scaled large quantities of data in SAP IQ, reducing required in-memory storage
- Gained insight into real-time diagnostics to make better decisions
- Improved asset reliability and service, thanks to predictions and error forecasting
- Reduced maintenance costs

"The SAP Predictive Maintenance and Service solution based on SAP HANA helps us cut costs and keep trains running smoothly."
Danilo Gismondi, CIO, Trenitalia

8%–10%
Reduction in maintenance costs

700 TB
Of data managed per year through SAP HANA and SAP IQ

5,000
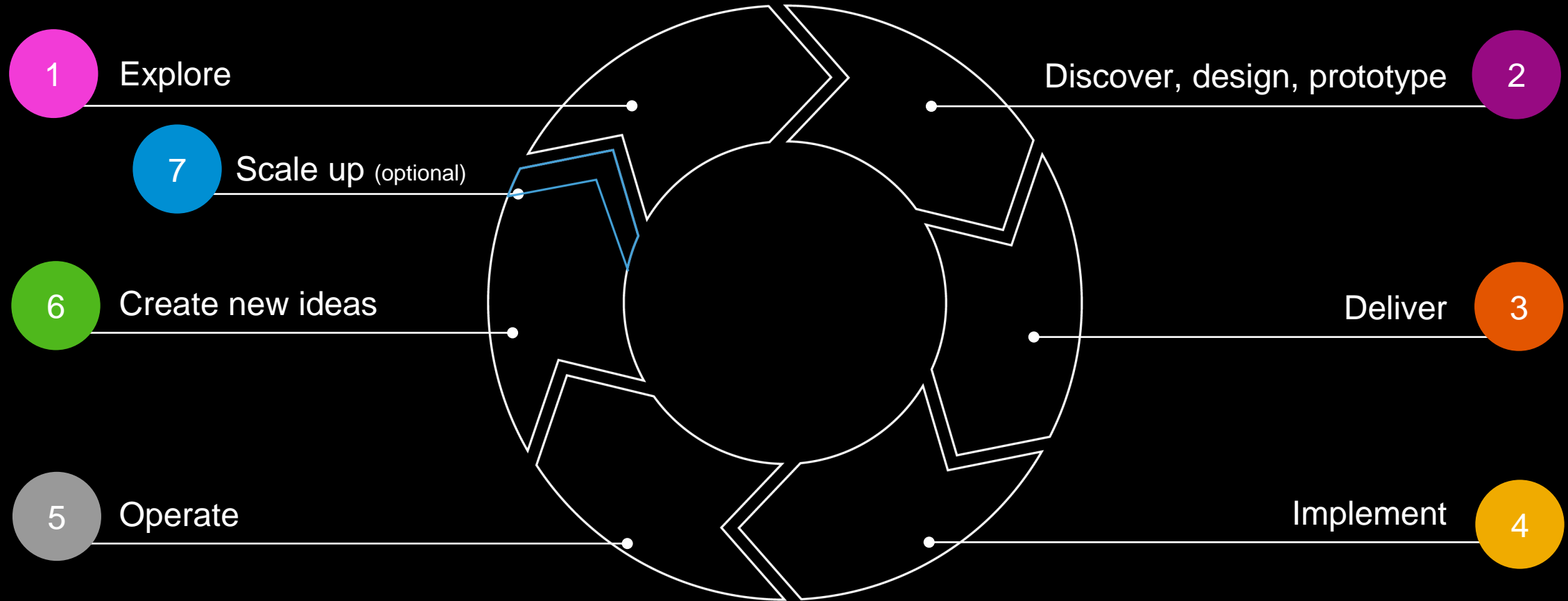Signals sent per train every second, thanks to sensors on board

Watch how Trenitalia keeps passengers happy with SAP solutions.
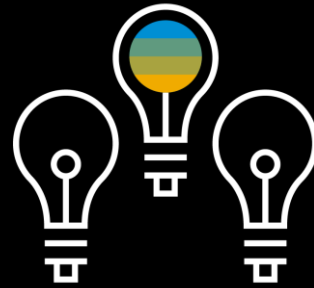
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SAP Leonardo – customer engagement overview

Unlike off-the-shelf software solutions, innovation requires collaboration and idea sharing

1 Explore

2 Discover, design, prototype

7 Scale up (optional)

6 Create new ideas

3 Deliver

5 Operate

4 Implement

Next steps: conduct an explore workshop

How do we find the right innovation path?

What "use cases" have been prioritized/designed/implemented?

For each innovation use case:

- What is the game plan?
- What are the design challenges?
- Who are the stakeholders?

Outputs:

- Prioritized business scenarios / use cases
- Design challenges and game plan
- Stakeholder map

SAP Leonardo

How do I see innovation in action?
Visit SAP Leonardo Centers in New York or Palo Alto, California

Thank you.

Contact information:

Gary A. Nelson
NA Industry Lead, Industrial Machinery & Components
Industry Value Advisors
Gary.nelson@sap.com
1 708 870 9990

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