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Transforming Manufacturing with IoT

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Vodafone IoT: Connect Anything, Anywhere...

2G/3G

- Basic access
- Legacy devices
- Supports data sensors

e.g. Smart Metering/Telematics



4G

- High data rate
- Business applications
- High bandwidth
- Supports data sensors
- Supports data sensors and routers

e.g. In-Car Entertainment/Video Surveillance



5G

- Low latency
- Control applications
- Supports private networks
- Highest quality of service

e.g. Manufacturing, industry 4.0



Mobile Private Networks

- Private & controlled
- Geo-fencing
- Supports data sensors
- Networks

NB-IoT

- Low bandwidth
- Deep coverage
- Long battery life
- Low-cost devices
- Supports private networks

LTE-M

- Low latency
- Control applications
- Supports private networks

Supported by platforms and applications

Why Vodafone Business IoT?

+1400 IoT
professionals

+100M
IoT connections

Rated by **#1**
Industry Analysts

+165B
IoT transactions
each year

193
destinations
across 500+
networks

+85%
Average data usage
growth YoY



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Manufacturing Ready: 5 characteristics

Connected

- Real-time data enabling collaboration with suppliers and customers
- Continuously pull traditional data-sets along with new sensor & location-based datasets

Proactive

- Automated restocking & replenishment
- Early identification of supplier quality issues

Optimised

- Reliable, predictable production capacity
- Increased asset uptime and production efficiency
- Highly automated production & material handling with minimal human interaction

Transparent

- Live metrics and tools to support quick and consistent decision making.
- Real-time linkages to customer demand forecasts

Agile

- Flexible & adaptive repair scheduling
- Implementation of product changes to see impact in real time



Raw materials in
smart supply chain

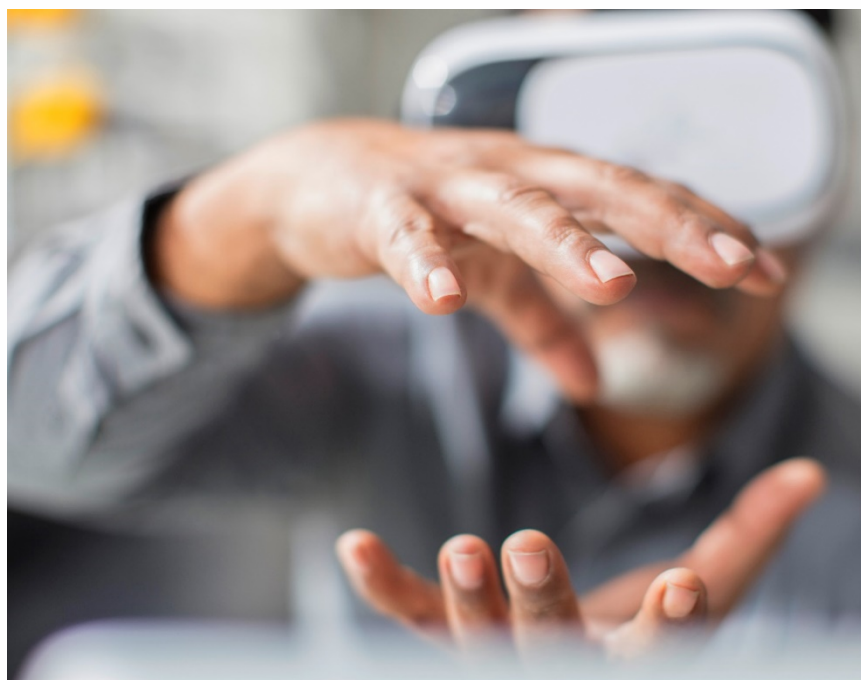
Finished goods out

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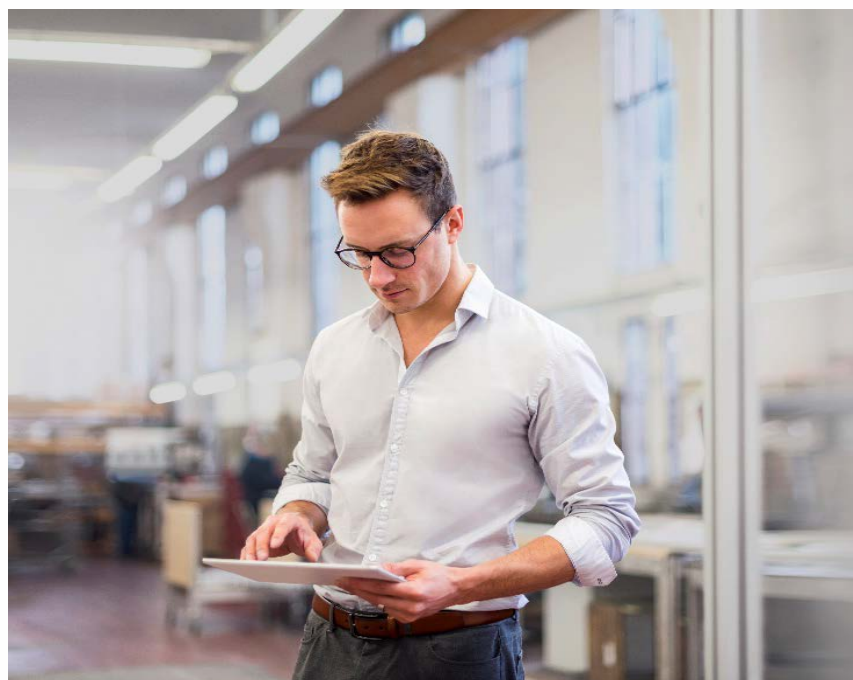
Changing the way manufacturers work, engage and communicate



Smart Factory



Smart Industrial Workers



Smart Manufacturing Business



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Manufacturing Ready



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Vital Command



The Challenge

- Vital Command and its services dealers monitor and mitigate property damage in 3,000 buildings across the US.
- Much can go wrong within a building - broken pipes, loss of heat and cooling, theft, power outages, etc. The company needed a secure cellular solution to detect immediately and properly monitor these issues.



Our Approach

- Using wireless automation and Vodafone IoT services, Vital Command's AWSAM building monitoring solution reduces the risk and cost of damage by notifying service teams about in-building incidents in real time, so that essential worker trips only happen when they need to and damage is reduced greatly.



Benefits

- Operating the AWSAM system on wireless IoT connectivity is secure, increases the systems uptime, reduces building repair costs and makes installation even easier, requiring less physical work and overhead.



Vital Command



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The Challenge

- **Inflexible** production facility with issues reaching targets per year
- Lack of full visibility of the production line causing **cost inefficiencies and safety issues**
- Lack of autonomous machines **increasing functional risk** and productivity issues



Our Approach

- **Co-creation partnership** was formed
- Vodafone Business and e.Go adopted an **agile approach** by forming a 'Smart Factory Squad'
- Developed **smart factory use cases** that enable production reliability, efficiency, safety and speed to market.



Benefits

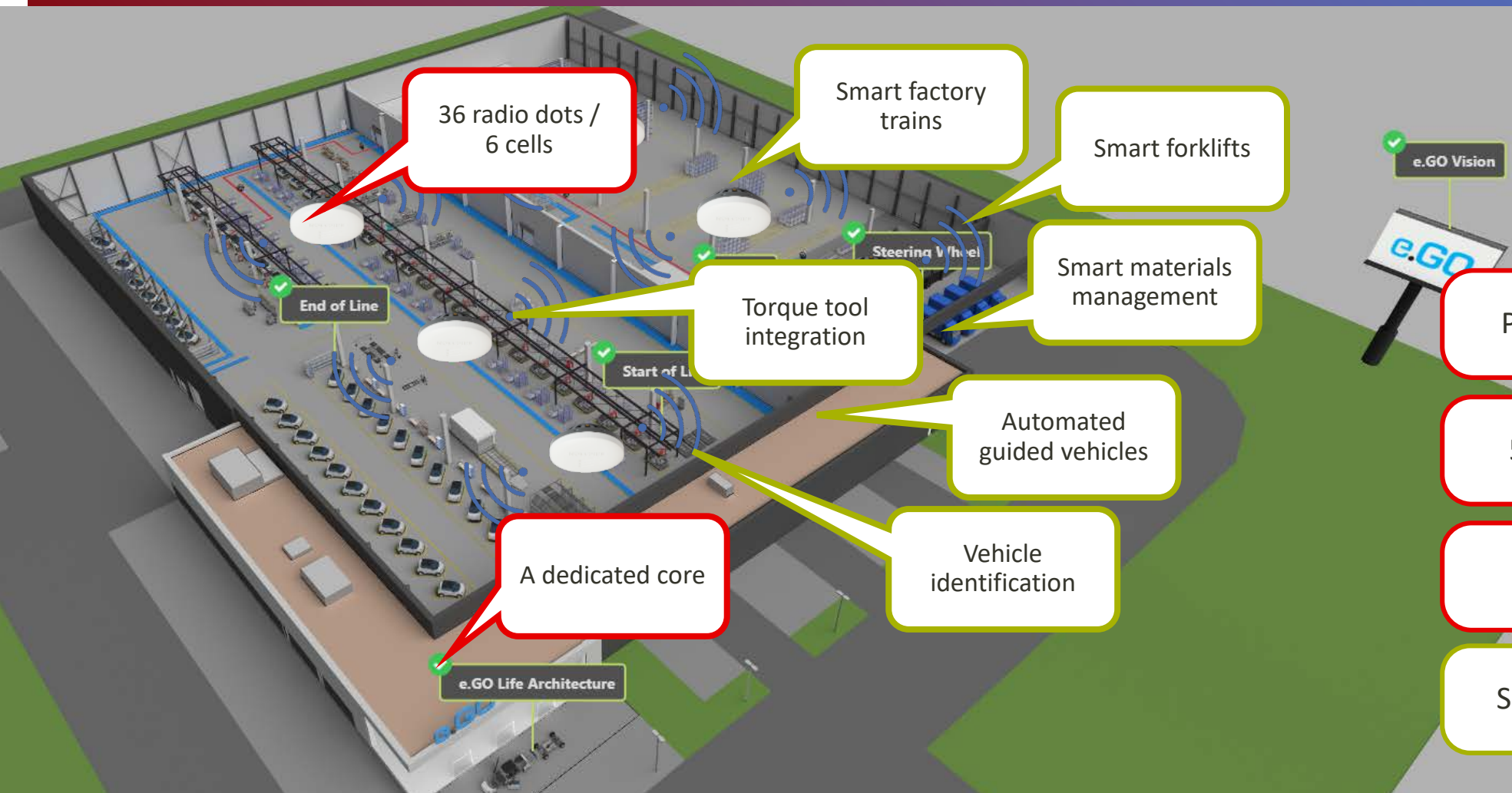
- **Identified industry 4.0 use cases** deploying a private network in factory
- **Real time data** and **fully autonomous vehicles** across the production chain
- **Increased operational speed and efficiency** across the supply chain



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e.Go Smart Factory: Factory of the future

e.GO



Private Mobile Network

5G Ready in June 2019

5G Upgrade in 2020

Smart Factory Use Cases



The Challenge

- Re-build Campofrio's factory over an 18 month period after being destroyed in a fire.
- Replace but also enhance their factory environment, using robustly interconnect plant machinery and robotics over a **secure and integrated platform**.



Our Approach

- A '**Connected Factory**' solution, connecting IT systems with a **converged, standards-based industrial Ethernet network**.
- By monitoring real-time data on asset performance and outages, Campofrio were able to improve their food production line efficiency and time to market.



Benefits

- Built the foundation for an adaptable, factory infrastructure that connects IT systems to the plant floor and provides monitoring and analytics in real time.



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