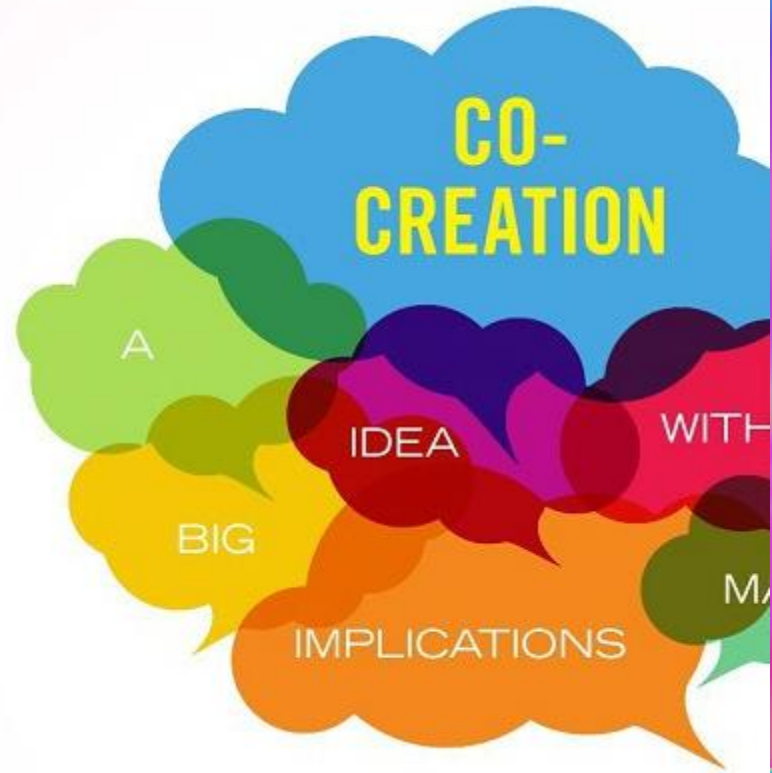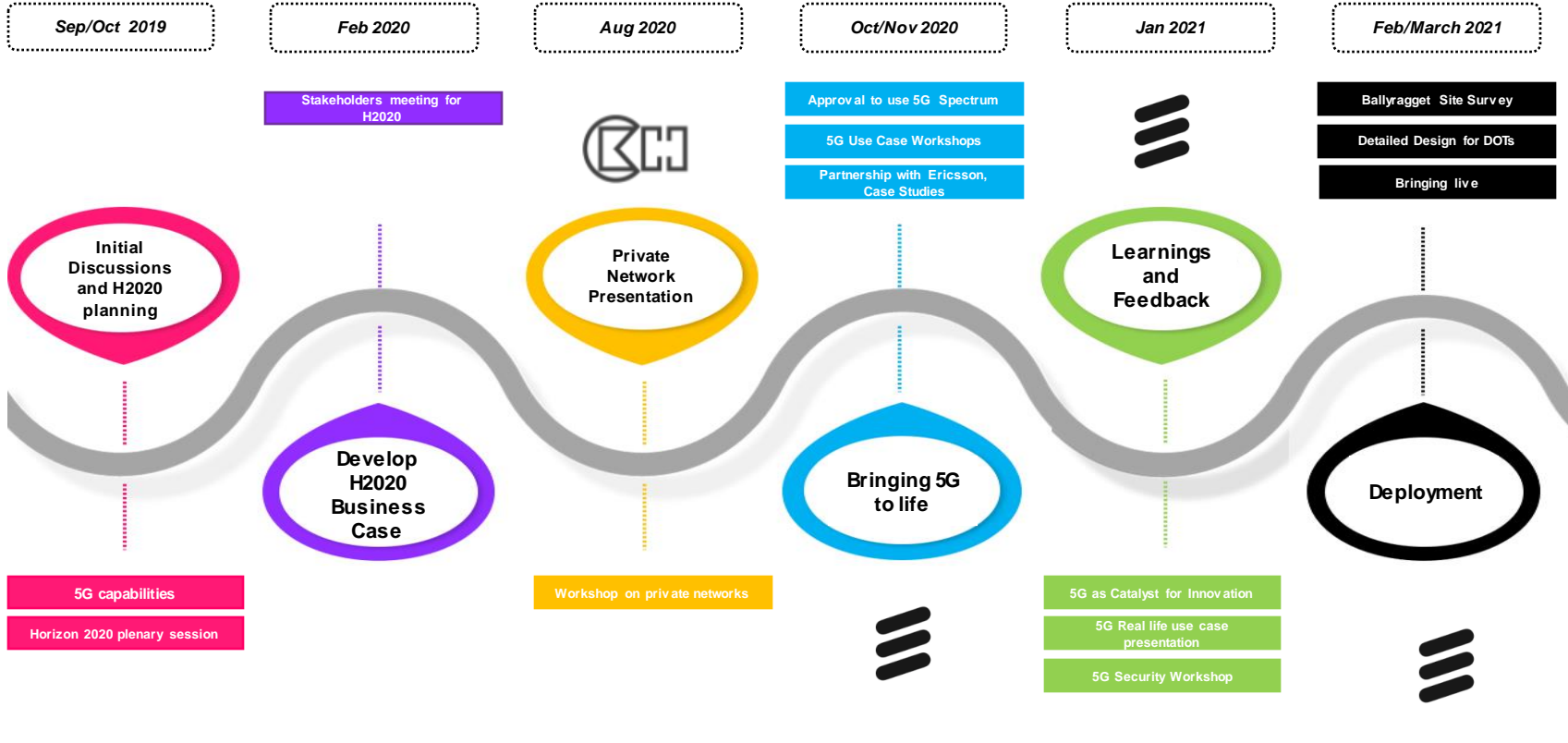# Co-Creation

Co-creation *is a collaborative initiative between companies and their customers enabling the joint design of products and services.*

There were multiple drivers behind the project.

- Glanbia have been monitoring and using data from production since the beginning.
- Strong interest in bringing Industry 4.0 to life.
- Had been trialling IIOT services using LoRa.
- Horizon 2020 participation and next phase.
- Accelerate Glanbia's transition into the use of 5G.
- Three looking to showcase 5G in the space of digital transformation.

Multiple workshops on 5G network technology and developing use cases beyond Industry 4.0.
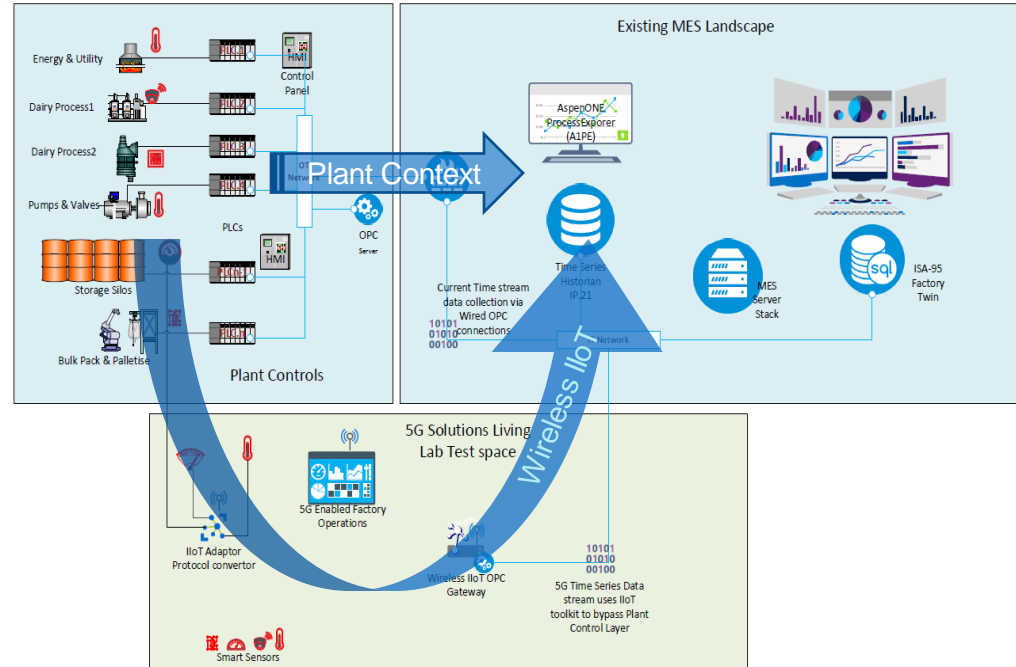
glanbia

| Sep/Oct 2019 | Feb 2020 | Aug 2020 | Oct/Nov 2020 | Jan 2021 | Feb/March 2021 |

Stakeholders meeting for H2020

Approval to use 5G Spectrum

5G Use Case Workshops

Partnership with Ericsson, Case Studies

Ballyragget Site Survey

Detailed Design for DOTs

Bringing live

Initial Discussions and H2020 planning

Private Network Presentation

Learnings and Feedback

Develop H2020 Business Case

Bringing 5G to life

Deployment

5G capabilities

Horizon 2020 plenary session

Workshop on private networks

5G as Catalyst for Innovation

5G Real life use case presentation

5G Security Workshop

Output was to define the goals for the project.

glanbia

- ✓ **Provide 5G coverage** in Glanbia's Cheese Factory to showcase the technology.

- ✓ **Deliver the two main use cases** posed by Glanbia in Ballyragget.

- ✓ Provide a foundation Glanbia to **utilise 5G in other locations** internationally.

- ✓ **Build the foundation** to expand solutions as the technology evolves.

- ✓ Partner with Glanbia to **deliver further use cases** which save money, deliver efficiencies and generate data/insights to optimise operations.

- ✓ **Demonstrate** the **security** & **latency** aspects of 5G over and above WiFi 6 and other connectivity solutions.

- ✓ Enable Three Ireland to build 5G solutions for enterprises across all industrial verticals.

Initial Use Cases to focus on Measurement and Maintenance processes.

The Use Case(s) will

1. Add a 5G data collection layer to the existing PLC OPC data collection methods and integrate that new data in real time with the existing data historian

2. Enhance mobile maintenance operations by allowing craft workers utilise 5G services to complete maintenance workflows at the physical job site within the plant.

The Solution - Built on the Radio Dot System

Faster & easier installation

Gigabit Indoor leadership

ERS Baseband simplicity
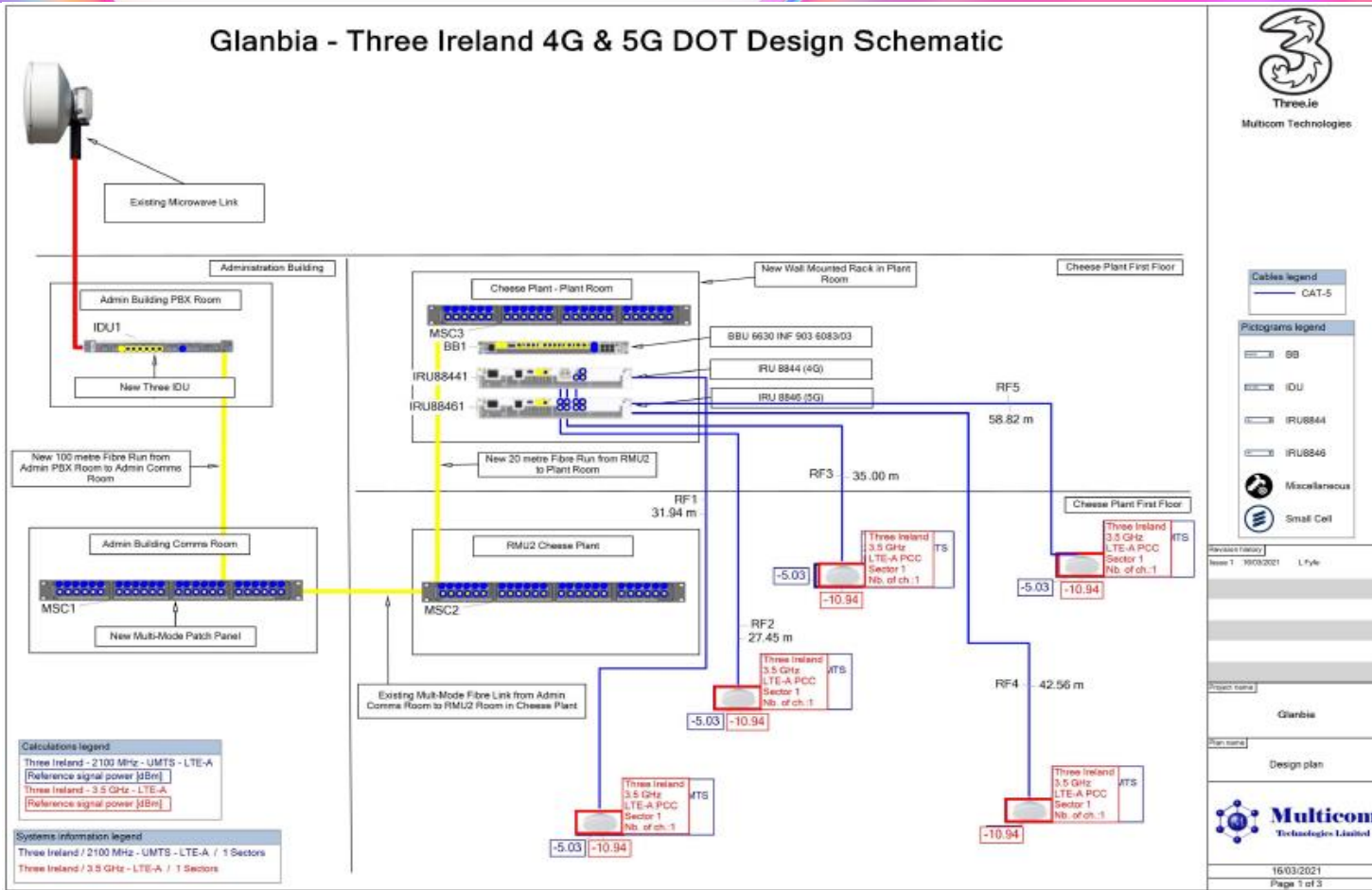
Smaller, lighter, lower energy consumption, longer cable reach

Full band, no compression, better coverage, 5G Ready
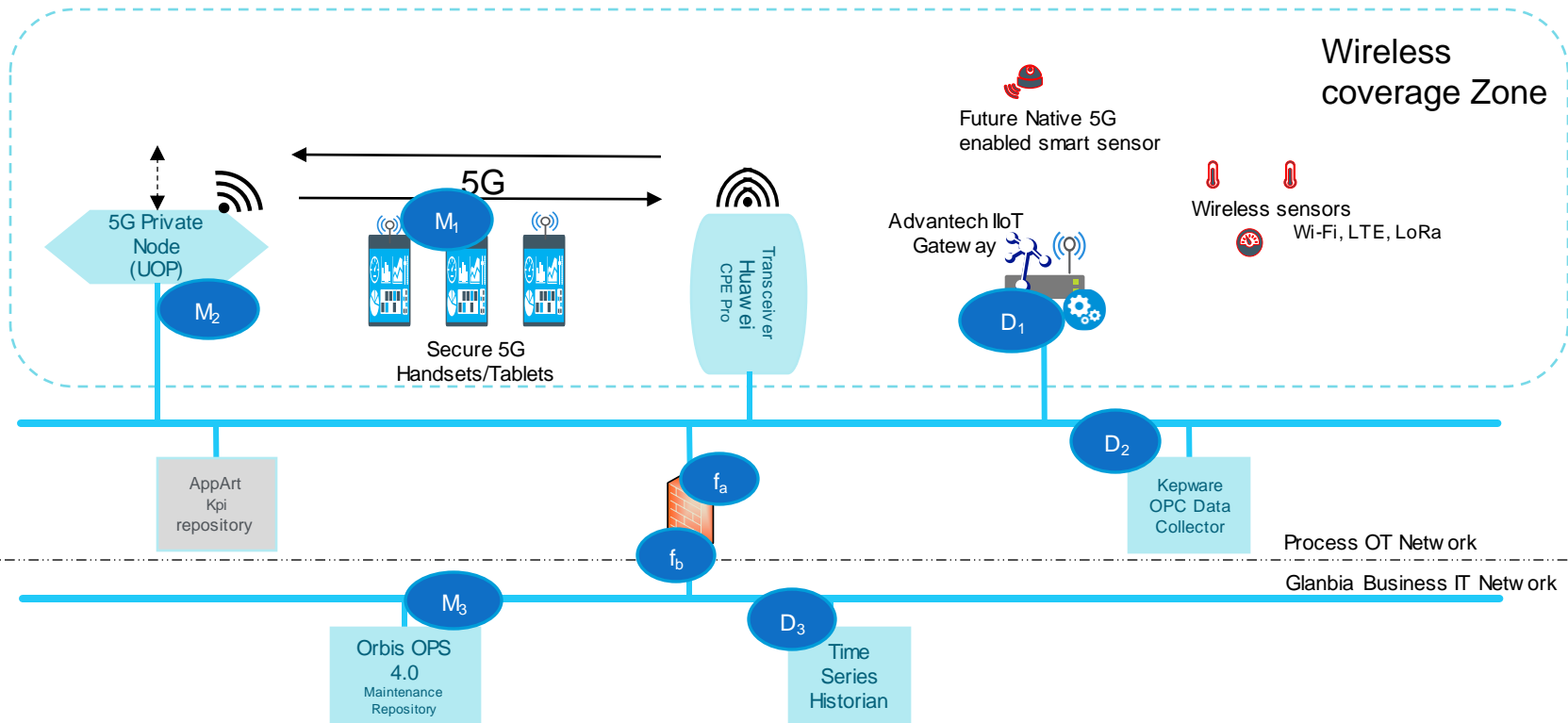
Powerful Baseband, 4x4 MIMO 5G/NR, NB-IOT

- High Performance
- 5G Capable
- Lower cost per GB/m^2
- IP66 rated casing

Market leading, high capacity, future-proof solution for indoor radio coverage

Dots deployed across the manufacturing floor connected back to Comms room and to core via high-capacity microwave.

Glanbia - Three Ireland 4G & 5G DOT Design Schematic

Network Architecture and Solution Design

Glanbia Facility

Wireless coverage Zone

Future Native 5G enabled smart sensor

Wireless sensors
Wi-Fi, LTE, LoRa

5G Private Node (UOP)

M_2

5G

M_1

Secure 5G Handsets/Tablets

Transceiver Huawei CPE Pro

Advantech IIoT Gateway

D_1

AppArt Kpi repository

f_a

D_2

Kepware OPC Data Collector

f_b

Process OT Network

Glanbia Business IT Network

M_3

Orbis OPS 4.0
Maintenance Repository

D_3

Time Series Historian

Outcomes seen

Employee engagement:
- ✓ App versus paperwork - improved accuracy
- ✓ 90% reduction in effort for capturing data

Manufacturing Improvements:
- ✓ Ability to deploy sensors quickly and at low cost
- ✓ Increased speed of delivery of accurate data to Neptune & MES systems

Other Benefits:
- ✓ Health and Safety benefit as deployment much less disruptive than wired
- ✓ Improved Quality Assurance data quality and audit trail

Next step is to accelerate the digitalisation of the manufacturing process.

Large number of sensors
deployed at lower cost than
wired MES (density)

Capture and analyse
information: real time action
to correct issues before it is
too late (latency)

Digital Twins for Real time
process monitoring and Root
Cause Analysis

Foundation in place to deliver to other facilities internationally

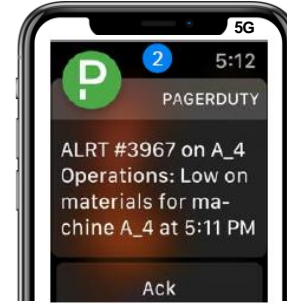# Further use cases in development and others as the technology evolves.

Empower manufacturing staff with **Advanced wearable VR and AR**

Mobile app for **maintenance**

Mobile **Alerting** for Safety and Communications

Questions?