PROMOTING **DIGITAL TRANSFORMATION** ACROSS **AGRICULTURE AND FOOD** SYSTEMS

Overview: Farmers and food producers are facing increasingly tough challenges linked to climate change and geopolitical upheavals, curtailing the flow of raw materials and finished products through the international supply chain.

World conflicts are taking a particular toll on the international availability of farming staples such as fertiliser. Resultant price volatility has had knock-on consequences for energy costs and the availability of labour, causing skills shortages. UK farmers have also borne the brunt of cost overheads resulting from Brexit, and the drive to support the UK achieve its NetZero targets.

The continued digitalisation of farming and food production may help the sector to negotiate its way through these turbulent times more effectively, by for example, improving the accuracy of crop predictions or reducing waste.

As part of their contribution to DIGIT (WP1), Professor Gerard Parr and his team at the University of East Anglia are developing next-level beta testing, allied to implementation frameworks that will deliver improvements in agricultural productivity that go beyond normal expectations for prediction and prevention.

Digital transformations: With the 'farm to fork' journey a central consideration, Professor Parr's team is working with Agri-tech partners to increase productivity and innovation from the farm to supermarket shelves.

While we may think of the agricultural sector as dominated by traditional craft skills and intergenerational know-how, much of the business of farming has become digitalised in recent years, such that it is now commonplace for data about crops and animal health to be held securely online (a topic also covered in our next case on the sharing of animal health data).

In most instances, this data is being collated and analysed for predictive purposes, to help manage crop rotation and harvesting; or to prevent and control disease risks. Advances in digital Agri-tech are nevertheless making new demands upon the sector, such as the need to secure data streams criss-crossing fields and farmyards from cyber-attacks or systems failures.

Ultimately, this requires increased investment in digital systems with 99.999 thresholds of reliability and accuracy that can also cope with the high volumes of real-time data, produced by interconnected systems. Opportunities to monetise this data will ensure that business models across the Agriculture and Food Systems (AFS) supply chain remain

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Prof. Gerard Parr
University of East Anglia

Key advantages:

- UK Farmers are benefiting from the managed integration of data-generating technologies such as low-power Internet of Things (sensors), 4G/5G connectivity, Artificial Intelligence, Imaging, GPS, and Cloud Computing.
- Connected farm vehicles are improving safety and precision, while mobile devices and sensors are making animal tracking and monitoring much easier.
- Software is now available to help run farm production facilities, manage water/soil reserves and manage optimise crop yields.

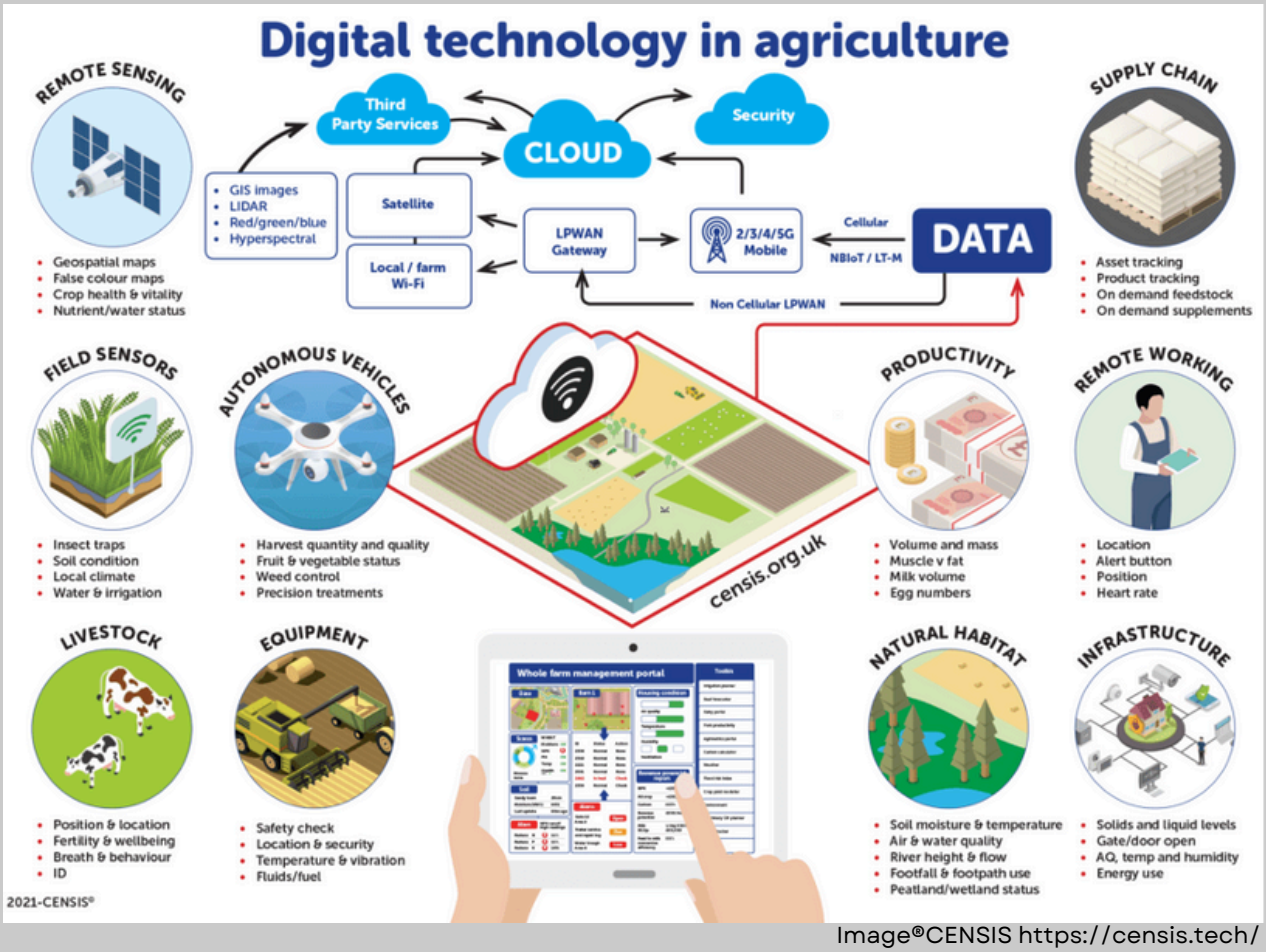
As part of this drive for productivity through connectivity, the team at UEA are devising:

1. *Low-power-low resource sensors for edge computing*
2. *Drone platforms for imaging, search & rescue*
3. *AI and machine learning, digital twins, cloud computing and remote sensing for use in farming and food production.*

These areas are increasing in capability and are directly relevant to sustaining the important Agribusiness sector across the UK.

Through our joint activities with AgriTechE, we have drawn expertise and insights from our network of stakeholders to help DIGIT position honest broker advice on systems and technologies as well as provide a means of validation/testing for new sensors, networked devices and software before major investments are made across a large agri-tech business.

We are exploring the development of a major use-case around Agri-tech in the UK and the use of digital technologies to support business productivity and efficiency. For example, we are looking to roll out a prototypical implementation of Digital Transformation in the Agribusiness sector (crop farming) by deploying some of the emerging technologies like IoT, 4G/5G, Edge/Fog and Cloud Computing, as well as AI/ML and other tools, into the business processes. This transformation comes with enormous benefits for business operators, investors, customers and the environment. However, the combination of these sensing, connectivity, processing and storage technologies in any deployment instance depends on the specific needs of the target organisation and their existing legacy systems, which we aim to discover using our pilot Digital Maturity/Readiness Survey.



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