Digital Transformation

How location technology is helping transform businesses and industries

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"New digital business models are the principal reason why just over half of the names of companies on the Fortune 500 have disappeared since the year 2000."

Pierre Nanterme, CEO, Accenture

Digital innovation is key to success and survival

Technological innovation, from the printing press to air travel, has been a force for economic and social change since the emergence of industry. **The pace keeps accelerating, with each innovation becoming adopted faster than the one before it.** It took over 50 years for the telephone to appear in half our homes. The home computer reached the same milestone in under 20 years. In 2016 Facebook reached half the UK population, having taken just 10 years[1].

The latest digital innovations feature little or no marginal costs of production. Companies leverage this cost structure, together with network effects, to reach massive scale ever faster. New products rapidly spread from unnoticed to ubiquitous, often in less than 5 years.

[1] More Than Half of UK Population Will Log on to Facebook This Year, *eMarketer*, Feb 25, 2016.

It's no surprise then, that the biggest challenge facing CEOs today is the rapid pace of technological innovation[2]. Kodak was a household name for the whole of the 20th century. But in January 2012 the firm filed for bankruptcy, having patented an early form of digital camera in 1975, but failed to exploit the innovation. Business leaders are now focused on ensuring that their business is one of the winners, not one of the losers. For many this means large scale transformation of the business or enterprise, potentially complete re-invention. The **'Gale of creative destruction'** was first identified in the 1940s[3], but now CEOs are acting on it, adopting the mantra: **'disrupt or be disrupted'**.

[2] Myth-busting the Fortune 500, *Fortune* magazine, 2015.

[3] *Capitalism, Socialism and Democracy*, Joseph Schumpeter, 1942.

Digital transformation is underpinned by data

What is digital transformation? Strategy consultants, systems integrators and industry analysts all have their own definitions and recipes for best practice. But the experts all agree on three common ingredients for successful digital transformation, each one underpinned by extensive use of large volumes of data.

1. **Focus on the customer experience.** Customers expect to be served via their choice of (increasingly digital) channel, at a time that suits them. The digital enterprise leverages the context and content of its customer data to deliver service on the customers' own terms.

2. **Embedding agility drives up performance.** The ability to respond faster and change direction when needed enables the enterprise to exploit opportunities before the moment has passed and tackle threats before they can cause damage.

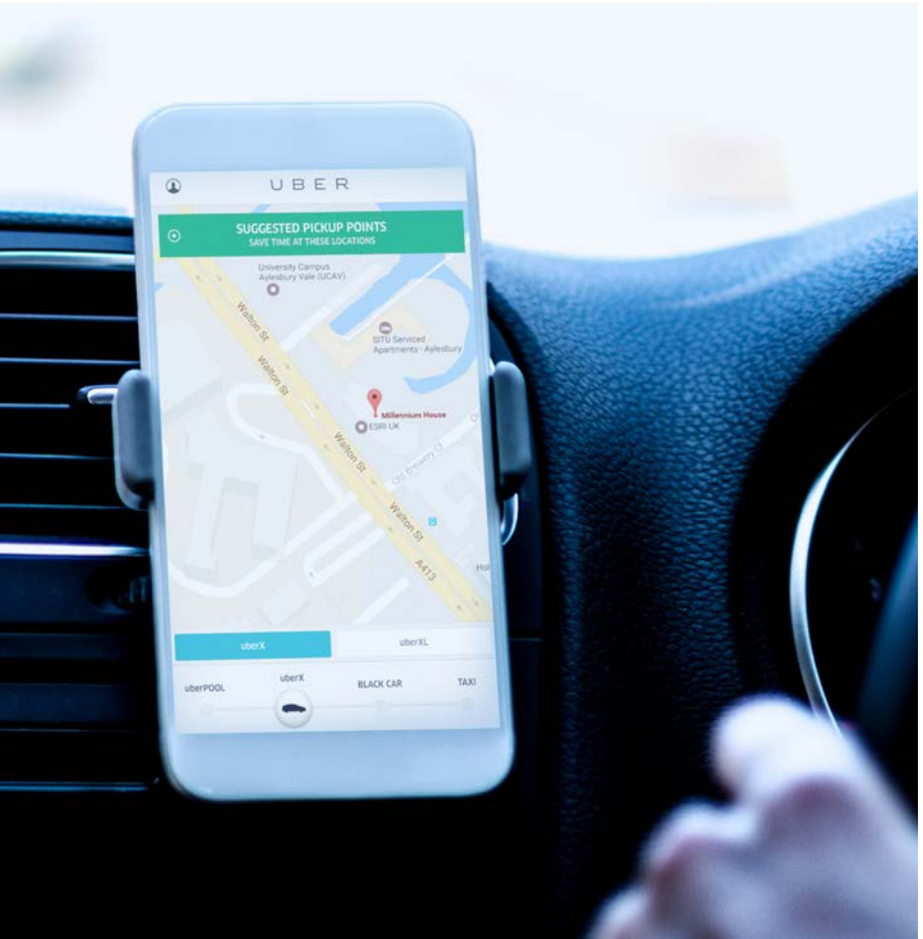
3. **Innovation becomes business as usual.** For too long, enterprises have hived innovation off to one side and then summoned it on demand. The digital enterprise is a constant innovator – across all functions and disciplines.

The World Economic Forum has concluded that to master this 'Fourth industrial revolution', we need to: 'Get a handle on the data'[4]. It points out that we have a treasure trove of information just waiting to be tapped and that the more this information is shared, the more we can do for the people of the world.

[4] World Economic Forum Annual Meeting 2016: Mastering the Fourth Industrial Revolution, p8.

"Thinking geographically is huge – if you are not you are missing something"

Dave Miller, Senior Director,
Market Planning & Research, Walgreens



Location data is a central component of digital transformation

Geospatial (or location) data is a key enabler of digital transformation, both at the macro level (entire industries) and at the micro level (individual enterprises).

Uber has transformed the taxi industry by creating a brand-new customer experience. Since creation in 2009, it has spread to more than 60 countries and was recently valued at nearly $70 billion[5]. The whole business process depends on geospatial knowledge. The location of the customer(s) and of nearby drivers is used to identify the best driver for every ride and enable driver and customer(s) to connect. **Real time location is used to determine distance travelled and calculate fares.** The convenient customer proposition and attractive business model have resulted in many other new players entering the industry: Lufy, Curb and Didi Chuxing to name just three, all driven on location data.

[5] *The Economist*, 3 Sept 2016.

"We are witnessing profound shifts across all industries, marked by the emergence of new business models, the disruption of incumbents and the reshaping of production, consumption, transportation and delivery systems"

Professor Klaus Schwab, Founder and Executive Chairman, World Economic Forum.

Starbucks invented the modern coffee house chain and is continuously transforming, through embedded data-rich innovation across the enterprise. Powerful tools combine geographic information on trade, traffic, demographics and planned developments to ensure Starbucks coffee shops are placed where demand is greatest. During the development process, location-based tools progress each site through permitting, construction and eventual opening. There is a constant focus on customer experience: map-based stories are used to drive engagement; local marketing campaigns take account of demand-changing variables such as weather; local staffing and inventory is planned geographically to respond to major events; and local promotions are delivered direct to the customer via a mobile app.

Uber and Starbucks are not alone, industries are being transformed by disruptive new entrants and established players leveraging the power of location to create a competitive edge. In this eBook, we look at how geospatial data and technologies enable the digital transformation of industries and organisations, highlighting the three themes identified above:

- Focus on the costumer experience.
- Embedding agility drives up performance.
- Innovation becomes business as usual.

Transforming Industries

Hotels

Hotel chains are constantly looking for competitive advantage. Digital technologies such as Wi-Fi, beacons, and GPS offer several ways to provide a differentiated experience and connect better with customers. **Location provides the context that enables hotels to anticipate customers' needs based on past behaviour or preferences.** A study of nearly 1200 hotels conducted by Zebra technologies found that 74% of hotels/resorts are planning to implement location-based technologies within the next year[6]. Services currently being trialled include: Speedier check in using a smartphone; promotional coupons or discounts, service personalisation based on tracking guests' location and facilities used and mobile wallets for payment and electronic baggage tracking.

The latest app from Hilton hotels, Fun Finder, provides guests with a personal travel guide. It includes detailed maps and wayfinding capabilities, information about on-property events and notifications of special offers and hotel features suited to guests' individual preferences. 'The whole idea was to build a personalized experience for the guest that was based on three different key elements — guest preference, place of the guest, and time,' said Rich DiStefano, senior director of mobile products for Hilton Worldwide[7]. 'We can make the experience different for you based on where you are and the time of day; it's about giving guests the right information at the right time.'

[6] Hospitality Vision Study, *Zebra Technologies*, 2016.

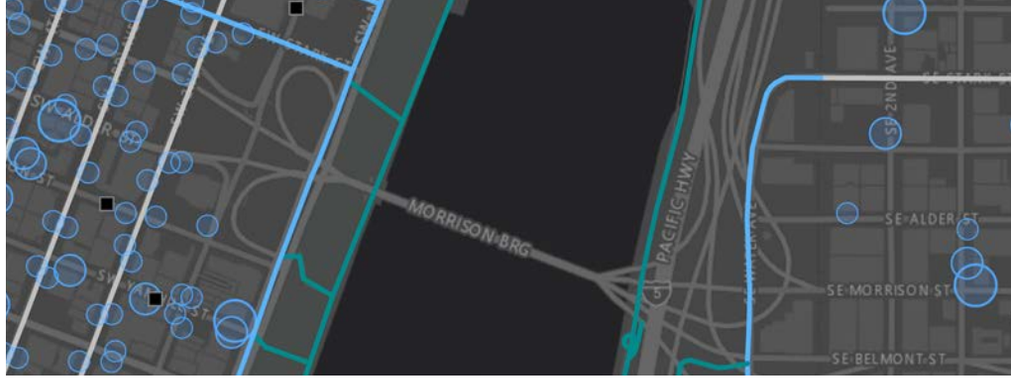
[7] Hilton's Newest App Feature Ups the Game in Guest Personalization, *Skift.com*, 6 Sep 2016.

Car Insurance

New UK-based insurance provider, Cuvva, offers a range of products[8] that are more flexible than the fixed, year-long contracts required by traditional car insurers. An innovative, all-mobile customer experience simplifies purchase. Drivers can insure themselves on a friend's vehicle for as short a period as an hour via an app on a mobile device. Or drivers who seldom use their car can buy lower cost insurance that is more suited to their usage.

Location data plays a key role. **The location of the customer's phone is mapped to a postcode, which determines the risk level, enabling a competitive quotation to be provided.** Telematics data covering routes taken is recorded, which will allow pricing based on individuals' actual behaviour, rather than on averages, proxy metrics or demographics. Going forward, even more sophisticated analysis will enable increased pricing precision and narrow down risk margins. Factors to be considered will include the weather at the time and place of the quote and the correlation of telematics data with road speed limits, junctions and roundabouts.

[8] Ten fintech start-ups that are causing a stir in insurance, *Financial Times*, 3 Oct 2016.



Dating

Online dating has become mainstream - the UK online dating market is predicted to grow to £225m by 2019[9]. One challenge it faces, however, is bridging the void between the online world and the real world. With 71% of users reporting that they found other users had been misleading in their profiles, often misrepresenting their appearance[10], this void remains a barrier to adoption.

Major player Match.com has added a new location-based feature in its mobile app that bridges the gap by giving users awareness of other members they might have encountered in real life. The feature enables users to see with which other users they've crossed paths, based on selected matching criteria and location. For security, the feature requires opt-in and does not provide real-time data - the information is delayed by a few hours. It could be a shared journey, a favourite café or the same choice of shop, art gallery or music venue. By blending user profiles and location data, the service is made more relevant, helping people connect in a way that relates
to their own daily lives through shared experiences.

[9] Mintel, 2015.
[10] Mintel, 2015.

Cycle rental

The first major UK City cycle hire scheme started in London in 2010. Driven by the resurgence of interest in cycling and the health and convenience benefits, these services are now appearing in cities across the country. However, city cycle hire services are not as user friendly as they could be. Cyclists must find local parking racks and then walk to them to find out if a bike is available. A special payment card is required and on return, there may not be a vacant slot. Rides can be expensive for consumers due to the costly infrastructure required.

In China, a new generation of cycle rental schemes is emerging, delivering an entirely new customer experience. Companies such as Mobike and ofo are creating new business models based on the principles of the sharing economy. It is forecast that by the end of 2017, 8m to 10m of these innovative Internet bikes will be in use in China[11]. Using a mobile app, cyclists can locate the closest available bike and reserve it before collection. Once they find the bike they can unlock it and validate the ride by scanning a QR code on the bike. Payment is calculated once the bike is returned, based on time and distance. **A pedal-powered GPS tracker ensures that the bike can always be found, wherever it is left.** Prices are much lower than traditional cycle hire schemes as powered racks do not need to be constructed and cycles do not need to be redistributed at night.

[11] The 'Internet of bicycles' is China's latest export, *Financial Times*, 19th January 2017.

"It is not the strongest of the species that survives, nor the most intelligent that survives. It is the one that is the most adaptable to change."

Charles Darwin, Naturalist and Author

Transforming organisations

Highways England – Putting agility into roads management

Highways England North West Operations Directorate (HENWOD) found that its structures and processes for geospatial information management were not keeping up with the changing needs and wants of internal customers and stakeholders. Geospatial information was being created and managed in numerous mapping systems, which had the potential to cause confusion. Manager's presentations were limited to static images of operational metrics, reducing flexibility to interrogate the data. Requests for data or analysis often had to wait up to a month, in line with the monthly meeting schedule.

Adoption of a centralised, cloud based geospatial information management platform delivered HENWOD multiple benefits. ArcGIS online from Esri gives staff and managers the power to create the visualisations they need whenever and wherever they are, with benefits across the organisation:

Better investment decisions

Highways England needs to maximise the public value of schemes (such as drainage and revised junctions) by geographically aligning problem and solution, for example a proposed new safety measure should align with an accident hotspot. New schemes can now be visualised in the context of all the highways challenges faced, ensuring maximum return on investment.

Faster stakeholder engagement

Area Managers now have the facility to present geospatial information in meetings with Government, transport authorities and contractors. Area managers can now remotely access the geospatial information they need from partner offices, so they can answer questions in the moment (rather than having to create an action and wait for the next meeting) and therefore speed up project delivery.

Greater public engagement

A user-friendly map based interface allows people from non-technical backgrounds to view and understand planning information online. Work is underway to enable the public to access online maps just as easily as HENWOD staff in areas such as road traffic collisions.

Better time-based decision making

Work programmes are often rescheduled or delayed, but roadworks must be coordinated to avoid traffic disruption. **Time sequenced geospatial visualisations ensure that the possibility of conflicting local roadworks is avoided.** Decision makers can now plan more effectively and respond to changes more flexibly.

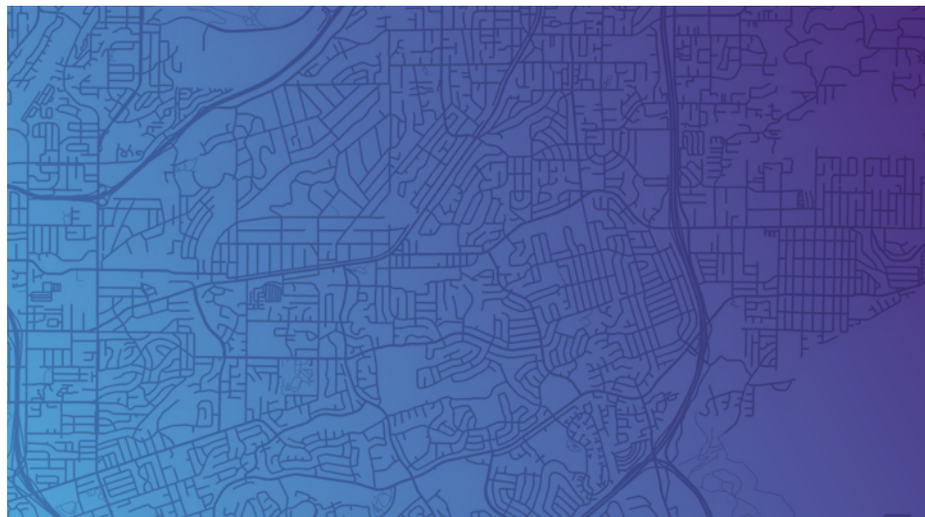
The result for HENWOD is a more agile organisation able to respond faster and meet the demands of customers and stakeholders, today and in the future.

Bracknell Forest Homes – transforming processes using geospatial tools

Bracknell Forest Homes is a housing association which owns and manages around 6,000 rented homes. Housing associations have traditionally used paper or digital maps to record property boundaries and ownership. But at Bracknell Forest Homes the full power of geospatial technology is being exploited to change business processes with improved outcomes for both the organisation and for tenants.

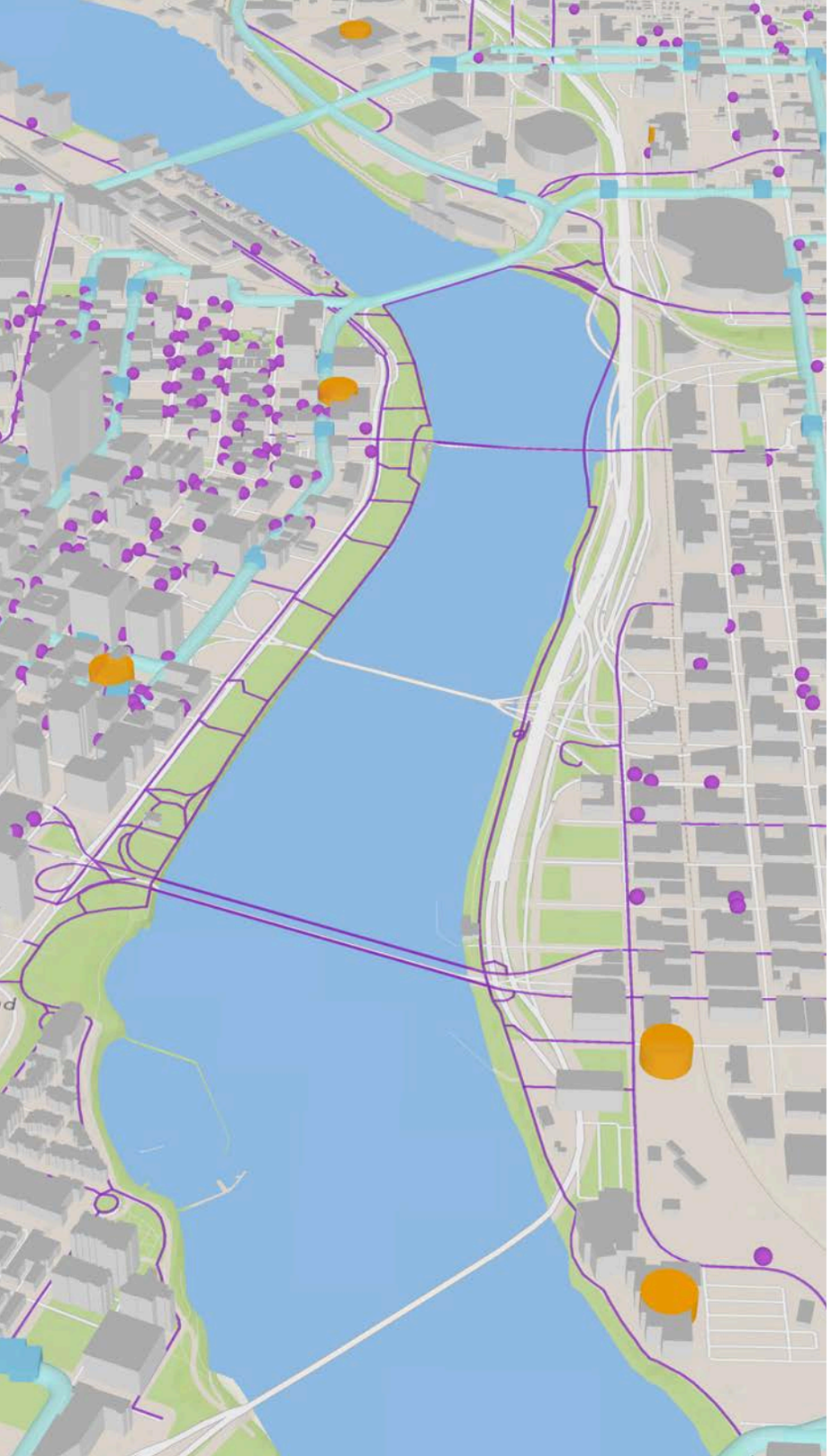
Reducing under occupancy

Making the best use of property assets requires minimising under-occupancy. Previously a manual method using paper and spreadsheets was employed to identify tenants potentially under occupying – but without visualisation, results were sub-optimal. Staff now use a survey app on a mobile device to gather tenants' property requirements. Potential under-occupiers are identified using spatial analytics on the survey data. **The whole system can be run by a single employee, with all the information needed assembled on a single screen.** The new process matches candidates to appropriate properties faster and more effectively. The system also reduces property conversion costs and means tenants are more likely to find an appropriate home.



Reducing tree risk

Bracknell Forest Homes is responsible for 10,000 trees. It is liable for any injury or loss of life caused by a falling tree and has a duty to spot the early signs of any disease that could spread beyond its jurisdiction. The old, paper-based, method of tree management was labour intensive and placed a strain on limited staff resources. Bracknell Forest Homes has introduced a new mobile app and completely redesigned the process. **Smart analytics are used to identify and prioritise areas for survey.** Survey data is captured live using mobile devices. Surveys are now accessible across the organisation, releasing the tree team from answering queries from other teams and freeing them to concentrate on higher value inspections activity. Not only has the risk from trees been reduced but also a cost saving of £50,000 per year been made. The entire management of the 10,000 trees can now be handled by just two members of staff.



Improving Customer Service

Geospatial tools have also been used improve the service to tenants and local residents. When a complaint is made about graffiti or fly tipping, an automated workflow is initiated that assigns field staff and provides them with job details and location. **Using a mobile app, the field team provide status updates and photos to the office.** Field staff can work more efficiently as fewer office visits are required and faster response times mean more satisfied customers.

"The airport of the future will be made more customer friendly, more environmentally friendly and safer, by unlocking the power of location information."

Vickie Withnell,
Group GIS Advisor, Manchester Airport Group

The shape of things to come

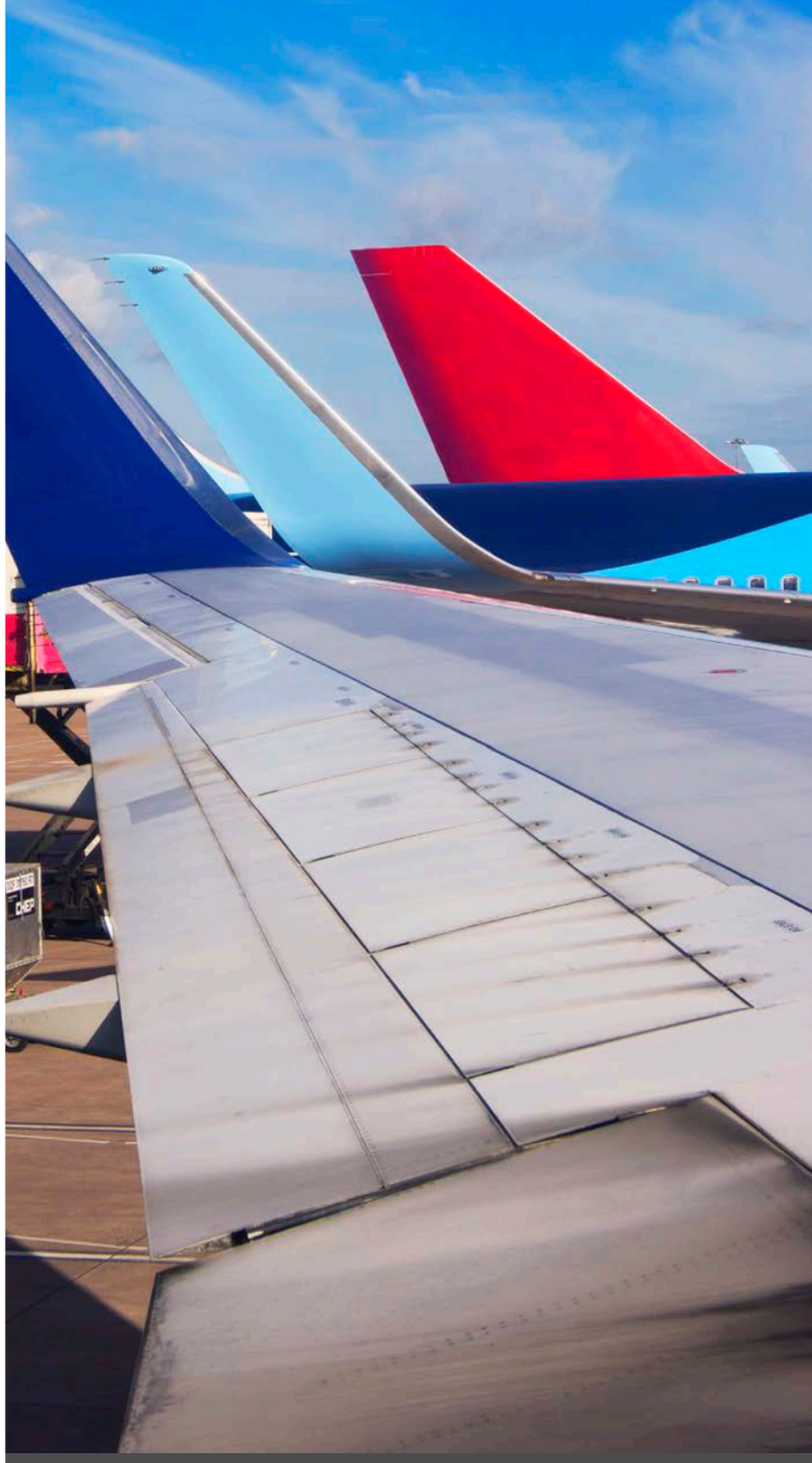
As we are just at the beginning of the fourth Industrial revolution, we can only speculate as to what coming decades will bring, but innovations such as the Internet of Things (IoT) indicate the direction of travel. The IoT is a network of devices, sensors and systems that work together autonomously, collecting and sharing data in pursuit of objectives set by the architects of the system. **It depends heavily on location information and technology**[12].

Manchester Airport Group (MAG), already a heavy user of GIS, has a bold vision for the role of geospatial information in airports. The customer experience will be transformed with faster, more convenient journeys and reduced likelihood of delay. Passengers will benefit from increased peace of mind, through better knowledge of what, where, when and how; whilst MAG will benefit from improved operational efficiency and reduced developmental impact.

[12] The Internet of Things – Why location matters, Esri UK, 2016.

Personalised information delivered to traveller's mobile devices (on an opt-in basis) will guide business travellers to a quiet space to make a call, provide shoppers with relevant and interesting promotions, or simply help gadget users find a charging point. A joined-up view of a passengers' complete journeys will allow MAG to optimise transport routes and minimise journey times. Extending beyond the flight itself this will include: road and rail connections to the airport; available parking spaces; timing of transfer buses; and optimisation of internal flows through arrivals and departures. Sensors that count passengers and track baggage will provide the information needed to manage flows, for example, by ensuring that sufficient check-in or customs desks are open.

The Manchester Transformation Programme, a major redevelopment of Manchester's Terminal 2 site, is putting the groundwork in place today. A central hub (or geodatabase) will contain the survey data and commercial data needed to run the airport. **The hub will provide a self-service GIS facility for staff who will be able to create views and access data whenever needed.**



Technological innovation will transform many other sectors, for example parcel deliveries. Amazon made its first commercial delivery by drone in Cambridgeshire in December 2016[13]. The service is currently a trial and there are many hurdles to be overcome before mass deployment. But in smaller scale applications, drones are delivering real value now. Where geospatial data cannot be sourced for an application, organisations will increasingly create their own data for their own purposes. **New image processing techniques enable raw images captured using drones, laser scanners and other sensors to be turned into valuable information products that help an enterprise to run**. Applications include:

- Creation of 3D models of buildings for facilities management.
- Inspections of difficult to access assets such as wind turbines and power lines.
- Capture and attribution of highways, buildings and street furniture for asset management.

[13] http://www.bbc.co.uk/news/technology-38320067

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To discover more about how the power of location can be used to transform your organisation or even your industry, contact Esri UK.

About Esri UK

Esri is the global market leader in geographic information systems (GIS), offering the most powerful mapping and spatial analytics technology. Since 1969, Esri has helped customers unlock the full potential of data to improve operational and business results. Today, Esri software is deployed in more than 350,000 organisations including the world's largest cities, national governments, 75% of the Fortune 500, as well as colleges and universities around the world.

Esri UK's team of experienced professional services consultants have delivered hundreds of projects, deploying the most advanced solutions for digital transformation, IoT and location analytics. To learn more about our products, services and customers visit **www.esriuk.com/about**.

Esri UK supports Digital Transformation projects with expertise and resources in:

- Data management
- Spatial analysis
- Collaborative working
- Real-time decision making

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