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Bringing logistics into the future

In recent years, the Internet of Things (IoT) has begun to expand into every corner of our lives, with applications ranging from remote monitoring, Smart cities and grids, connected cars and wearable technologies, to name just a few. Asset tracking is one of the simplest IoT applications, and yet the field is still growing in leaps and bounds thanks to new takes on established ideas, and new market sectors becoming a possibility as connectivity costs fall. One of the greatest sectors of growth right now is logistics, particularly in the commercial goods sector. Here, Satellite Evolution takes a look at new developments in the field, and how it might develop into the future.

The Internet of Things (IoT) is still a new idea to much of the general population, even in developed countries. Despite this, its use is already well-established in the commercial and industrial sectors alike, as those at the forefront of innovation have recognised its potential. Today, the IoT is gaining momentum throughout many areas of our lives, be it things we can experience ourselves, such as Smart homes and wearable technologies, to the things we don't see, but still benefit from, such as commercial goods deliveries.

Today, many of us will have shopped online. It's convenient, often cheaper, and you can do it at a time and place that suits you. The only problem from a consumer perspective is the delivery step. With the massive number of commercial parcels travelling around the world each day, a percentage is likely to get lost or damaged en route. In addition, most of us will be familiar with the dreaded 'We tried to deliver a parcel, but you were out' card, followed by the stress of trying to arrange redelivery or a collection from

a sorting office that may well be miles away.

For companies active in the delivery sector, the IoT can optimise operations, improve business processes, reduce costs, increase productivity, and gain insight into future actions. "It's about giving enterprises the ability to see into every corner of their operation. It's letting them know where every asset is, and what it's doing," said Wayne Harper, Senior Technical Director of the APAC region for Zebra Technologies, a prominent IoT solutions company.

In their 'Internet of Things in Logistics' report in 2015, DHL and Cisco Consulting Services forecast that the IoT will generate US\$8 trillion in revenue in the next decade, including US\$1.9 trillion in supply chain and logistics. According to DHL, connected pallets and items will be a driver for smarter inventory management, tracking and tracing goods will become more accurate, predictive and secure, while connected fleet analytics will help predict asset failure and schedule maintenance checks automatically. In addition,



connecting delivery personnel with surrounding vehicles can enable the monetisation and optimisation of the return trip, improving efficiency and service in last mile delivery.

“For any organisation with a supply chain or logistics operations, the IoT will have game-changing consequences, from creating more ‘last mile’ delivery options for customers, to more efficient warehousing operations and freight transportation,” commented DHL.

Streamlining delivery logistics

One of the key areas in commercial package delivery where the IoT comes into play is the transportation from sorting house to local delivery centre. The top priorities, such as transporting a package as quickly and efficiently as possible, and preventing loss, theft or damage, can all be managed with the IoT. Accordingly, major players in Europe and the USA are opting in to new technologies to enhance their operations.

In February 2016, parcel delivery company Hermes invested in more than 20,000 TC75 hand-held scanners from Zebra Technologies to equip its local courier network and myHermes ParcelShops in the UK. The 4G TC75 devices feature a built-in camera and improved GPS functionality, allowing geo-fencing technology to provide pinpoint accuracy, meaning parcels are satellite-tracked to the customer’s door. The new scanners will provide greater visibility during delivery progress, assisting Hermes to move towards its goal of 100 percent first-time delivery success.

“Our aim is to achieve 100 percent first-time delivery success as well as industry-leading customer choice and convenience. We continually place innovation at the heart of our business, and this substantial investment equips us with the capability to add premium features such as ETA to a standard product. This strengthens Hermes’ positioning in the UK delivery industry as the market leader in innovating and changing the face of standard delivery at standard process,” said Carole Woodhead, CEO of Hermes.

Meanwhile, in July 2016, parcel carrier DPD automated its parcel shops’ processes to meet the increasing workload created from the growth of e-commerce. DPD integrated Zebra’s TC55 touch computers and GK420D printers to track and trace every package in real-time, and relay the data back to the main database centre in Austria. Since partnering with Zebra, DPD has doubled the number of partner parcel shops throughout Austria.

Solving the ‘while you were out’ conundrum

In addition to providing a boost to the logistics sector, the rise of e-commerce has also created demand for new delivery technologies. With the convenience of online shopping comes the inconvenience of waiting in for the delivery, or else picking up packages from depots that may well be miles away. In some cases, packages are left in unsecured locations, providing opportunities for theft, or damage in poor weather. Connected lockers and mailboxes have been lauded as the answer for online shoppers everywhere, since they provide security and convenience.

In March 2016, Cleveron introduced PackRobot, a Smart locker system with adjustable internal climate controls that make it ideal for storing temperature-sensitive parcels, such as food or medical equipment, as well as standard packages.

A delivery person can deposit a packet using the single port, and PackRobot measures the dimensions and uses a patented 3D lift system to configure the optimal locker slot for storage, adjusting the height of internal shelves to fit more in. This enables more efficient use of space than other Smart lockers on the market today. Once the parcel is deposited, a message is sent to the recipient to alert them. Upon collection, PackRobot releases the item through the same port it was deposited with, by-passing the time spent searching for the right number locker. 10 PackRobot units are currently being trialled in Viljandi and Tartu, both in Estonia. A second stage pilot project is planned later, designed on the basis of the first trials.

Later, in August 2016, Deutsche Telekom launched PaketButler, ‘A connected parcel mailbox that accepts parcels when no one is home.’ PaketButler is a tear-resistant fabric box with a PIN-locked cover, and a strap that is secured between the door and its frame to prevent theft. During use, a delivery person enters the PIN to open the bag and deposit that parcel, locking it after. When the process is complete, the system sends a text message to the owner of the parcel. PaketButler is equipped with a SIM card so that the owner can manage the device via iOS or Android Smart phone.

Next-generation parcel delivery

In the last couple of years, we’ve been hearing a lot about driverless vehicles and connected cars. Surpassing the potential for the consumer market are the possibilities within the logistics sector. With so many delivery vehicles on the roads each day, driver-free vehicles would provide increased operational efficiency, cost savings, fuel reductions and lower wages. Accordingly, several companies are exploring the possibilities, including Amazon and Mercedes-Benz.

Amazon is currently developing Prime Air, which was first announced in 2013 by Amazon boss Jeff Bezos. The ultimate goal of Prime Air is to enable the delivery of parcels to consumers, via an automated drone, in less than 30 minutes. However, deliveries would be limited to locations that are within a 30-minute radius of an Amazon distribution centre; currently, Amazon estimates that this will include just 2.3 million households. The drones are expected to weigh less than 55lb, fly lower than 400 feet, and safely carry packages up to 5lb, beyond line of sight, with distances in excess of 10 miles. Amazon has drone testing facilities in the USA, the UK, Austria and Israel.

There has been some debate about the project’s viability in the USA, since the Federal Aviation Administration (FAA) requires all drones to stay in line of sight of their operator at all times, while new rules stipulate that commercial drone operators must have a ‘remote pilot certificate’ from an FAA-recognised test centre. However, in September 2016, agricultural drones manufacturer PrecisionHawk was granted FAA permission to fly beyond operator line of sight using a ‘low altitude traffic and airspace safety system’ (LATAS) to avoid other air traffic and obstacles, paving the way for Prime Air to potentially one day be approved by the FAA.

The outlook is more immediately promising in the UK, where, in July 2016, Amazon was granted permission from the Civil Aviation Authority (CAA) to test its drones without being bound to the normal rules that govern most remote controlled aircraft. Sightings of prototype tests have been

reported in Cambridgeshire in September 2016.

Meanwhile, in September 2016, Mercedes-Benz announced a US\$562 million, five-year plan to develop 75kW electric vans with automated drones for parcel delivery applications. When nearby a delivery location, the driver can manually deliver one package, while the cloud-connected 'Vision Van' can release two drones through the roof to make automatic deliveries at nearby locations.

The Vision Van is being developed under Mercedes-Benz's new 'adVANce initiative, and will be assisted by the company's recent investment in commercial drone manufacturer Matternet. The Matternet M2 drones can be loaded by a robotic system inside the van, and be programmed to carry packages up to 4.4lb up to 12 miles, and are capable of charging their own batteries.

According to Mercedes-Benz, the Vision Van system will eliminate the time spent by drivers rearranging packages during rounds, currently estimated at 10 times per round. Additionally, an interconnected cargo space system loads the van in one go, reducing loading times and the time spent in distribution centres. Indeed, the company believes that the Vision Van could improve delivery efficiency by up to 50 percent. The Vision Van is currently in the concept phase, and is expected to go on sale by the end of this decade.

"It is the first van worldwide to fully digitally connect all people and processes involved, from the distribution centre to the consignee," said Volker Mornhinweg, Head of Mercedes-Benz Vans. "This makes the deliverer's job easier, reduces the delivery time and offers end customers new opportunities such as same-day delivery at an agreed time. Demand for same-day delivery or delivery within an hour is increasing rapidly. At the same time, more and more people are living in cities - by 2030, urban areas will be home to more than two thirds of the world's population. It is clear that the rising transportation requirements will need to be met even faster and more efficiently in future and, above all, in an environmentally friendly way."

Augmented reality – more than fun and games

Anyone in the technology sector has read a lot about augmented reality in recent months, as the blockbuster success of the Smart phone game, Pokémon Go, has set tongues wagging around the world. However, there's a lot more to augmented reality than fun and games.

The augmented and virtual reality markets are expected to be the 'next big thing' after Smart phones, and are forecast to produce US\$80 billion in revenues by 2025. In the last two years, 225 venture capital investments worth US\$3.5 billion were made. In the medical field, a near-infrared vein finder can scan a patient's veins and project the image into the skin, while in the automotive industry, augmented reality is used to compare calculated and actual crash test imagery. In the consumer arena, the Google Translate app uses augmented reality to translate texts and overlay them on the screen. Today, manufacturers are testing augmented reality for the logistics sector.

In August 2016, DHL Supply Chain announced that it was rolling out the latest phase in its 'Vision Picking Programme' following the successful trial of augmented reality technology in the Netherlands. DHL Supply Chain has now partnered with Google, Vuzix and Ubimax to refine the solution and is

expanding the programme into new industry sectors on a global scale. In a warehouse in Columbus, the US Vision Picking pilot is being utilised for single picking, cluster picking and retail store order picking. Warehouse pickers use Smart glasses, which show where each picked item must be placed on a trolley, enabling faster free order picking and reduced error rates.

"We are excited to further test and develop vision picking as a solution that can be readily available to our customers. More importantly, this technology is not just one step towards digitalising manual processes on the shop floor, it also takes us one step closer towards Industry 4.0. Testing technologies like augmented reality, robotics and IoT will continue to be a big part of our DNA," said John Gilbert, CEO of DHL Supply Chain.

The Smart glasses will be trialled throughout the retail, consumer, automotive and technology industries over the rest of the year prior to broader implementation. In addition to improving the picking process, the trials have been shown to reduce training time for new and seasonal staff, reduce error rates, and increase overall employee satisfaction.

Growing investment, expanding opportunities

Clearly, the IoT is already playing an important role in the delivery market, with innovators like Hermes and DPD jumping on board to take advantage of the available efficiency gains. Heavy investments in new IoT applications from Amazon, Google, Walmart, DHL and Mercedes-Benz, to name just a few, evidence the industry-wide belief in the benefits of the IoT within the delivery and logistics sectors.

Interest in IoT applications for the logistics field isn't limited to terrestrial companies either. Satellite operators, pre-existing and start-ups alike, are planning new constellations specifically for IoT applications. Kepler Communications, for example, plans to launch a constellation of nano-satellites, starting in 2017, to serve the M2M and IoT sectors. The company has highlighted the growing needs of the logistics industry, which sees more than 50 million parcels shipped every day, as one of its target markets.

In the coming years, we can certainly expect to see the wider population gain more awareness of the IoT and the benefits it can bring us all. At the same time, companies across the globe are likely to continue to develop new IoT applications for both pre-existing and new niche markets as connectivity becomes more affordable and ubiquitous. 🌐



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