Mapping for Mercedes

A new system using Bluetooth on smartphones is helping Mercedes-Benz to track cars at its Tuscaloosa plant, as well as assisting numerous dealerships. Lem Bingley reports

In June this year, Mercedes-Benz US International (MBUSI) announced the outcome of its inaugural Innovation Challenge, a competition for start-ups which promised $50,000 in prize money as well as the alluring prospect of a contract with Mercedes-Benz in the US, and perhaps also its global parent, Daimler AG.

Not entirely philanthropic, the contest was also designed to connect the carmaker with agile start-ups offering new approaches to what it terms ‘critical challenges’ in production flow management, Big data and digital communications.

“One of the things we wanted to get out of this was to see some of those outside-the-box ideas that we wouldn’t traditionally do on our own,” Jason Hoff, president and CEO of MBUSI, said of the initiative.

One of two winners chosen this summer was AutoMap, a technology business based in Hillsboro, Oregon. It has created a wireless product for tracking inventory on car dealers’ sites.

“Our фло, vice-president of business development at AutoMap. “The entire conference, from what I heard, was people complaining about transparency – not knowing where vehicles were and dealing with inconsistencies. I said to myself: this is what AutoMap was made for.”

Locating the assets
AutoMap’s technology was developed to determine exactly where particular cars are located, with an exceptionally low tolerance for error. “We were approached by a bank that wanted to be able to securely audit dealers that had borrowed money to purchase vehicles,” Sargeant says. The AutoMap team had already worked with RFID tracking but knew this technology would not meet the bank’s exacting requirements.

“They say RFID can be secure, with tamper-proof tags, but I haven’t found a determined dealer that couldn’t spoof the system,” Sargeant explains. “We’ve seen a salesperson remove an RFID tag, hang it on a free branch, and hide the car, because they want that sale and don’t want any of their co-workers finding the car.”

What AutoMap developed instead was a module that plugs directly into the car’s OBD (onboard diagnostic port, using low-power Bluetooth technology to securely broadcast key data about the vehicle, including its VIN. The signal can be picked up by the Bluetooth receiver of a smartphone whenever it comes within a few yards. Since information flows only in one direction, from module to smartphone, there is no need to establish a Bluetooth pairing beforehand, allowing the smartphone to pick up data from an unlimited number of modules as the phone’s user moves around a large parking lot or marshalling yard. The signal is encrypted for security, making the data inaccessible to unauthorised users; and the data is unscrambled not within the handheld itself, but by the system’s cloud-based server software. A smartphone app simply picks up the Bluetooth digital message and forwards it via its mobile or wi-fi data connection.

Once the back-end system has unlocked the encrypted data, the smartphone can present further information to authorised users about the status and location of particular vehicles. Desktop or laptop computers can also securely access information via the system’s online management software. When every car in a lot is fitted with its own OBD module and every worker in the yard receives signals as they move about, the back-end system is able to build and maintain an accurate location map of where every car is parked. Whenever a car is moved by a team member carrying their smartphone, the changing position will be automatically registered in real time. And even if, for some reason, a smartphone is not present when a car moves, the change in position will be picked up the moment that plug is again within detection range.

“The entire approach makes it simple to accurately specify precise location even in the absence of formal streets. It’s much greater simplicity than using longitude and latitude coordinates,” Sargeant says. “The three English words chart, punk, reform”, for example, pinpoint the south side of Nelson’s Column in the middle of London, England. The approach makes it simple to accurately specify destinations using text or voice input.

Just a year after its selection, the What3words system began to be rolled out as part of the new MBUSI infotainment system fitted to the latest generation of Mercedes-Benz cars. The pace of adoption underscores the scheme’s aims of rapidly fostering innovation.

For more on What3words, see the January-March 2018 edition of Automotive Logistics or visit https://automotivelogistics.media/intelligence/133782.

The prize money in Mercedes-Benz US International’s inaugural Innovation Challenge, which attracted 100 applications, was $50k, with the other winner being a start-up offering drone-based aerial inventory tracking and recording.

The Innovation Challenge was staged in partnership with Startup Autobahn, a larger scheme to support innovation, which was established by Daimler in May 2018. It aims to accelerate promising start-ups with working space and resources, as well as access to potential customers, investors, mentors, universities and government agencies.

Among the notable winners to date is What3words, selected as one of Startup Autobahn’s second wave of innovators in February 2017. What3words has divided the entire globe into 57 trillion squares measuring three metres square, and has given each square a unique three-word address, translated into various languages.

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someone else’s phone passes within range.

“It’s like crowd-sourcing,” Sargeant says. “Every time you move a car, not only is the car you’re moving updated, but the location of every car you pass by is registered – either reaffirming its position or updating it. If it’s been moved in the absence of a phone, if you’ve got 30 people running around your lot moving cars, you’re going to see every car many times every day. The data collected is both secure enough and reliable enough to meet the original business case of the bank’s collateral audit. “We partnered with Ally Bank here in the US,” Sargeant says. “We went through all their security inquiries and testing procedures. Our device ensures that the signals come from legitimate cars, not from an emulator or anything else that might be spoofing the system.”

The largest dealer to adopt AutoMap so far has about 4,000 cars on its lot, Sargeant says. “The bank used to send six auditors for four days to make sure
Mark Sargeant, couldn't spoof the a determined but I haven't found

They touched every car. Now they send one auditor for half a day, to take care of any exceptions.”

The biggest issue faced by the many operators of finished vehicle yards is managing complexity, says Paul Nurse, CEO of ProAct International, a company that provides a suite of yard management software systems to the finished vehicle industry. “There’s what all these sites are about: multiple tasks, multiple vehicles, different types of models, whether they’re hybrid, diesel, electric, or whatever, and all the different processes they may potentially go through,” he says.

Efficient decision-making is, therefore, a vital task for yard management systems, Nurse stresses. “We know from the VIN how a vehicle has certain characteristics, where it’s going, where it comes from and a whole bunch of other attributes,” he says. “Based on those things, we know it needs to go down a particular process, but that’s not static, because you can get some way down the process and something happens — damage, as a simple example. Then the system has to re-evaluate and re-plan.”

On top of these process requirements are other operational factors, such as high-priority vehicles that need to jump queues; resource and personal constraints; and overall efficiency. Ruggedised handheld devices are typically used to tell drivers in the yard what to do, whereas the system has to re-evaluate and re-plan. “That end-to-end scenario remains just a vision for now, but the ability to accurately track vehicles from factory to customer, seamlessly and without human error, is a capability that adds such value it must surely emerge soon by one means or another.”

Above left: WhatCoviers’ location system is now part of the MBUSI enforcement system fitted to the latest generation of Mercedes-Benz cars

Above right: ProAct’s handheld devices move towards made-to-order, autonomous cars, which will be able to move themselves around a marshalling yard under direct software supervision and perhaps, ultimately, drive straight from the factory to the customer without human intervention. That should eliminate the kind of human errors that creep into today’s processes, and is likely to alter finished vehicle logistics beyond all recognition.

Taking advantage of telematics

... Our vision is to have the transport companies use our system as well, tracking cars as they leave the site all the way through to the dealership, where the system can be used on the lot Mark Sargeant, AutoMap

Taking advantage of telematics

“Most [telematics] information today is targeted at the consumer end of the process. What we’re pushing for — and what the industry is realising — is that a lot of that information is important from a supply chain perspective.”

Taking advantage of telematics

Puzzles are a determining factor for efficiency. “They’re always looking for efficiencies,” Nurse notes. “One of the things that’s going to change all that is the use of telematics from the vehicles themselves.”

Gaining insights directly from the cars will alter many of the tasks that are automatically scheduled today. “For example, it will be able to charge a car’s battery every 30 days,” Nurse says. “In the future, the vehicle’s itself will be able to say what they have a problem and notify us through telematics — whether it’s a low battery or low fuel, or whatever it might be. Then we can schedule action. So a lot of the triggers they touched every car. Now they send one auditor... they touched every car. Now they send one auditor for half a day, to take care of any exceptions.”

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