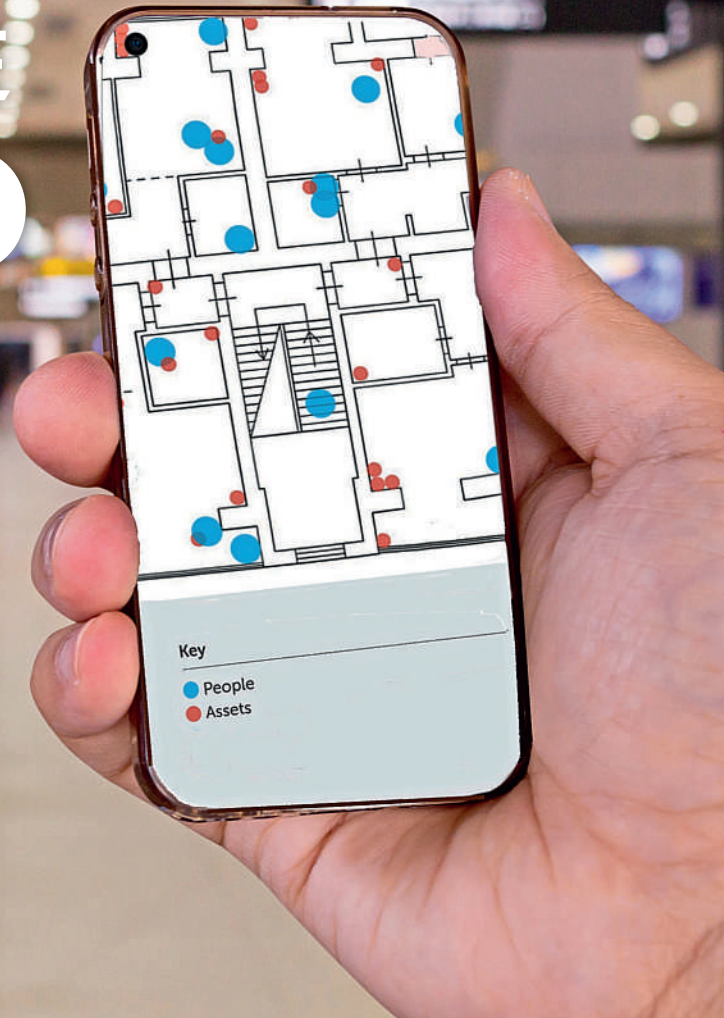# NAVIGATING THE NAVENIO WAY

WHAT'S THE SECRET FOR A HIGHLY-SCALABLE, INFRASTRUCTURE-FREE B2B INDOOR MAPPING AND LOCATION-FINDING PLATFORM? NAVENIO BELIEVES IT HAS THE ANSWER. AND SO DO ITS BACKERS, WHO HAVE INVESTED MORE THAN £22 MILLION IN THE OXFORD UNIVERSITY SPIN-OUT. GEOCONNEXION SPOKE TO **ANDREW LOVELESS**, CHIEF REVENUE OFFICER AT NAVENIO, TO FIND OUT MORE

GEO: The idea of an indoor location platform that works without dedicated RTLS infrastructure has been around for years. How has Navenio managed to translate the idea into practice since its founding in 2015?

Andrew Loveless: The work was pioneered by a team led by our Founder and CTO, Professor Niki Trigoni, at the University of Oxford's Department of Computer Science. Their research into the localisation problem in GPS-denied environments led to the development of robust sensor fusion methods that only rely on smartphone sensor data. Further innovations within Navenio's team have made it possible to set up a venue for localisation and maintain it with minimal effort.

The team, now numbering some 80 individuals, can deploy at scale a flexibly-priced SaaS solution, accurate to within a few metres.

GEO: This is obviously a departure from the way developers have traditionally addressed indoor location.

Andrew Loveless: Indeed. Where developers have tended to place an infrastructure-heavy emphasis on their proofs of concept, they may get good data, but scaling-up across multiple buildings entails huge investment. At Navenio, we've eliminated this barrier using some clever software, patents and tools that are now in everyone's pocket.

GEO: Sounds good. But how does the platform map-out its surroundings in the first place?

Andrew Loveless: Again, using a smartphone as a simple data capture device, the Navenio platform is initially used to detect existing signals within a building and process them to generate comprehensive signal maps of the environment in a crowdsourced manner. If the signal map changes over time, the Navenio platform identifies and remembers those changes. And as such changes can be frequent, this automated signal mapping is one way of ensuring an up-to-date map is always available.

This capability is a powerful way of maintaining the map removing the need for resurveying. Another unique capability of our technology is that it can work flexibly with or without indoor floorplan information. Thus, it enables our customers to offer a seamless location system in larger complex venues with multiple buildings even if we don't have floorplans for some of them. In the absence of a physical
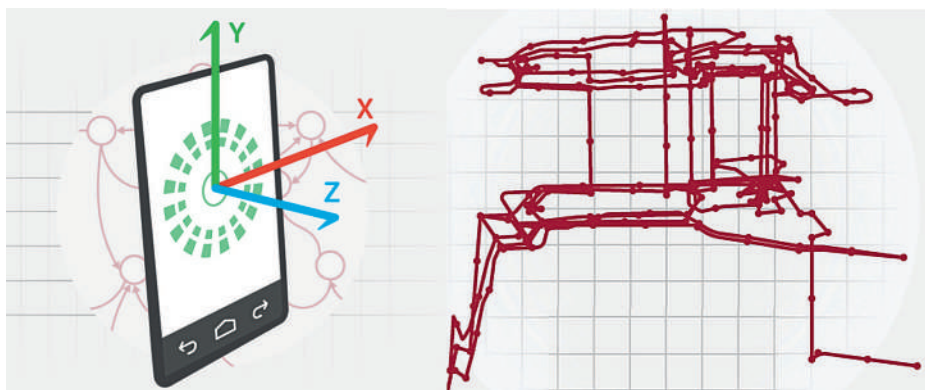
Using a mix of smartphone sensor inputs, a 3D 'experience' map (right) is generated

map, we place the blue dot on 'experience' maps from crowdsourced user data.

GEO: How long does this preliminary survey take?

Andrew Loveless: A typical site can be surveyed and completed within a matter of days, many of our clients crowdsource the collection via their workforce as they go about their daily activities. Effectively a zero-cost survey when compared to other infrastructure based solutions. In those venues where the customer would like to leverage location information to optimise their workflows, we offer a location-aware work efficiency system tailored to the customer's work patterns. With some input from the customer about their task types and priorities, we tailor our solution to their requirements, and then offer rapid multi-site rollouts as required.

GEO: The mass-market potential of this innovation has drawn significant funding from Oxford Science Enterprises, as well as Innovate UK and private investors at home and abroad. What is the perceived size of this marketplace and where are you concentrating your initial effort?

Andrew Loveless: While the potential is huge – one estimate points to a global Indoor location market worth £17 billion by 2026[1] – our current effort is focussed on addressing a number of sectors: healthcare, retail, hospitality, geospatial and smart cities, both in the UK and in the United States, Asia and Australia. As part of this move, Connie Moser joined us earlier this year as CEO to lead our global expansion and, with over 30 years healthcare experience, is well placed to address the challenges of the States, the largest health economy in the world.

Also, the Health Secretary Thérèse Coffey announced her four-step plan to fix the ailing NHS, with an 'ABCD' list of priorities. This promises to place ambulances, backlogs, care, doctors and dentists at the top of the UK's health agenda, as health systems try to get back to capacity post-pandemic. With this in mind, we know that Navenio's technology can support these goals through helping to make teams more efficient, giving them back more time to care.
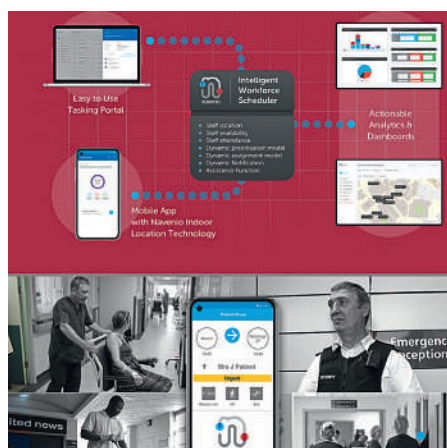
In the healthcare sector, Navenio's Intelligent Workforce Solution can deliver significant productivity and efficiency gains in tasks such as portering, catering, cleaning and security.

Other interesting sectors include logistics, retail and virtual warehouses as they typically lack dedicated RTLS infrastructures, as do oil, gas and nuclear plants and where safety and knowing the location of the workforce is critical. To address these and other markets, we are currently recruiting and strengthening our sales force on both sides of the Atlantic.

GEO: How is Navenio tailoring its platform to meet the day-to-day needs of organisations?

Andrew Loveless: Navenio supports clients in a number of ways. Configuration of business rules, priorities and permissions allows for automatic task allocation removing the need for a help desk which can often be a bottleneck. With the Navenio SDK, developers can adapt the software and business rules to suit a variety of applications.

We have employed this approach in our Intelligent Workforce Solution (IWS) which works on the basis of getting the right person or asset to the right place at the right time. For an organisation such as the NHS, it removes a lot of the blockages and wastage and raises the level of patient care and patient throughput – a major consideration at a time when resources are finite and services stretched.

GEO: Clearly, IWS confers significant operational benefits. Can you elaborate on this?

Andrew Loveless: Based on user feedback, we find IWS is delivering a 100% improvement in workforce productivity and, in many instances, eliminating the need for a manual Help Desk. It has helped increase capacity by 30% and response times by 40%. Furthermore, by analysing and modelling how tasks are assigned and closed-off, Navenio brings powerful Business Intelligence to bear in optimising these improvements.

The business impact is easy to assess in NHS departments such as radiology and, where having the right staff on hand as and when needed, optimises the use of expensive equipment. This ensures that more people can be treated and/or discharged and, as such, makes it possible to calculate the RoI.

GEO: What management tools are provided to monitor and assess how the platform is delivering on its promise?

Andrew Loveless: An easy-to-use web-based Tasking Portal can be set up to automate the prioritisation and assignment of tasks to staff members via the Navenio smartphone app. Dashboards for analytics allow managers to gain deep insight into what has happened, where workflow can be improved, and how risks can be reduced.

GEO: Navenio has recently entered a partnership whereby HERE's Indoor Map-as-a-Service offering will be combined with the Navenio platform and NavViz point cloud and visual positioning technology. Can you say more about this?

Andrew Loveless: The move will offer a one-stop shop for those seeking enterprise-grade secure asset tracking and indoor mapping solutions in complex settings.

GEO: Looking ahead, what can we see in the Navenio pipeline?

Andrew Loveless: The next step in terms of product development is to further modularise our services and products in order to offer flexible points of integration to cater for diverse customer needs. At the same time, we will continue to improve our self-serve tools that clients can use to set up our solutions and tailor them to their environment. In terms of technology, it is in Navenio's culture to continuously innovate introducing new sensor modalities, devices and algorithms to expand the reach and robustness of our location solutions to existing and new sectors. And, of course, we will continue to prioritise top-tier support for customers and third-party developers.

[1] Indoor Location Market report from MarketsandMarkets, Aug 2021