

Y&H Workforce Challenge

About the challenge

To deliver the LTP and Interim People Plan we need to make the best use of our skills and resources - including new types of roles, richer skills mixes and harnessing new innovations and technology to release time for patient care.

We have great relationships with a range of regional and national stakeholders in healthcare, academia, the third sector and industry that we have successfully brought together to meet specific workforce challenges.

'There is remarkable potential for digital healthcare technologies to improve accuracy of diagnoses and treatments, the efficiency of care, and workflow for healthcare professionals, but implementation must only be carried out when there has been robust clinical validation' **The Topol Review: Preparing the healthcare workforce to deliver the digital future**

How can innovation help?

Opportunities offered by innovation include:

- Digital technology in primary care matching activity with resources
- Models for transforming the way we think about workforce and roles
- Systems that contribute to reduced absenteeism, staff turnover and presenteeism
- Agile ways of working and using digital technologies efficiently

We are seeking to identify a wide range of innovations in addition to the above that can support health and social care systems in transforming our workforce to deliver the needs of our patients and staff in the long term

Submission questions

- Name
- Featured image; so Navenio branding
- Featured video; optional
- Overview

- About your project/product
- Resources; you can attach documents
- Topic; there is a list of options; like a hashtag option for people searching
- Category:
 - Digitalising the system
 - Greater support and resource for primary care
 - Improving system flow
 - Independence and prevention
 - Operational excellence
 - Patient activation and self-care
 - Patient safety and quality improvement
 - Workforce resource optimisation

When adding details of your innovation, please ensure that you include information in relation to the following points:

- The problem that your innovation is trying to address.
- How your innovation has been evaluated.
- The evidence for clinical effectiveness and cost savings to the NHS.
- The likely impact of your innovation in terms of patient impact and health economy impact.
- How easy (or difficult) your innovation will be to implement.
- What you can do to support the implementation process.

Navenio submission

Overview

The Topol Review; “preparing the healthcare workforce to deliver the digital future”, focuses on the potential for digital healthcare technologies to help improve the efficiency of care, and workflow for healthcare professionals. More recently following the challenges all healthcare organisations have faced with the COVID-19 pandemic it has never been more relevant that new models are considered for transforming the way we think about workforce and roles. New innovations and technology need consideration that promote more agile ways of working and help release time for patient care.

Many have tried to change the way clinical teams work to be more efficient; but few have focused on optimising the supporting teams that provide the logistics which underpin the flow of patients throughout the hospital.

Navenio has done just that. By looking at the teams working within a hospital, they have proven that knowing where people are, indoors in real-time, unlocks significant improvements in their workflow and efficiency.

This in turn helps to improve patient flow and release time for patient care.

Much like the logistics industry, which has dramatically cut delivery times using GPS location data. Unfortunately, GPS doesn't work indoors - whereas most of the staff in a typical hospital do, so a different solution is required.

Navenio has pioneered frictionless, accurate and robust indoor location solutions, built on award-winning science from the University of Oxford – enabled simply using sensors in existing smartphones. Unlike other RTLS, RFID, Bluetooth and Wi-Fi solutions, the Navenio technology requires no new investment in infrastructure at all; is easily scalable and accurate to within 1 to 3 metres.



The Navenio solution is available in three forms:

- Intelligent Workforce Solution (IWS)
 - automates the prioritisation and allocation of tasks to ensure the right person is helping in the right location every time
- Location only solution
 - provides details of current and past movements of staff via their smartphones
- as a fully integrated location solution that feeds into other clinical/non-clinical solutions/applications
 - can provide valuable data to aid and improve patient consultations, discharge and referrals; and provide confirmation of where a staff member at infection risk has travelled between over a period of time

About your product/project

Intelligent Workforce Solution

Navenio's IWS is a tasking solution that allows tasks to be entered by wards/depts via a portal page as shown in the screenshot below. The solution then automatically prioritises tasks to ensure that most important tasks across the organisation are dealt with first, and then uses location data to assign those tasks to the nearest appropriately skilled resource to ensure tasks are actioned and completed as quickly as possible. Navenio provides insight about the status of tasks, likely start and completion times and the causes for any delays, enabling highly accurate resource and policy planning. The solution is highly flexible and customisable.

The screenshot shows the 'Porter tasking' interface. On the left is a navigation menu with categories: 'Tasks' (Add Task, Task list, Cancelled task list, Recurring Task List, Return Patients List), 'Administration' (Edit task metrics, Activity logs, Porters, Dashboard, Diagnostic, Scheduler status, Last known positions, Live tracking), and 'Navenio' (Support). The main content area is titled 'What do you need help with?' and contains several sections: 'Type*' (Blood Samples) and 'Urgency*' (Routine); 'When does this need to be done?' (Schedule*: ASAP); 'Items to be moved*' table with columns for item name and quantity; 'From' and 'To' location and contact name fields; and 'Any other details?' (More info...).

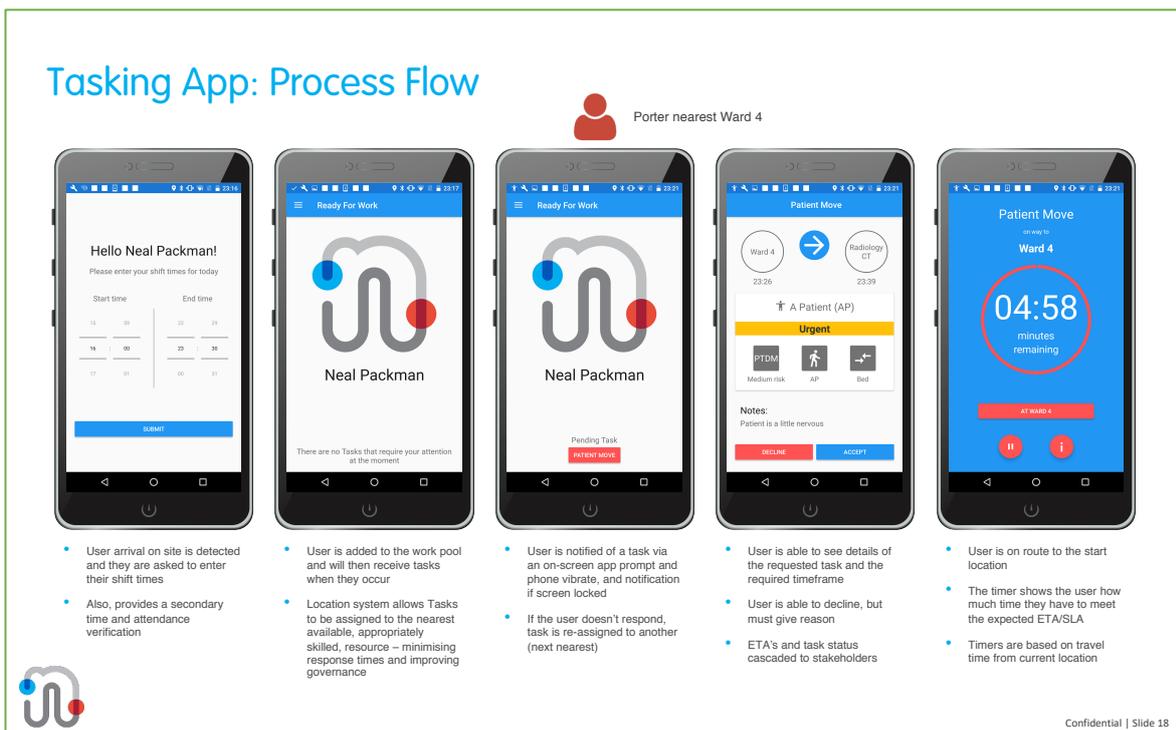
Items to be moved*		Quantity
Blood		<input type="text"/>
Sample		<input type="text"/>

From	To
Location*	Location*
<input type="text"/>	Pathology
Contact name*	Contact name*
<input type="text"/>	<input type="text"/>

- Wards and depts access the Navenio tasking system via a secure shortcut in their Google Chrome Browser
- Here they are taken to the 'Add Task' screen from which they are able to request assistance for a range of task types
- All relevant task details can be added quickly and simply. Fields are pre-populated wherever possible to minimise data entry

- Tasks can be booked to happen ASAP or for completion at a specified time
- As soon as a task is booked the user is taken to their 'Task List' screen
- From here users can see the progress of the tasks they have requested (or to which they are party)
- The status of tasks and ETA's are automatically updated by the porter's actions (this screen refreshes every 30 secs)
- Detailed task logs allow every stage of the task handling process to be seen and analysed
- Tasks no longer required can be cancelled (auto notifying the porter if it has been assigned)
- The Cancelled Tasks list allows cancelled tasks to be seen, edited and re-scheduled
- The Return Patient List, allows departments to return patients to their prior location without the need to re-enter details

A patient move task takes ~30 seconds to complete, assuming all mandatory fields and additional information, such as free text notes to advise portering staff of infection barrier and contacts for both pick up and drop off locations, is entered. A blood sample move takes ~10 seconds to input, as there are less fields required. Both are much quicker than calling a helpdesk and waiting in turn. The use of the portal methodology also improves the quality of the input data and therefore the insights that can be surfaced in later analysis.



A typical task flow for the app user can be seen in the screenshot above. The content of graphic 1, app screen 4 varies dependent upon the task type. In this case it shows a patient move. If the mode required the porter to bring a wheelchair, then 'wheelchair bring' would replace the 'bed' icon below. For a non-patient task, say perhaps a linen move task, it lists the items required. This screen is scrollable.

Navenio can generate tasks that can be sent to groups as well as individuals. Every app user is provided with a unique account and login details so that their activity can be recorded, and they can be identified to other relevant task stakeholders.

Each user is assigned to a workgroup and each user is assigned to a pool (general or designated - A&E, Radiology etc.).

In this way we are able to task an individual user, a group or a pool. We do however recommend that in the majority of cases a task should be assigned to an individual; however, if the current portering pool is fully utilised there is the option to overflow tasks to other pools of staff that may be on standby with spare capacity.

We have a 'Request Assistance' function within the app, allowing the task recipient to then request assistance from one (or a number of) colleagues if required on a task (in whole or part). In practice we find this to be highly efficient.

Location only module/full integration

The underlying indoor location technology provides details of current and past movements of staff via their smartphones - which can either provide valuable data to aid confirmation of where a staff member at infection risk has travelled between over a period of time, or can be integrated into existing applications to provide staff presence, proximity and audit services.

The Navenio indoor location module simply requires users to carry a compatible smartphone device running the Navenio Location App.

This app runs on the device without the need for any interaction from the user and provides a continuous trace of the users' movements throughout the

building. Navenio uses GPS Geofences to ensure that if the device leaves the hospital then then location tracking is shutdown, and vice-versa.

Several forms of integration can enhance this proposition further, for example

- Integration via a real-time XML / HL7 / FHIR or similar feed to an integration engine such as Rhapsody, or to any app that has an RTLS interface already
- Integration with SSO solutions, so that user details / identification tokens can be provided without the need for login to the Navenio App

Location data includes any region or zone information configured at venue setup – for example a ward or corridor name, as well as geo-referenced XYZ coordinates.

Implementation

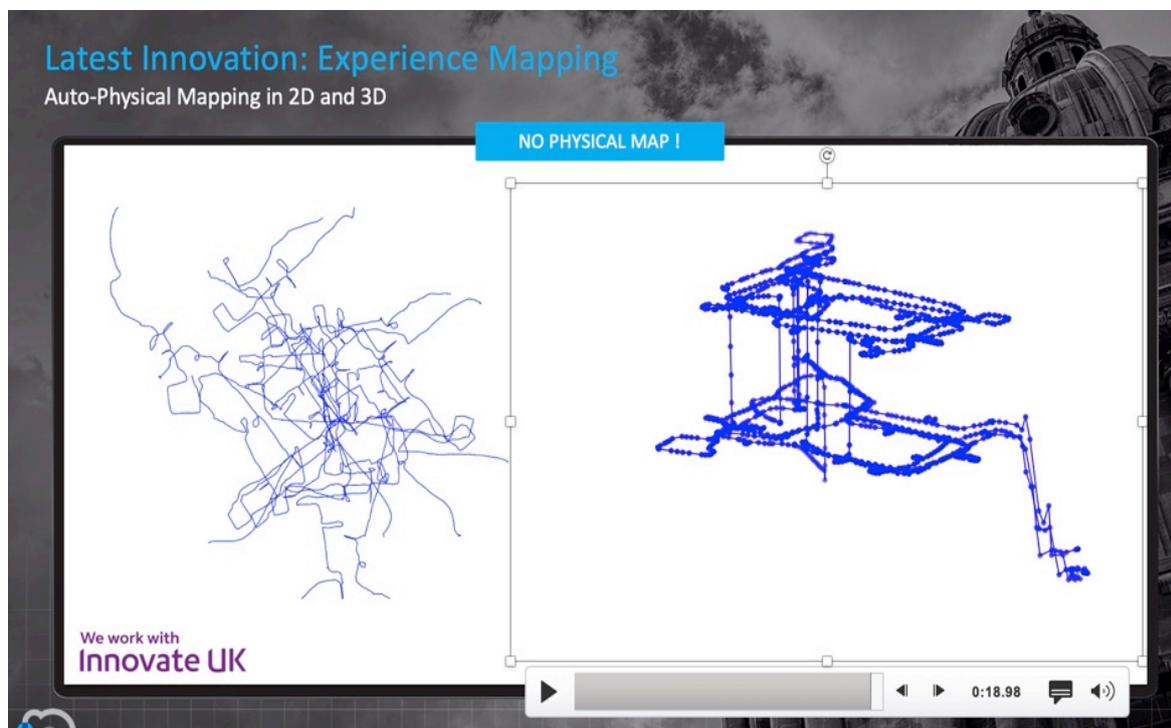
As the Navenio solution is infrastructure free implementation is very simple. The site setup process in relation to maps is briefly outlined in the screenshot below. An effective working solution can often be provided at hospitals within one month, and we are gearing up to be able to deploy up to one site a day within 2 months.

Site Setup Process: Minimal Input Needed

- Provide a Map**
 - Deploy the Navenio app, or integrate our location SDK into your own app
 - App reads the device's motion sensors
 - Energy efficient
 - Phone can be carried in any way – accuracy maintained
- Map Processing**
 - Our algorithms clean the map and generate an X-Y grid across areas that can be walked – supporting our unique location algorithms
 - We also generate a lat-long version that positions the site geographically, allowing geofences to be added and sites to be compared
- Define Report Zones**
 - Our solution automatically defines room boundaries and reads any room id's to create reporting zones
 - Edit tools allow reporting zones to be adapted to suit any future changes/needs
 - We add any room names/ other details you have given us to the database
- Geo-Fencing**
 - We add GPS Geofences around the site
 - These detect proximity to building and turn the location tracking function on/off
 - Once within the near geofence motion tracking and GPS help determine the entry point to the building

Confidential | Slide 7

In partnership with Innovate UK we have recently adopted auto-mapping which negates the need for a map or building plans; and significantly improves the pre-implementation process.



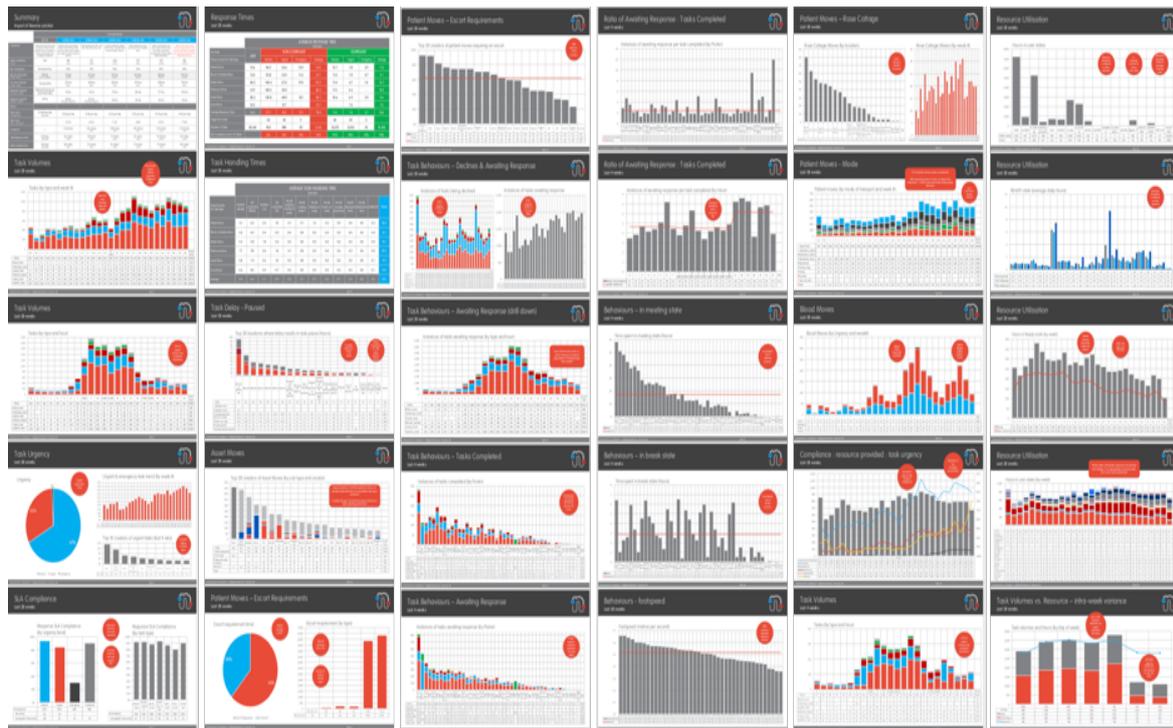
Every room/area within the site is uniquely addressable and can have metadata associated to it.

Entry to / exit from each reporting zone (room) by an app user is recorded. We are also able to determine the steps taken, distance travelled and dwell time within each zone.

As a bi product of our location methodology, we are also able to determine the location of BLE Beacon tagged assets.

Reporting

The solution also creates significant data points for analysis live or in retrospect, using the Navenio Dashboard, ensuring transparency and the ability to align staff rotas, resolve any blockages or refine processes to maximise efficiency.



Overall the solution allows operators to:

- Transform throughput and service levels, whilst supporting patient flow
- Establish the right portering requirements for all wards and departments
- Create task types that conform to agreed operational procedures, including heightened Infection Control scenarios
- Dynamic prioritisation, assignment and notification model
- Ability to require approval for Patient Moves for certain types of Infection states
- Automatically prioritise task requests, based on agreed rules
- Automatically assign tasks to nearest available, appropriately skilled user
- Provide live updates on the status of tasks to portal users
- Wards and departments will receive estimated arrival times of porters
- Establish common delays to allow discussions and changes where required
- Establish resource requirement to achieve desired compliance levels
- Provide insightful analytics & dashboards
- Underpin Patient & Staff safety

Operational benefits

The location technology is already live in a number of NHS hospitals where it is in full time 24x7 use, as is the Navenio Tasking solution. Development is always ongoing around refinements to the tasking solutions to accommodate new task types and functionality as well as to enhance scaling.

With live data Trusts are now able to make operational changes that have real and immediate impact on patient care; for example:

- Optimising patient flow and length of stay
- Full audit trail: supporting daily operations, roster optimisation and CQC
- Releases time for patient care by stopping nurses and other staff doing tasks instead:
- Proves the team is adding value; builds relationships and job satisfaction
- Increases staff retention: reduces unnecessary travel and increased achievement levels
- Delivers a measurable SLA by driving quality and reducing patient wait times
- Provides deep operational insights into workflow and blockages
- Deep building usage insights

Commercials

There is a flexible recurring licence model that can adapt to multiple scenarios and varying levels of professional services support for organisations to deploy:

SaaS Platform pricing for

- Venues (per venue)
- Tasking Modules (per concurrent user)
- Location Only (per concurrent user)
- Integrations (per integration)

Professional Services for

- Module Setup & Configuration
- Training Support & Go-Live Assistance
- Integration Support

Additionally, Navenio can provide smartphone hardware and charging equipment, or the hospital is free to do this through its own supply chain to Navenio's specification.