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The Download: Lessons from the NHS's most successful AI project

By Nick Carding | 31 May 2022

The fortnightly newsletter that unpacks system leaders' priorities for digital technology and the impact they are having on delivering health services. This week by senior correspondent Nick Carding.

"Carefully targeted AI is now ready for practical application in health services," announced then NHS England CEO Sir Simon Stevens when the government launched its National Artificial Intelligence Lab back in August 2019.

Yet almost three years on, AI remains a bewildering concept for many within the health service.

This is not surprising given the fact no single definition of what AI is exists, though this does not stop many tech firms attaching the AI label to their solutions.

It is striking, then, that the man who oversaw the NHS's most important AI project to date "doesn't think of [him]self as a huge evangelist for AI in general".

'Genuinely leading-edge tech'

That man is Marc Warner. The project in question is the work done by his company – Faculty – to help the NHS predict covid demand on hospitals when the pandemic hit the UK in March 2020.

According to media reports, it was the modelling Mr Warner provided that persuaded prime minister Boris Johnson to abandon the "herd immunity" strategy and instead opt for lockdown

measures, while Dominic Cummings, former chief advisor to the prime minister, heaped praise on him a year ago during that infamous hearing in front of two parliamentary select committees.

After his intervention at No. 10, Mr Warner's attention shifted quickly to helping NHSE respond to the outbreak, with Faculty among the companies which played a major role in the success of the NHS covid-19 data store.

Prior to the pandemic, the company was already working with the health service as NHSX's strategic partner for the aforementioned AI lab, and it had previously helped the East Midlands Imaging Network with a breast screening project.

Marc Warner, CEO of Faculty.

But it was Faculty's work with the covid-19 data store that saw the NHS access what Mr Warner describes as "the most sophisticated use of genuinely leading-edge tech in the context of important decision-making in the NHS".

Using the information provided in the data store, Faculty built predictive models to forecast demand on hospitals throughout the pandemic and proved to be an invaluable tool for NHS chiefs.

While creating the modelling was a "very complex challenge", Faculty also had the tricky task of helping busy NHSE chiefs understand and trust the forecasts.

"Every day at 5.30pm, we sat down with the leadership and explained what was going on and what the forecasts were showing," Mr Warner says.

"Over time, we built more validation into the tool itself because we wanted to make sure they trusted it the right amount.

"They could see what we had forecast and then also the real data showing what had happened, and we made that open so they could see where we were confident and less confident."

Asked if Faculty's forecasts were correct from the outset, Mr Warner confirms they were, but adds it was simpler at the start as fewer issues, such as testing and public behaviour, needed to be factored in.

"Over time, when things got released and there were complicated patterns and people changing their behaviour, it became harder to forecast. It was easier to make predictions at the start of the pandemic than at the end," he says.

Exploiting AI

As the *Download* has written previously, the covid-19 data store is one of the best examples of the game-changing role data can play for the NHS, if it is collected, stored, analysed and acted upon in the right way.

Faculty's ability to accurately forecast covid demand at hospitals raises the obvious question of how this type of technology can be used to help the NHS going forward.

It is while pondering this that Mr Warner makes his comment about not being AI's most staunch cheerleader.

"I don't think anyone should be priding themselves on whether their solution uses AI – it should be on whether your solution is helping patients," he says.

"In certain circumstances, AI unlocks very powerful new capabilities that mean you can serve patients better. But, we should do things as simply as possible and go as deep as possible when required."

He identifies two main areas where he thinks AI should play its biggest role. These are diagnostics, where much AI-related activity is ongoing for issues like improving imaging and automating diagnoses through symptom-checkers, and the operation of the NHS – in other words, making the NHS more efficient, for example, by being better at forecasting demand and managing available resources accordingly.

It is in this second area that Mr Warner is focusing Faculty's work, which, despite being "a bit less flashy", potentially holds "greater value", he says.

"Until covid kicked off, the majority of AI-based solutions were in the diagnostics space, but then covid became such an urgent problem and the operational stuff suddenly became so important," he adds.

Faculty's forecasting tool is now being rolled out to more than 100 trusts to help them predict emergency department demand, which Mr Warner hopes will mark the start of more work with individual trusts. The tool's forecasts are based on data, including NHS Digital's emergency care data set and mobility data from Apple and Google.

Crucially, the modelling tool also attempts to show why demand rises or drops, which in tech speak is known as "explainability".

Mr Warner says explainability is key because it "helps NHS staff develop trust in the forecast and understand the cause behind an increase or decrease in admissions".

Asked how the NHS can improve its use of AI more broadly amid an increasingly complicated ecosystem of suppliers and solutions, Mr Warner says NHS chiefs have a "tricky balance" to strike.

"They have to protect patients' interests, and they are making life and death decisions – so a certain amount of conservatism about new tech is totally understandable," he says.

"There is real merit in being careful and protecting patient safety, and then there's bureaucratic slowness which you can see in any large organisation.

"They're taking steps to make things easier but there is more to be done."