Case study: Embracing the cloud for agility and scale at the National Institute for Health Research (NIHR)

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Summary

The UK's National Institute for Health Research (NIHR) plays a fundamental role in the development of new health services and treatments in the UK by supporting the management and coordination of clinical trials in the NHS (National Health Service).

The NIHR Clinical Research Network Coordinating Centre manages the Clinical Research Network (CRN) on behalf of the Department of Health. The CRN provides the infrastructure that allows the NHS to conduct clinical research funded by charities, research funders, and life-sciences organisations.

The task of coordinating over 4,500 trials a year involving over 650,000 people can be challenging, compounded by strict regulatory scrutiny and ethical guidelines. The ultimate goal of the CRN is to facilitate research and development in the UK and to provide opportunities for patients to gain earlier access to new and better treatments through research participation. The underlying technology used by the CRN was developed over several years, with core applications hosted by the University of Leeds. In 2015, the NIHR engaged with PA Consulting to modernise its application estate to deliver a more cost-effective, scalable, and reliable platform. PA Consulting worked alongside the NIHR to modernise key elements of the application estate and migrate core applications to the Amazon Web Services (AWS) Cloud.

By leveraging the AWS Cloud, 23,000 users across research teams, regulators, and other authorised individuals can now track the status of trials centrally through a single portal. This has simplified data collection through improvements to the workflow and user interface, and the platform's new design can accommodate future integrations with external systems. Additionally, when the public responds to appeals for research participants, the platform can scale up and down to handle spikes in traffic.

Why AWS?

While many organisations initially turn to cloud computing for the potential cost savings it offers, other benefits are equally compelling. The effective adoption of cloud technology improved NIHR's reliability, availability, and scalability. They now have an environment where new services can be developed, tested, and deployed in a flexible and agile fashion.

"The benefits of embracing cloud infrastructure for NIHR Clinical Research Network infrastructure go far beyond the day-to-day efficient delivery of the core systems required for the CRN to function," said Nick Hirst, CIO of the Clinical Research Network Coordinating Centre. "Properly built application systems running on AWS, which are effectively configured, give the CRN a level of reliability, resilience, security, performance, flexibility, and future-proofing not previously experienced by the organisation. The CRN embraced 'cloud first' and have been able to decommission all on-premises data centre capability."

Key Outcomes

Stakeholder engagement is fundamental to any transformation project

The CRN Coordinating Centre's Hirst further emphasises the importance of engaging with key stakeholders and partners throughout the process. For this project, this meant establishing relationships not only within the NIHR, but also with partner organisations, research funders, and patients.

Stakeholder engagement needs to span the entire lifecycle of the project, so all participants feel as if they are part of the process, rather than "subject to it." Throughout the process of developing the new portal, users were invited to test and provide feedback on the platform, its functionality, and its interface.

Invest effort in migrating data effectively

With a number of legacy applications needing to migrate from the legacy on-premises model into the new cloud environment, data migration represented a significant challenge. Data from multiple systems needed to be transformed and combined. The team decided to migrate the data early on in incremental steps, enabling them to improve the quality of the underlying data as it was transferred.

Nick Hirst points out that the benefits of this decision cannot be understated; the ability of the NIHR to combine data sources from multiple systems onto a single infrastructure has played a key role in making it easier to share data, integrate it with other systems, and make it available to third parties.

Traditional approaches to procurement need to adapt to support the "as a service" model

The traditional approach to procuring infrastructure typically assumes that the infrastructure will be largely static over the course of its lifecycle. This has resulted in rigid, inflexible procurement processes. Suppliers and buying organisations should build flexibility into their agreements, so that they can balance the need for predictability and certainty with the ability to adapt to changing processes or demand.

Effective governance is key to getting the best value out of cloud technology

One of the main benefits of cloud infrastructure is the ease with which cloud-based services can be deployed, and their usage scaled up or down based on depend. However, to effectively manage usage of cloud infrastructure, and associated spending, organisations need to establish the appropriate governance framework, incorporating the tools provided for monitoring and managing service utilisation.
The NIHR's relationship with PA Consulting is such that PA handles the procurement of cloud services and then manages how those services are charged to the NIHR. This provides a level of insulation from usage flotation, and enables the NIHR to more

accurately predict spend.

“While the NIHR CRN have only just started to explore some of the benefits of cloud adoption, we have worked closely with our partner, PA Consulting, to share both the value and the risks. The NIHR CRN is on a journey and although technology offers many opportunities, there are often wider business considerations and practices, which will take time to adapt both in the approach to procurement and effective governance,” Hirst further explains.

Taking the Right Approach

The use of “Agile” techniques, commonly used to coordinate and streamline the work of application development teams, is now being applied to the management of cloud infrastructure as well. Agile techniques can help to bring governance, architecture, and discipline to infrastructure management. This approach can scaled from small up to large-transformation projects, provided they are delivered within a framework that supports good governance and emphasises the importance of architecture.

“The use of agile development in transformation projects undertaken by NIHR CRN, supported by PA Consulting, were key to the success and speed with which results were realised. A constant delivery of working functionality delivered to the business allowed rapid progress and visible outcomes,” said Hirst.

The right approach to architecture and design can have a dramatic impact on running costs

In an environment where resources can be added or removed while the system is in operation, cost management requires organisations to coordinate the interactions between resources, data management of data, and appropriate scaling of the cloud infrastructure. As James Mucklow from PA Consulting pointed out, even the difference between caching data versus fetching it from the database each time it is requested can have an impact on ongoing operational costs.

From Hirst’s perspective, it is important that the NIHR retain control of its overall architecture and vision, as they can reflect the strategic aims of the organisation. While partners like PA Consulting have a highly valued role in helping the NIHR shape its architecture and strategy, ownership remains with the NIHR. Hirst adds, “While some of the legacy applications were simply shifted into the cloud, most were modernised in the process to take advantage of the underlying services offered by AWS.”

Risks should be managed proactively, aided by early action

The key to effective risk management is to identify risks as early as possible in the process so that you can implement the appropriate countermeasures. This requires proactively engaging with stakeholders and the technical team to mitigate risks upfront.

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