Keeping Your Options Open

Transforming NHS service delivery

Demand for NHS services will continue to grow as the population ages, lifestyle illness become more prevalent, and innovation increases the range of treatments available. Healthcare services will need to shift from a reactive model of care to a proactive prevention-based approach focused on improving the overall health of the population. This will require a shift from transactional hospital centric services to ongoing long-term care in the community, requiring multiple providers in the NHS, Local Authority, third and private sectors to work together to deliver patient centric care packages. This will only happen when providers can easily share information between themselves, and with service users and their carers.

Digital technology promises significant improvements in service delivery and opportunities to deliver seamless services across multiple organisations. Realising the full potential of such technologies will require the implementation of modular digital applications and services which support secure interoperability between systems and organisations. In turn, this will require a commitment to **open systems architecture** which provides a principled way for new digital systems to be designed to enable better adoption, interoperability, and continuous adaptation.

Open Systems

System 'openness' refers to both the business and technical characteristics of the way a system is procured and constructed. An open system architecture is one that supports a collection of modular, reusable components, which interact to deliver what an organisation and its users need. It provides interfaces designed to enable third-party interactions and implementations; with components based on open commercial and industrial standards. The impact of adopting open system architectures in the health and care sector is profound. One of the key benefits is that, by enabling third party interactions, it helps organisations to avoid being "locked-in" to a single vendor. It encourages a more competitive supply chain which can drive cost savings not only at the point of purchase, but throughout the life of the system. Open architectures also enforce transparent and standardised access to processing, data and other information resources. This allows multiple suppliers to provide hardware and software upgrades on a continuous basis, and ensures that complexity of adding new capabilities to legacy systems is as simple as possible. The level of modularity, and thus openness, will vary from one system to another depending on issues such as assurance, safety, integration of legacy components, and functional role.

Practical Considerations

Based on our experience, we have identified five critical success factors for successfully implementing an open systems architecture.

1. **Defining Open** - Open architecture is not just about technical standards but provides an interoperability framework for suppliers to adhere to and integrate with. An architecture is defined as "open" when other modules can be readily integrated into the larger system – whatever technology has been used to develop such components. Determining a set of criteria by which the architecture's 'openness' can be objectively assessed over time. These criteria should include architectural characteristics, such as its modularity, and how well it conforms with open standards as well as commercial aspects such as intellectual property and licensing constraints.

2. **Affordability** - Open architecture requires upfront investment in concept development, design and verification. The benefits are accrued through-life from simpler, quicker and compete-able updates and enhancements. Business cases need to reflect this pay-off by moving the focus from initial implementation cost to through-life cost.

3. **Cultural change** - Open architectures will require a significant cultural shift. All stakeholders need to understand how to specify and contract for systems with open characteristics, which requires thinking more in terms of capability building blocks rather than just an isolated item of equipment. Suppliers need to think beyond closed systems to business models which are modular and capable of continuous updating.

4. **Collaboration** - Realising open architecture requires collaboration and compromise between the NHS and its suppliers. Commercial interfaces can be both closed and open. An open architecture does not necessarily preclude existing vendors from continuing to provide commercial services via open and standards-based interfaces. Neither does open architecture preclude the use of commercially closed and non-standard components where the assessment process concludes that no better-fit, open alternative exists.

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5. **Evolution** - 'Openness' is a goal which is reached incrementally, following agile principles. It should be seen as a multi-year, strategic programme which seeks to generate early benefits while ensuring continuity of service and establishing the building blocks which will allow further transition towards the overall 'openness' goal.

How Frazer Nash can help

Frazer Nash provides a full range of architecture services to both public and private sector clients in highly regulated sectors. We are technology agnostic and have a specialist focus on the practicalities of implementing open system architectures in demanding environments. Our capability covers:

•   Open Systems Architecture from discovery to implementation support
•   Advice on adoption of open standards and open source software
•   Data architecture and advice on open data use and principles
•   Advice on open licensing and its implications and impacts
•   Open systems approach to technology evaluation and selection
•   Open architecture testing and assurance of system-wide healthcare solutions
•   Intelligent Customer capability definition and development

Frazer-Nash were the Openness Testing Partner and Architecture Conformance Partner for a £3bn defence programme. In this unique role, we provided independent assessment of how well the system's openness criteria are being met (conceptually, logically and physically) as the architect "evolves to open".

Our team of qualified experts and proven methods will reduce the risk of implementing open systems architecture in your organisation.

About Frazer Nash

Frazer-Nash is a leading systems, engineering and technology company. We help organisations deliver innovative engineering and technology solutions to make lives safe, secure, sustainable, and affordable. With over 1200 employees, we work from a network of nine UK locations. Our people apply their expertise to develop, enhance and protect our clients' critical assets, systems and processes.

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