Integrated Health and Social Care Digital Platform

Scottish Government and the Local Government Digital Office

April 2018
The Scottish Government and the Local Government Digital Office need to support health and social care reform through the use of digital technology, in order to help address spiralling costs, improve outcomes and to enhance the service user experience. Health and Social care providers must improve business operations by adopting a citizen-centred business architecture, which will require an increased focus on Enterprise Architecture in Health and Social care. The new enterprise architecture (EA) will focus on a Digital Platform with shared system integration and principles that drive holistic outcomes, a better service user experience, convenience, and flexibility. There will be a need for greater business modularity so that multiagency integrated care teams can operate as effectively as they can across Health Boards, Integration Joint Board’s (IJB’s), Local Authorities and third sector or private sector operators within a multi-healthcare organisation context.

- **The Target Architecture** required to underpin the Digital Platform should be built in such a way that it enables interoperability, maximum flexibility and the loose coupling of components. At the heart of the platform will be API’s that facilitate the integration of systems and data. Systems should be configured rather than customised, and vendor lock in should be avoided by ensuring that international open standards are adhered to, and that data migration plans and exit strategies are in place.
- Whilst the technology underpinning the Target Architecture is important, equally as important is the painting of the vision, the stakeholder engagement, external party participation and the communications that surrounds it. It is essential to involve all users of the systems and the owners of the data (the end user) in defining requirements, testing and deployment. In developing the Digital Platform there is a need to define a common language that is recognised by all. It is also essential to provide clarity on Governance surrounding the Digital Platform — both in terms of information, finance and technology. It should be clear who is able to make decisions and who is accountable. Health and Social Care Policy and Legislation should support the aims of the vision and may need to change to enable a holistic view of the user.
- **Skills and Resources** will be key to the success of the Digital Platform. Digital Skills, Developers, Agile delivery, Enterprise Architects, Commercial Managers and User Researchers will all be fundamental. There will need to be dedicated funding to enable the Digital Platform to succeed. The requirements should be clearly articulated in a Business case, which outlines the Benefits Realisation and Success Criteria for the investment. The identification of quick wins will build confidence and gain support for further investment. Finally how both end users and employees are identified will underpin the success of the Digital Platform. Linked to this will be security and how privacy is dealt with. There will need to be clear rules as to who has access to which data.
- **The function** of the target architecture is to enable the seamless exchange of health and social care data across Scotland using industry standards, and for the data to be accessible by any authenticated and authorised party. Further, the platform acts as a centralised hub for collecting data events to generate insight and intelligence with the aim of using this to help improve peoples health and wellbeing. The Digital Platform should be considered as a layer sitting on top of the systems used across health and social care in Scotland. The purpose of the platform is not to be a ‘mega-system’ and replace the highly specialised systems used to deliver health and social care today. These systems are still required and will participate in the digital ecosystem by allowing their data and services to be accessed by the platform. Importantly, these systems will be able to benefit by using the platform themselves to access data that has not been possible in the past.
Health & Social Care – Digital Platform

This layer does not represent a comprehensive list of systems, only a cross section for illustration.
At the core of Scotland's challenge to modernise and improve health and social care, is the capability to enable the fluid movement of information around the country regardless of the organisational or regional boundaries that exist. Equally as important, will be to utilise the data to enable new models of care and improve health and social care for the citizens of Scotland. Research conducted in formulating this architecture reinforces this and goes further by identifying 18 key areas which must be considered in order to enable the efficient and effective movement of data and to gain insight from the data. The architecture proposed in the report has addressed each of these key areas.

### Architectural Design Principles

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## Architectural Key Considerations

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<td><strong>Conventional interoperability approaches based on Enterprise Service Buses (ESBs) and message brokering will still play a part in the medium to long term in Scotland, however, these more traditional integration approaches will be increasingly replaced by Application Programmable Interfaces (APIs) as new contracts and systems are developed, in line with the common standards.</strong></td>
<td><strong>Allowing users to engage with their health and social care data is at the forefront of the challenge Scotland faces, regardless of the device or platform they use. The proposed architecture has been designed to allow users to engage by offering APIs to be consumed by public services, mobile applications, IoT devices, portal and third-party health platforms and providers.</strong></td>
<td><strong>A universally consistent and semantically interoperable data model is recommended in the proposed architecture. Systems of records should adopt this data model as a standard for storing health and social care data. However, at a minimum, data stored in the platform should be done so using the standardised data model.</strong></td>
<td><strong>The platform must support the rate of change demanded by ‘systems of innovation’ which are those developed out-with the platform, but rely on the Open APIs to access citizen data. Adopting agile methodologies is therefore a key requirement to build a platform that will fuel innovation and be flexible enough to handle the pace of change demanded by the digital and API economy and ever-evolving citizens needs.</strong></td>
<td><strong>Making data more fluid and accessible is just one dimension of the challenge Scotland faces around health and social care. Equally as important is how insight can be harnessed, patterns identified and how clinicians and care workers can be empowered to make more informed decisions. Going further, how situations relate to a citizens health or wellbeing can be predicted and avoided before they occur. Collecting data is the foundation of gaining insight and intelligence, and the proposed architecture has data stores to capture electronic health data (EHR), citizen provided data (PHR) and operational data (such as when a particular event or action occurred).</strong></td>
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Gartner conducted interviews across a broad range of social care, local authority and healthcare stakeholders to understand perceptions, challenges and concerns about developing and deploying a Health & Social Care Digital Platform across Scotland. People are engaged and willing to make changes but they want explicit leadership and direction from the top. They also felt that the design of the architecture needs to be built within the wider strategic context for delivering integrated Health and Social Care not just from a technical perspective. The summary findings from interviews revealed the following:

**Stakeholder Analysis Key Findings**

- **What are your key business goals?**
- **What are your key issues and factors** this high level Information Architecture design needs to consider?
- **Which key policies or commitments** does the Digital Platform need to address?
- **What is your assessment of the culture** of the organisations involved and their **readiness to adapt** to new ways of working?
- **What technical constraints** need to be considered and factored into the new Digital Platform design?

**Data standards, Content and Information Governance**

- **Observations**
- Can you summarise existing ‘as-is’ IT service provision currently and where would you like to see **improvements**?
- **What tasks and workflows** should be considered for early testing on the Digital Platform?
- **What do we need to know about the information seeking and usage behaviours** of users across your estate and services?
- **What are your main concerns regarding security?**

Other areas stakeholder felt required **further consideration and thought.**
Stakeholder Analysis Key Findings (1 of 11)

Gartner conducted interviews across a broad range of social care, local authority and healthcare stakeholders to understand perceptions, challenges and concerns about developing and deploying a Health & Social Care Digital Platform across Scotland. People are engaged and willing to make changes but they want explicit leadership and direction from the top. They also felt that the design of the architecture needs to be built within the wider strategic context for delivering integrated Health and Social Care not just from a technical perspective. The summary findings from interviews revealed the following:

What are your key **business goals?**

### Key Observations

- Transformation should be driven by practitioners on the ground in health and social care, not technologists
- The approach and roadmap for implementing a Technical Architecture will need to consider each Healthcare provider and Local Authority operationally and politically to ensure an affordable and effective capability is made available at the right time
- Health and Social Care stakeholders all recognise and are willing to engage in a new Digital Platform capability to facilitate more efficient Health and Care pathways and improve health/care outcomes
- Efficiency and productivity that exploit emergent technologies are big drivers in Local Authorities and Health Care.
- There is an opportunity to maximise the special capability and unique position of DHI to help shape what is required from vendors and partners
- There is a need for a simplified interface for all service users and patients
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**Stakeholder Analysis Key Findings (2 of 11)**

What are your key **issues and factors** this high level Information Architecture design needs to consider?

**Key Observations**

- Stakeholders want a platform that delivers "What's right for the patient, what gives both patients and staff back time"
- A unified ID capability and improved infrastructure will be key to the delivery of the Digital Platform concept
- Stakeholder engagement will be optimised if people are included early, bought into the concept and have some say in the direction of travel. A centrally mandated dictate is unlikely to succeed
- There needs to be clarity and explicit leadership — it should be clear who has decision rights, and who has input rights
- The Digital Platform capability needs to enable both clinicians/social and care workers as well as citizens
- Joint agreement, central funding and buy-in across all stakeholder groups will need careful and continued engagement in order to deliver success
Gartner conducted interviews across a broad range of social care, local authority and healthcare stakeholders to understand perceptions, challenges and concerns about developing and deploying a Health & Social Care Digital Platform across Scotland. People are engaged and willing to make changes but they want explicit leadership and direction from the top. They also felt that the design of the architecture needs to be built within the wider strategic context for delivering integrated Health and Social Care not just from a technical perspective. The summary findings from interviews revealed the following:

### Stakeholder Analysis Key Findings (3 of 11)

Gartner conducted interviews across a broad range of social care, local authority and healthcare stakeholders to understand perceptions, challenges and concerns about developing and deploying a Health & Social Care Digital Platform across Scotland.

### Key Observations

- The platform will need to support a number of related, emerging and ongoing policies and standards.
- The platform should be built in such a way that any policy changes could be reflected in the rules engine rather than in the code.
Gartner conducted interviews across a broad range of social care, local authority and healthcare stakeholders to understand perceptions, challenges and concerns about developing and deploying a Health & Social Care Digital Platform across Scotland. People are engaged and willing to make changes but they want explicit leadership and direction from the top. They also felt that the design of the architecture needs to be built within the wider strategic context for delivering integrated Health and Social Care not just from a technical perspective. The summary findings from interviews revealed the following:

What is your **assessment of the culture** of the organisations involved and their **readiness to adapt** to new ways of working?

**Key Observations**

- Culture varies considerably between health and social care groups
- The readiness to adopt a Digital Platform is mixed. Some groups embrace the idea and want to move now, others are reluctant because of the cost, operational impact or transformational effort required
- Communication is patchy. Cross health awareness is variable at best, cross social care awareness appears less mature
- The appetite to change is driven by many factors, operational, cultural and financial
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**Stakeholder Analysis Key Findings (5 of 11)**

What **technical constraints** need to be considered and factored into the new design?

**Key Observations**

- Data needs to flow freely within and across the Digital Platform to ensure accessibility is provided to health/social care professionals as well as citizens who interact with the capability
- Maximising the use of existing developments such as the DEU ecosystem catalogue and GGC’s National Health & Social Care platform among others are important to capture lessons identified, exploiting existing technologies and deliver financial savings
- Effective semantic interoperability is considered a critical success factor to the delivery of an interoperable Digital Platform
- Effective and transparent data management, security and resilience are mandatory design considerations
- Performance and interoperability issues with some social care services and isolated communities are expected to persist due to poor interconnectivity, legacy systems and technology
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**Data standards, Content and Information Governance Observations**

- Open Standards are considered by most parties to be the optimal way to support a fully interoperable health and social care information exchange
- Information Governance is sub-optimal and not ready to support a Digital Platform capability
- The emergence of GDPR complicates information governance which will require further guidance and practical education to ensure it's application is implemented smoothly
- Decision rights and investment need to be allocated to the right groups to ensure the Digital Platform can operate effectively and satisfy policy/legislation
- Semantic integrity will be key to the Digital Platform’s success and ensure the safety of patients and service users alike
Stakeholder Analysis Key Findings (7 of 11)

Gartner conducted interviews across a broad range of social care, local authority and healthcare stakeholders to understand perceptions, challenges and concerns about developing and deploying a Health & Social Care Digital Platform across Scotland. People are engaged and willing to make changes but they want explicit leadership and direction from the top. They also felt that the design of the architecture needs to be built within the wider strategic context for delivering integrated Health and Social Care not just from a technical perspective. The summary findings from interviews revealed the following:

Can you summarise your existing ‘as-is’ IT service provision currently and were would you like to see improvements?

Key Observations

- The landscape across Scotland is a complex mix of legacy ‘mega-suite application’, disparate systems of record and fragmented integration capabilities geared toward delivering health and social care services at regional and local levels.

- Some groups appeared frustrated with the limitations of legacy systems and the efforts to maintain ‘business as usual’ operations.

- IT supply side stakeholders face the challenges of maintaining complex, disparate IT estates whilst balancing strategic changes and growing user expectations driven by evolving technology.
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**Stakeholder Analysis Key Findings (8 of 11)**

What *tasks and workflows* should be considered for early testing on the Digital Platform?

**Key Observations**

- The Digital Platform should be used as a catalyst to develop new ways of working and evolve the care/health pathways
- A number of use case scenarios exist that could be deployed on the Digital Platform
- Start small before addressing the high tempo, high impact pathways to prove the concept
Gartner conducted interviews across a broad range of social care, local authority and healthcare stakeholders to understand perceptions, challenges and concerns about developing and deploying a Health & Social Care Digital Platform across Scotland. People are engaged and willing to make changes but they want explicit leadership and direction from the top. They also felt that the design of the architecture needs to be built within the wider strategic context for delivering integrated Health and Social Care not just from a technical perspective. The summary findings from interviews revealed the following:

**What do we need to know about the information seeking and usage behaviours of users across your estate and services?**

**Key Observations**

- The Digital Platform should be used as a catalyst to develop new ways of working and evolve the care/health pathways
- Current data and information generation is complicated by multiple systems in use and repetition of effort
- A number of use case scenarios exist that could be deployed on the Digital Platform
Gartner conducted interviews across a broad range of social care, local authority and healthcare stakeholders to understand perceptions, challenges and concerns about developing and deploying a Health & Social Care Digital Platform across Scotland. People are engaged and willing to make changes but they want explicit leadership and direction from the top. They also felt that the design of the architecture needs to be built within the wider strategic context for delivering integrated Health and Social Care not just from a technical perspective. The summary findings from interviews revealed the following:

**Stakeholder Analysis Key Findings (10 of 11)**

What are your main concerns regarding **security**?

**Key Observations**

- All users and operators of the Digital Platform will need to understand the security implications of a highly interoperable platform and adjust behaviours and ways of working accordingly to protect data assets.
- Interfacing Health systems and Local Authority systems deployed on PSN will need development and effective codes of connection to ensure compliance is satisfied.
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**Other areas stakeholder felt required **_further consideration and thought._**

### Key Observations

- New technologies and growing user/citizen expectation require new services and multiple channels to be put in place.
- Deploying a new, pan Scotland Digital Platform will be complex and difficult therefore some big decisions will be required
Stakeholder Analysis Key Findings Summary & Conclusion

The key business goal of every stakeholder interviewed was to enable better health and social care outcomes for citizens with the intelligent and optimal use of current and emergent data assets. This should be driven by both care practitioners in health and social care rather than the technologists. To that end the engagement appetite to develop and deploy a Digital Platform is high especially if it can be shown to deliver efficiencies and better productivity. Stakeholder engagement will be optimised if people are included early, bought into the concept and have some say in the direction of travel. A centrally mandated dictate is unlikely to succeed. There also needs to be clarity and explicit leadership — it should be clearly understood by all parties who has governance decision rights, and who has SME input rights around operations, integration, change and the commercial arrangements. Joint agreement, central funding and buy-in across all stakeholder groups will need careful and continued engagement in order to deliver success. The Digital Platform will also need to address and support a number of key policies and legislation such as Digital First, Scottish Government’s 2020 vision and GDPR to name but a few.

Overall all stakeholders acknowledged and recognised that a new way of thinking would be required starting from the top down. Direction is wanted from the ‘centre’ but control over delivery needs to remain at a local level. This includes more explicit and clear leadership, understanding of the impacts of implementing a Digital Platform across multiple organisations as well as an increased awareness of and ability to exploit new technologies. Decision rights and investment need to be allocated to the right groups to ensure the Digital Platform can operate effectively and satisfy policy/legislation.

The technical challenges are not insurmountable and can be addressed with sufficient investment for new integration and analytics technologies. Ideally these could be fused with existing IT capabilities where they are found to be both fit for purpose and of use within a hybrid Digital Platform operation. Some existing IT technologies in place or being deployed may now be deemed outmoded and may need de-commissioning. Whatever the technology deployed, an ‘as-is’ asset inventory will be required to establish the current interoperability platforms and their applicability to a Digital Platform.

More challenging though are the ‘softer’ aspects of implementing an inclusive information exchange capability. A platform ready to meet the needs of many disparate groups needs to satisfy many agendas, styles of working and operational priorities. New, joint ways of working across health, care and the wider public sector (such as policing and housing) will be needed. This will require continual user engagement and communication at all levels. Use of innovation, diverse thinking and changes to the ‘old school’ IT delivery mechanism are highly likely. The re-skilling of service providers will also be necessary to ensure better outcomes are achieved. When deployment begins Scottish Government and Local Government Digital office should start small looking to improve outcomes in simple but meaningful ways to prove the concept before addressing the high tempo, high impact pathways.
A number of 'quick wins' have been considered when deciding on the implementation of the Digital Platform. It will be key to identify opportunities that realise the benefits of the platform quickly. Delivering early benefits will build trust among stakeholders and ensure that momentum is maintained.

The quick wins considered are:

- Obtain agreement for the Digital Platform design architecture and principles. Test with a wider Scottish Government audience with roadshows
- Brief CEOs of Local Authorities and Health Boards — use the Technical Architecture to showcase what others have done to achieve this
- Agree the operating and commercial model — joint ownership
- Data standards: Agree on the 5 dimensions of vocabulary/code sets, content structure, message transport, security and directory/discovery (e.g. a centralised repository of definitions)
- Repeat steps 1 and 2, to get buy-in on the Target Operating Model and the commercials which will drive the economic and financial cases
- Funding and initial proof of concept — money has to be identified — ideally 75%/25% biased toward the centre
- Agree on the innovation approach — Link with organisations such as DHI, DataLab and Census
- Establish a working position on GDPR, consent and data ownership
- Agree and advertise the Digital Platform
- Recruit and deploy a hybrid Digital Platform team — made up of cross Government IT SMEs, health and care practitioners (e.g CCLG, key stakeholders)
- Identify a low profile use-case to test and engage with stakeholders to define and map onto the architecture
- Identify an innovation challenge which is supported by the platform architecture. This could effectively provide a Platform Beta
- Identify a Minimum viable product in terms of the Platform and use to test with the use case
- Consider Security in all aspects of the Platform

The next phase of development will examine the ‘as-is’ footprint across Scotland. This will be an important step to establish what is currently deployed, what assets can be reused and where there are functional gaps that should be replaced by new capabilities. Further, a number of use-cases need to be developed and selected so a proof of concept (alpha) can be performed which will be used as a safe way to demonstrate the capabilities of the platform and as a learning exercise. Once the current footprint has been established a roadmap detailing how the capability will be implemented and an operating model will be developed. It is acknowledged that the platform will take a number of years to become established and to be implemented at a national scale across all health and social care services in Scotland. Capabilities will be added to the Digital Platform over time, and health and social care systems will integrate with the platform incrementally when they are mature enough to do so.