

# Scotland's Digital Future: High Level Operating Framework

ACCESS APPROACH DATA  
BUSINESS COLLABORATION DATA  
DELIVER DEVELOPMENT DIGITAL  
EFFICIENCY FRAMEWORK ICT LOCAL  
NATIONAL OPEN OPPORTUNITIES IMPROVE INFORMATION EFFECTIVE  
PUBLIC SCOTLAND PROCUREMENT  
SERVICES SHARING SCOTTISH  
STRATEGY SUPPORT STANDARDS  
TECHNOLOGIES WORKFORCE  
USERS



The Scottish  
Government  
Riaghaltas na h-Alba

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# 1 Introduction

## 1.1 Purpose

This paper has been prepared in response to a commitment made within the strategy *Scotland's Digital Future – Delivery of Public Services*, [DPS Strategy] within which is the following statement:

We will develop a high-level operating framework which supports the strategic goals of this strategy. This national framework will support transformation through

- providing a set of architecture and design principles
- promoting and supporting the use of commonly agreed standards and specifications
- an information assurance approach

The collaboration and integration that this will support, with a focus on reuse before buy, will help to eliminate duplication and avoidable spend. The development and adoption of this framework will be led through our national and sectoral governance arrangements

This document therefore identifies the guiding architecture principles that underpin the architecture that will be developed to deliver digital public services that achieve:

**“public services that are high-quality, continually improving, efficient and responsive to local needs” (National Outcome 16).**

## 1.2 Vision and Drivers

The Vision as outlined in the DPS Strategy is a key driver and motivation for the practical aims of this Framework.

Our vision for Scotland is a country in which:

- Digital technology provides a foundation for innovative, integrated public services that cross organisational boundaries and deliver to those in most need, and for services for business that promote growth
- Digital technology captures patterns of service use and feedback, so that users of public services are more directly involved in service design and improvement
- This use of digital technologies provides a firm basis for a shared commitment to, and responsibility for, public services

The Scottish Government's ambitions for public service reform requires all public services to drive reform at pace and to prioritise actions around four pillars. The work of the Digital Public Services can provide crucial under-pinning for all of this, in relation to:

- **Prevention** - Reduce future demand by preventing problems arising or dealing with them early on. To promote a bias towards prevention, help people understand why this is the right thing to do, the choices it implies, as well as the benefits it can bring
- **Performance** – To demonstrate a sharp focus on continuous improvement of the national outcomes, applying reliable improvement methods to ensure that services are consistently well designed, based on the best evidence, and are delivered by the right people to the right people at the right time.

- **People** – We need to unlock the full creativity and potential of people at all levels of public service, empowering them to work together in innovative ways. We need to help create ways for people and communities to co-produce services around their skills and networks
- **Partnership** – We need to develop local partnership and collaboration, bringing public, third and private sector partners together with communities to deliver shared outcomes that really matter to people

### 1.3 Audience

The framework outlined in this paper provides guidance to the public sector, and the ICT Industry that works with the public sector, on how to design, develop and deliver future digital public services.

The intended audience for this document is all Chief Executives, Chief Information Officers, Chief Technology Officers and Service Leads and can be applied as follows:

- Chief Executives and Corporate Leads to be aware of the framework and seek assurance from Chief Information Officers/Heads of ICT that re-use, procurement, design, development and implementation are in line with the framework
- Chief Information Officers and Heads of ICT and Service Leads to make use of the framework and guiding principles in working with strategic and corporate leads to take forward digital initiatives
- Chief Technology Officers, their team leaders and team members, who will procure, design, develop and implement digital public services to apply the framework

### 1.4 Governance

The National DPS Strategy defines the framework within which each of the sectors' strategies will align, so this paper is founded on the notion that the set of principles defined will be reviewed, accepted and owned by a cross sector architectural governance board. That board will be responsible for maintaining the overarching principles in line with the changing environment, as well as individually confirming (and sharing) their respective sector principles' alignment. This board will operate under the authority of the National DPS Board. A copy of the Governance structure can be found in Annex A.

The groups that are therefore within scope are:

- the Scottish Government, its agencies and non-departmental bodies accountable to Ministers
- NHS Scotland
- local government
- the police and fire services and
- universities and colleges

The Framework in general, and the principles in particular, are intended to be of general application across all sectors. If particular issues arise for a sector, or sectors, this would be referred to the cross sector architectural governance board.

The framework and principles will be reviewed and updated as digital public services priorities develop and as warranted by changing business and technical circumstances. Where changes are applied, the ethos followed when creating these principles should also be applied, regarding each of the above sectors as part of a wider:

## **Scottish Public Sector (SPS) ‘Enterprise’ with a share collection of common goals.**

It should be noted that the term ‘Enterprise’, as used in this context, relates to both the individual organisations within sectors, as well as to the extended enterprise which includes partners, suppliers and customers.<sup>1</sup>

In order to deliver on the National DPS Strategy, a number of specific projects have been identified (e.g. SWAN, Data Centre consolidation, Identity and Authentication). The implementation of this Framework will, similarly, require establishment of specific projects, reflecting cross-sectoral agreement that a national approach is required. In all these cases, the principle of ‘use or explain’ will be applied, where the expectation is that all relevant bodies will utilise the results of the national project, except where they can identify compelling business needs that require a different approach.

## **1.5 Scope**

### **1.5.1 Strategic Principles**

The SPS Enterprise has set out the following high level principles for the national strategy:

- **Customer/Citizen Focus**
  - adopt an approach of “digital first” in service design; that means that organisations will deliver on line everything that can be delivered on line
- **Privacy and openness: using data appropriately**
  - Make effective use of all forms of data to deliver business outcomes, within a framework that maintains public confidence and meets statutory requirements
- **A Skilled and Empowered Workforce**
  - have a workforce that is motivated and skilled in using digital technologies and gains recognition for doing so
- **Collaboration and Value for Money**
  - through common standards and interoperability collaborate locally, nationally and internationally
  - collaborate in planning and procurement of ICT so as to re-use and avoid unnecessary duplication and so reduce purchase and running costs
  - have a public sector network which supports resilient high-volume and high-speed communication

### **1.5.2 Architecture Principles**

This framework provides a collection of architecture principles, which are relevant to those strategic principles and goals, alongside a number of more general principles to:

- promote following of industry best practice in operational delivery
- encourage reuse and sharing of existing assets
- ensure investment in ICT is bought with sharing in mind

### **1.5.3 Common Reference Model**

As Scottish public sector bodies move more towards shared procurement, consumption and delivery of ICT services, a shared definition of technical standards and specification will provide a common vocabulary and context for decision-making and help bodies develop capabilities needed for the future.

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<sup>1</sup>TOGAF 9.1 definition of Extended Enterprise.

This paper must therefore be developed to enable re-use and interoperability across agencies, providing a framework that allows departments to describe ICT capabilities in a way that allows them to be consumed and shared across traditional organisation boundaries.

## 2 Architecture Principles

### 2.1 Introduction

The principles are founded on the four strategic principles set out in the paper Scotland’s Digital Future – Delivery of Public Services. Each of those strategic principles is used to group together the Architecture Principles.

The architecture principles define the rules and guidelines that inform and support the way in which the architecture and design for services and systems in scope of this ICT Framework are delivered. They are intended to reflect a level of consensus across National, Sector and Local levels and should be used to assess the compliance of any new ICT initiative at each of those levels.

Architecture Principles are intended to be enduring and stable and are therefore defined at a high level. However, it is expected that the principles will be updated/extended over time where this is found to be appropriate. The principles are interrelated and should be applied as a set. In some cases, principles will compete; a governance process for their management should therefore be established to include a resolution process to manage these conflicts.

Each architecture principle defined in this paper is described using the following format (based on the TOGAF Enterprise Architecture<sup>2</sup>).

<b>Reference</b>	A unique reference identifier for the architecture principle
<b>Name</b>	An easy to remember name that represents the principle’s objectives.
<b>Statement</b>	An unambiguous statement that describes the principle.
<b>Rationale</b>	A statement or list of statements that describe the benefits of following the principle.
<b>Implications</b>	A statement or list of statements that describe the consequences of adhering to the principle.

This paper is intended to be a living document, reviewed and updated as warranted by changing business and technical circumstances. The principles are provided in this section as a starting point for the formulation of a more complete set under each strategic principle pillar.

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<sup>2</sup> The TOGAF9.1 Enterprise Architecture Framework

## 2.2 Citizen/Customer Focus

<b>Ref. No.</b>	OFP-CC1
<b>Name</b>	Digital Standards
<b>Statement</b>	The design of applications and services (information and transactions) will be user focused and with a presumption of alignment with the technical standards and design principles of the full (not prototype) version of MyGovScot.
<b>Rationale</b>	A common approach will facilitate effective user journeys.
<b>Implications</b>	Service providers will design digital services as part of a wider public sector approach and not in isolation.

<b>Ref. No.</b>	OFP-CC2
<b>Name</b>	Multi-Channel
<b>Statement</b>	The design of new applications and services shall not restrict service consumers from accessing the new functionality from currently known or defined access devices.
<b>Rationale</b>	<p>Applications and services have a potentially large and diverse client-base that may choose or need to employ a variety of access channels e.g. PC/Mac/Linux devices, secure kiosk, thin client, smartphone or other mobile device.</p> <p>The way in which citizens consume services will change over the life of a solution/service and should not be constrained by the current technology available.</p>
<b>Implications</b>	The solution architecture must be adaptable and provide the capability to support these changes at the appropriate points and in a cost-effective manner.

<b>Ref. No.</b>	OFP-CC3
<b>Name</b>	Identity and Access Management
<b>Statement</b>	Where possible, the solution architecture and design shall leverage existing central security services (rather than creating application-specific security). Access will be granted once the requester (human or computer) has been authenticated and authorised. The requester shall only be given enough privileges to execute those tasks needed to perform a specified job activity or function; no more and no less.
<b>Rationale</b>	The information held within the solution or service is deemed to

	warrant sufficient protection to make the need for access to it controlled to an appropriate level.
<b>Implications</b>	<p>Managing access and authentication to public services across multiple bodies from a single point limits required level of resource overhead.</p> <p>Organisations with additional security requirements (e.g. HMG protective marking schemes of IL3 and above) will require a federated authentication mechanism.</p> <p>Where the use of existing central security services is impossible, the solution should comply with standards-based federation.</p>

## 2.3 Privacy & Openness

<b>Ref. No.</b>	OFP-PO1
<b>Name</b>	Data Management – Open Data
<b>Statement</b>	The Scottish public sector produces huge amounts of data. There is ,however, relatively little open publishing of that data. By making non-personal information more accessible and encouraging its publication and reuse, opportunities exist to maximise its economic and social value.
<b>Rationale</b>	Publishing of open data for public use supports opportunities to improve efficiency in public services and promotes economic activity and innovative use.
<b>Implications</b>	A cohesive overview of data is required to ensure a consistent approach is taken. Common standards for data will need to be considered.

<b>Ref. No.</b>	OFP-PO2
<b>Name</b>	Data Management – Data Sharing
<b>Statement</b>	The Scottish public sector produces huge amounts of data. There is , however, relatively little sharing of that data. Opportunities exist to benefit from and/or improve services via better use of the data, whilst complying with privacy requirements.
<b>Rationale</b>	Better use of data provides the opportunity for organisations to target delivery of services, provide better integrated services and to become more efficient in their working, separately and together.
<b>Implications</b>	A cohesive overview of data is required to ensure a consistent approach is taken and common standards for data will need to be considered. All work in this area must comply with the legal framework for data sharing, respect for individuals' rights to privacy and confidentiality and consider public confidence about when and how personal information is shared.

## 2.4 Skilled & Empowered Workforce

<b>Ref. No.</b>	OFP-SW1
<b>Name</b>	ICT work force Capability
<b>Statement</b>	To increase the capability of ICT professionals at all levels in the public sector to support digital public service delivery.
<b>Rationale</b>	In order to deliver and support digital public services, a professional and appropriately skilled ICT workforce is essential.
<b>Implications</b>	A common approach to skills identification and development of the ICT workforce, such as SFIA, and collaboration in their deployment in order to maximise the impact of their skills.

## 2.5 Collaboration & Value for Money

<b>Ref. No.</b>	OFP-CV1
<b>Name</b>	Reuse, Before Buy, Before Build
<b>Statement</b>	<p>The design of solutions must seek to maximise reuse of existing services across the Scottish Public Sector. If existing services do not meet the business requirements and cannot be extended cost-effectively, then a supplier will be sought to provide that product or service and make it available for reuse across the sector.</p> <p>If there are no existing services to reuse or suitable COTS packages that can be obtained cost-effectively, then bespoke solutions that strictly conform to the architecture principles will be considered.</p>
<b>Rationale</b>	<p>The ability and options to deliver ICT services in the most flexible and cost-effective manner across a range of (internal and external) customers with differing technology domains. For long term stability and maintainability of the enterprise architecture, the focus should be on maximising reuse of existing services.</p> <p>However, depending on the business requirements and timeframe, buy/build options cannot be precluded.</p>
<b>Implications</b>	<p>The requirements analysis and change management disciplines that underpin this principle must be embedded in the architecture governance processes.</p> <p>The use of COTS products reduces the amount of bespoke coding required whilst also leveraging 3<sup>rd</sup> party investment and future development. With the existence of architecture principles, the requirements governing a COTS procurement must be considered from a more holistic strategic perspective.</p> <p>If bespoke development is unavoidable, then this should be restricted, where practical, to the business process layer of the architecture from where existing technical services can be consumed.</p>

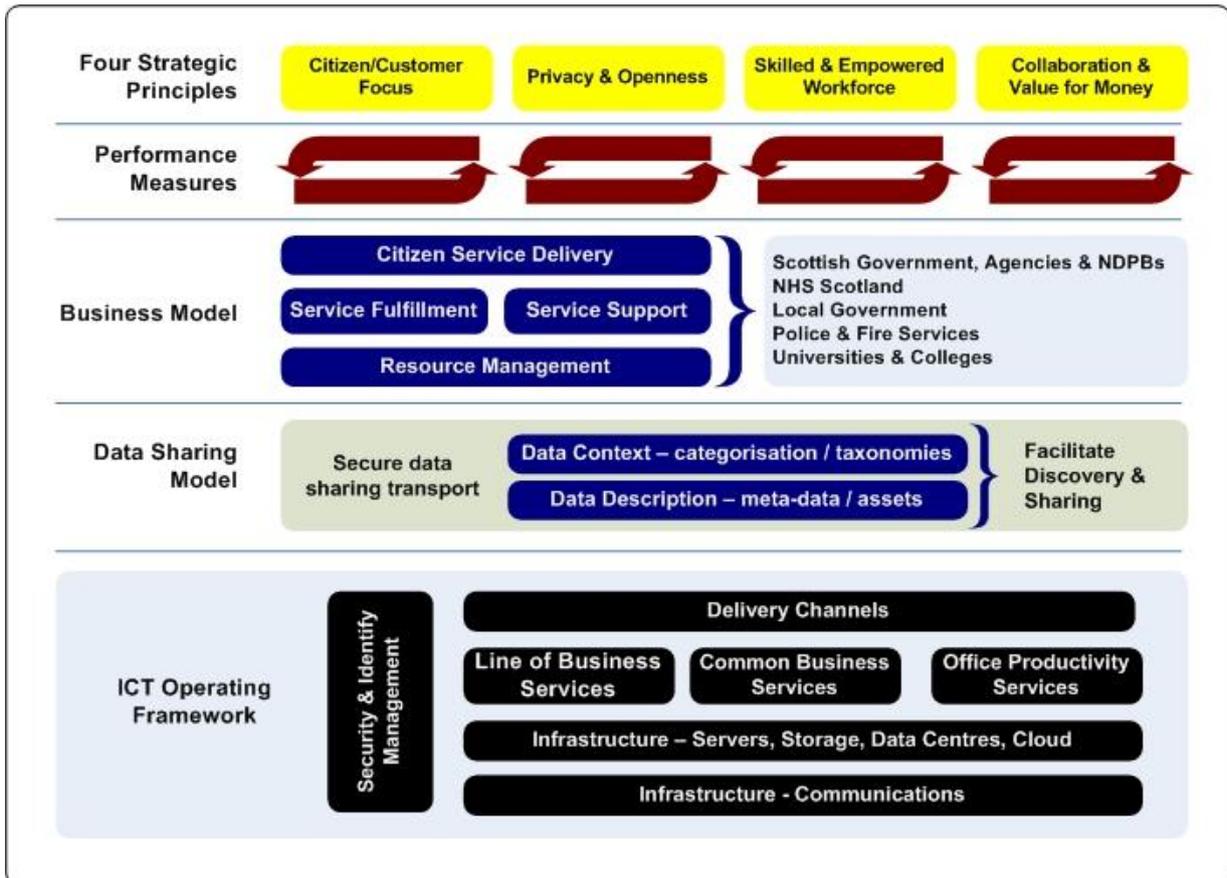
<b>Ref. No.</b>	OFP-CV2
<b>Name</b>	Collaboration
<b>Statement</b>	Collaboration is now the default choice in the design and delivery of services and in the procurement and deployment of ICT infrastructure to support this.
<b>Rationale</b>	The public services delivery sector should collaborate across organisational boundaries to ensure that the services delivered – whether at national, sectoral or local level – can be truly joined up to meet the needs of the users of public services, the citizens and businesses of Scotland.
<b>Implications</b>	The requirements analysis and change management disciplines that underpin this principle must be embedded in the architecture governance processes. The requirements governing any collaborative development or procurement must be considered from a holistic and strategic perspective.

<b>Ref. No.</b>	OFP-CV3
<b>Name</b>	Architectural Governance
<b>Statement</b>	The governance framework for all applications and services shall be owned and managed by a cross sector Governance Forum.  The governance framework will be informed by the TOGAF Architecture Framework.
<b>Rationale</b>	A governance framework is required to ensure that the evolution of the architecture is managed and controlled so that it continues to align with government's strategy and drivers.  The architecture, design, development, operation and support of solutions will be governed using business and ICT/IS standards as approved within the particular organisation. To ensure that all technical as well as programme governance processes are completed, the TOGAF Architecture Framework will be applied in conjunction with business governance models.
<b>Implications</b>	Application of this principle within the wider National Governance framework will provide the transparency and guidance required to define and support best practices.

### 3 Common Reference Model

The Reference Model illustrated below has been derived from the US Federal Government<sup>3</sup> and Australian Government Architectures<sup>4</sup>. It is included within this document to provide some context for the ICT Operating Framework described in the following section.

A short description only has been provided in support of this model, as any detailed examination of each element should be undertaken collaboratively by the respective Technical Design Group; it is therefore regarded as premature at this early stage of development.



A detailed description of the ICT Operating Framework is provided in Section 4 of this document, supported by a summary description of each of the model layers.

<sup>3</sup><http://www.whitehouse.gov/omb/e-gov/fea/>

<sup>4</sup>[http://www.finance.gov.au/e-government/strategy-and-governance/docs/AGA\\_RM\\_v3\\_0.pdf](http://www.finance.gov.au/e-government/strategy-and-governance/docs/AGA_RM_v3_0.pdf)

### **3.1 Four Strategic Principles**

These are reproduced from the paper *Scotland's Digital Future – Delivery of Public Services*, from which the following summary is derived:

#### **3.1.1 Citizen/Customer Focus**

Service design will be consumer centric and the on line experience delivered will be of an exceptionally high standard. Public services will be:

1. Accessible via a range of media devices and in formats suited to all end user capabilities
2. Presented as a single entity to the end user, regardless of source organisation
3. Integrated into a shared approach to identity and authentication management
4. Compliant with local, national and international standards

#### **3.1.2 Privacy & Openness**

Personal data will be handled appropriately and securely across all systems and managed in line with legal requirements, applicable standards and good practice. Public services will:

1. Use common standards and approaches to collecting, storing, referencing and sharing data
2. Reuse those standards to share data across organisations in support of a better, simpler and singular view of government systems for the citizen
3. Support update and management of personal information by the citizen and businesses
4. Share and reuse data in support of research and analysis in contribution towards national outcomes

#### **3.1.3 Skilled & Empowered Workforce**

Delivery of high quality digital public services and the underpinning ICT systems will be supported by a skilled and supported workforce. Public Service delivery will be:

1. Flexible in its approach to sourcing and sharing resources across organisations to optimise utilisation, effectiveness and efficiency
2. Supportive of collaboration in developing and maintaining services
3. Sustainable through on going skills sharing and development across and between sectors
4. Designed to encourage innovation, creativity and new ways of working

#### **3.1.4 Collaboration & Value for Money**

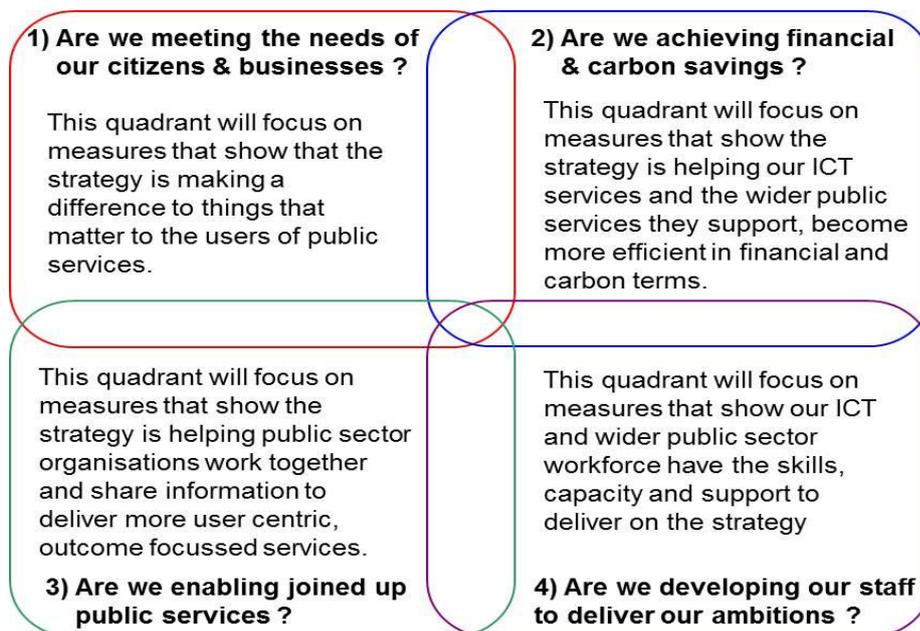
Collaboration will be the default choice in design and delivery of services and associated ICT infrastructure. Public Services will:

1. Adopt common interoperability and connectivity standards to support reuse and sharing of existing & proposed assets
2. Consolidate and converge its application portfolio where feasible
3. Where cost effective, use transaction/usage based services e.g. PAAS, SAAS
4. Demonstrate savings on ICT spend, delivered through a 'joined up' approach to ICT procurement.

### 3.2 Performance Measures

The Performance Measurement layer in the above model is in place to confirm that there is alignment between national, sector and local initiatives and that they are in turn aligned with the Governing Principles set out in the strategy Scotland's Digital Future – Delivery of Public Services.

A measurement and benefits framework has been created to monitor progress with the implementation of the DPS Strategy and Supporting Sectoral Strategies and can be found at <http://www.scotland.gov.uk/Topics/Economy/digital/digitalservices/MandBframework>. The framework uses a score card format, covering four areas of key strategic importance for the DPS Strategy and the Scottish Government's wider Public Service Reform agenda. The four score card quadrants are described in the diagram below.



The benefit areas that will be measured are those contained within the Measurement and Benefits Framework that are directly related to the four Architecture Principles used in this document. The framework document provides further detail on the sources of data that will be used to measure these benefits.

It is anticipated that, at a sector and/or organisational level, additional benefits and related performance measures, specific to the activities contained within the sector strategies, will be identified.

### 3.3 Business Model

The Business Model provides a simplified functional view of the common business areas instead of through a stove-piped, organisational structure view<sup>5</sup>. It provides a simple representation of the business of Scottish public sector bodies using four primary business functional areas and may be useful in considering:

<sup>5</sup>The US Federal Business Reference Model is illustrated in Figure 10 of the following document, which may support understanding of the above structural description.

[http://www.whitehouse.gov/sites/default/files/omb/assets/fea\\_docs/FEA\\_CRM\\_v23\\_Final\\_Oct\\_2007\\_Revised.pdf](http://www.whitehouse.gov/sites/default/files/omb/assets/fea_docs/FEA_CRM_v23_Final_Oct_2007_Revised.pdf)

- opportunities for service, application and systems consolidation
- collaboration opportunities
- shared investments
- data sharing
- citizen service delivery, within and across sectors

It is deliberately a non-technical layer of the model and focuses attention on what activities and business services are required to perform the business of serving Scotland's citizens.

A further level of abstraction may be performed to an organisational grouping level, where business capabilities are represented by business services that are enacted through the business processes created by bodies providing similar functions. This is deemed outwith the scope of this paper.

### **3.3.1 Citizen Service Delivery**

The Citizen Service Delivery Business Area describes the purpose of the Scottish Public Sector in terms of the services it provides both to and on behalf of citizens, businesses and other organisations.

It could include:

*Law enforcement & Justice; Education; Health; Transport; Social Services; Economic Development; Environmental services and controls*

### **3.3.2 Service Fulfilment**

The Service Fulfilment Business Area represents the functions and mechanisms used to achieve the purpose of the Scottish public sector. It is the functional channel through which government services are provided to citizens.

It could include:

*Student Awards; Grant Aid; Permits & Licensing; Victim and Witness information; Advice & Skill; Housing Repairs, Benefit Processing*

### **3.3.3 Service Support**

The Service Support Business Area provides the policy, programmatic and managerial foundation to support public sector operations in the provision of services to citizens, businesses and other organisations.

It could include:

*Strategy and Performance; Policy and Legislation Development; International and Constitution; Information for Transparency and Openness of Government*

### **3.3.4 Resource Management**

The Resource Management Business area refers to the support activities that enable the public sector to operate effectively and efficiently.

It could include:

*HR and Financial Management; Supply Chain Management; ICT Management; Administration; Information Governance & Knowledge Management; Asset Management;*

### 3.4 Data Sharing Model

The Data Sharing Model is a flexible, standards-based framework to enable (within broader considerations of privacy and ethics) information sharing and re-use, via the standard description and discovery of common data and the promotion of uniform data management practices. It provides a standard means by which data may be described, categorised and shared.

Within the model there are four standardisation areas:

- **Data Description:** provides a means to describe data uniformly, thereby supporting its discovery and sharing
- **Data Context:** facilitates discovery of data through an approach to the categorisation of data according to taxonomies
- **Data Sharing:** supports the access and exchange of data where access consists of ad hoc requests (such as a query of a data asset) and exchange consists of fixed, recurring transactions between parties. It is enabled by capabilities provided by both the Data Context and Data Description standardisation areas
- **Data Ownership:** Data is owned by the business and accountability for its quality lies with business owners

## 4 ICT Operating Framework

### 4.1 Overview

This section discusses and outlines a framework to support and develop the ICT Architecture of public sector bodies in Scotland. A number of architectural layers are defined to allow the ICT architectural landscape to be simplified and synthesised into common, industry recognised components.

The application of those layers allows for the modelling of current and planned architectures against a target ICT Architecture. The architectures under review may be aggregated at local, sector and national levels in support of moving towards the target (or blueprint) architecture and also influencing the use of ICT to improve the quality and effectiveness of services delivered.<sup>6</sup>

This Operating Framework is aimed at assisting organisations in:

- The assessment and modelling of their current architectures in a consistent manner
- Comparing architectures across organisations
- mapping commonality and understand uniqueness
- Identifying a Target ICT Architecture at National, Sector and Local levels
- Establishing a roadmap to support organisations as they move towards that target architecture

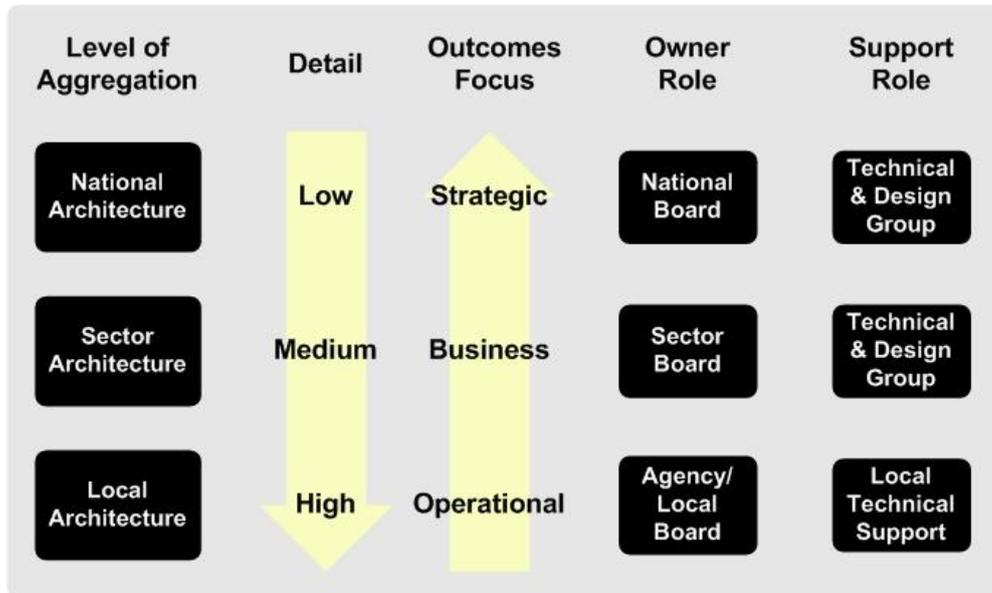
Technology evolves at a rapid pace and future opportunities, which offer further improvements on the current model, may be presented. The Target Architecture will therefore need to be revised on a regular (at least annual) basis, with the layers and maturity model (presented later) developing over time.

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<sup>6</sup><http://www.scotland.gov.uk/Publications/2011/06/15104329/14>

## 4.2 Architecture Levels

The aggregation of those different architectures is captured in the following diagram<sup>7</sup>, which provides some context in support of how the governance around their formulation, modelling and collection may be organised.



### 4.2.1 National

This level of detail supports the sectors and brings them together into a national framework, where common or shared assets may be identified and a common strategy created and maintained in line with changing business and ICT landscapes. It sets the context against which sector architectures and resources should align.

### 4.2.2 Sector

Supports the creation of a simple roadmap for each sector, used to shape the ICT Architecture to align with the national strategy and deliver products that improve the delivery of services to citizens.

### 4.2.3 Local

Represents a level where Agency/NDPB, etc. ICT assets are brought together and support those individual functions within the local organisation. Definitions and constraints set out at higher levels of the architecture direct architecture design and resource decisions e.g. on use of common hosting facilities.

## 4.3 Architectural Framework

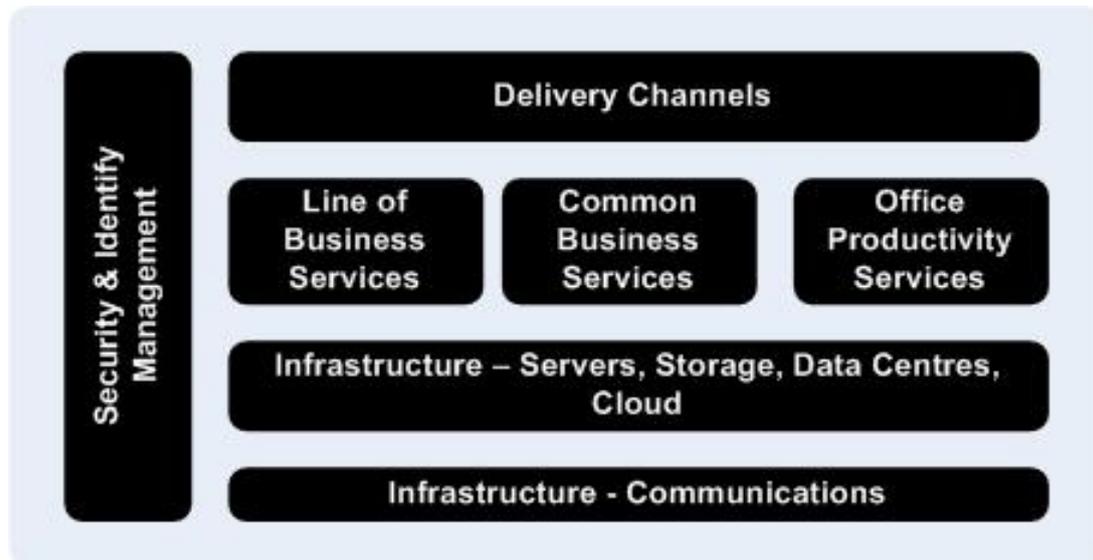
A modern ICT Architecture has a number of complex components. Technological evolution has introduced a number of innovations and the ICT landscape in most businesses or public sector bodies now contains a range of technology of differing age.

Yet, in order to address the recommendations from McClelland we must define some standard services or tiers within the architecture. These are proposed based on accepted industry practice today (in order to maximise the ability to procure these on the marketplace)

<sup>7</sup>Loosely based on The Federal Enterprise Architecture Practice Guidance (2006)

and with an eye on the challenges faced within the Public Sector in Scotland (for example the need to share citizen data).

A proposed model of Architectural tiers or services is depicted in the following diagram. This model identifies accepted industry services, which are outlined further below. Services higher up this model are more specialised and depend upon services supported by lower tiers in the model. In addition, higher tier services will, by definition, be less re-usable which is depicted by the width of the service in the model.



Each of the components is explained in the following text and later expanded to describe and support their measurement against a baseline 'Ideal Organisation'.

#### 4.3.1 Infrastructure – Communications

All public sector locations and establishments require some form of ICT (data) and/or telephony (voice) service. There is already a national level procurement in progress (SWAN) to support rationalisation and convergence of multiple network services into a single, unified service portfolio.

#### 4.3.2 Infrastructure - Servers, Storage, Data Centres and Cloud

The deployment of physical ICT assets has evolved dramatically in recent years. Critical business applications, for example ones which impact the safety of the public or employees, require high availability, which can best be delivered through modern data centres.

#### 4.3.3 Security and Identity Management

Security needs to be central to how modern business operates. Within the public sector specifically, there is a need to:

- support the concept of “The Citizen” nationally, across sectors and locally
- share information more readily (e.g. within the health, social services and criminal justice domains)
- enable public or citizen access to an increasingly diverse service base in a uniform and consistent manner

Common security and ID management processes, services and tools are essential elements of the architecture to enable all of these aspirations.

#### **4.3.4 Standard Office Productivity Applications**

Standard applications like Word, Excel and email are widely prevalent in the user community today. Their interoperability and the incorporation of new 'standard applications', such as emerging social media platforms, are vastly common across the Scottish Public Sector. Where there is a perceived unique requirement in this tier, this should be considered the exception rather than the rule.

#### **4.3.5 Common Business Services**

Currently most public sector bodies operate as largely independent businesses with their own employment processes, payroll, etc. Therefore there are a number of business services, payroll, HR, etc. which are similar in their application. As noted in the national and draft sectoral strategies it is expected that there are significant opportunities to standardise and re-use across these services.

#### **4.3.6 LOB Applications**

Line Of Business Applications are by definition, specific to the agency/public body that requires them. In a number of cases they may be bespoke applications. However, even at this level, there will be opportunities to share data, or perhaps compromise on process to allow for standardisation of applications.

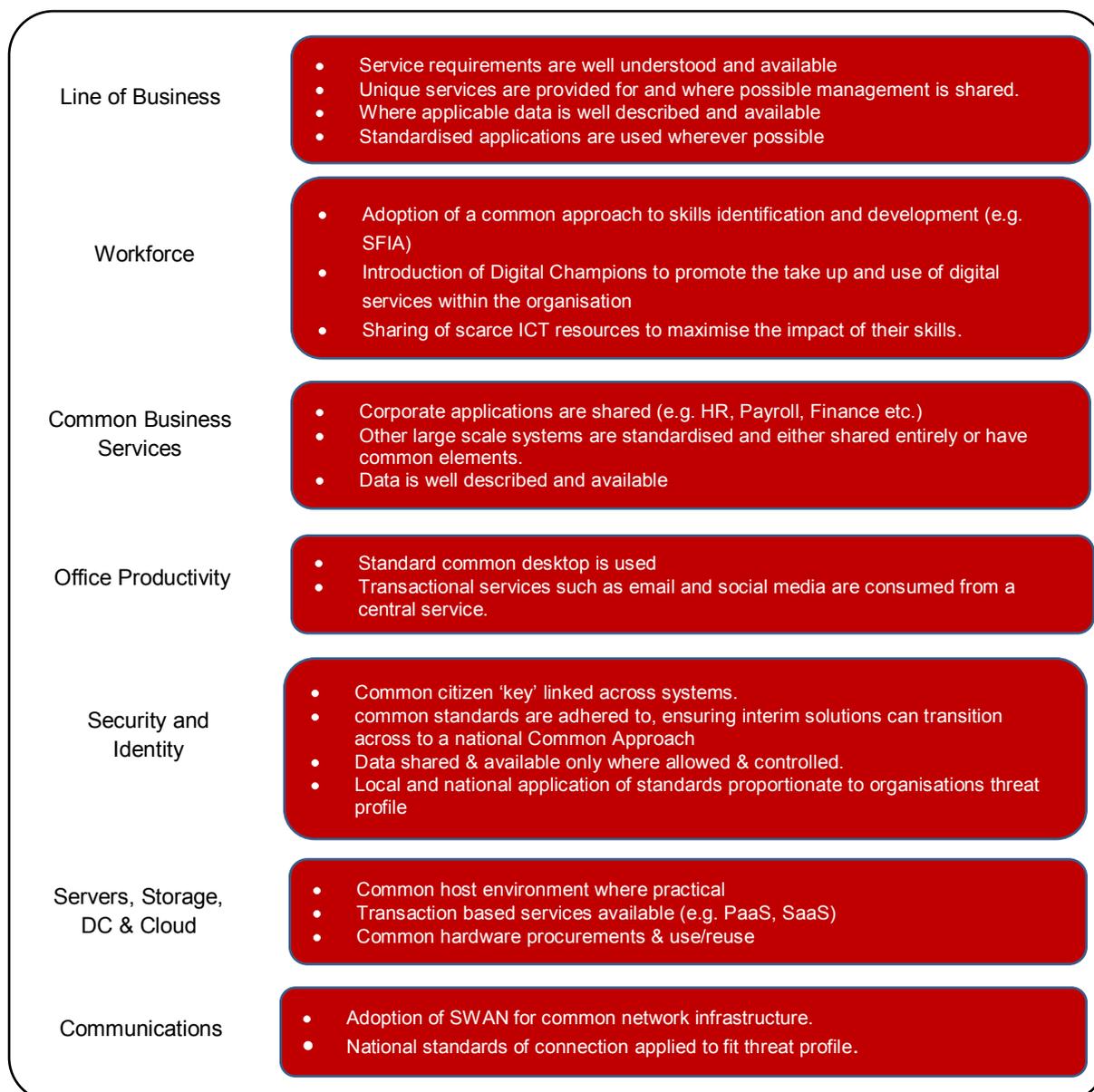
#### **4.3.7 Delivery Channels**

Applications and services have a potentially large and diverse client-base that may choose or need to employ a variety of access channels e.g. PC/Mac/Linux devices, secure kiosk, thin client, smartphone or other mobile device. Common standards and approaches will support the delivery of services over these channels in as efficient means as possible.

### **4.4 An Ideal Organisation**

It is recognised that public sector bodies will have different capabilities for each of the components described above. In addition, they will not all be able to advance at the same rate. A model is therefore outlined below to support each organisation to evaluate their current capability and maturity and map out their short term plans and longer term strategies.

The ICT of an ideal organisation is described below, restating the architecture components in terms of Tiers, which model the possible adoption profile for each component i.e. the lower the tier in the diagram, the earlier it is likely that an organisation will be able to incorporate and align their own approach to that of the National Strategy.



Note that Channels are not included in the above model, as their development and uptake will be drivers for the above service delivery routes evolution, rather than being part of the organisations delivery capability.

#### 4.5 Model to Assess Maturity and Support Planning

Agencies and other public bodies will not be at the same stage of ICT maturity. Many will have complex ICT landscapes across a mixture of technologies. In addition, with current constraints on public spending, no single body will be able to evolve to the optimum architecture overnight.

A model to assess the current maturity or adoption of the architectural principles, assessed against each tier above is therefore presented. Qualitative criteria will be developed against which each organisation may be assessed. It is recommended that this assessment should be carried out on 3 planning horizons:

<b>Current</b>	As-is assessment of the architecture
<b>Planned</b>	Funded and in-flight projects. It is recommended that these are re-evaluated at least annually.
<b>Strategic</b>	Assessment of where that organisation wants to be, taking into account that each organisation will by its own uniqueness be limited to where on the maturity model its optimum level of adoption will reside.

Applying this approach will result in a model similar to Figure 1. Using this model, organisations will be able to track their progress against their plan and strategy. Also, an aggregate level of governance can be applied at sector and national levels.

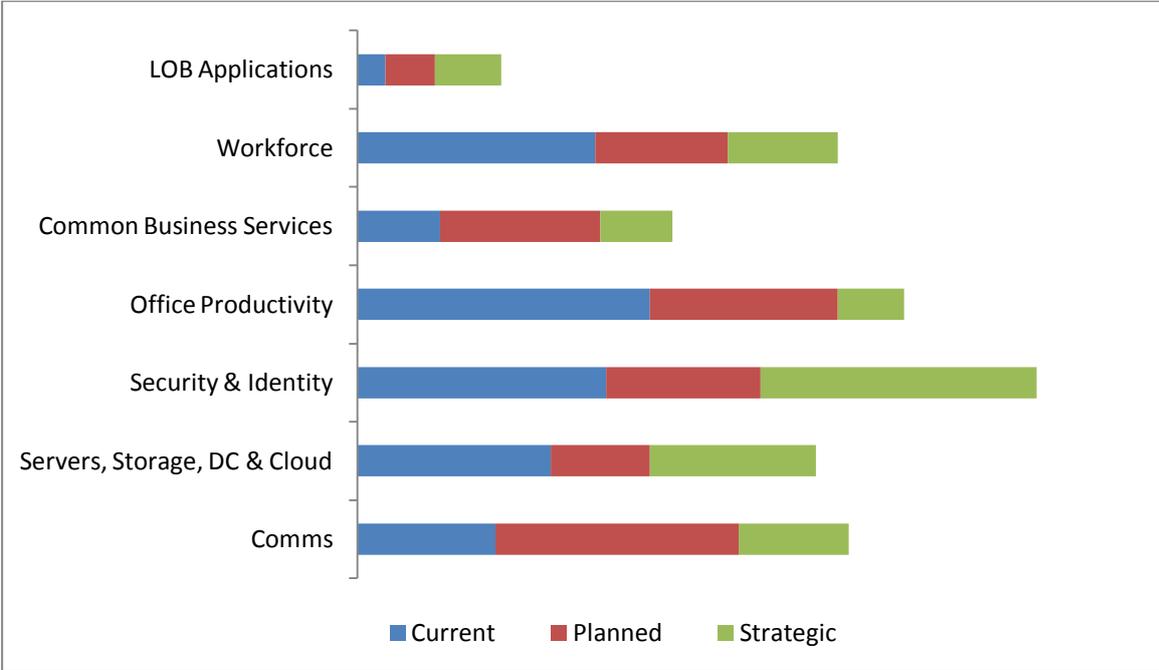


Figure 1 – Example Architectural Maturity Model

In arriving at the above model, a form of numeric scoring is proposed (for further development) to give a comparable measure for local, sector and national levels.

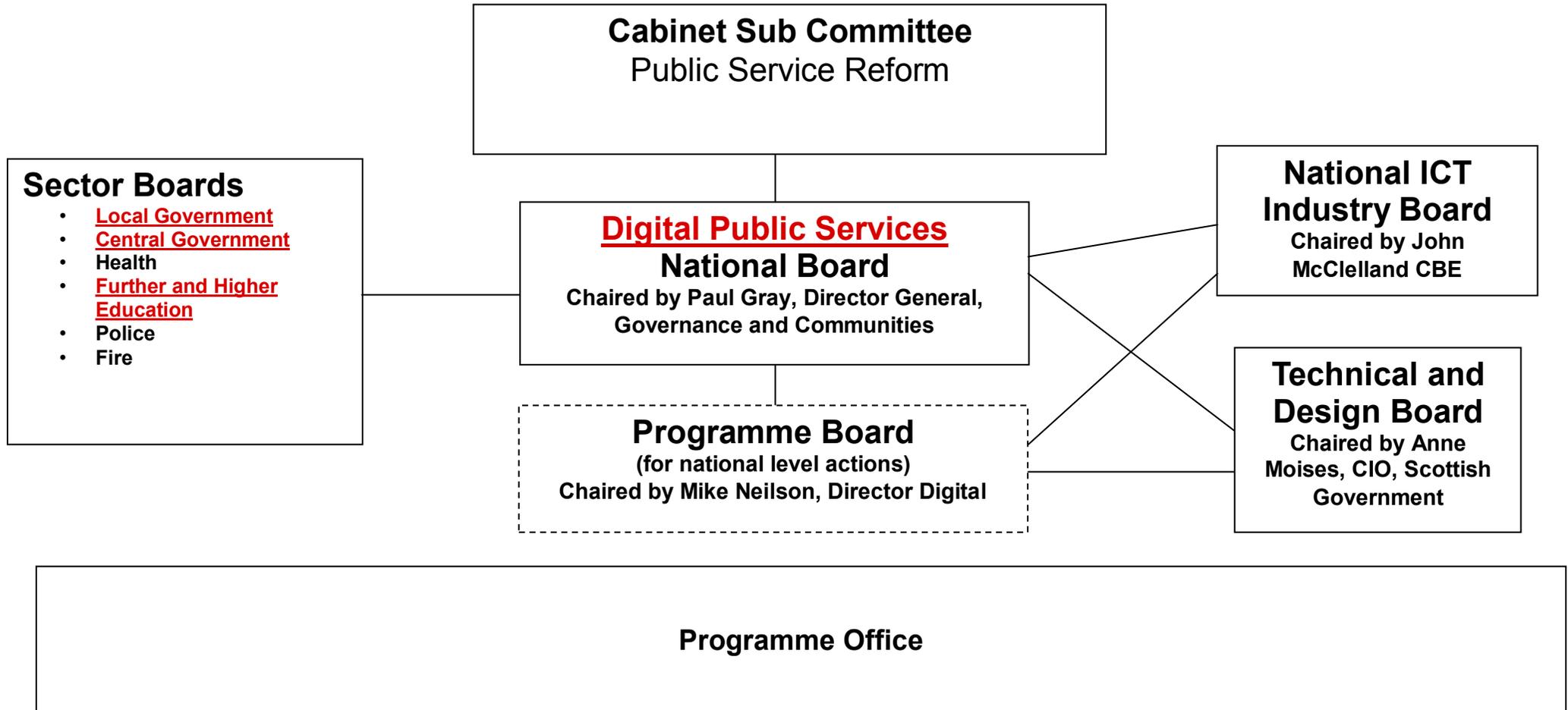
**4.5.1 Illustrative Organisational assessment criteria**

Illustrative Organisational assessment criteria is included at Annex B

## 5 Glossary

Term	Meaning
AP	Architecture Principles
CESG	The National Technical Authority for Information Assurance
COTS	Commercial Of The Shelf software
DPA	Data Protection Act
e-GIF	e-Government Interoperability Framework
FOI	Freedom of Information Act
IGF	Information Governance Forum
Open Data	Data that meets the following criteria: <ul style="list-style-type: none"><li>• accessible (ideally via the internet) at no more than the cost of reproduction, without limitations based on user identity or intent;</li><li>• in a digital, machine readable format for interoperation with other data; and</li><li>• free of restriction on use or redistribution in its licensing conditions.</li></ul>
OSIAF	Open Scotland Information Age Framework
PAAS	Platform as a service
SAAS	software as a service
TOGAF	The Open Group Architecture Framework
WS-*	Web Services Standards

# Governance and Support Structure: National Level



## Annex B –Illustrative Organisational assessment criteria

<b>LOB Applications</b>	<ol style="list-style-type: none"> <li>1. Are you sharing data with other Public Sector bodies (in or out)?</li> <li>2. Is your data sharing interactive or batch driven?</li> </ol>
<b>Workforce</b>	<ol style="list-style-type: none"> <li>1. Do you have succession planning for critical ICT roles?</li> <li>2. Do you have a structured career development for your ICT staff?</li> </ol>
<b>Common Business Services</b>	<ol style="list-style-type: none"> <li>1. Do you support HR, Finance, and Procurement operations from a shared platform?</li> <li>2. Are your HR, Accounting or Procurement systems purchased through a central agreement?</li> <li>3. Do you have a SAAS model for obtaining these services?</li> </ol>
<b>Office Productivity</b>	<ol style="list-style-type: none"> <li>1. Do your employees use a common, shared office platform?</li> <li>2. Do you procure your applications on a per usage or per set basis (SAAS)?</li> </ol>
<b>Security &amp; Identity Management</b>	<ol style="list-style-type: none"> <li>1. Do all your users access your systems using a logon ID that can be used across the public sector or by using an ID or multiple IDs that are local to you organisations?</li> <li>2. Do you carry out penetration testing on your applications annually?</li> <li>3. Do you have an external web site?</li> <li>4. Do you offer any services via your web site to external organisations or the public?</li> <li>5. Do you support logon credentials for members of the public; are they supportive of the citizen account?</li> </ol>
<b>Servers, Storage, CD &amp; Cloud</b>	<ol style="list-style-type: none"> <li>1. Are your servers hosted in your offices or in a shared data centre?</li> <li>2. What proportions of your servers are hosted on virtualised infrastructure?</li> <li>3. Do you have a rolling program of DR testing?</li> </ol>
<b>Communications</b>	<ol style="list-style-type: none"> <li>1. Is your organisation using communications procured under shared Public Sector frameworks?</li> <li>2. Are all parts of your network accredited to a particular standard of CoCo?</li> <li>3. Do your offices and data centres have resilient communications links (i.e. multiple routes)?</li> <li>4. Do you offer video conferencing/VOIP on your network?</li> </ol>

## Annex C – Action Plan

Priority	Action	Timeline	Lead
<b>Citizen Customer Focus-</b> Digital Standards	<ul style="list-style-type: none"> <li>Digital Public Services Best Practice Review</li> <li>Priority route map of digital services</li> <li>User Analysis and User Experience Review</li> <li>Quality standards for digital services</li> </ul>	Mid 2013 Mid 2013 Autumn 2013 Autumn 2013	Online Services and Strategy
<b>Citizen Customer Focus-</b> Identity and access management	<ul style="list-style-type: none"> <li>Report from working group on a common approach to Identity and discussion with Ministers</li> <li>Implementation programme and wider engagement</li> </ul>	April 2013 Mid 2013 onwards	Identity and access management work stream.
<b>Privacy &amp; Openness -</b> Data Innovation (Big and Open Data)	<ul style="list-style-type: none"> <li>Establish dialogue on data opportunities</li> <li>Publish programme (signpost) to public data available for re-use</li> </ul>	May 2013 Mid - 2013	Identity and access management work stream.
<b>Privacy &amp; Openness -</b> Data Sharing	<ul style="list-style-type: none"> <li>Good practice recommendation report to Data Management Board</li> </ul>	June 2013	Identity and access management work stream.
<b>Workforce –</b> ICT capability	<ul style="list-style-type: none"> <li>establish a common approach to skills identification and development, and examine the feasibility of a Skills Bank for the workforce to register their skills and capacity</li> <li>Create a Cadre of Digital Leaders/Champions across the public sector, who will inspire and drive digital transformation</li> </ul>	April 2013 onwards June 2013	Workforce work stream
<b>Collaboration and Value for Money –</b> Create an agreed measurements and benefits framework	<ul style="list-style-type: none"> <li>A scoring sheet will be developed to enable organisations to assess themselves against the maturity model.</li> </ul>	Aug. 2013	Technical and Design Board.

<p><b>Collaboration and Value for Money-</b></p> <p>Identify excellence and develop a framework for sharing and supporting the adoption of good practice</p>	<ul style="list-style-type: none"> <li>• Develop sector based ICT Operating Framework's, where needed, using the same model as supplied here.</li> <li>• Work with volunteer organisations who have undertaken the maturity model assessment.</li> </ul>	<p>Sept. 2013</p> <p>Sept. 2013</p>	<p>Technical and Design Board.</p>
<p><b>Collaboration and Value for Money -</b></p> <p>efficiency and re-use</p>	<ul style="list-style-type: none"> <li>• Identify commonality and opportunities (for example Green ICT &amp; Open Source).</li> </ul>	<p>Oct. 2013</p>	<p>Technical and Design Board.</p>
<p><b>Governance</b></p>	<ul style="list-style-type: none"> <li>• Develop options for a technical design authority (TDA) function.</li> <li>• Agree and establish a TDA</li> </ul>	<p>Jun. 2013</p> <p>Oct. 2013</p>	<p>Technical and Design Board.</p>



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