Open Standards for Digital Local Public Services

A response to the Policy Exchange paper "Small Pieces Loosely Joined"[1]

September 2015

iStandUK was previously known as Local eGovernment Standards Body (iStandUK).

This iStandUK[2] white paper is a response to the influential March 2015 Policy Exchange report "Small Pieces Loosely Joined - How smarter use of technology and data can deliver real reform of local government".

Members of the iStandUK Executive Board provided significant input to this report for which iStandUK would like to express its gratitude.

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[1] http://www.policyexchange.org.uk/publications/category/item/small-pieces-loosely-joined-how-smarter-use-of-technology-and-data-can-deliver-real-reform-of-local-government

[2] http://www.legsb.gov.uk

1 Executive Summary

This iStandUK report responds to the January 2015 Policy Exchange report "Small Pieces Loosely Joined: - How smarter use of technology and data can deliver real reform of local government".

Whilst it aims to elaborate on the recommendations made in that document, it also relates to other recent publications and several recent political party publications.

The iStandUK welcomes the Policy Exchange paper but recommends that the changes required go further and are considered together more holistically, particularly in the area of open standards for digital local public services. iStandUK and its stakeholders can offer capabilities and tested models developed for organisations such as the British Standards Institute, the Local Government Association, GDS and so on.

This report proposes practical approaches to devising and applying standards, to improve data sharing, towards local digital public services, in line with the conclusions and recommendations of the Policy Exchange report.

We also consider how relevant parts of the Government Service Design Manual[3] can be applied or adapted to support a local data ecosystem, linking to a local and national information infrastructure.

iStandUK[4] is the Local Government programme for information standards and is hosted by Tameside Council, with representation on its board from:

- Department for Communities and Local Government

- Department for Work and Pensions

- Local Government Association

- Local authorities

- Education Skills and Children's Services Information Standards Board

- Health and Social Care Information Centre

- Sector and industry organisations and programmes including SocITM.

The iStandUK mission is to promote information standards that support efficiency, transformation and transparency of local public services.

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[3] https://www.gov.uk/service-manual

[4] http://www.legsb.gov.uk

2   Introduction: Small pieces loosely joined

As quoted in the Policy Exchange report, the Local Government Association (LGA) forecasts that "local authorities in England face a funding shortfall of £12.4 billion by 2020" and demand for the services provided by local government is rising, particularly in social care.

On top of this over £10 billion has already been saved and, according to Treasury officials, a similar amount needs to be extracted in the coming spending round which, it is expected by some councils, to results in the Government's revenue support grant to councils being reduced to a negligible amount.

In the context of these challenges the Policy Exchange report voices a stark fact felt by many in the sector, namely that "the sector therefore has a choice: either it must stop providing some services altogether or fundamentally reinvent the way it works.".

The report argues that some of the savings that needs to be made to fill the funding gap can be made through public service transformation in particular through the use of digital technology and data. It argues that funding is wasted through fragmentation of digital services and data in local authorities and that more can be done through a more coordinated approach.

We agree that public service transformation, and digital services give rise to a greater need to share data. There are examples across the Country where there is a need to:

- Identify groups of people with specific health and care needs / risks, so that services can be targeted to support them. This requires data from health and social care.

- Identify groups of vulnerable people and families to target support, and then help them back into work. This could require data from a wide range of organisations including Local Authorities (Children and Adult Social Care for example), DWP, Police, Probation etc

- Assess the impact of service changes arising from the above

These sort of initiatives require data to be shared, cleaned and matched from across organisations and services, and then made accessible in a number of different ways. Sometimes this may require re-identification of people, and sometimes the resultant data can be used anonymously to help identify patterns, or assess impact.

In order to undertake this type of work, there is a need for:

- Services / organisations to work together to agree the type of analysis they need to do, how they will do it, and how it will be used to inform their decisions.

- A service infrastructure that allows this kind of analysis to be done (data matching services, research services etc).

- A technical infrastructure that supports this kind of analysis.

- Standards that underpin all of the above.

This kind of work is relatively new to public services. We see that organisations and departments are working towards doing more of this kind of work, and there are many examples of good practice. But we also see that the data services that are developing are fragmented, in that approaches are inconsistent at best, and incompatible in some cases. This response is primarily focussed on standards, but acknowledges the need to conduct work on technical and cultural issues that impact on information sharing. It is important that all organisations that work on information and data sharing also develop a cultural of collaborative working to help support the development of the wider infrastructure.

The Policy Exchange report proposes a number of recommendations which can be summarised as:

1. A newly appointed Government Chief Data Officer should work with others to define open standards for data.

2. The whole public sector needs to have one secure mechanism for exchanging data, with a single set of compliance standards covering PSN and N3.

3. An Office of Data Responsibility should be established as an extension to the work of the Information Commissioner's Office.

4. The public sector should commit to compatibility with personal data stores,

5. To ensure interoperability of IT across the public sector, a new iteration of the Digital Marketplace (formerly the CloudStore) should be created.

6. A Local Government Digital Service, owned by the sector, should be established that creates and manages a Local Government Data Marketplace (LGDM).

7. Each of the UK's cities should establish an Office of Data Analytics (ODA) to emulate the New York City Mayor's Office of Data Analytics.

8. The roll out of Whole Place Community Budgets should be accelerated for Local Authorities that commit to sharing data with their region's Office of Data Analytics

For over 10 years the iStandUK (formerly Local eGovernment Standards Body) has been sponsored by, amongst others, the Cabinet Office, Department for Work and Pensions and Department for Communities and Local Government to improve information flows between central and local government and for effective information standards to be applied more constructively and effectively in the sector. Standards have been developed in a sector led approach with the support of the LGA and the ESD Toolkit5.

The Policy Exchange report calls for open standards as a basis for overcoming fragmentation. iStandUK and the LGA, on behalf of Local Authorities, have promoted a standards approach, initially in support of e-government service delivery, and now into digital services and transparency. The ESD Toolkit has built an extensive library of standards, vocabularies, and tools, to overcome

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5
 http://standards.esd.org.uk

some of these fragmentations. As an example, the LG Inform[6] service provides access to consistent metrics describing and comparing local services, underpinned by these standards.

This report proposes practical approaches to devising and applying standards, to improve data sharing, towards local digital public services, in line with the conclusions and recommendations of the Policy Exchange report.

We also consider how relevant part of the Government Service Design Manual[7] can be applied or adapted to support a local data ecosystem, linking to a local and national information infrastructure

3   The context of local information

It is helpful to think of information flowing across the five contexts defined below.

Operational information: about real people and places, with real needs and circumstances, using real services, e.g. case work

Statistical information: aggregated operational data, organised using common classifications and segmentations;

Analytical information: the conclusions drawn from an analysis of statistical data;

Political information: the decisions taken to shape services, e.g. budgets, strategies, priorities, targets etc;

Reference information: master data to give common identifiers and definitions to objects that can be used to link data;
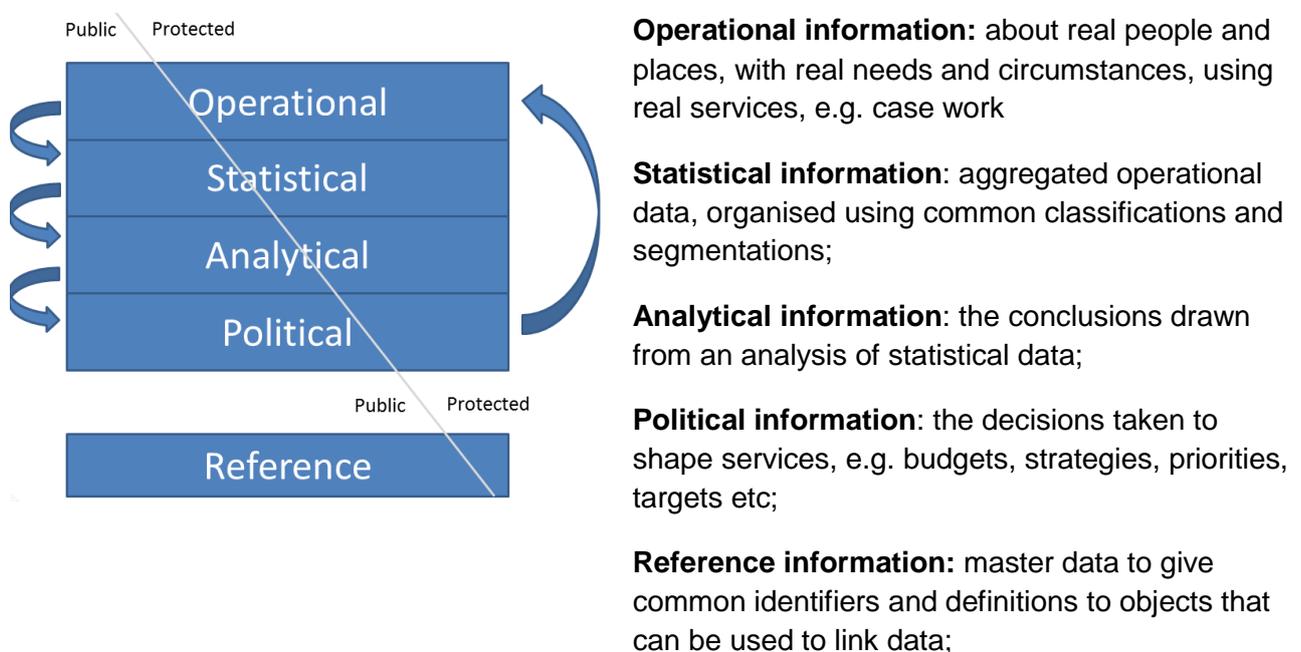
Figure 1. iStandUK's information contexts.

Each dataset, will have been assessed by its owner as to whether it is public, or protected as described in Figure 2.

Public Data	"Public Data is the objective, factual, non-personal data on which public services run and are assessed, and on which policy decisions are based, or which is collected or generated in the course of public service delivery."
	http://data.gov.uk/opendataconsultation/annex-2

6
http://lginform.local.gov.uk/

7
https://www.gov.uk/service-manual

Protected Data	Data …
	• containing personal information which Is covered by the Data Protection Act,
	or
	• for which there is a relevant exemption from legislation such as the Freedom of Information Act.
	or
	• containing IPR, which itself maybe from a 3rd party, which requires special licence conditions or fees as described by the regulations for the re-use of public sector information.
	Risk assessments can be applied to protected data to determine a series of 'business impact levels', and consequently, determine appropriate information security controls.
	The Government Service Design Manual introduces information security at https://www.gov.uk/service-manual/making-software/information-security.html

Table 1. Protected vs public data.

Data that may be protected in one context, may become public when processed into another context. For example, data about people and their circumstances may be protected, but statistics about caseloads and segmentations may be public, and valuable insight might be released.

Local Authorities commonly generate 'customer insight' and 'business intelligence' from various sources of data, as evidence to support service delivery and public service reform.

Sharing data within a single organisation is difficult enough; but the context diagram proposes that data can be shared at each level, between many organisations and citizens, who have a right to it, rather than those who have the privilege of having ready access to it. So perhaps, one organisation can confidently discover and use the analytics generated by another organisation. Shared analytics on the predicted well-being of local communities can lead to joined up policies, and use of resources, across agencies, and engaged citizens.

Sharing data is not confined to the public sector, for instance

- a local authority may need to know if someone has current valid insurance to drive;
- a company will need to know if an individual has the right to work in the UK.

Applying these principles to the Policy Exchange report calls for data sharing at a casework level …

> *"Coordination, meanwhile, can be improved when different teams have real-time data on the activities of those with whom they work.*
>
> *Thirty-one separate organisations can be involved in supporting a troubled family and their interactions can be numerous, complex and*

expensive”.

Policy Exchange - Small Pieces Loosely Joined

and at an analytical level

"Targeting can be achieved by having accurate data that shows where the greatest incidences of problems are, or by correlating data from a number of different sources to predict where problems are most likely to occur in future.

What's the demand for library services in the community that falls at the intersection of three councils' areas?”

Policy Exchange - Small Pieces Loosely Joined

… and that that data sharing should be systematic, i.e. business as usual, rather than having to set up point-to-point data sharing arrangements for individual initiatives.

"Local government needs systematic data sharing across the sector.”

Policy Exchange - Small Pieces Loosely Joined

The Policy Exchange report proposes that sector-wide standards can underpin systematic data sharing

"Ensuring compatibility with open standards – common formats and schemas for recording data – makes it easier to move, share and analyse data from different IT systems.

Since the delivery of complex public services – such as social care or supporting troubled families – requires coordination between many different organisations, compatibility with open data standards is needed across the entire public sector.

Compatibility with open standards should be highly recommended for 10 years, with a clear commitment that it will become legally mandated from 2025, allowing each organisation to phase out non-compliant systems.”

Policy Exchange - Small Pieces Loosely Joined

… and that those standards can form the rules that support a local data ecosystem, and a marketplace for apps.

We therefore propose the nature of standards, applicable to all contexts, necessary to:

- discover data that is available for a defined purpose;
- assess if data is fit for a purpose;
- join data based on a common understanding of its meaning and links to reference information;
- access and handle data legally and securely;
- trace how data has been derived, used, and re-used;
- support a marketplace for the development of solutions that create and/or consume data.

iStandUK has considered the standards necessary to achieve the ambition of the Policy Exchange document, over seven themes some of which are reference or alluded to the in the Policy Exchange report:

Semantics	the meaning of information
Syntax	the format of information
Quality	the confidence to re-use information
Rights	permission to use information
Trust	who is accessing information
Transport	how to move information
Governance	the behaviour and culture to protect and exploit information

Table 2. iStandUK's information standards model

This document considers each of these themes, proposing the standards that should be re-used or developed, to form the compliance regime necessary to enable systematic data sharing across many agencies and the public, via a data ecosystem.

3.1 Semantics – the meaning of information

We are working with Local Authorities who are looking to find elegant and systematic ways to answer simple queries such as:

- what happened to each member of a family last month?
- how much is spent in an area, dealing with anti-social behaviour?

These queries are hard because the data is stored in individual systems, supporting specific 'vertical' services, which are not designed to interrogate each other, and which use language from practitioners that does not translate across sectors.

> *"On a technical level, the different IT systems used by each team make it hard to share data, as information is recorded in different styles and formats.*
>
> *Within a single council, the same individual can be recorded on as many as 30 separate systems with no unique identifier linking the*

> *records."*
>
> **Policy Exchange - Small Pieces Loosely Joined**

The Policy Exchange report calls for standards that can describe data from the *entire public sector*, and which focus on outcomes such as integrated care for the elderly. Given that the ESD Toolkit lists over 700 types of service [8] that are provided by local authorities, building a separate interchange standard for each would

- reinforce the semantic barriers between each;
- re-invent ways of representing common recurring patterns of data;

… and would not build into an ecosystem that could be queried on 'outcomes'.

We therefor need a high level set of simple patterns, as truisms, for how public services are assessed and delivered, so for example

> a PATIENT with a CONDITION has TREATMENT at a HOSPITAL and FEELS BETTER
>
> a PUPIL learning a SUBJECT has a LESSON at a SCHOOL and gains a QUALIFICATION
>
> These could both be considered as
>
> a PERSON in a ROLE has a NEED uses a SERVICE from an ORGANISATION at a LOCATION and achieves an OUTCOME.

Table 3. Applying a concept model to join data from different disciplines.

To make these types of joins will require an 'Upper Ontology' that gives definitions of concepts that can be used in any public sector setting, against which, detailed sector level standards can be defined and mapped.

A Public Sector Concept Model becomes a key asset when sharing data between agencies and across sectors.

Some good standards have already been developed that can form the basis of the concept model

- iStandUK has supported the British Standards Institute (BSI) to publish a Smart City Concept Model which addresses this need as the basis of a city wide data ecosystem.
- The Local Government Association (LGA) have a Local Government Business Model against which they have created and maintained a set of controlled vocabularies such as 'Service Type', Function type and 'Audience Type'.
- schema.org defines sector neutral classes and properties, and is referenced in the Government Digital Services Manual

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[8] http://standards.esd.org.uk/?uri=list%2FenglishAndWelshServices

Having established a common concept model, persistent identifiers and common vocabularies, can be published by the appropriate lead local/national organisation for each item that data can be joined or segmented by. These then form the 'Reference' context providing real-time high quality sets for concepts such as

- PLACE
- SERVICE
- ORGANIZATION
- ITEM

… and so on.

The Cabinet Office Open Data Standards Board has mandated HTTP URLs as the means of publishing persistent resolvable identifiers as URIs.
https://www.gov.uk/government/publications/open-standards-for-government/persistent-resolvable-identifiers

Some sets of reference data are now being made available in this way, from, for example

- The Esd Toolkit

- National Land and Property Gazetteer

- Open Data Communities

- Land Registry

- Companies House

Recommendations

1.1 Public Sector Concept Model is devised and adopted, capturing common patterns of public service delivery, against which service level interchange standards can be developed collaboratively, supporting an ecosystem of data that can be queried across outcomes.

1.2 A common set of reference data is defined, and published as HTTP URIs against which data from many sources can be joined.

3.2   Syntax – the format of information

To share data, the owner should provide it in a format that the intended recipients can consume,

which should be 'open', as defined in the UK's open standards principles [9]. Open formats can also encourage the take up of open source tools to consume and manipulate data.

The syntax of data refers to both

a format type	e.g. csv, xml, rdf, gml

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[9]   https://www.gov.uk/government/publications/open-standards-principles

a schema for a particular application rendered using a format type.	e.g. the column names for a csv file, an XML Schema, an RDF vocabulary.

A single dataset may be made available for sharing or publishing, in more than one format, to meet the needs of audience groups, or to provide simple or richer versions.

Local Authorities have been encouraged to publish open data using the 5* scheme[10] defined by Sir Tim Berners-Lee, in which a 3* dataset may be downloaded in an open format, and a 5* dataset uses 'linked data' techniques to make links to external data. The ESD Toolkit collaborates across Local Authorities to define and validate 3* datasets, and iStandUK has published a guide[11] to local authorities about how to publish local data to a 5* standard.

For some types of data, there are recognised format types, for example:

- the financial sector makes use of XBRL[12]
- statistics suit SDMX[13].

The concept model highlights where commonly recurring patterns of data are to be represented in a schema, and it will be necessary to build a catalogue of data-types that can be re-used across many schemas representing otherwise disparate services. In this way

- schemas can be developed across the sector collaboratively;
- schema development is accelerated and de-risked;
- an ecosystem of data, from many sources, can be created;

This approach has already begun

- the ESD Toolkit provide a collaborative environment to define and validate common column headers across many CSV schemas[14] for use when publishing open data;
- the Government Data Standards Catalogue[15] (now archived) defined common XML elements to be used when sharing XML data between government agencies.

Recommendations

2.1 A set of format types that are suitable for contributing or consuming from a local data ecosystem are defined.

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[10] http://www.w3.org/DesignIssues/LinkedData.html

[11] http://www.legsb.gov.uk/resources/publishinglocal5stardata/

[12] XBRL – Extensible Business Reporting Language - http://www.xbrl.org/Home/

[13] SDMX – Statistical Data and Metadata Exchange - http://sdmx.org/

[14] http://transparency.opendata.esd.org.uk/

[15] GDSC – Government Data Standards Catalogue – now archived at http://webarchive.nationalarchives.gov.uk/+/http://www.cabinetoffice.gov.uk/govtalk/schemasstandards/e-gif/datastandards.aspx

2.2 A catalogue of commonly recurring data structures is defined and sustained.

2.3 A collaborative environment is provided, and allow the sector to define and share schemas.

3.3   Quality - the confidence to re-use information

The Policy Exchange report highlights the difficulty in agreeing data quality as a barrier to sharing data.

To re-use data, the consumer must be confident that it is fit for the new purpose.

The data owner should therefore make statements about the quality characteristics of the data such as

- provenance – the processes that the data has gone through, such as collection, verification, audit, aggregation and so on;
- expectations such as accuracy, timeliness, completeness and so on;
- success rates for data matching.

Sharing this information will assist a potential consumer of data to assess if it is suitable for its new purpose, and if it can be joined with data from another source.

Some standards exists, such as the Open Provenance Model[16], and INSPIRE[17], but they are not sufficient to support an ecosystem.

Recommendations

3.1 Define a set of standards to consistently describe the data quality of a dataset.

3.4   Rights - the permission to use information

The Policy Exchange document highlights a disparity across local authorities as they interpret how the law applies to each data sharing opportunity, leading to a risk averse approach, and an inability to benefit from innovations at a national level.

> *"Councils are currently hindered from embarking on data sharing initiatives due to confusion over what the law does and does not permit."*
>
> **Policy Exchange - Small Pieces Loosely Joined**

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[16]   http://openprovenance.org/

[17]   http://inspire.ec.europa.eu/index.cfm/newsid/11241

We believe that a decision to share, or not to share, remains with the data controller, but we can support those decisions by bringing some structure, standards, and visibility, into the definition of how rights are applied to a dataset.

For protected data to be shared, the data controller[18] needs to be assured that

> *A **person** is **empowered** by their **organisation** to act in a **role** that has a **right** to a set of **data items** for a **purpose,** and agrees to the **terms** by which the data is to be used and handled.*

To determine if a data share is authorised, the following information also needs to be shared

		Example
Purpose	The '*purpose*' for which data can be shared. This can be drawn from a list of public sector services and activities.	In Local Government, the esdToolkit[19] lists types of functions and services, linked to the legislation that gives the relevant powers and duties.
Data Items	The set of '*data items'* that support the '*purpose*', drawn from a data catalogue.	
Right	The legal basis for the disclosure of the set of '*data items*' being shared. This may refer to defined legal gateways.	HMRC publish all the legal gateways, by which that can share data. See http://www.hmrc.gov.uk/manuals/idgmanual/IDG50000.htm
Terms	The Information Governance undertakings necessary, or the licence terms.	A Local Government Information Governance Toolkit is being set up, based on the Department of Health Information Governance Toolkit, which lists 'measures' that can be combined to provide a set of IG terms. See http://legsb.i-network.org.uk/promoted-standards/information-governance-toolkit/ .

Table 4. Information rights

If this metadata were available, local authorities could quickly

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18   http://www.ico.gov.uk/for_organisations/data_protection/the_guide/key_definitions.aspx

19   http://standards.esd.org.uk/

- find what data is available for them to use for a purpose;
- see how other local authorities have interpreted the law regarding data that they too control;

… and the public could see and challenge those decisions.

There will be occasions when the user does not need the actual data items, but wants information that is derived from one or more data items. This may be because

- The detail of individual data items is too complex for a person who is not a professional in that discipline;
- The requirement may be for less sensitive data.

Such derived data has become known as 'attribute exchange', and may include

Data Item	Trusted Attribute
Date of Birth	Person is over 65 years of age.
In receipt of Jobseekers Allowance (Income Based)	On a 'passported' benefit
Has had an epileptic fit in the past 12 months.	Unfit to drive

Table 5. Attribute Exchange example

Attribute Exchange, is defined as a **generic** mechanism for the **online**, **real time** exchange of **attributes**, with the data subject's **consent**, to deliver a **specific service** at a **specific point in time**, under the governance of a **trust framework**.

It should therefore be possible to define business rules acting on the data catalogue, to produce intermediate results, that can be associated with defined purposes. This derived data may:

- require a lower strength of assertion;
- require less controls to handle and protect;
- require less interpretation as it is used in other disciplines.

In many cases, people and organisations have a right to view data about themselves, and see how that data has been used. This should be built into a data ecosystem defined by standards, via linking to a concept model, and a reference layer of data.

Open Data, has a simpler set of requirements for authorisation, which requires that the user agrees to the licence conditions. The Public Sector Transparency Board recommends the use of the Open Government Licence[20].

Recommendations

4.1 Provide a catalogue environment in which an agency can declare the data from an asset register, that can be shared, and the

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[20] Open Government Licence (OGL3) - http://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/

- organisation type;
- purpose;
- legal basis;
- terms

… by which they will permit the re-use of the data.

4.2 Define a series of Trusted Attributes which can be derived from richer data and associated with defined purposes, so that eligibility for services can be checked online.

3.5   Trust – who is accessing information?

The Policy Exchange document highlights the GOV.UK Verify Service "which allows citizens to prove their identity via a trusted third party", and goes on to recommend the use of Personal Data Stores "that allow individuals to choose which public sector organisations see their data and for how long".

For protected data to be shared, the data controller[21] needs to be assured that the person requesting access, is the same person for whom a permission has been agreed, using the Rights theme.

An assessment of the risk of a loss of confidentiality, leads to a consideration of the level of certainty required as to the identity of the user.

Some individual councils or partnerships offer credentials to the public so that an electronic identity can be matched to their records, however, this will lead to a proliferation of credentials that cannot be used between organisations.

Where a person wishes to access protected data in a role that is representing a public sector organisation, they must prove their identity, and their role within the organisation. This then requires a national scheme which is trusted by public sector data owners.

Recommendations

5.1 Provide a national identity verification service, such as GOV UK Verify to authenticate the electronic identity of the public and organisations, using a standards interface, to authorise access to data.

5.2 Enable people to present verified information to public services by promoting a market for standards based personal data stores.

5.3 Establish a national service to verify the identity of those acting for public sector, linked to

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[21]   http://www.ico.gov.uk/for_organisations/data_protection/the_guide/key_definitions.aspx

roles and purpose.

5.4 Organise data so that people and organisations can view information about themselves and see how that has been used..

3.6 Transport - how to move information

The Policy Exchange document recommends that

> *"For public services to be joined up and efficiently coordinated, the whole public sector needs to have one secure mechanism for exchanging data, with a single set of compliance standards. The Public Services Network (PSN) and N3 (used by the NHS) should be merged to create a Single Public Services Network (SPSN)."*
>
> **Policy Exchange - Small Pieces Loosely Joined**

There are other networks that will also need to be joined in this way, including the Criminal Justice Secure eMail service (CJSM)[22].

The means by which information will be moved will be determined by factors including an assessment of the risk to confidentiality, availability, and integrity. That is …

Confidentiality	Does the transport mechanism protect the information from unauthorised access?
Integrity	Does the transport mechanism ensure that the information is not altered between sending and receiving?
Availability	Does the transport mechanism operate reliably at the speed and times required to meet the needs of the business process?

A common set of risk profiles for Confidentiality, Integrity, and Availability should be adopted across local public services. The Government Digital Services Manual highlights CESG's Business Impact Levels.

Many options exist as data transport mechanisms, including

- the post
- a courier
- telephone
- fax

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[22] https://www.cjsm.net/

- email
- web site
- transmission over a network
- access to an API

… each with their own risk characteristics.

Some networks require that a 'code of connection' (CoCo) is met before an organisation is allowed to use it. CoCos(s) typically assure that the organisation's perimeter is secure, and that it has sufficient governance procedures. CoCo(s) are the compliance standards for networks and need to be harmonised as a part of defining a single standards based network.

As a principle, it may be preferable to avoid making copies of data which is then sent to the recipient, as further controls and governance are then required on the copy. Where appropriate, it may be better to give access to the data 'in-situ', perhaps via a portal, or an API[23].

A Framework for local public services APIs should be developed so that common tasks are handled consistently, leading to 'local public services as a platform'. API(s) can be developed collaboratively across the sector, encouraging a market for tools that expose them, or consume them.

Recommendations

6.1 Adopt a common risk framework across local public services to describe the impact of a loss of confidentiality, integrity, availability so that appropriate transport mechanisms can be aligned.

6.2 Align network compliance standards so that separate networks can be reduced

6.3 Define a framework for local public services APIs so that common tasks are handled consistently, leading to 'local public services as a platform'.

6.4 Provide a collaborative environment for the development of API(s), conforming to a framework, encouraging a market for tools that expose them, or consume them.

3.7   Governance - the behaviour and culture to protect and exploit information

Each data sharing scenario typically comes with a set of undertakings that the receiving organisation accepts which define the purposes that the data may be put to, and how it will be handled through its data-lifecycle.

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[23]   http://en.wikipedia.org/wiki/Api

Without some coordination, or a base set of measures, there can be many of these arrangements, each with its own audit and enforcement regime. Local Authorities, who share data with many sectors, can find that they must comply with a number of these separate arrangements.

- Information Governance arrangements are typically based on ISO27001.
- The Department of Health Information Government Toolkit is a leading example where a base set of measures is defined, from which Information Governance arrangements are built for each data sharing scenario. See https://www.igt.connectingforhealth.nhs.uk/

Recommendations

7.1 Adopt a set of base 'measures' from which the information governance requirements of all data handled locally, can be defined.

4 Building an Inventory of Datasets that could be shared

As a response to the Shakespeare Review[24] (reporting in 2013) , each department has created, and published, an Inventory of all of their datasets (not just those that could be published as open public data). Data.gov.uk now lists this information, but does not go on to describe the terms upon which it could be shared.

Local public service providers, such as local councils, serving their local communities, will hold similar data to other providers serving other communities. An inventory of local public data should

therefore be linked to a national vocabulary of services and/or purposes. The ESD Toolkit[25] provides a list of each of the types of services that are provided locally, linked to associated powers and duties to define the purpose for which data is collected. The sector has developed a schema for inventories which is hosted on LG Inform Plus and which is incorporated into a range of open data platforms, which is then directly harvested by data.gov.uk.

An Inventories of data, both local and national, can then add further metadata for

Semantics	The Identifier Schemes used. The core concepts contained in the data
Syntax	The formats that the data is available in
Quality	Provenance Data Quality characteristics
Rights	Licence Terms Legal Gateways applicable

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[24] https://www.gov.uk/government/publications/shakespeare-review-of-public-sector-information

[25] http://standards.esd.org.uk/

	Purpose
Trust	Risk Levels Acceptable Trust Schemes and Credentials
Transport	Risk Levels Acceptable Networks API(s)
Governance	MoU(s) Information Governance Measures

Recommendations

Create inventories of data from local and national data owners with sufficient metadata to quickly ascertain if data can be re-used for a new purpose.

5   A Local Government Service Design Manual?

The Government Service Design Manual[26] provides a pool of guidance and advice about how to design and build digital services from teams across government. The manual is organized across 117 guides.

It this section, we highlight the guides from the Design Manual that are relevant to the Policy Exchange vision of a "flexible marketplace for online services", and highlight where they may need to be adapted for local public services.

Service Design Guide	Highlights	Applicability for Local Public Services
APIs	Recommends • HTTP methods • Authentication techniques Proposes that organisations should consume their own APIs to ensure	Should be developed against a common API Framework so that • APIs appear to be from the same 'family'; • consumers invest in one approach to solving a pattern;

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https://www.gov.uk/service-manual/browse

	that they are high quality.	• APIs can be developed collaboratively across the sector.
Configuration Management	About managing how the pieces of software and/or service work together. Recommends use of open source configuration management tools Installing and configuring software across tens or hundreds of servers (if done by hand) is definitely monotonous.	A common Configuration Management tool for local digital services deployed via a marketplace.
Information Security	the theory and practice of defending data or information systems against: • unauthorised or unintended access • destruction • disruption • tampering 3 main concepts that security professionals frequently refer to: • **confidentiality** • **integrity** • **availability** Business Impact Levels as an assessment of risk	Adoption across Local Public Services of a common risk assessment framework.
User accounts and logins	Avoid if possible. For High Volumes – use GOV.UK Verify	LAs should avoid providing their own login credentials, because • Adds to the many credentials that citizens have to manage • Not re-useable by other organisations • Admin overhead for the LA
Gov.Uk	Users of digital government services need to be able to sign in securely	Each relying party must carry out a risk assessment of their digital

Verify	and conveniently to access services and records, and be confident that their data is secure and their privacy protected	service, using Good Practice Guide 43: Requirements for secure delivery of online public services
	Service providers can be assured they're providing their service to the right individual or business after matching an assured identity to their own records.	
	The identity's 'level of assurance' is the degree of confidence the relying party requires that a user is who they say they are:	
	• level of assurance 1 is used when a relying party needs to know that it is the same user returning to the service but does not need to know who that user is	
	• level of assurance 2 is used when a relying party needs to know on the balance of probabilities who the user is and that that they are a real person	
	• level of assurance 3 is used when a relying party needs to know beyond reasonable doubt who the user is and that that they are a real person	
	• level of assurance 4 is as level of assurance 3, but with a biometric profile captured at the point of registration. This level is not within the scope of this stage in the GOV.UK Verify programme	
Government as a platform	to harness the power of its users to co-create—its offerings. Could be • use of social media by	Local Government as a platform, to define the standards and rules to create a marketplace for local public services solutions.

government agencies.
- government transparency
- government-provided data API
- adoption of cloud computing
- wikis
- crowdsourcing
- mobile applications
- mashups
- developer contests

6   Annex A. Summary of Recommendations

Semantics	1.1 Public Sector Concept Model is devised and adopted, capturing common patterns of public service delivery, against which service level interchange standards can be developed collaboratively, supporting an ecosystem of data that can be queried across outcomes. 1.2 A common set of reference data is defined, and published as HTTP URIs against which data from many sources can be joined.
Syntax	2.1 A set of format types that are suitable for contributing or consuming from a local data ecosystem are defined. 2.2 A catalogue of commonly recurring data structures is defined and sustained. 2.3 A collaborative environment is provided to allow the sector to define and share schemas.
Quality	3.1 Define a set of standards to consistently describe the data quality of a dataset.
Rights	4.1 Provide a catalogue environment in which an agency can declare the data from an asset register, that can be shared, and the - organisation type; - purpose; - legal basis; - terms … by which they will permit the re-use of the data. 4.2 Define a series of Trusted Attributes which can be derived from richer data and associated with defined purposes, so that eligibility for services can be checked online.
Trust	5.1 Provide a national identity verification service, such as GOV UK Verify to authenticate the electronic identity of the public and organisations, using a standards interface, to authorise access to data. 5.2 Enable people to present verified information to public services by promoting a market for standards based personal data stores. 5.3 Establish a national service to verify the identity of those acting for public sector, linked to roles and purpose. 5.4 Organise data so that people and organisations can view information about themselves and see how that has been used..
Transport	6.1 Adopt a common risk framework across local public services to describe the impact of a loss of confidentiality, integrity, availability so that

	appropriate transport mechanisms can be aligned. 6.2 Align network compliance standards so that separate networks can be reduced 6.3 Define a framework for local public services APIs so that common tasks are handled consistently, leading to 'local public services as a platform'. 6.4 Provide a collaborative environment for the development of API(s), conforming to a framework, encouraging a market for tools that expose them, or consume them.
Governance	7.1 Adopt a set of base 'measures' from which the information governance requirements of all data handled locally, can be defined.

Building an Inventory of Datasets that could be shared: Recommendation

Create inventories of data from local and national data owners with sufficient metadata to quickly ascertain if data can be re-used for a new purpose.