

# Standards for classifying services and related information in the public sector

## Abstract

This report describes the role of standards in local government. It draws on the experience of esd-toolkit in the UK and describes how controlled vocabularies maintained by esd-toolkit help municipalities improve their service delivery. Standards are viewed within the context of a consistent model for the public sector

## 1 Means of Profiling Citizens and Customers

### 1.1 What is meant by 'Standards'

For the purposes of this report, standards are defined as:

- Data structures that are common to organisations (primarily municipalities) who share or refer to the same information.
- Controlled vocabularies which list values that are acceptable to describe a particular concept (eg a service, a citizen, a resource) according to commonly agreed definitions.

The term “standards” is also used to describe these things, which are beyond the scope of this report:

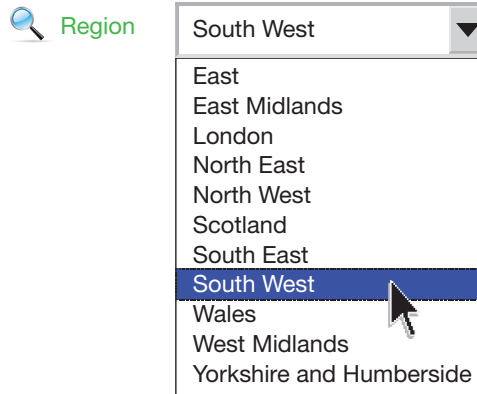
- Protocols for controlling the transfer of information
- Rules defining the security model for data access
- Quality levels used to assess work against political, policy and customer service goals

### 1.2 Lists, taxonomies and ontologies

The simplest type of controlled vocabulary is a ‘flat’ list of values suitable for populating a data element. Adherence to the list may be achieved through an encoding scheme within a programming language or schema, such as an XML schema used to constrain and validate information transferred between electronic data repositories.

Computer systems typically use drop-down lists, as illustrated in Figure 1 overleaf to constrain the value(s) selected to those from a controlled list.





**Figure 1**

Drop-down list constraining values to a controlled list

A taxonomy adds structure to a list defining relationships between terms. Relationships may include:

- Preferred term – the preferred terminology for the concept that is being described
- Non-preferred term – one of possibly many alternative terminologies for the concept
- Broader term/concept – the concept that typically sits above the term or concept being described in a hierarchical structure
- Narrower term/concept - the concept that typically sits as one of a number of concepts beneath the concept being described in a hierarchical structure
- Related term – a term or concept that has a different relationship to the concept being described. Such terms are often listed under the heading “See also”.

Multi-lingual taxonomies may employ a different preferred term for each language. However the actual hierarchical structure of a taxonomy and the grouping of concepts may be different under different languages or cultures or for different audience groups.

Figure 2 shows an extract of a subject taxonomy displayed in an interactive online viewer with attributes of one selected concept shown on the right.



**Figure 2**

Taxonomy with attributes (on the right)  
for a selected concept

An *ontology* defines relationships between concepts in a structured way. For example: A Customer has Circumstances which generate Needs which are addressed by Services which lead to Outcomes.

Mappings between controlled lists identify that there are relationships between specific concepts. Formal ontologies represent the nature of these relationships. Ontologies can be represented in different ways, including:

- Rich Data Format (RDF) according to the rules of the Ontology Web Language (OWL) or the Simple Knowledge Organisation Systems (SKOS)
- Unified Modelling Language (UML) class diagrams
- XML schemas

A standards registry can be used to represent controlled vocabularies, ontologies and or other standards in a consistent way. A registry may provide unique identifiers for every concept (including each term in a controlled vocabulary). Unique identifiers may simply be numbers which are unique within the vocabulary or they may be formal Unique Resource Identifiers (URIs), which are sometimes also Unique Resource Locations (URLs) that can be accessed over the Web.

### 1.3 Standards, not standardisation

The purpose of standards is to allow different organisations to behave according to their own priorities employing a set of uniform building blocks in different ways. Standards allow organisations to efficiently offer services in accordance with their priorities whilst using resources developed and tested elsewhere.

Use of standards for the design and measurement of public sector services may be seen as analogous to the adoption of standards for manufacturing at the time of the industrial revolution. Then, by using nuts and bolts of standard sizes, manufacturers could develop a range of products more cheaply than engineering each from first principles.

### 1.4 Information sharing via standards

Information sharing in the public sector is more efficient where:

- Controlled vocabularies achieve consistent meaningful indexing of information
- Data interchange standards (eg XML formats) permit electronic interchange of information

Dublin Core (DC) defines rules for applying metadata (data describing data) to resources under a number of element headings. These include:

- Elements such as “language” that are populated from internationally recognised controlled lists (such as that defined by ISO 639-2)
- Elements such as “subject” that can be populated from domain-specific controlled lists, defined as “schemes” within DC protocols



The UK e-Government Metadata Standard (eGMS) defines an application profile for describing UK public sector resources which are shared across organisational boundaries. The application profile lists elements – some from DC and some extra ones needed by eGMS – and schemes used to populate them. The “subject” element uses a scheme which can be:

- The Integrated Public Sector Vocabulary (IPSV) of pan-government subject terms
- The Local Government Service Lists (LGSL) defining services delivered locally by the UK public sector – primarily by UK local authorities (ie municipalities)

By use of consistent subject or service identifiers, officers from organisations who use different terminologies and organise their work in different structures can identify and retrieve information relevant to them. Mappings between subject or service terms and other concepts help make links between pieces of information.

## 1.5 Metrics and benchmarking via standards

If quantitative information is associated with specific concept identifiers from controlled lists, it can be aggregated and analysed across organisational boundaries.

UK customer profiling work (see “Smart Cities Research Brief: Customer profiling to target service delivery”) references service transaction records from more than 20 municipalities against these UK controlled vocabularies:

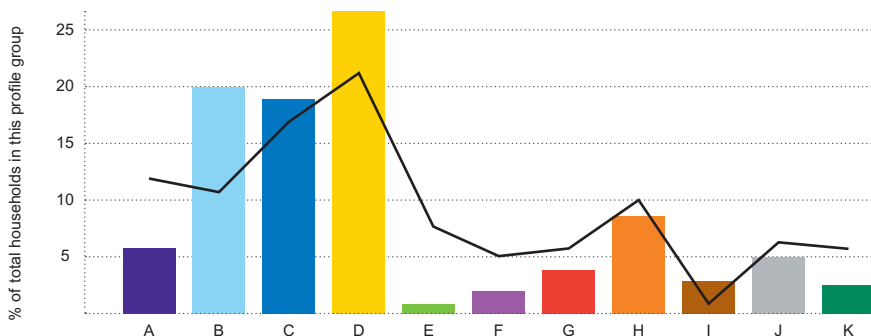
- Local Government Service Lists (LGSL) – defining services
- Local Government Interaction Lists (LGIL) – defining interaction types (eg “Provide information”, “Application for service”)
- Local Government Service Lists (LGChL) – defining access and delivery channel types (eg “Telephone”, “Web”, “Face to face”)

Use of these standards makes it possible to derive typical customer profiles across far bigger (and therefore more statistically significant) samples of service transactions than is possible for a single municipality.

One municipality can compare its findings with others (individually or via an aggregate of others) as illustrated by Figure 3, showing a bar graph of service profiles for a municipality overlaid by a line graph with average values for a group of other similar municipalities.

**Figure 3**

Service profiles for a municipality compared with average profiles for other municipalities



## 1.6 Driving Systems Via Standards

Information interchange between digital systems is made possible by standardisation of data formats and by ensuring consistent referencing is made of information. If multiple organisations use standard information gathered collaboratively, they reduce the effort required by each and information quality is improved by cross-checking between organisations.

A good example in the UK is the Local Government Navigation List (LGNL) which provides a web site browse navigation structure (typically presented in a left navigation menu on municipality websites). At the third level branch of the navigation structure there are links to web pages for specific services, as defined by LGSL.

LGNL is used by approximately 100 UK municipalities. Some use the navigation structure as a guide and a means of checking the completeness of their own websites. Others use it unedited and configure their Content Management Systems by taking an XML feed of LGNL each time a new version is issued.

## 2 UK Vocabularies

### 2.1 The Products Catalogue (or Service List)

The Local Government Services List (LGSL) is a mature list of public sector services delivered locally in the UK. It results from work by the esd-toolkit programme from 2002 and prior work by other initiatives. LGSL is subject to quarterly update in response to submissions from users. Changes sometimes result from changes in legislation which impact on the services delivered (eg the introduction of Civil Partnerships or changes to licensing regulations).

A “service” may be defined as a piece of work performed on behalf of a citizen, group of citizens or business to meet needs in accordance with policy objectives. A service can normally be linked to the legal power or duty under which the municipality (or other public sector organisation) is authorised to deliver it.

Services may be viewed as the “products” of municipalities. Hence a services list may be seen as a products catalogue.

Different types of public sector organisation involved in local service delivery may reference their work against different concept types. Typically police define “incident types” and health professionals define health “conditions”.

Appendix A illustrates the kind of information that is referenced against LGSL. The following sections give some current uses of LGSL.

## 2.2 LGSL within esd-toolkit

esd-toolkit is the framework for evidence based improvement of locally delivered services in the UK public sector.

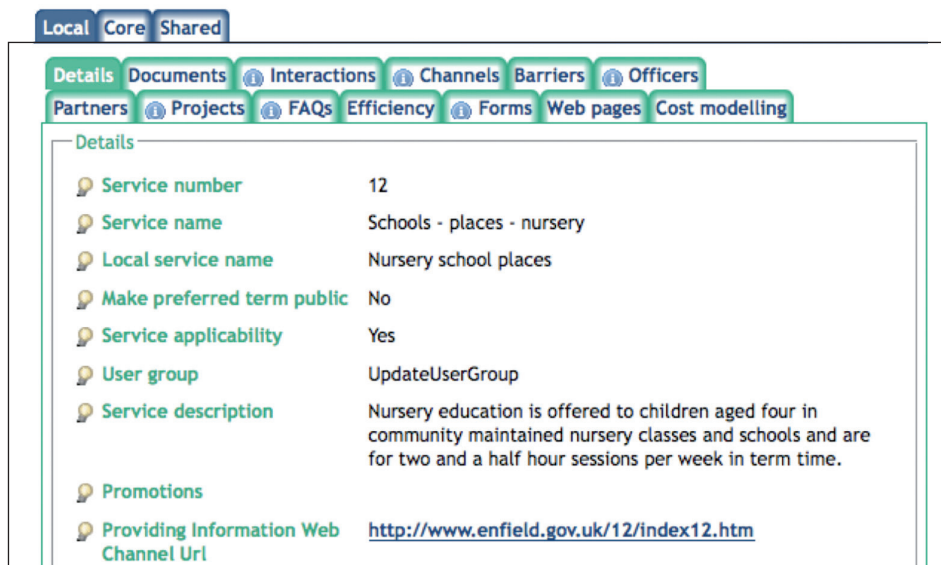
Within esd-toolkit, municipalities reference most resources against specific LGSL services. Hence information has a standard reference that is meaningful to all municipalities. Nevertheless, municipalities localise information to make it familiar to themselves by:

- Defining local service names, which may be viewed as non-preferred terms, for each service
- Putting services in a departmental structure that matches how their municipality is run

Service information is stored under different headings and sub-divided into:

- Local information shared by officers within the municipality across departments
- Shared information which officers have chosen to expose to their peers in other municipalities
- Core information which is gathered and input centrally, but relevant to all municipalities

### Details for Nursery school places



Details	
Service number	12
Service name	Schools - places - nursery
Local service name	Nursery school places
Make preferred term public	No
Service applicability	Yes
User group	UpdateUserGroup
Service description	Nursery education is offered to children aged four in community maintained nursery classes and schools and are for two and a half hour sessions per week in term time.
Promotions	
Providing Information Web Channel Url	<a href="http://www.enfield.gov.uk/12/index12.htm">http://www.enfield.gov.uk/12/index12.htm</a>

**Figure 4**

Screen shot from esd-toolkit showing the different types of information stored for a service

One municipality can benchmark service metrics against others by comparison of its data with average data from other municipalities. Hence sensitive data is not exposed except at an aggregate level.

## 2.3 LGSL for service metadata

Approximately 70 UK municipality websites use eGMS compliant metadata to define the LGSL service relevant to specific web pages.

Automated techniques are used to gather and index references to these web pages so officers from each municipality can view the web content of others for each service.



Select a character to filter the list by Web site name:  
[A](#)[B](#)[C](#)[D](#)[E](#)[F](#)[G](#)[H](#)[I](#)[J](#)[K](#)[L](#)[M](#)[N](#)[O](#)[P](#)[Q](#)[R](#)[S](#)[T](#)[U](#)[V](#)[W](#)[X](#)[Y](#)[Z](#) [1](#)[2](#)[3](#)[4](#)[5](#)[6](#)[7](#)[8](#)[9](#)[0](#) [All](#)

Web site	Web page
Orkney Islands	<a href="#">Orkney Islands Council Local Government : Nursery school places</a>
Orkney Islands	<a href="#">Orkney Islands Council Local Government : School Admissions - Enrolments/ Placing Requests</a>
Orkney Islands	<a href="#">Orkney Islands Council Local Government : School Catchment Arrangements</a>
Pendle Borough Council	<a href="#">A-Z of services   Nursery school places</a>
Ribble Valley Borough Council	<a href="#">A-Z of services   Nursery school places</a>
Rossendale Borough Council	<a href="#">Rossendale Borough Council - Nursery school places</a>
Royal Borough of Windsor and Maidenhead	<a href="#">Nursery Schools   The Royal Borough of Windsor and Maidenhead</a>
Rugby Borough Council	<a href="#">A-Z of services   Nursery school places</a>
Rutland County Council	<a href="#">Service Directory : Nursery school places</a>
Stafford Borough Council	<a href="#">Stafford Borough Council - Nursery school places</a>

[1](#) [2](#) [3](#) [4](#) [5](#) [6](#)

[\[Go back to term details\]](#)

If you have a public sector Web site that you think is not properly listed here, please [e-mail](#) us.

**Figure 5**

Screen shot of links to web pages of different municipalities for the same LGSL service

## 2.4 LGSL to drive a Government portal

The UK government intends that the Directgov website [www.direct.gov.uk](http://www.direct.gov.uk) becomes the single website for all citizen transactions with government.

Citizens requesting from Directgov a service that is delivered locally by a municipality are automatically redirected to the relevant service page on the website of the relevant municipality, dependent on the citizen's location. Directgov uses LGSL service references to define each service and maintains records of web page addresses for each LGSL service from information submitted by English municipalities.

Customer profiling work by UK municipalities for LGSL services is enhanced by service profile data taken directly from Directgov web logs.

## 2.5 LGSL to configure websites

As described above, many municipalities configure their websites to support browse navigation against LGSL and service page referencing via LGSL. Municipalities can compare content between one another for services referenced against the same LGSL pages and can draw on generic content gathered centrally for many LGSL services and made available in a human and (standardised) machine readable format.

### 3 The Public Sector Object Model

A “public sector object model” is an ontology that attempts to define the main elements (ie concepts such as services, customers, places and organisations) that interact in the work of the public sector and relationships between them.

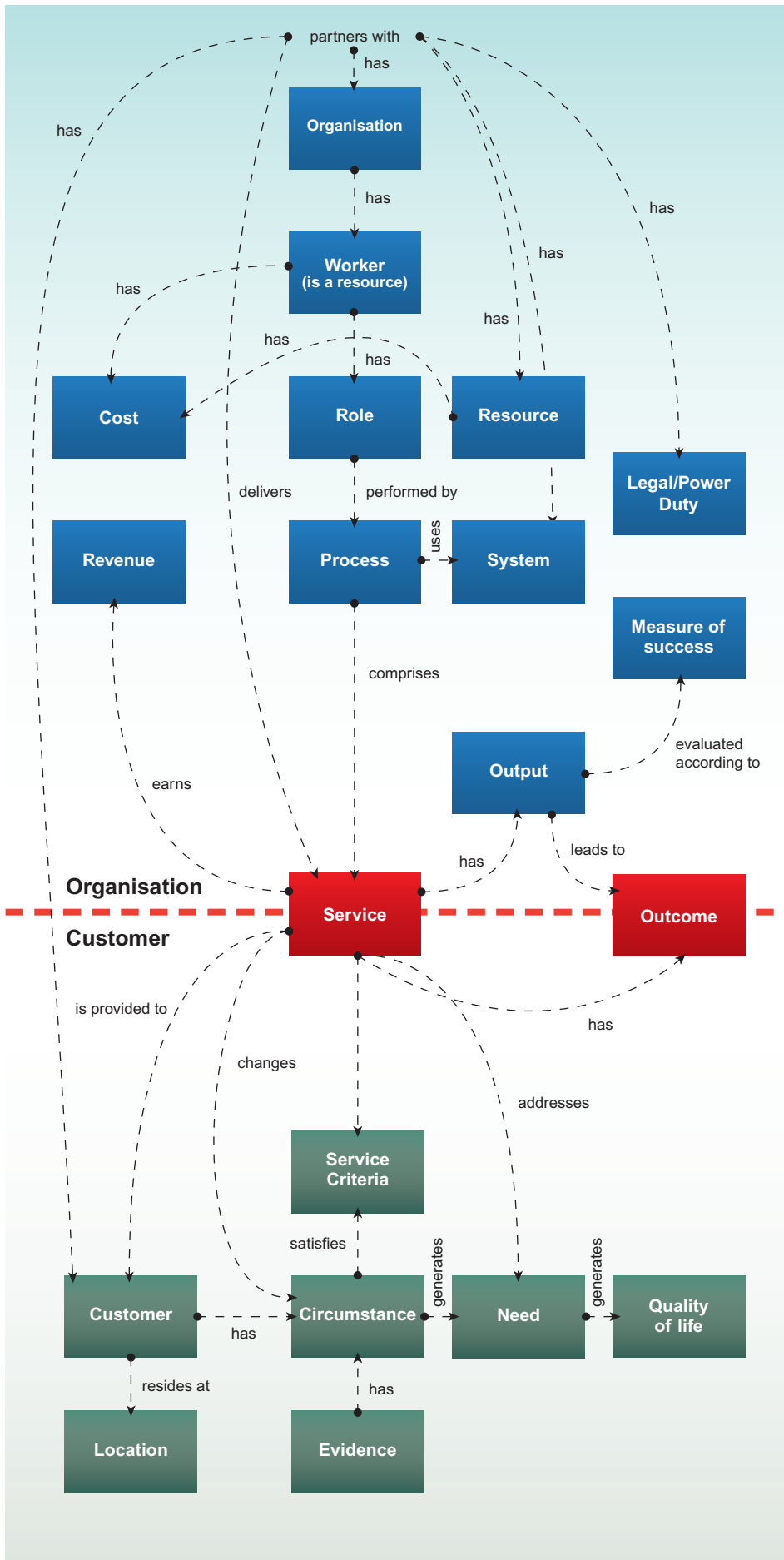
Figure 6 opposite shows a draft ontology for local government.

The selection of fundamental elements/concepts is somewhat subjective, although this is not important if the model meets functional requirements and key users agree on its structure.

A high level basic model can be designed at a pan-government level and sector (eg health, local government, education) specific extensions made to a level of detail appropriate for each sector. RDF lends itself well to defining ontologies in this way.

Ideally a product catalogue should be defined within (and compliant with) a local government ontology that itself is consistent with a pan-government ontology.





**Figure 6**

Draft ontology for local government

## 4 Further information

### 4.1 Related reading

- Integrated Public Sector Vocabulary:  
<http://www.esd.org.uk/standards/ipsv>
- ISO 639-2: <http://www.loc.gov/standards/iso639-2/>
- Local e-Government Standards Body: <http://www.legsb.gov.uk/>
- Local Government Navigation List: <http://www.esd.org.uk/standards/ignl>
- Local Government Service List: <http://www.esd.org.uk/standards/lgsi>
- National Knowledge Service Metadata Registry (UK National health Service) <http://schemas.library.nhs.uk/>
- Simple Knowledge Organization System:  
<http://www.w3.org/TR/swbp-skos-core-guide>
- Smart Cities paper “Smart Cities Research Brief: Customer profiling to target service delivery”
- Sotirios K. Goudos, Vassilios Peristeras and Konstantinos Tarabanis. Mapping Citizen Profiles to Public Administration Services Using Ontology Implementations of the Governance Enterprise Architecture (GEA) models, 3rd Annual European Semantic Web Conference Jun. 11-14 Budva, Montenegro  
[http://www.semantic-gov.org/index.php?name=Web\\_Links&req=visit&lid=65](http://www.semantic-gov.org/index.php?name=Web_Links&req=visit&lid=65)
- Structured Vocabularies for Information Retrieval. British Standard 8723:  
<http://schemas.bs8723.org/>
- Web Ontology Language: <http://www.w3.org/TR/owl-ref/>
- What Are All These Lists?: <http://www.esd.org.uk/standards/waatl>

### 4.2 Contacts with expertise within Smart Cities partnership

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## 5 Document information

### 5.1 Author(s) and Institution(s)

Mike Thacker is Systems Director of Porism Limited, which is the technical partner in the UK local government esd-toolkit programme. He has worked with UK local authorities on esd-toolkit since 2002 and before that on the Life Events Access Project. He has experience developing online service directories and standards registries for the UK public sector, through esd-toolkit, Scottish Enterprise and the National Library for Health

### 5.2 Intended audience

Within Smart Cities, this research brief is specifically aimed at members of Work Package 2 - Methodology. However, the standards described are relevant to structuring information, sharing and enabling the work of all work packages. Hence the content is relevant to Service Managers, officers responsible for Business Process Re-engineering (BPR) and software managers in local and regional government.

### 5.3 Critical issues addressed

Standards are required to allow different municipalities to take different approaches to service delivery in an efficient way that maximises reuse of knowledge between municipalities.

### 5.4 Document history

**Date** : 2009.01.27  
**Version** : 1  
**Author** : Mike Thacker

[www.smartcities.info](http://www.smartcities.info)

[www.epractice.eu/community/smartcities](http://www.epractice.eu/community/smartcities)

The Smart Cities project is creating an innovation network between cities and academic partners to develop and deliver better e-services to citizens and businesses in the North Sea Region. Smart Cities is funded by the Interreg IVB North Sea Region Programme of the European Union.

Smart Cities is PARTLY funded by the Interreg IVB North Sea Region Programme of the European Union. The North Sea Region Programme 2007-2013 works with regional development projects around the North Sea. Promoting transnational cooperation, the Programme aims to make the region a better place to live, work and invest in.

