USING DC FOR SERVICE DESCRIPTION

Background

E-government programmes that use Dublin Core have a common need to describe services as well as documentary resources. Following discussion at Working Group meetings in Florence (2002) and Seattle (2003), the DC-GOV workplan for 2003/04 included the development of "a set of best practice guidelines … for the use of DC to describe services." The intention of this is to allow consistent interpretation of the Dublin Core when used in this way. This document provides a proposed set of interpretations for DC elements (and selected other elements in common use in DC-based e-government metadata schemas) for discussion by the DC-GOV community.

The Nature of Services

Developing a satisfactory definition of a 'service' that is explicit and unambiguous has proved elusive.

The DC Type definition of a Service is: "A service is a system that provides one or more functions of value to the end-user. Examples include: a photocopying service, a banking service, an authentication service, interlibrary loans, a Z39.50 or Web server." http://dublincore.org/documents/dcmi-terms/#H5

Another expression of this was given in the "DC Collection Description Application Profile: Data Model", section 2.4 Service: "The provision of, or system of supplying, one or more functions of interest to an end-user or software application." http://www.ukoln.ac.uk/metadata/dcmi/collection-model/

To help reach agreement on how to use Dublin Core based metadata terms to describe services, the use of each element is suggested. The choice of how to use the elements depends upon the interpretation of what is the content of a service, and the choice made as to the aggregation level the service should be described at.

"Content" of a service

Many of the Dublin Core element definitions refer to the (intellectual) content of the resource. The Dublin Core and AGLS/NZGLS elements that are used to describe 'content' aspects of the resource are: Audience, Coverage, Description, Function, Language, Relation, Source, Subject, and Title.

It may be useful to consider the provision of information as a service. A document would then be a means of delivering the service, a container for the value (the information) which is to be conveyed.

Generalising, the "content" of a service can be understood as:
- the information that flows between participants in the transaction of business;
- the benefit/value obtained.

These might reflect the nature of two different types of services.

A service that occurs in one instance of delivery [a unitary service]. For example the granting of a licence, where the service could be considered to be the assessment of the applicant's rights which is completed when the information exchange has occurred and a decision made. The actual licence (if issued) could be considered as being a replaceable, convenient means of referring to that assessment. After the licence is issued, there may be no further interaction.

A service that is delivered in instalments [an on-going service]. For this type of service the assessment may be viewed as secondary to the ongoing benefit provided. An example might be unemployment payments. While the assessment process may be the same as in the first case, there is an on-going relationship in which an agency delivers a benefit (literally in this example), which is explicitly delivered to an identified user (individual or group)

This distinction could be challenged, based on the perspective taken of the function supported by the service. What if the driver's licence/ provision of roading service/s is seen as but a part of a service of transportation system provision/construction? Obtaining a driver's licence would merely be a matter a hurdle to be crossed in accessing the service – use of the road network. This is the reason for asserting that the second type of (ongoing) service is tagged to an identified user.

The number of agencies involved in providing a service, or the separation of functions across agencies, should not be a consideration as this can change for bureaucratic convenience or political ideology.

Aggregation/Boundary

Services do not exist purely at one level of aggregation. However in any given implmentation setting they will be more usefully described at particular levels. Just as document resources can be decomposed into smaller units, which are also document resources (e.g. books into chapters, or websites into pages), so too service resources can be meaningfully defined and described at various levels of aggregation. Also, services are often provided by means of a collection of standard transactions, and possibly of outputs. Those transactions/outputs may be made commonly available for use by any appropriate service. In considering the appropriate level of aggregation a number of factors are relevant.

First, an appropriate level of aggregation of services for description in a single metadata resource discovery record might be determined by considering **completeness** - as a service, does it stand on it's own?

A second consideration in choosing the aggregation level at which to describe a service might be the **degree of variation** between the ways a service is delivered by different channels. For example, a service may be available in different languages in one channel, that it is not available in through another channel.

Thirdly **comprehensiveness**, does this collection of outputs answer the user's need?

There may be cultural aspects to how services are perceived that might also affect this grouping. Service definition is largely based on the perception of service users. The target audience of any service description programme is therefore central to the choices in this area.

Use of Elements to Describe Services

The way definitions of Dublin Core resource discovery metadata terms are worded allows room for interpretation as to how to describe services. Further, some of the key aspects of published resources that Dublin Core terms exist to describe may not be aspects of services. Each element is presented with:
- the Dublin Core definition (or NZGLS definition for non-Dublin Core elements);
- Comment on the usage, given the definition and the aspect of the element. These comments are given for discussion. A proposed interpretation is given and issues around that, or possible alternative interpretations are then identified. This 'comment' section is presented to provide a starting point for discussion.

Elements are grouped by the aspect of the resource that they describe, and within that grouping are listed alphabetically.

Other, wider issues include;
- how to distinguish between where the transaction is undertaken, and where the benefit is delivered. This issue was raised in the "DC Collection Description Application Profile: Data Model" http://www.ukoln.ac.uk/metadata/dcmi/collection-model/

Resource content: Audience, Coverage, Description, Function, Language, Relation, Source, Subject, Title

Metadata Element	Obligation and Recommended Use

Audience

Definition	A class of entity for whom the resource is intended or useful.
DC Comment	A class of entity may be determined by the creator or the publisher or by a third party.

Comment

Interpretation:

The service users who are eligible and able to use the service.

Issues:

The interpretation of "is intended or useful" could be broad, but resource discovery metadata is more useful if it is focussed. Narrower interpretation is therefore to be favoured.

There is potential to confuse Audience and Rights – perhaps because we try to describe resources from the point of view of the person who is trying to find them. From their perspective, they may think of rights primarily in terms of their rights. This discussion is also raised under Rights.

Is a person who accesses a service on behalf of another (e.g. a parent on behalf of a child) the user or recipient of the service? Are they the Audience?

Coverage

Definition	The extent or scope of the content of the resource.
DC Comment	Coverage will typically include spatial location (a place name or geographic coordinates), temporal period (a period label, date, or date range) or jurisdiction (such as a named administrative entity). Recommended best practice is to select a value from a controlled vocabulary (for example, the Thesaurus of Geographic Names [TGN]) and that, where appropriate, named places or time periods be used in preference to numeric identifiers such as sets of coordinates or date ranges.

Comment

Interpretation:

The boundaries within which the benefits of the service are enjoyed

Issues:

Typically this will be the physical area (whether geographically [= coverage.spatial] or legally [= coverage.jurisdiction] defined), and (if appropriate) the time period [= coverage.temporal], that the service covers. There is an important distinction between where and when a service is valid, and where and when transactions to gain access to the service may be conducted. In NZGLS, Coverage is used for the former, and Availability for the later.

Who the service covers is perhaps best described using Audience, as people cannot be transactions or outputs (i.e. a person can not be the 'content' of a service).

Is the argument, that a benefit/ right conveyed (i.e. the content of the service) may be bounded spatially or temporally, consistent with the definition?

Are other limitations of a service best described under Coverage, or in Description?

Description

Definition	An account of the content of the resource.
DC Comment	Description may include but is not limited to: an abstract, table of contents, reference to a graphical representation of content or a free-text account of the content.

Comment

Interpretation:

A description of the benefit that a service user may obtain from the service.

Issues:

AGLS/NZGLS advise that the Description should include text: "identifying the problem that people enquire about" because the connection between the outcomes intended for services may not relate obviously to the starting position.

Limitations on the service (e.g. if accommodation is provided it may be unfurnished), and reasons not to use the service (e.g. disqualifies for some other entitlement), need to be described in the metadata. Is Description the appropriate element?

Function

Definition (from AGLS/NZGLS)	The business function of the organisation to which the resource relates.
DC Comment	Not a DC term
NZGLS Comment	Used to indicate the business role of the resource in terms of business functions and activities. Functions are the major units of activity which organisations pursue in order to meet the mission and goals of the organisation. They are defined in the Australian Records Management Standard [AS4390] as 'the largest unit of business activity in an organisation…'.

Comment

Interpretation:

The function that the service is made available to fulfil.

Issues:

Functions are enduring responsibilities or units of activity. Services are ways of discharging Functions.

Language

Definition	A language of the intellectual content of the resource.
DC Comment	Recommended best practice is to use RFC 3066 [RFC3066], which, in conjunction with ISO 639 [ISO639], defines two- and three-letter primary language tags with optional subtags. Examples include "en" or "eng" for English, "akk" for Akkadian, and "en-GB" for English used in the United Kingdom.

Comment

Interpretation:

Language(s) in which a service user can transact business using the service.

Issues:

The language in which a service user can receive an output of the service may be important for some services. For example, a user may be able to request to go on a mailing list using any one of several languages, but the content mailed out may be in only one language.

If the service is to assess eligibility, for example a licence, then the language the licence is printed in seems of less importance than the languages that the information exchange leading to provision of that licence can be transacted in.

The language in which a service was designed may influence the design. Cultural concepts may be embodied in an artefact, such as a licence. Could the significance of these considerations be sufficient, in some circumstances, to justify creating the additional resource discovery metadata?

Title

Definition	A name given to the resource.
DC Comment	Typically, a Title will be a name by which the resource is formally known.

Comment

Interpretation:

A name by which the service is known.

Issues:

Services may not have formal titles and may also be known by different titles to the service provider and service users. Multiple titles may be needed as a result.

The title might not remain constant over the life of the service. Old titles may be retained as alternative titles.

Relation

Definition	A reference to a related resource.
DC Comment	Recommended best practice is to reference the resource by means of a string or number conforming to a formal identification system.

Comment

Interpretation:

A reference that provides a link to a pertinent resource. This could include related services, documents or other forms of resource.

Issues:

The definition of Relation is broad. Potentially any two resources can be viewed as "related". Some aspects of a resource that are described using other elements, such as Creator, Audience and Mandate (a NZGLS/AGLS element), can be viewed in terms of relationships.
What determines whether a relationship should be expressed using Relation or that there should be an explicit term (element)?
What guidance can be given on thresholds of relevance for creating Relation metadata?

Relation might also be used for identifying:
   alternative services. Services provided by the same or different agencies that provide substantially the same outcome (the mix of outputs may be the difference), possibly differentiated by Audience; or
   complementary services (services which may be used in conjunction); or
   reversal services (services which undo the output of another service – e.g. apply for a passport / surrender a passport).

Refinements can give an indication of the reason the reference is relevant. Additional refinements beyond those currently recognised by DC are likely to be needed to describe the relationships between services and other resources.

Source

Definition	A reference to a resource from which the present resource is derived.
DC Comment	The present resource may be derived from the Source resource in whole or in part. Recommended best practice is to reference the resource by means of a string or number conforming to a formal identification system.

Comment

Interpretation:

A reference to a service, which the service being described is based on. Source can be used where a service is a "value-added" version of another service.

Issues:

Where a service is an aggregation of transactions and/or outputs, these components might be identified as 'source' services if they are separately described.

In NZGLS/AGLS Source is effectively depreciated in favour of a Relation refinement term "isBasedOn" and a "value added" service is tagged using Relation.isBasedOn.

A service can be said to be 'derived' from the legislation (or other legal instrument). For this relationship, in NZGLS/AGLS, the Mandate element is used.

What is the threshold that leads to using a distinct element (Source) rather than a refinement of Relation?

Subject

Definition	The topic of the content of the resource.
DC Comment	Typically, a Subject will be expressed as keywords, key phrases or classification codes that describe a topic of the resource. Recommended best practice is to select a value from a controlled vocabulary or formal classification scheme.

Comment

Interpretation:

A topic of the outcome the service is intended to produce.

Issues:

It may also be useful to identify a topic of the information communicated in transacting business through the service. However, the information communicated while transacting the service will not always be relevant to the subject of the service. For example, identity information may have to be provided when arranging to receive a driver's licence, but it is not useful in the context of description for resource discovery to consider the individual as the subject of the service.

Resource manifestation: Availability, Date, Format, Type

Metadata Element	Obligation and Recommended Use

Availability

Definition AGLS/NZGLS	How the resource can be obtained or contact information for obtaining the resource.
DC Comment	Not a DC term
NZGLS Comment	Availability is used to describe contact information showing where searchers can obtain a service or other resource. Availability is mandatory for online services as this is the element in which the URI to access the service online is entered. [Identifier is not used for the URI because the URI is not uniquely associated with the service or the service channel. A URI specifies a virtual location, not the content of that location.] The web page through which a service 'is made available' is a resource in it own right and may have a separate 'document' metadata record. If a service is available both through an online channel and an offline channel. Repeat the Availability element to provide the details of the different channels. (Provide the URI for the online channel).

Comment

Interpretation:

The where and when and how of the channel(s) through which the service may be accessed.

Issues:

There is an important distinction between where and when a service is valid, and where and when transactions to gain access to the service may be conducted. It is proposed that Coverage be used for the former, and Availability for the later.

In NZGLS Availability is mandatory for online services, as this is the element in which the URI to access the service online is entered. The URI is the "address" at which the service is delivered. [Identifier is not used for the URI because the URI is not uniquely associated with the service or the service channel. A URI specifies a virtual location, not the content of that location.]

In NZGLS the web page through which a service 'is made available' is considered a resource in it own right and may have a separate 'document' metadata record. The service is recognised as being conceptually separate from documents associated with it.

Date

Definition	A date associated with an event in the life cycle of the resource.
DC Comment	Typically, Date will be associated with the creation or availability of the resource. Recommended best practice for encoding the date value is defined in a profile of ISO 8601 [W3CDTF] and follows the YYYY-MM-DD format.

Comment

Interpretation:

The dates of significant events in the administrative life-cycle of the service.

Issues:

Typically Date will show when a service was first offered. In DC it may be appropriate to use the refinement 'available'.

The date a service was created is important both for historical context and as an aid to user's recognition.

"Modified" may be important to aid recognition, especially where service names change, and to indicate that aspects of the service changed which may include changes to eligibility, or outputs.

"Valid" – a service may come into effect before they can actually be obtained because of the time taken to set up the administrative systems to deliver the service.
- There is a need for clear guidance with respect to distinguishing Date.valid from Coverage.
- Also to distinguish Date.valid from Date.available. (Availability in NZGLS/AGLS)
- Seasonal services. Some services are open to requests only seasonally (possibly a period) which seems to fit as Date.available in DC or Availability in NZGLS/AGLS. (In NZGLS/AGLS this puts all the information about how to obtain the resource in one place.) The service may be the granting of some right (a licence) which may be valid only for a particular 'season'. Should this be Date.valid (resource manifestation) or Coverage (resource content)?

"Issued" is perhaps not useful in the resource discovery metadata for the service, which is describing the service at the abstract level, not a particular instance. Potentially of critical importance to the service instance as it may be the date the transaction is completed (and thus part of the administrative/financial record of that instance of the service).

Format

Definition	The physical or digital manifestation of the resource.
DC Comment	Typically, Format may include the media-type or dimensions of the resource. Format may be used to determine the software, hardware or other equipment needed to display or operate the resource. Examples of dimensions include size and duration. Recommended best practice is to select a value from a controlled vocabulary (for example, the list of Internet Media Types [MIME] defining computer media formats).

Comment

Interpretation:

A mode of delivery of a service (i.e. the type of delivery channel(s), e.g. Face-to-face, phone, post, web, etc).

Issues:

A controlled vocabulary for service channels would be of value.

Identifier

Definition	An unambiguous reference to the resource within a given context.
DC Comment	Recommended best practice is to identify the resource by means of a string or number conforming to a formal identification system. Example formal identification systems include the Uniform Resource Identifier (URI) (including the Uniform Resource Locator (URL)), the Digital Object Identifier (DOI) and the International Standard Book Number (ISBN).

Comment

Interpretation:

A unique identifier for the service.

Issues:

Services frequently do not have unique identifiers.

This is not the same as an identifier for a document that describes the service or is used in transacting using the service.

The Identifier should be for the service, not for an instance of the service, or for the delivery point.

An URI would not be used as an Identifier for a service because the URI is not uniquely associated with the service or the service channel. A URI specifies a virtual location, not the content of that location.

The uniqueness of the identifier is bounded by a given context, which may need to be represented to avoid ambiguity. Should the 'given context' be:
- explicit in the value entered as the Identifier?
- explicit in an encoding scheme name?
- implicit from the context of the metadata record?

Type

Definition	The nature or genre of the content of the resource.
DC Comment	Type includes terms describing general categories, functions, genres, or aggregation levels for content. Recommended best practice is to select a value from a controlled vocabulary (for example, the DCMI Type Vocabulary [DCMITYPE]). To describe the physical or digital manifestation of the resource, use the Format element.

Comment

Interpretation:

The nature of the service. This will generally represent the form of benefit or value received by the service user (for on-going services) or the type of transaction (for unitary services).

Issues:

An encoding scheme is probably appropriate. For an example, see the AGLS Service Type Controlled Vocabulary. http://www.naa.gov.au/recordkeeping/gov_online/agls/schemes/agls-service1.0.html

Resource ownership: Contributor, Creator, Mandate, Publisher, Rights

Metadata Element	Obligation and Recommended Use

Contributor

Definition	An entity responsible for making contributions to the content of the resource.
DC Comment	Examples of a Contributor include a person, an organisation, or a service. Typically, the name of a Contributor should be used to indicate the entity.

Comment

Interpretation:

An entity responsible for providing a component (a transaction or an output) of the service.

Issues:

If multiple agencies work together to provide a service, then typically one is a lead agency and the others will be contributors. This will be most relevant where services are described at a high level.

Creator

Definition	An entity primarily responsible for making the content of the resource.
DC Comment	Examples of a Creator include a person, an organisation, or a service. Typically, the name of a Creator should be used to indicate the entity.

Comment

Interpretation:

An entity that sets the rules/procedures that define the service.

Issues:

This interpretation allows for instances where different agencies are involved in the set-up and the delivery of a service.

The concept of "who is accountable for the provision/ adequacy of the service?" is also relevant. This could cover the situation where a government agency is mandated to provide a service and chooses to out-source the actual provision. Responsibility/ accountability for the overall performance remains with the agency setting up the contract even though individual complaints might be addressed to the supplying organisation in the first instance.

Mandate

Definition (from AGLS/NZGLS/UK e-GMS)	A specific warrant which requires the resource to be created or provided.
DC Comment	Not a DC term
NZGLS Comment	The element is useful to indicate the specific legal mandate that requires the resource being described to be created or provided to the public. The content of this element will usually be a reference to a specific Act, Regulation or Case, but may be a URI pointing to the legal instrument in question.

Comment

Interpretation:

The specific legal instrument that requires the service to be created or provided.

Issues:

This element is used in NZGLS/AGLS to indicate the specific legal mandate that requires the resource being described to be created or provided to the public. The content of this element will usually be a reference to a specific Act, Regulation or Case, but may be a URI pointing to the legal instrument in question.

Publisher

Definition	An entity responsible for making the resource available
DC Comment	Examples of a Publisher include a person, an organisation, or a service. Typically, the name of a Publisher should be used to indicate the entity.

Comment

Interpretation:

An entity that is directly responsible for the provision of information to the service user who is transacting business through the service.

Issues:

This may be different from the Creator, for example in cases where an agency has outsourced aspects of its service delivery, in which case it may be appropriate to use Publisher for the entity with which the service user has direct contact. In NZGLS/AGLS this information could be covered in Availability.

Rights

Definition	Information about rights held in and over the resource.
DC Comment	Typically, a Rights element will contain a rights management statement for the resource, or reference a service providing such information. Rights information often encompasses Intellectual Property Rights (IPR), Copyright, and various Property Rights. If the Rights element is absent, no assumptions can be made about the status of these and other rights with respect to the resource.

Comment

Interpretation:

Rules and restrictions set by the service Creator for access to and use of the service.

Issues:

Rights over a particular service may be defined by the Mandate.

Is Rights intended to describe:
- who has a right to use the resource, or
- who has rights to control the use of the resource?

Should entitlement be described under Audience – 'who the service is for'?

References:

A number of DC-based metadata schema deal explicitly with service description. The following have been considered in developing this document.

AGLS: Guidelines for the Description of Government Services Using the AGLS Metadata Standard AGLS Services Working Group September 2000 Version 1.0
http://www.naa.gov.au/recordkeeping/gov_online/agls/describing_services/services_intro.html
[Still current as that the publication of AGLS Metadata Element Set Part 2: Usage Guide v1.3 December 2002]

AGLS Service Type Controlled Vocabulary.
http://www.naa.gov.au/recordkeeping/gov_online/agls/schemes/agls-service1.0.html

NSW-AGLS: NSW AGLS Metadata Guideline v3.9
http://www.oict.nsw.gov.au/Guidelines/2.3.34.a-AGLS.asp

NZGLS http://www.e-government.govt.nz/nzgls/standard/

Glossary

This glossary is provided to explain terms. The comments given are not intended as formal definitions.

Channel	a means for organisations to deliver services. Includes electronic, voice, face-to-face, [physical] post
Component	a transaction or an output that is aggregated with other components to constitute the service being described
Delivery point	location (physical or virtual) where a channel may be accessed.
NZGLS	New Zealand Government Locator Service (NZGLS) Metadata Element Set. Based upon AGLS and Dublin Core – i.e. an application profile of DC
On-going service	a service that is delivered in installments
Process	a defined set of steps, eligible parties, and rules for interaction of those parties, designed to achieve a specified result.
Service	a repeatable process, that forms a set of interactions between initiating and responding parties, that is complete.
Service provider	an entity which delivers benefits through a service; the entity which a service user interacts with when a service is delivered
Service user	the person, group, or software application obtaining the benefit from a service (sometimes referred to as Client or Customer)
Transaction	a communication or delivery, possibly including some form of confirmation that the communication or delivered resource was received. A transaction is typically an instance of service delivery
Unitary service	a service that occurs in one instance of delivery