

Enterprise Architecture Data Domain Roadmap

Technology Roadmaps

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1.0 Introduction

This document is the high-level roadmap for the Data Domain, but **does not** describe a Data Architecture (or detailed technical roadmap for the same). Typically, the review of a Data Domain takes several months of dedicated work. The effort devoted to this Domain within the enterprise architecture project should therefore be seen as an initial review of this complex area.

However, it is clear that Data Architecture at the Enterprise level has significant impacts on the Customer Experience, The Council's Vision and business goals and on the feasibility of future integration and solution consolidation.

This document highlights two areas where the absence of data standards are considered to impede The Council in moving to a desired Future State, and uses these to illustrate the benefits of proper consideration of the Data Domain.

Any roadmap for the Data Domain needs to be carefully aligned with the Applications Domain and Collaboration Domain roadmaps, as there are areas of overlap and interdependence. For example, the provision of a common application *Identity* service requires the development of a core customer record and associated metadata definition.

1.1 Objectives

The objectives of this document are:

- To provide a summary of the roadmap for the Data Domain, at a high-level
- To provide an overview of the Business and Integration problems posed by the lack of standards
- To communicate an understanding of the tangible benefits of data standards to stakeholders at an appropriate level of detail

2.0 Executive Summary

2.1 The importance of change

The British Council's enterprise architecture is currently organised into seven domains: - data, applications, collaboration, platform, networks, system management and security. This document focuses on the data domain. Data architecture is an area of significant opportunity for the British Council because there has been relatively little work done in this area at an enterprise level, other than in the context of the FABS initiative.

Information is one of the British Council's major assets. In the past, it has been challenging to leverage these information assets across the organisation partly because of the way the business is organised, but also because of the disparate applications architecture (which in turn reflects on business organisation).

Currently, new data architectures 'happen' when application architectures are procured or developed. Business departments historically have chosen these themselves and then passed them to GIS to support and sustain. This still goes on today. Many organisations are discovering that this endless recreation and proliferation of data and architectures is an ineffective approach. It creates problems that include duplication of effort, inability to target services and data compliance issues. There are therefore major benefits in adopting an *enterprise-wide* data architecture approach as outlined in this document.

This represents a considerable step up in terms of enterprise architecture maturity and can only happen with the support of senior management. In the medium term therefore, we recommend that the Council focus on one or two specific areas of the business, for example the development and implementation of data standards for 'core' customer data.

2.2 Customer Data Underpins Service Quality and Fit

The Council gathers customer information in a variety of systems and types or interaction, through 'face-to-face' interaction, through telephone contact and through multiple internet-facing systems.

Customer information is critical to the Council because it can be:

- Shared with other parts of the Business
- Used to target and sell new business and services to customers

At present, that cannot happen. The Council holds multiple (often overlapping) sets of data held in stovepipe applications. It is not possible reliably and consistently to identify individual contacts, even down to the country of origin. This basic level of information is required to understand the effectiveness of business strategies and programs and to improve services provided to customers.

This hampers current performance and the council's evolution as a service organisation. Consumers (and organisations such as NAO) are increasingly intolerant of organisations that:

1. Ask us to supply information that we have already given them
2. Send duplicate (sometimes conflicting) communications (often as a result of '1' above)
3. Cannot assure them that their data is managed, clean and appropriately audited

In an increasingly competitive and service oriented environment those weaknesses compromise the Council's development business competitiveness. Developing enterprise-wide data architecture is therefore an important Council objective. This will take time and will require the buy-in from all parts of the business. That may be difficult

to obtain in the short term. A better approach will be to focus on one or two areas that will deliver short and medium term benefit, and are more likely to receive business support and funding.

HP recommends that focussing on **customer** would seem a good place to start. Initial discussions with E&E indicated that developing a good understanding of how customer interacts with the Council has value, and is likely to receive support from the business.

Therefore, HP recommends an approach based on developing an understanding of customer data as each customer passes through their lifecycle journey with the British Council. Once this understanding is established, a core set of customer record 'metadata' can be created which will be used to enable sharing of customer data across the organisation and also to underpin a common identity management service.

Some may argue that SAP provides all the answers. HP's view is that SAP is a major application and will contain key data. However, the enterprise is wider than SAP/FABS and sole reliance on SAP may be inappropriate. HP therefore recommends that the data architecture be developed to take account of SAP but not be limited or controlled by it. Such architecture would describe the important data entities and map them to business processes and owners. It would also define where these entities are mastered within applications and systems. The key here is to start small, focussed on an area that will deliver maximum benefit, for example customer, while at the same time creating an overall understanding of the important data and its relationships within the Council

2.3 Developing the Enterprise-wide Data Strategy

Based on current understanding, a strategy based on adopting the following approaches is suggested:

Priority	Initiative	When	Key Benefits
High	Develop conceptual 'core' customer record	ASAP	<ul style="list-style-type: none"> Provide informed design decisions
High	Develop 'core' metadata for managed content	By end 2008	<ul style="list-style-type: none"> Consistent implementation of new content management solutions
High	Implement consistent metadata across content management solutions	Ongoing from end 2008	<ul style="list-style-type: none"> Enable management of assets throughout their lifecycle
High	Develop High-level data architecture	Agree architecture By mid 2009 Embrace in procurement and change of existing systems from thence forward	<ul style="list-style-type: none"> Manage customers effectively through their lifecycle Facilitate Master Data Management
High	Implement identity management ¹ solution for web users	By end 2009	<ul style="list-style-type: none"> Maximise knowledge and value of web user data Improve customer perception of web presence
High	Develop Master Data Management plan and implement	By end 2010	<ul style="list-style-type: none"> Become a vendor of unique, high quality data Provide a best-in-class user experience

¹ Part of the Application Domain, initial pilot in 2008 followed by roll-out in 2009

Priority	Initiative	When	Key Benefits
Medium	Reduce portfolio of applications that manage customer data ²	Ongoing from mid 2008	<ul style="list-style-type: none"> Minimise the cost and complexity of Master Data Management

Table 1 - Data Domain Strategic Approaches

In parallel with the development of the customer record, it makes sense to define a 'core' metadata set for 'managed' content. As described in this document, this core set could be based on *Dublin Core* and does not need to be over-complicated. This work can start relatively small and potentially in one or two areas of the business, for example in English & Exams and perhaps marketing.

In the longer-term, it will be beneficial to develop high-level data architecture, working across the organisation. The final step is to develop and implement a Master Data Management plan that will ensure that the data architecture is implemented in an effective consistent manner across the organisation.

² Part of the Application Domain simplification and standardisation initiative, but is included here as there is an impact on the data architecture

3.0 Data Domain Architecture Description – Highlighted Areas

3.1 British Council’s Enterprise Architecture Approach

The Enterprise Architecture is a comprehensive framework used to manage and align an organization's business processes, Information Technology (IT), software, hardware and information requirements with the organisation’s overall business strategy.

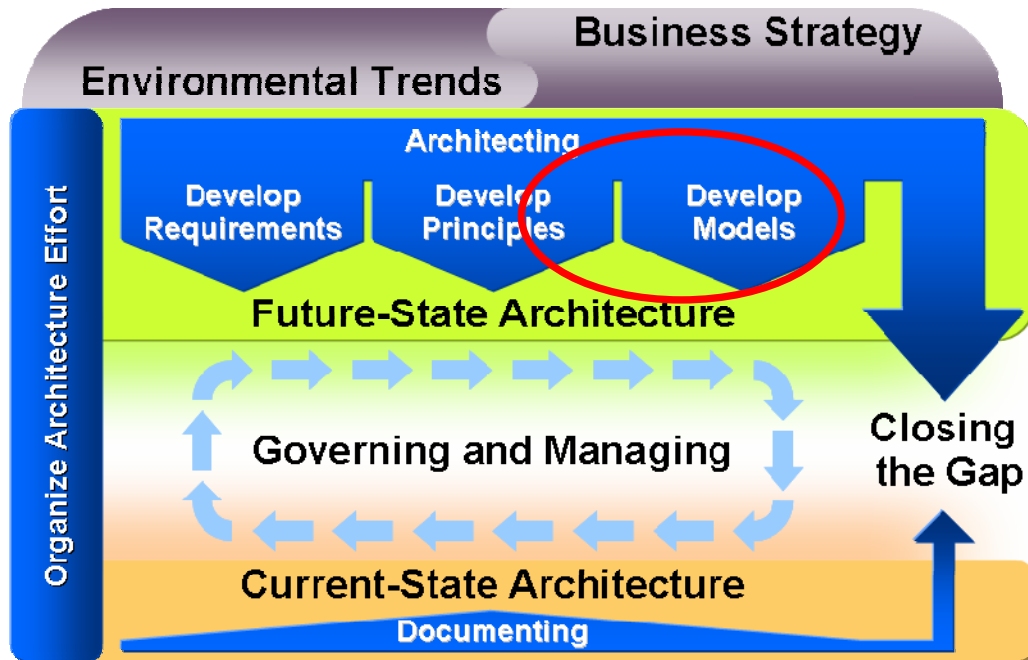


Figure 1 - British Council Enterprise Architecture Approach

This document focuses on developing the architecture model for the Data Domain.

3.2 Position of the Data Domain within the overall British Council Enterprise Architecture

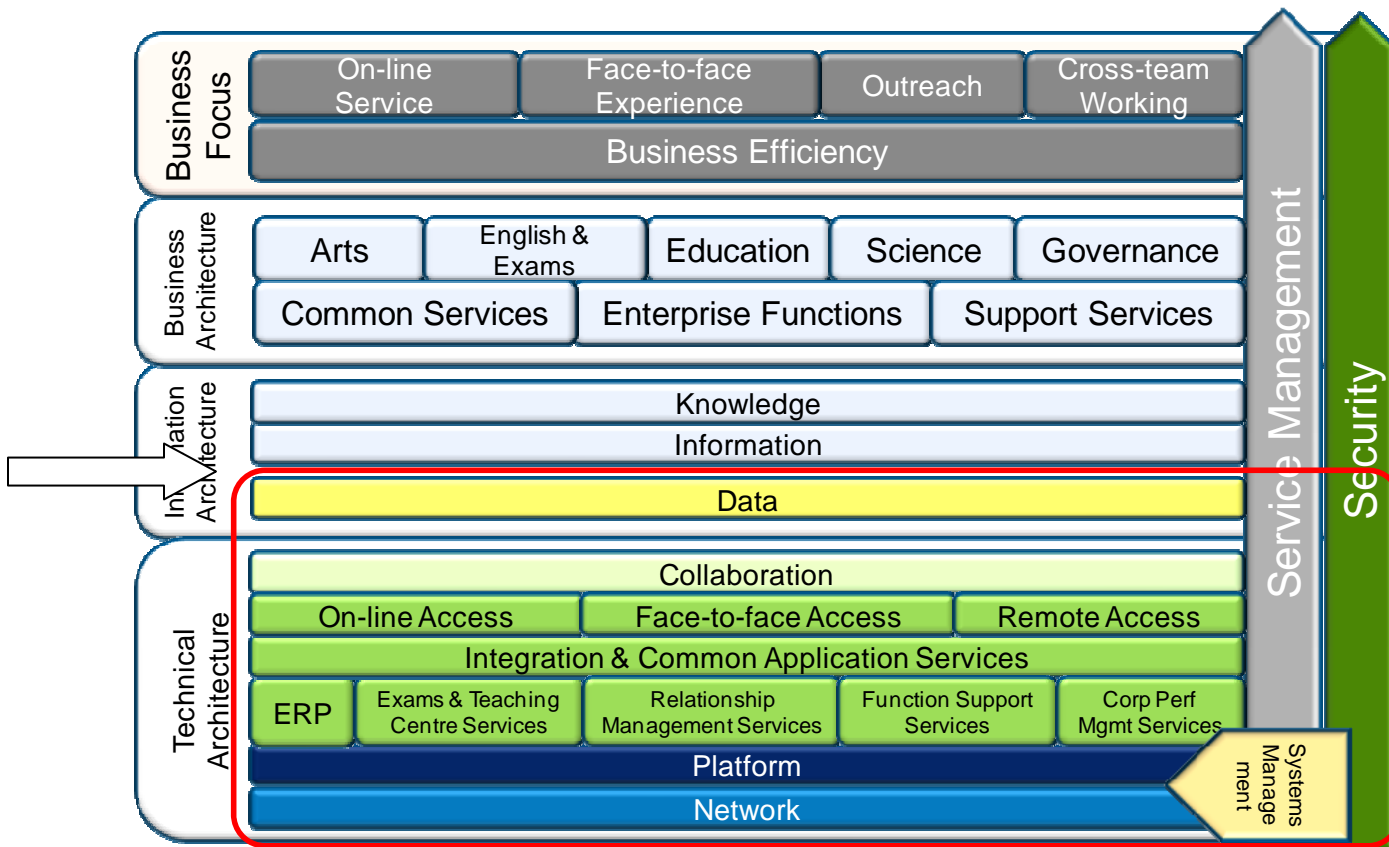


Figure 2 - British Council Enterprise Architecture domains

The platform domain is one of seven enterprise architecture domains currently identified within the British Council. The 'in-scope' domains are shown within the red box in the picture above.

The boundaries between the Data Domain and the Collaboration and Application Domains are in some ways problematical, because there is a lot of overlap and interdependence between the domains. However, for the purposes of this document these boundaries are respected.

3.3 'Core' Customer Data

The Current State with respect to customer identifiable data is shown below. HP has found that there is no recognized 'system of record' for customer data and no cross system 'golden key', which allows a customer to be uniquely identified across The Council.

There are multitudes of systems (with the greatest number being various web applications) that hold customer data that would be expected to form the core of a customer record if a CRM solution existed. In the majority of cases, this 'CRM-like data' is unique to the system that captures it, and not used or integrated outside of that application boundary.

The exception to the above is the CAMPUS system, which falls within what one would expect to be the better-understood data domain of the SAP system. One would expect that this 'integration by default' would make

CAMPUS a promising area on which other systems use of Customer Data might in future coalesce – it should be understood however that at present CAMPUS is simply a peer of all of the other systems that hold like data. Currently no single document consolidates the data that the Council holds (or may hold) about a Customer throughout the ‘Customer Journey’. Previous efforts in this area have focused on the potential of a CRM system and have had to consider a broader range of requirements (campaign management etc.).

Concentrating on ‘core’ data about the customer (data supplied by the customer explicitly or because of specific events e.g. initial course enrolment) is likely to be a more manageable exercise with clear returns. Consideration of the chronological ‘life’ of the customer will aid understanding.

While CAMPUS is only ‘one among peers’ in the data that it holds about customers, early investigation should be made to the suitability of the CAMPUS data model, as this is (assumed to be) well integrated with SAP.

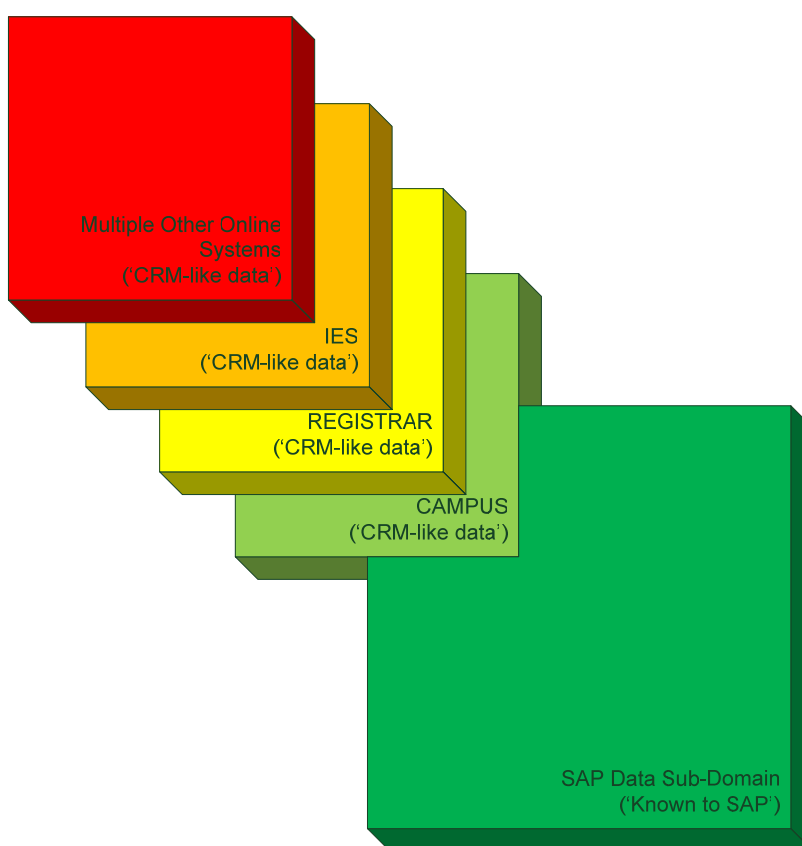


Figure 3 - As-is situation for customer data

There is recognition that web visitors to The Council are impossible to identify, even as the same anonymous individual. Inviting and encouraging early registration, and tracking the user through their credentials on subsequent return visits can be seen as:

- Convenient for the user ('single sign on')
- Leveraging the value of customer information by enabling federation of data based on a shared User ID
- Gathering information (such as 'are you a teacher') that is vital to allowing the Council to meet politically declared commitments.

Introducing a single-sign-on service does not of itself 'fix' all of the issues previously voiced as to inconsistency of user experience with respect to providing data – it is however a pre-requisite for gaining control.

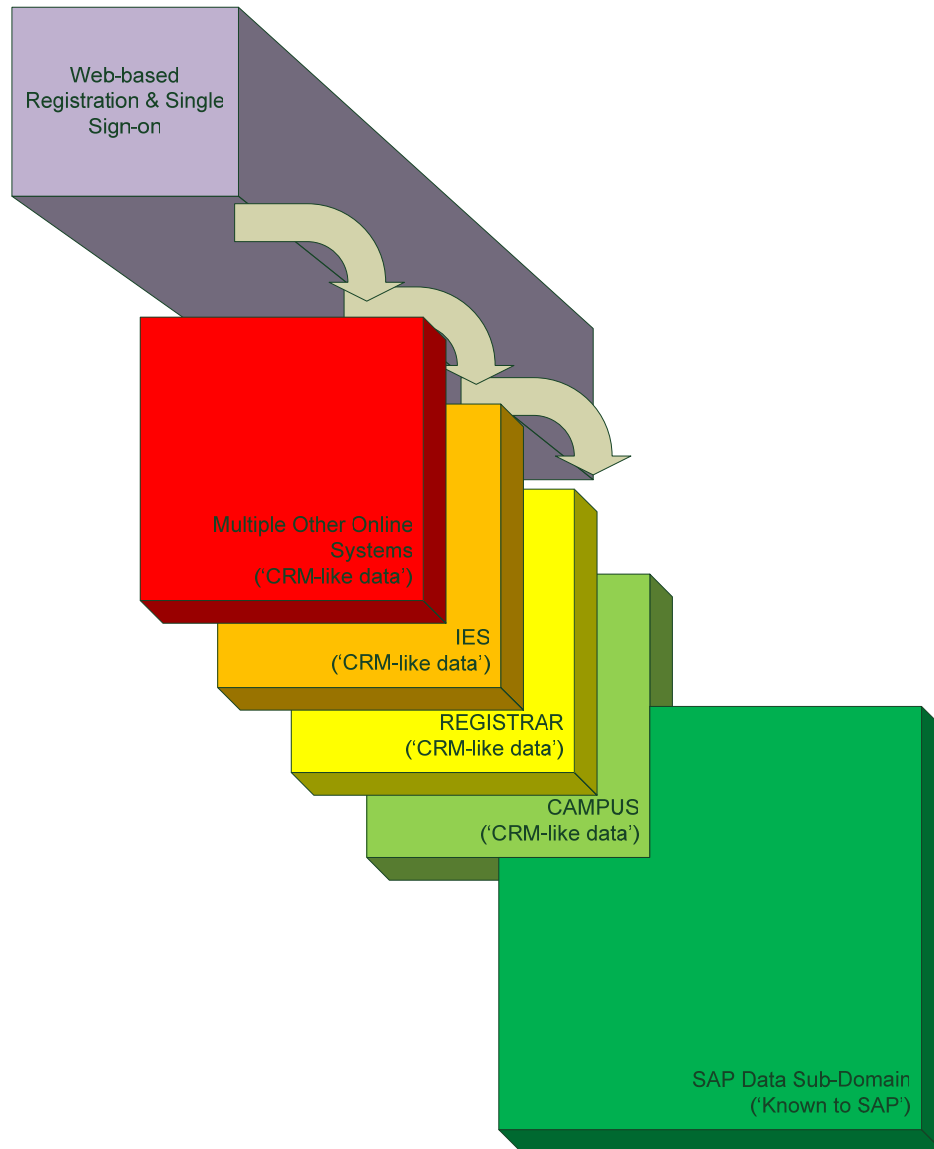


Figure 4 - Intermediate state; *single sign-on*

Global identification of the customer is an enabler for effective Master Data Management. Whatever solution architecture is applied to this Domain requirement, the complexity of implementation will be reduced by managing the portfolio of applications that currently manage customer data.

Where possible, the elimination or reduction of application 'count' will be a positive action. Where that is not possible, consideration should be given as to whether the application needs to manage customer data, or whether it can be integrated with another application (the single sign-on and SAP systems being likely candidates).

Whether achieved by a single customer data repository or through federation, a Master Data solution will in future, provide a unified logical representation of consistent customer data.

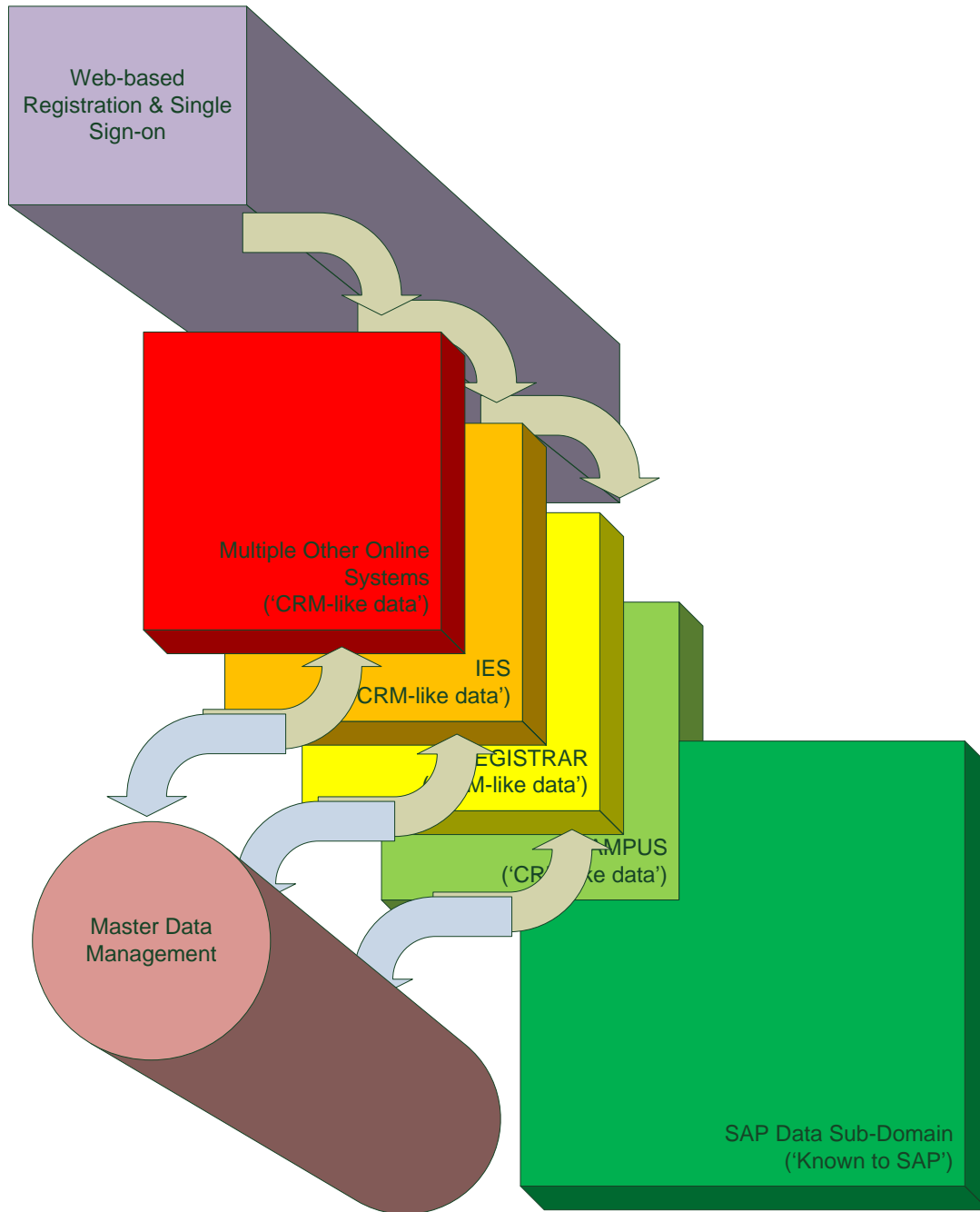


Figure 5 - Future state; *managed Master Data*

3.3.1 Managing Content Assets

We noted previously the existence and proliferation of multiple web-facing applications. Most of these manage content ('web content management') to some degree.

Discussion of the benefits of rationalizing the number of web content managements solutions lies outside the scope of this domain, however it is still likely that there will in future be more than one content management

solution. The development of consistent metadata standards across systems is therefore recommended as an enabler of:

- Cross-system integration
- Easier migration of content from one system to another
- Consistent application of policy to the management of content (is this a candidate for a Record? when was this last refreshed? is this content still licensed?)

In the current state, as new content management applications have been implemented, their metadata configurations have defined the metadata associated with the content that they hold, rather than a Council data model that describes content consistently throughout the enterprise.

While it is both likely and practical that a metadata ‘standard’ will need customizing to the Council’s needs, its implementation and enforcement should be undertaken. The Dublin Core Metadata Element Set (‘Dublin Core’, dublincore.org) is a mature extensible set of metadata attributes that provides a good ‘starting point’ for an enterprise standard.

Dublin Core is not prescriptive and can be extended through qualification. It is ‘agnostic’ of implementation technology and therefore supportable by most content management technologies. The 15 elements of the ‘core’ record are described in the following table.

Term Name: contributor	
URI:	http://purl.org/dc/elements/1.1/contributor
Label:	Contributor
Definition:	An entity responsible for making contributions to the resource
Comment:	Examples of a Contributor include a person, an organization, or a service. Typically, the name of a Contributor should be used to indicate the entity.
Term Name: coverage	
URI:	http://purl.org/dc/elements/1.1/coverage
Label:	Coverage
Definition:	The spatial or temporal topic of the resource, the spatial applicability of the resource, or the jurisdiction under which the resource is relevant
Comment:	Spatial topic and spatial applicability may be a named place or a location specified by its geographic coordinates. Temporal topic may be a named period, date, or date range. A jurisdiction may be a named administrative entity or a geographic place to which the resource applies. Recommended best practice is to use a controlled vocabulary such as the Thesaurus of Geographic Names [TGN]. Where appropriate, named places or time periods can be used in preference to numeric identifiers such as sets of coordinates or date ranges
References:	[TGN] http://www.getty.edu/research/tools/vocabulary/tgn/index.html

Term Name: creator	
URI:	http://purl.org/dc/elements/1.1/creator
Label:	Creator
Definition:	An entity primarily responsible for making the resource
Comment:	Examples of a Creator include a person, an organization, or a service. Typically, the name of a Creator should be used to indicate the entity.
Term Name: date	
URI:	http://purl.org/dc/elements/1.1/date
Label:	Date
Definition:	A point or period of time associated with an event in the lifecycle of the resource
Comment:	Date may be used to express temporal information at any level of granularity. Recommended best practice is to use an encoding scheme, such as the W3CDTF profile of ISO 8601 [W3CDTF].
References:	[W3CDTF] http://www.w3.org/TR/NOTE-datetime
Term Name: description	
URI:	http://purl.org/dc/elements/1.1/description
Label:	Description
Definition:	An account of the resource
Comment:	Description may include but is not limited to an abstract, a table of contents, a graphical representation, or a free-text account of the resource.
Term Name: format	
URI:	http://purl.org/dc/elements/1.1/format
Label:	Format
Definition:	The file format, physical medium, or dimensions of the resource.

Comment:	Examples of dimensions include size and duration. Recommended best practice is to use a controlled vocabulary such as the list of Internet Media Types [MIME].
References:	[MIME] http://www.iana.org/assignments/media-types/
Term Name: identifier	
URI:	http://purl.org/dc/elements/1.1/identifier
Label:	Identifier
Definition:	An unambiguous reference to the resource within a given context
Comment:	Recommended best practice is to identify the resource by means of a string conforming to a formal identification system.
Term Name: language	
URI:	http://purl.org/dc/elements/1.1/language
Label:	Language
Definition:	A language of the resource
Comment:	Recommended best practice is to use a controlled vocabulary such as RFC 4646 [RFC4646].
References:	[RFC4646] http://www.ietf.org/rfc/rfc4646.txt
Term Name: publisher	
URI:	http://purl.org/dc/elements/1.1/publisher
Label:	Publisher
Definition:	An entity responsible for making the resource available
Comment:	Examples of a Publisher include a person, an organization, or a service. Typically, the name of a Publisher should be used to indicate the entity.
Term Name: relation	
URI:	http://purl.org/dc/elements/1.1/relation

Label:	Relation
Definition:	A related resource
Comment:	Recommended best practice is to identify the related resource by means of a string conforming to a formal identification system.
Term Name: rights	
URI:	http://purl.org/dc/elements/1.1/rights
Label:	Rights
Definition:	Information about rights held in and over the resource.
Comment:	Typically, rights information includes a statement about various property rights associated with the resource, including intellectual property rights.
Term Name: source	
URI:	http://purl.org/dc/elements/1.1/source
Label:	Source
Definition:	A related resource from which the described resource is derived
Comment:	The described resource may be derived from the related resource in completely or in part. Recommended best practice is to identify the related resource by means of a string conforming to a formal identification system.
Term Name: subject	
URI:	http://purl.org/dc/elements/1.1/subject
Label:	Subject
Definition:	The topic of the resource
Comment:	Typically, the subject will be represented using keywords, key phrases, or classification codes. Recommended best practice is to use a controlled vocabulary. To describe the spatial or temporal topic of the resource, use the Coverage element.
Term Name: title	
URI:	http://purl.org/dc/elements/1.1/title

Label:	Title
Definition:	A name given to the resource
Comment:	Typically, a Title will be a name by which the resource is formally known.
Term Name: type	
URI:	http://purl.org/dc/elements/1.1/type
Label:	Type
Definition:	The nature or genre of the resource
Comment:	Recommended best practice is to use a controlled vocabulary such as the DCMI Type Vocabulary [DCMITYPE]. To describe the file format, physical medium, or dimensions of the resource, use the Format element.
References:	[DCMITYPE] http://dublincore.org/documents/dcmi-type-vocabulary/

Table 2 - Dublin Core Metadata Elements

The development of an appropriate core Content Metadata set is strongly recommended with consistent implementation in future state content management solutions. Dublin Core is commended as a candidate for the development of this standard, though it is acknowledged that 'almost any standard is better than none!'

4.0 Direction of Travel

4.1 Business changes impacting the Data Domain

The key business changes that affect the Data Domain in the near future are³:

4.1.1 Responding Effectively to the Business

The British Council is, like many organisations, experiencing a major shift from doing business face-to-face to on-line working. A feature of this change is that it is moving very quickly and subject to many short-lived fads and fashions.

Many of the British Council's customers will be involved in this change and in order for the British Council to thrive and survive it must be able to compete and lead the field in terms of its on-line presence.

The dynamic nature of this environment means that IT has to be even more responsive to demands from the business. If not, the British Council is in danger of losing the race with its competitors.

In order to achieve such levels of responsiveness it is imperative that business solutions can be quickly built up from existing components or 'services' rather than having to acquire complete systems from scratch every time requirements change.

4.1.2 Transforming On-line Business

On-line transformation is fundamental to the future growth and success of British Council. As noted above, there is a significant move from face-to-face to on-line working. However, it is no longer enough just to have a web presence. If the British Council is to attract and keep customers it must provide a leading-edge on-line experience, otherwise it will quickly lose business to its competitors.

Emerging technologies such as Web 2.0 are beginning to transform how we think about and use the Internet and other communication channels.

Access to the internet is becoming widespread, even in third world countries⁴. British Council's target audience is rapidly becoming web 'savvy' and attracted by these new technologies.

The growth of the high profile Social Networking sites, which take a significant percentage of many web users 'mindshare', may force organisations to 'take their content to the user'; rather than to ask 'how do we compete with (for instance) Facebook?', it may be better to develop a strategy of being present on these sites.

It must be possible to integrate new and emerging technologies into existing solutions with minimal disruption. It is not enough just to 'bolt on' new functionality without integration since this will not provide the best user experience nor make available the consistent valuable information required by the Council.

The business requirements for internal systems tend to be far more stable and much more likely to evolve slowly. A key challenge is to develop an architecture that will successfully mesh these two seemingly conflicting requirements.

³ Note these are the same as those affecting the Application Domain, but are included here to avoid having to reference that document

⁴ Currently in some countries, access to the internet may be via mobile phone.

4.1.3 Leveraging Our Information Assets

Information is one of the British Council's major assets. In the past, it has been challenging to leverage these information assets across the organisation partly because of the way the business is organised, but also because of the disparate applications architecture (which in turn reflects on business organisation).

The introduction of SAP via the FABS program has enabled considerable progress to be made in this area, especially in terms of financial data. However, there is still much information, especially relating to British Council's customer, which is inconsistent, difficult to manage and reconcile.

In some cases, valuable information is simply lost (for example, *who* is accessing a web site) because no mechanism is available to capture that data. Even where data is captured, it is challenging to reconcile it across process boundaries and this significantly reduces the value of the information.

While part of the solution to this is outside the scope of the application domain (because it sits within the Data Domain), it is the application that will collect process and deliver the information to maximise its use.

4.1.4 Increasing Business and IT Efficiency

Another key business objective is to optimise both business and IT efficiency. This involves balancing IT investment against business value, and ensuring that maximum value is obtained from existing IT assets. When applied to the British Council application architecture domain, this means leveraging as much value as possible from the SAP and Microsoft applications and infrastructure.

It also indicates that there is a need to simplify and standardise the application domain. This means that the British Council must ensure that as far as possible, solutions are designed for use and re-use across the whole organisation.

4.2 Technology Opportunities

The technology opportunities are linked closely to the applications and collaboration domains, since it is in those domains that the actual data architecture is implemented.

4.3 Summary of Benefits

		Data			
		Core Customer Record	Core Metadata for Managed Content	High-level Data Architecture	Master Data Management
Prioritisation Rating		25	18	18	16
Difficulty (1 = easy, 5 = difficult)		2	3	4	3
Cost (1 = low, 5 = high)		2	3	2	3
Dependency Factor (1 = has dependents, 5 = no dependents)		1	2	2	3
Benefit	Importance (1 = low, 5 = high)				
Increase business efficiency	5	4	4	4	4
Reduce operational risk	3	3	4	4	4
Faster time-to-market	3	3	4	3	4
Flexible business relocation	3	1	2	3	3
Flexible delivery channel support	2	2	3	3	3
Flexible working (e.g. 3rd parties)	2	2	3	3	3
Better access to information	4	5	5	5	5
Improve service quality	3	5	5	5	5
Improve scalability	3	4	4	3	3
Reduce IT costs	5	1	3	3	2
Strengthen compliance & security	4	5	5	5	5
Reduce training needs	1	2	3	2	2
Value (Higher = more value)		123	147	143	141

Figure 6 - Enterprise Architecture Benefits Matrix – Data Domain

Figure 6 above illustrates the relative benefits attributed to the initiatives described in this document. It can be seen that based on the above assessment, developing the core customer record has the highest priority, followed closely by core metadata for managed content and then the development of the British Council high-level data architecture.

Once this work has taken place, the next step is to consider implementing Master Data Management for prioritised key data.

5.0 Making it Happen

This section describes the consideration in order to implement the recommendations in this document for the Data Domain.

5.1 Technology Choices

No specific technologies have been identified at this stage, although the Dublin data management structure has been commended. As more work is done to understand requirements, for metadata and master data management it will be possible to identify technology options.

5.2 Key Organisation Processes

The following processes are required to develop and implement the data domain:

- Enterprise architecture governance
- Business process analysis
- Data analysis

5.3 Resources and Skills

The key resources required to implement the data domain are:

- Enterprise architecting
- Business process analysis
- Data analysis

5.4 Provision Assumptions

It is assumed that the British Council will want to retain control over the Enterprise and (at least at the enterprise level) the data architecture. It may however be appropriate to use third party assistance to develop specific capabilities.

5.5 Milestones and Deadlines

The key milestones that affect the application data are as follows:

- Completion of SAP FABS rollout by 2010
- Implementation of Online Transformation – no specific timescale are currently available
- Retirement of Obtree, the current Web Content Management system, and the need for a replacement for E&E and OTP

5.6 Domain Strategic Roadmap

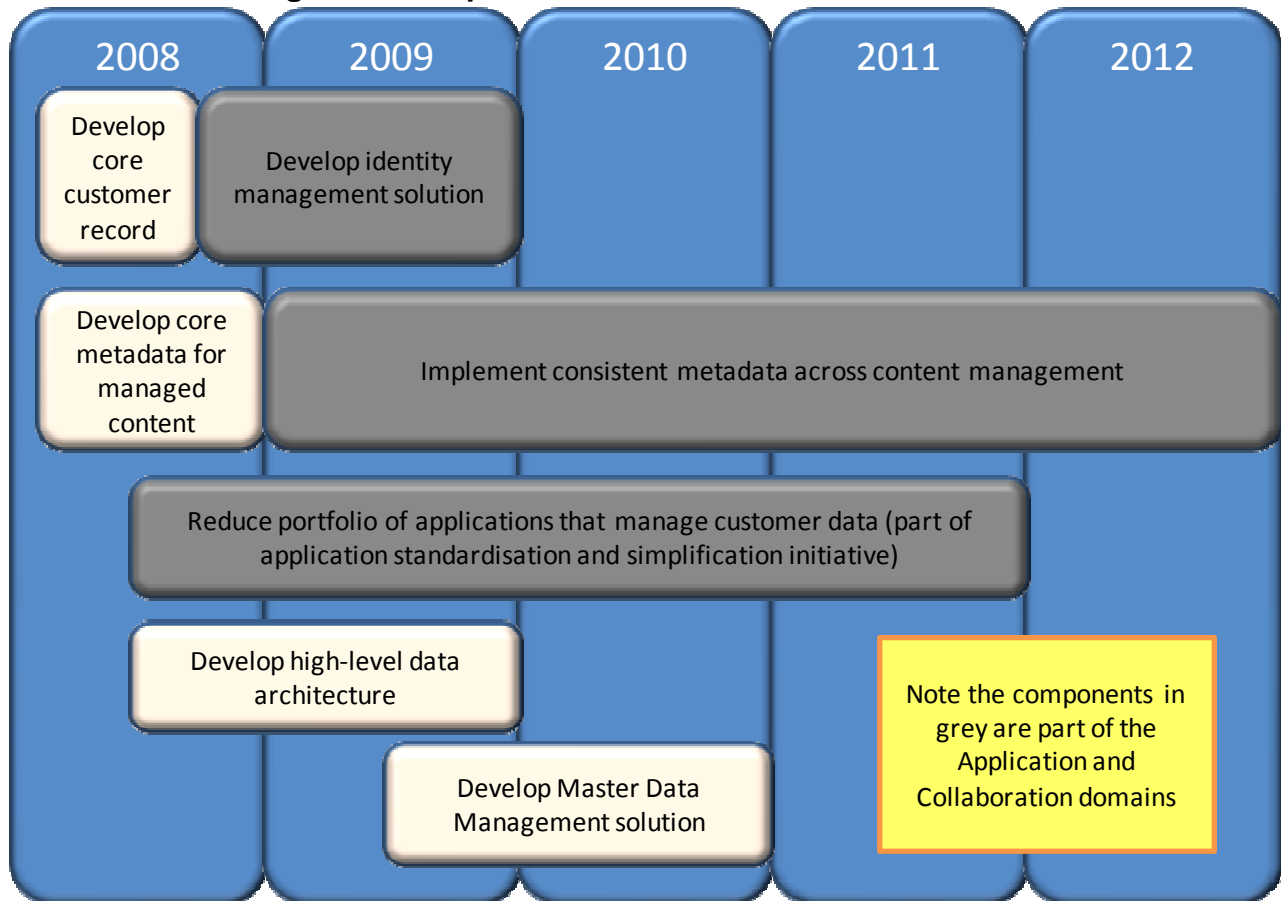


Figure 7 - Data Domain Strategic Roadmap

5.6.1 Step 1 - Develop Core Customer Record

Working within one or two areas of the business, develop a simple core customer record defining the key information required to identify each customer and the important information that needs to be captured and tracked.

5.6.2 Step 2 - Develop Core Metadata for Managed Content

Establish a small core set of data that will be used to ensure that consistent metadata is applied to all managed content. Suggest that this is based initially on the *Dublin Core*.

5.6.3 Step 3 - Develop High-level Data Architecture

Develop an overall understanding of the critical data across a significant part of the organisation. Identify and prioritise which data needs to be managed as master data.

5.6.4 Step 4 - Develop Master Data Management Solution

Once the high-level data architecture has been sufficiently developed and the key data items prioritised, implement the master data-management solution.

6.0 Appendix 1 – Principles Guiding the Data Domain

6.1 Business Principles

Business Principle 1 - Climate Change and Environmental Policy
Business Principle 2 - Business Agility
Business Principle 3 - Maximising Efficiency
Business Principle 4 - Information as an Asset
Business Principle 5 - Security Strategy
Business Principle 6 - On-line Working

6.2 Functional Principles

Functional Principle 1 - Common Functionality
Functional Principle 2 - Modular Solutions
Functional Principle 3 - Scalability and performance
Functional Principle 4 - Legal and Regulatory Requirements
Functional Principle 5 - Confidentiality, Integrity and Availability of Data and Systems
Functional Principle 6 - Security Policy
Functional Principle 7 - Information Quality
Functional Principle 8 - Business Continuity

6.3 Technical Principles

Technical Principle 1 - Business Applications and the British Council
Technical Principle 2 - Maximising Microsoft Infrastructure Benefits
Technical Principle 3 - Industry Standards
Technical Principle 4 - Buy not build
Technical Principle 5 - Flexibility
Technical Principle 6 - Non-vendor specific solutions
Technical Principle 7 - Security Standards
Technical Principle 8 - Common data model
Technical Principle 9 - Data duplication

6.4 Implementation Principles

Implementation Principle 1 - Health & Safety
Implementation Principle 2 - Strategic Suppliers and the British Council
Implementation Principle 3 - Provision of Services

6.5 Governance Principles

Governance Principle 1 - Enterprise architecture is business driven
Governance Principle 2 - Architectural values are to be publicised
Governance Principle 3 - Architecture efforts must be unified across the Enterprise