BRITISH COUNCIL

Enterprise Architecture Application Domain Roadmap

Technology Roadmaps

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1.0   Introduction

This document describes the target architecture roadmap for the Application Domain.

1.1 Objectives

The objectives of this document are:

- To provide a summary of the roadmap for the Application Domain
- To communicate an understanding of the Application Domain target architecture to stakeholders at an appropriate level of detail
- To position the Application Domain within the overall British Council enterprise architecture and describe the capabilities covered by this domain
- To describe how the business direction and technology opportunities have shaped the target domain architecture
- To explore the options available to British Council for this domain
- To identify the major deadlines and milestones for the delivery of the capabilities provided by this domain
- To identify at a high level the resources and skills required to implement the capabilities
- To describe the Application Domain roadmap

2.0   Executive Summary

The British Council's enterprise architecture is currently organised into seven domains. These are data, applications, collaboration, platform, networks, system management and security. This document focuses on the application domain.

Currently application architectures are decided by the different business departments and are often times passed to GIS to support and sustain. There is a potential for considerable benefit for the British Council if the *enterprise-wide* application architecture approach described in this document is adopted.

However, 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, it is recommended that the Council focus on one or two specific areas of the business, for example English & Exams and Marketing & Customer Services, though this will still need the specific buy-in and sponsorship of the senior managers within those areas.

2.1   Developing the Enterprise-wide Application Strategy

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

Priority	Initiative	When	Key Benefits
High	Complete the FABS rollout Implement financials MI within SAP	By end 2010	• Return on SAP investment • Increase IT and business efficiency • Minimise operational risk
High	Simplify and standardise the application architecture, specific areas of focus: • Web Content Management[1] • Relationship Management	Agree architecture By end 2009 Implement as driven by business cases	• Reduce procurement costs • Improve customer experience • Improve use of corporate data assets • Reduced support costs • Reduced operational risk
High	Pilot common application services in 1 or 2 business areas (E&E, MCS), candidates include: • Identity Management • Global Search	Pilot By end 2008	• Maximise use of corporate data assets • Improve customer experience • Reduced operational risk
Medium	Develop integration framework and implement common application services	By end 2011	• Reduced procurement costs over time • Reduced support costs • Maximise use of corporate data assets • Improve customer experience • Reduced operational risk

Table 1 - Application Domain Strategic Approaches

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[1] Note that general enterprise content management (ECM) is within the Collaboration Domain, though Web Content Management should be considered a subset in architectural terms

2.1.1 Complete FABS Rollout

The British Council has made a considerable investment in SAP in the context of the FABS program. Completion of *financials* rollout is expected imminently and completion of *Campus* rollout by the end of 2010. During that time, it is recommended that the SAP architecture is kept relatively stable while the business adopts FABS in order to minimise operational risk. It is therefore *not* recommended that the scope of SAP be allowed to creep as this could threaten the FABS/SAP programme, FABS will have a considerable impact on the business and they need time to complete their change management processes before absorbing additional change.

2.1.2 Implement Global Application Standards

There is evidence of application architecture proliferation across the organisation. Two areas where this might happen are content management and relationship management. In the case of content management, E&E are exploring a different solution from MCS. In other cases, such as with relationship management, numerous local geographic solutions have been implemented.

This proliferation of solutions is compounded by the tangential Collaboration Domain, where many of the underlying horizontal tools are identical or similar to those required in the Application Domain.

Clearly, this is suboptimal for many reasons adding cost, risk and making it much more difficult to share and benefit from corporate information. Therefore, a priority is to establish strong governance, especially in this critical area, ensuring that the key stakeholders from the business are involved in the process.

In some cases, it may well be appropriate to have more than one system provided appropriate integration mechanisms exist. However, such decisions should be made in a global context, not driven by isolated business cases.

It is imperative that the enterprise architecture team within GIS is given the authority to govern the selection of solutions and products. This will require the support of senior management across the organisation.

It may take time to enable this globally, in which case it may be appropriate to begin by engaging with one or two business areas. Given the pressing need to establish standards for web content management this indicates working with E&E and MCS initially.

2.1.3 Pilot Common Application Services

Two major objectives of the business are to transform British Council's on-line presence and maximise benefit from corporate data assets. Initial analysis suggests that developing a common mechanism to capture access and report customer information will benefit both objectives.

Currently very little customer information is captured other than for transaction contacts. In some cases it is impossible to identify from which country a contact was made (IP addresses are not accurate enough). Providing a common identify service will enable the capture of customer information at various levels appropriate to the type of contact. Such an approach can also enable the integration of transaction information within SAP with the unstructured data that supports much of the on-line user interface with minimal impact on SAP (see 2.1.1 above).

It is recommended that the British Council initially focus on one area of the business where there is clear business benefit, for example E&E. However, it is also important to develop an overall understanding of requirements from across the businesses to increase the likelihood of the common service meeting the global need.

2.1.4 Develop Integration Framework

Currently integration of application components is point-to-point. This is appropriate where there are relatively few system components and the business environment is static. The increasing need to respond quickly to accelerating business change indicates that a better approach to integration will be required in the future. Because the needs of the Council are relatively modest, an integration framework can be lightweight and developed over time. The starting point is to establish the overall architectural approach, set some key standards and implement strong governance to ensure that all emerging solutions are compliant.

2.2   Potential for Outsourcing

The recommended approach to outsourcing is as follows:

- Identify the services and processes that are unique to the British Council and give the Council its competitive advantage
- Ensure that the Council retains ownership of the architecture and potentially development and support for the systems supporting the services and processes unique to the Council (see bullet above)
- Identify current bespoke solutions that can be migrated to industry standard systems and develop migration plan
- Consider outsourcing the industry standard solutions to a 3rd party, e.g. SAP
- Retain in-house ownership of the overall enterprise architecture

The above approaches are described in more detail in the following sections of this document.

3.0   Application Domain Architecture Description

The Application Domain consists of all the British Council business applications, excluding those that are a part of the collaboration domain or the platform domain.

In summary, these applications provide the following services:

- Service Access:
  - On-line access services (e.g. Web Content Management)
  - Face-to-face access services (.e.g. Teaching Productivity Tools)
  - Remote access services (e.g. B2B services such as payroll)
- ERP Services
- Exams & Teaching Centre Services
- Relationship Management Services
- Function Support Services
- Corporate Performance Management Services (e.g. MI, Dashboards)
- Integration and Common Application Services (e.g. Identity Management)

The following services are *not* included in the application domain:

- Collaboration services (Collaboration domain)
- Generic Content Management (Collaboration Domain)
- Workflow (Collaboration domain)
- Mail and messaging (Platform domain)
- MS Office (Platform domain)
- Desktop productivity tools (Platform domain)
- System and Service Management tools (System Management domain)

However, it is unwise to ignore the application services that are not directly a part of the Application Domain when considering the overall applications architecture. This is because either now or in the future there may be a need for integration of components across the complete applications landscape. In addition, re-usable components can exist within each of the domains, so the Applications, Collaboration and Platform domains should be considered when exploring new potential solutions.

Therefore, in places this document includes references to those application components that are outside the defined scope of the domain.

3.1 British Council's Enterprise Architecture Approach

The Enterprise Architecture is a comprehensive framework used to manage and align an organisation's business processes, Information Technology (IT), software, hardware and information requirements with the organisation's overall business strategy.
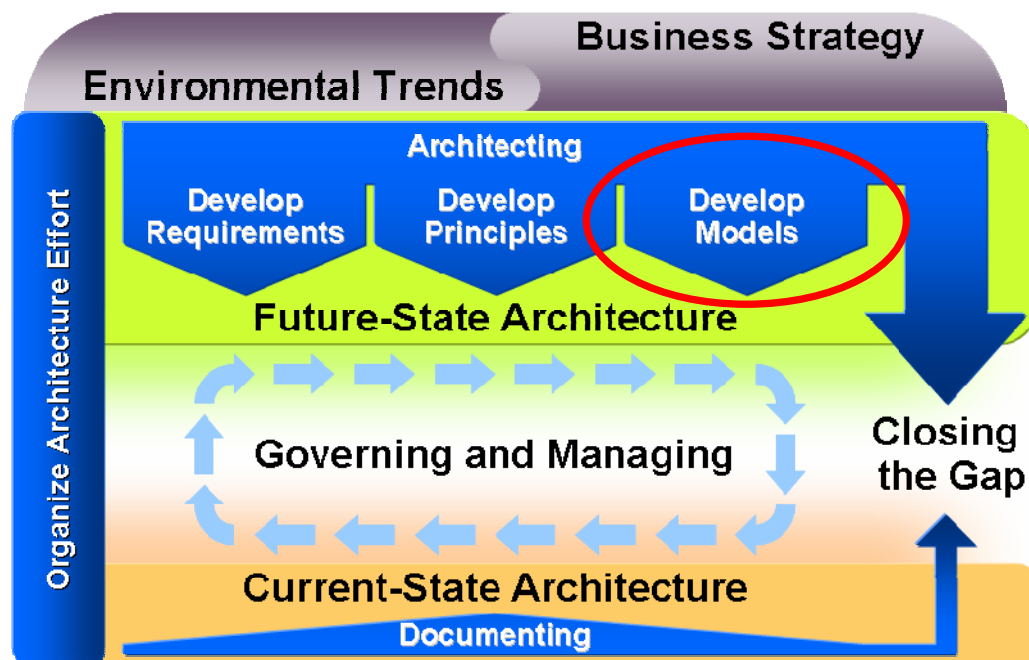
Figure 1 - British Council Enterprise Architecture Approach

The document focuses on defining the future state model for the Application Domain.
As part of the overall enterprise 'architecting' process, a number of guiding principles have been developed. Those principles that specifically affect the Application Domain can be found at the back of this document in Section 7.0 *Appendix 1 – Principles Guiding the Application Domain.*

3.1 Position of the Application Domain within the overall Enterprise Architecture
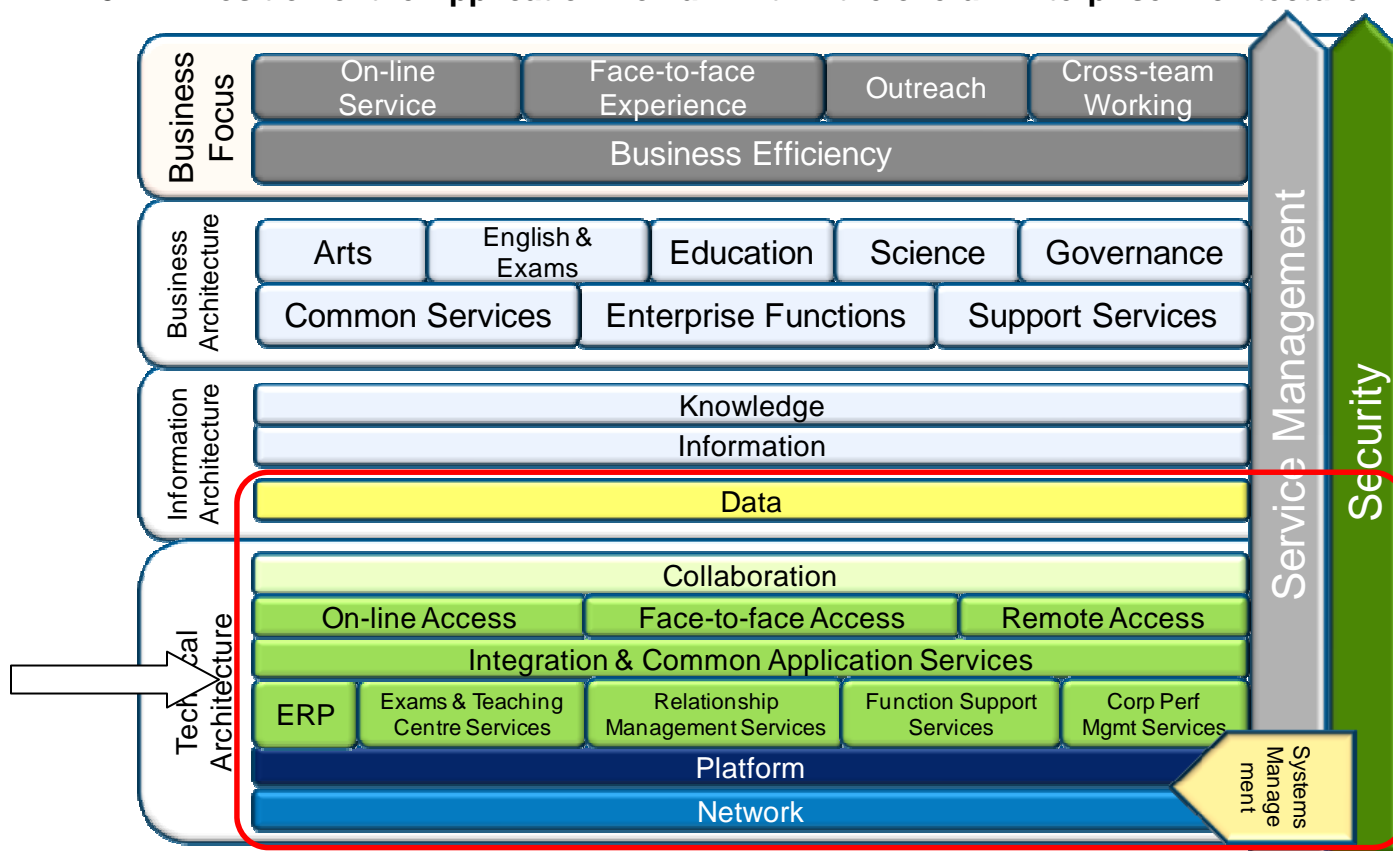
Figure 2 - British Council Enterprise Architecture Domains

The Application 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 application domain incorporates the main business applications and excludes application components that are part of the collaboration or platform domains (see introduction to this section above).
The capabilities of the Application Domain are listed in detail below.

3.2 Capability Summary

Application services fall into one of three areas:

- Customer Facing Services – services directly accessed by British Council's customer and partners
- Integration and Common Services – the mechanism for integrating services across different systems and providing consistent common services to systems
- Internal Services – services which enable the British Council to run its businesses but which are not directly accessible to its customers or partners
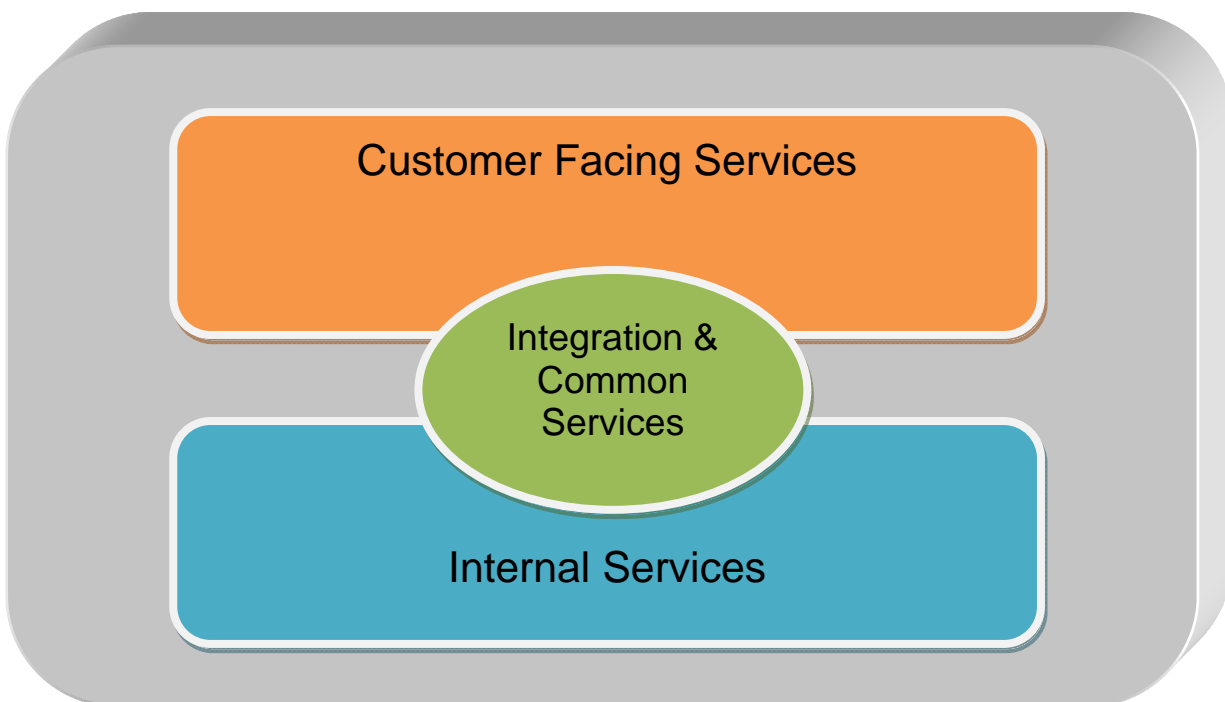
Figure 3 - Application Domain Service Model

3.2.1   Customer Facing Services

Figure 4 - Customer Facing Service Model

3.2.1.1 On-line access services

While a considerable amount of business still takes place face-to-face, there is an emerging trend to increase on-line activity. On-line activity can take a number of different forms.

Interaction Services

Interaction services are services that enable British Council's customers to interact with each other as well as the Council, for example:

- Blogs
- Wikis
- eMail
- Chat
- Emerging capabilities – still to be defined

Note that this is a fast moving area and new requirements and capabilities are expected to emerge on an ongoing basis.

These Interaction Services are a strong example of the tendency for service functionality to cross Domain boundaries; all of the above are candidate services in the Collaboration Domain and furthermore, interactions will often start as internal interaction ('Collaboration') before resulting in client-facing dialogue ('Applications'), or vice versa.

Transactional Services
- Registration
- Order Capture
- On-line Training
- On-line Exams (potential future requirement)
- Enterprise Feedback

The recurrent need to 'know who the customer is' makes early registration and encouragement of sign-on a highly desired behaviour; the implementation of cross-platform behaviour (for client-facing, 'Web' applications) makes the proliferation of Web Content Management solutions of particular concern.

Web Content Delivery
- Media streaming

Web Content Management
- Content Authoring
- Content Lifecycle Management
- Performance Management (May be part of the Systems Management Domain)

Content Authoring and Lifecycle Management are activities that take place in the Collaboration Domain and frequently cross Domain boundaries; the implementation of services that do not have the ability to operate seamlessly across these boundaries will, at best, lead to cost multiplication and user inconvenience.

3.2.1.2 Face-to-face access services
- Events Management
- Learning Productivity Tools

3.2.1.3 Remote access services
- Order Capture Validation

- Customer Support
- B2B Partners (e.g. The British Accreditation Council, Cambridge Assessment)
- B2B Suppliers (e.g. Logica, Global Crossing, HP)

3.2.2 Integration and Common Application Services

Integration & Common Application Services

Common Services

Integration Platform

Service Lifecycle Management
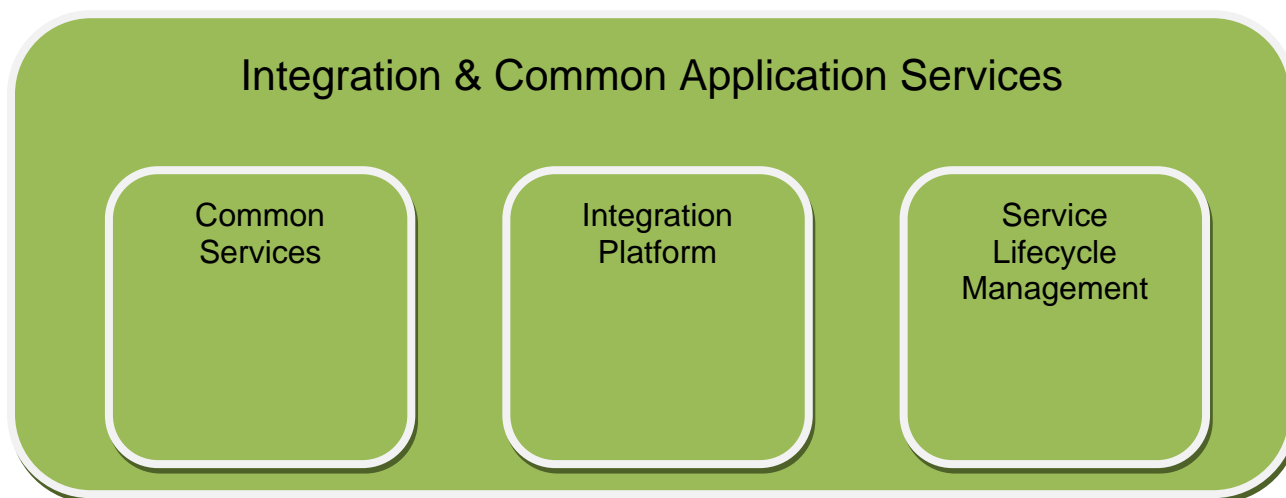
Figure 5 - Integration & Common Application Services Model

3.2.2.1 Common Application Services
- Identity and Authentication Services
- Search Services
- Common Content Management Services
- Web Analytics

Currently a small set of potential common application services has been identified, however more work needs to be done with the business units to identify which business services need to be common, and which can remain specific to point business solutions.

3.2.2.2 Integration Framework
- Security (access control) Services
- Service Auditing
- Service Orchestration[2]
- Service Instrumentation[3]
- Service Management
  - o Availability Management
  - o Performance Management

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[2] Combining two or more services together in a sequence to perform a business function

[3] Incorporating functionality within a service to log and report performance and behaviour in business terms, for example to measure how often a user enters an invalid data item, or how long it takes to complete on on-line course booking

A good example of a service which should be made available through the integration framework is *common identity management.* Providing the service through the common framework will make it easier for service consumers to access the service in a simple and consistent manner. It will also provide the control and monitoring required to deliver the service effectively.

In the identity management example, the service would need to be used by multiple channels, including on-line systems, call centres and possibly even when registering face-to-face contacts. For on-line integration, the on-line system can call a simple web-service to capture the user identity and any security identifiers and provide a simple go/no-go response.

This same web-service could also be used by a simple stand-alone, or lightly integrated front-end that could be used in call centres. Such a (front-end) component could easily be developed and supported in-house. Over time, as the existing contact centre system is migrated to a common platform, a more robust integration would be implemented, but still using the same common identity service.

3.2.2.3 Service Lifecycle Management
- Service Definition and Standards
- Service Catalogue
- Service Publication & Discovery
- Service Contract Management
- Service Quality Assurance
- Service Governance

Internal Services

Internal Services

ERP Services	Exams & Teaching Centre Services	Relationship Management Services	Function Support Services	Corporate Performance Management Services
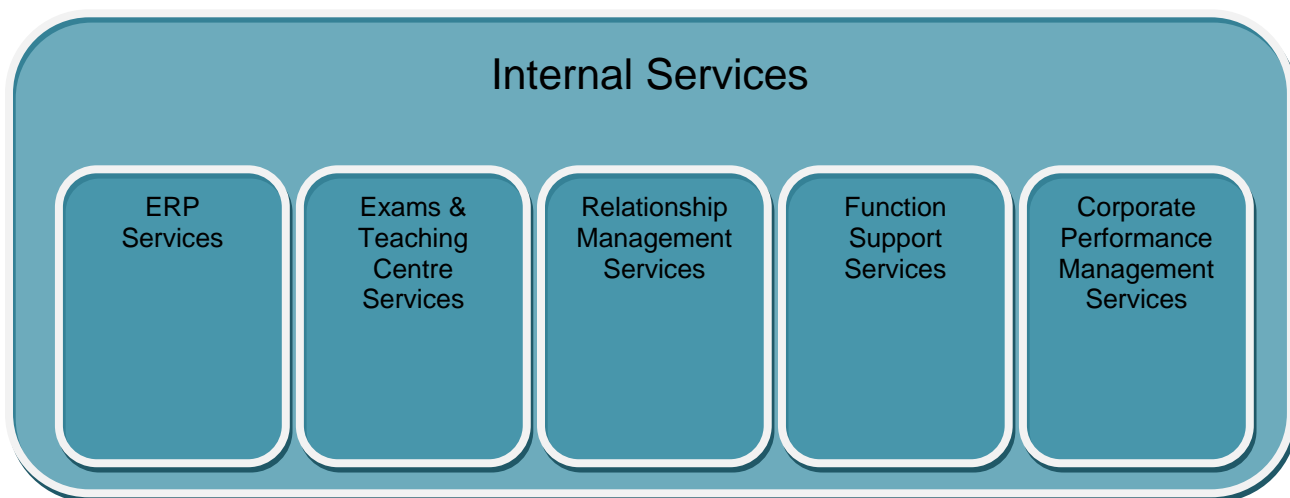
Figure 6 - Internal Services Model

3.2.2.4 ERP Services
- Purchase Order Accounting
- Sales Order Processing
- Accounts Receivable
- Accounts Payable
- Billing Invoicing
- Contract Accounting
- General Ledger
- Financial Reporting
- Travel & Expenses
- Sourcing Contract Reviews
- Product Catalogue
- Order Management
- Order Fulfilment
- Stock Management

3.2.2.5 Exams & Teaching Centre Services
- Course Registration
- Exam Registration
- Teaching Centre Management
- Student Exchange Management

3.2.2.6 Relationship Management Services
- Contact Management
- Call Centre Management
- Strategic Partner Management

3.2.2.7 Function Support Services
- Asset Management
- Human Resources
- Payroll
- Records Management
- Library Management
- IT Service Management (may be part of the Systems Management Domain)

3.2.2.8 Corporate Performance Management Services
- Corporate Performance Monitoring BI
- KPI Dashboard

4.0   Direction of Travel

4.1 Business changes impacting the Application Domain
The key business changes that affect the Application Domain in the near future are:

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 otherwise 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 loose business to its competitors.

Emerging technologies such as Web 2.0 and eventually Web 3.0 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 countries[4]. British Council's target audience is rapidly becoming web 'savvy' and is 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.

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 (it could be argued in turn that this is a result of the 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.

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

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

A number of technology opportunities can have an impact on the application domain. These include:

4.2.1   Leveraging SAP capabilities

The British Council has made a considerable investment in SAP in terms of both solutions and capability. Wherever possible and where it meets requirements, SAP should be used to provide functionality. This is most likely to be in the area of internal services where there is likely to be a close (enough) match between business requirements and application functionality. It is also generally easier, though not without its challenges, to change business processes internally to match SAP's implemented processes.

However, SAP is less likely to provide the flexibility that is required, especially for on-line access other than in the area of transactional access. It may be better to expose SAP functionality thorough a common service interface, allowing the Council to develop user interfaces quickly and effectively.

Consideration also needs to be given to the cost and availability of SAP resources when implementing new functionality.

More investigation of the capabilities of SAP needs to take place before any hard and fast decisions are made in this area.

4.2.2   Leveraging Microsoft capabilities

As with SAP, the British Council has made considerable investment in Microsoft Infrastructure again both in terms of solutions and capability. In addition, the British Council's status as an educational establishment means that it receives favourable licensing pricing for all Microsoft products.

Microsoft provides capabilities for implementing an integration framework based on .NET and BizTalk Server technologies (See 4.2.3 below). MOSS should also be included as a potential solution development platform.

4.2.3   Integration Framework

The requirement to be able to build solutions from components and to combine functionality and information from a number of different systems strongly indicates the need for integration.

Traditionally integration has happened in an ad-hoc point-to-point manner. Such an approach rapidly reaches unmanageable proportions as the number of integration points increases.

An added complication in such an arrangement is that there can be a lack of standardisation between point-to-point integration mechanisms. This can make it increasingly difficult to support and over time this can lead to a critical situation where if becomes exceedingly difficult to integrate any additional components.
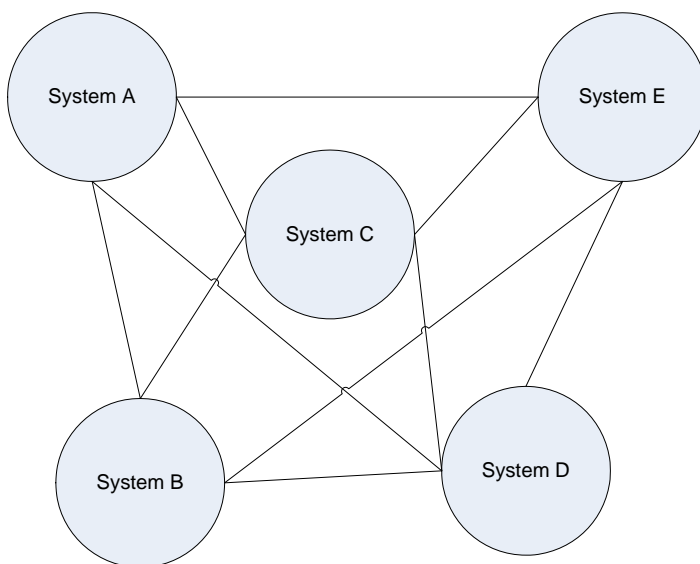
Figure 7 - Point-to-Point Integration

A better approach is to implement a common integration framework that acts as a 'hub' When a system requires a service, it communicates with the central framework rather than the service provider directly. The framework knows where to find the service because it keeps track of service providers.

In such an arrangement, the total number of integration points equals the total number of systems to be integrated. In addition, because every integration point uses a common standard, the solution is much easier to support.

Such an arrangement makes it very easy to change where a service is provided from in the future. For example, identity management may initially be provided in-house but in the future may be provided by a third party. This requires a simple parameter change within the framework.
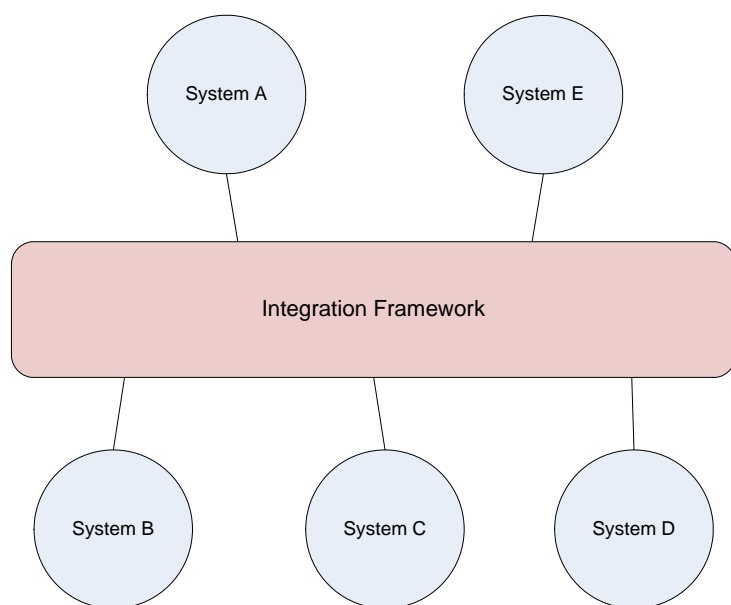
Figure 8 - Hub Integration

Once the concept of an integration framework has been accepted, a natural progression is to move common 'technical' functionality, such as auditing, error handling and service instrumentation into the framework itself so that it does not have to be implemented repeatedly by each application.

An integration framework can provide a pre-defined set of standards, tools and common service components. Applying British Council's architecture principles there are a number of candidates for the provision of an integration framework, for example based on SAP using SAP's Netweaver technologies, or alternatively based on Microsoft's technologies such as .NET and MOSS.

An integration framework does not have to be a huge investment, in fact, experience has shown that it is much better to start small and grow outwards. The starting point is to establish a set of standards and a governance process to ensure that all new solutions consider the use of the integration framework and the common services that it can support.

An example of a common service might be *identity management* which can help the British Council to gain a much better understanding of who they interact with, who is using on-line services and enable tracking customer engagement over time.

4.2.4   Software as a Service and Service Oriented Architectures
Software as a service (SaaS) is a software application delivery model where a software vendor develops a web-native software application and hosts and operates (either independently or through a third-party) the application for use by its customers over the Internet.

Customers do not pay for owning the software itself but rather for using it. They use it through an API accessible over the Web and often written using Web Services or REST. The term SaaS has become the industry preferred term, generally replacing the earlier terms Application Service Provider (ASP) and On-Demand.

Service Oriented Architecture (SOA) is a computer systems architectural style for creating and using business processes, packaged as *services*, throughout their lifecycle. SOA also defines and provisions the IT infrastructure to allow different applications to exchange data and participate in business processes. These functions are loosely coupled with the operating systems and programming languages underlying the applications.

SOA separates functions into distinct units (services), which can be distributed over a network and can be combined and reused to create business applications. These services communicate with each other by passing data from one service to another, or by coordinating an activity between two or more services.

SOA concepts are often seen as built upon and evolving from older concepts of distributed computing and modular programming.

While the British Council's current requirements do not suggest a wholesale move toward SOA architecture, adopting some of the SOA principles, applying a 'light touch' can be beneficial, especially when considering the provisioning of common application services. In some cases it may be possible and beneficial to provide such services, for example identity management, as SaaS, in which case SOA can be seen as an enabler.

4.2.5   Web 2.0 (and Web 3.0)
Web 2.0 is having a significant impact on how people perceive and use the Internet. Web 2.0 allows users much greater control over how content is created and accessed. It also potentially allows users to provide a much greater degree of customisation of their personal web experience.

A key question for British Council is how can the Web 2.0 capabilities be integrated into the overall architecture while maintaining the benefits of Web 2.0 and without adversely affecting the core BC systems.

However, Web 2.0 services are provisioned there is a need to define a set of common interfaces which will enable the British Council to maximise the overall benefits of these technologies.

4.3 Exploring the Options

The next step is to begin to map the business changes and technology opportunities onto the application domain model to understand how they can affect the British Council's target application architecture.

4.3.1 Mapping Business Change to the Application Domain
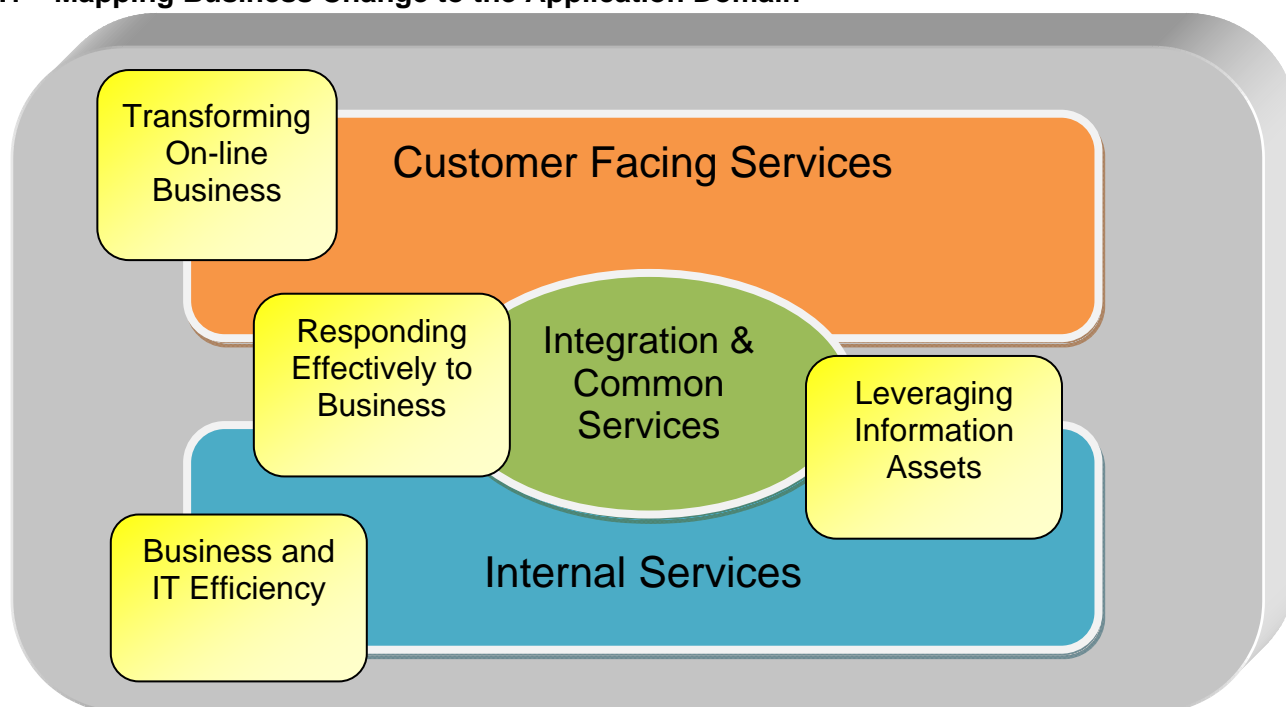
Figure 9 - Mapping Business Change to Domain Model

4.3.2 Attributes Supporting the Key Business Requirements

Considering the mapping of business change to the application domain, a number of characteristic emerge which begin to describe the architecture desired state.

4.3.2.1 Attributes - Responding Effectively to Business

- Simplified
- Reusable
- Modular
- Open standards
- Easy to integrate
- Strong governance

4.3.2.2 Attributes - Transforming on-line business

- Consistent British Council branding, look and feel
- Compelling
- Functionality - ability to access services and information
- Easy to use

4.3.2.3 Attributes - Leveraging Information Assets
- Consistent data access mechanisms
- Data quality and validation
- Data standards
- Taxonomy and metadata
- Master data management

4.3.2.4 Attributes - Business & IT Efficiency
- Business process standardisation
- Leveraging IT assets
- Reuse
- Strong governance

Mapping Technology Opportunities to the Application Domain
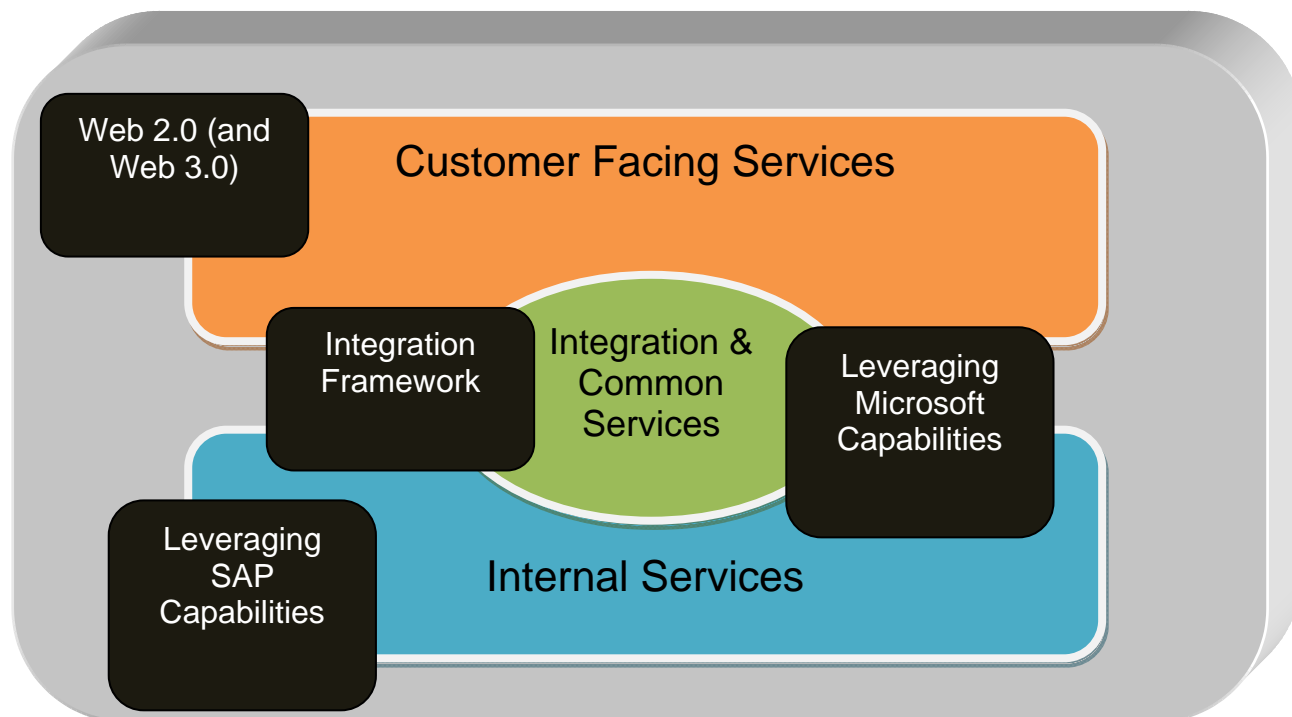
Figure 10 - Mapping Technology Opportunities to Domain Model

4.3.2.5 Technology Mapping - Leveraging SAP Capabilities
Where SAP is a good fit, which is primary in the financial management and transactional areas it should be used to meet future requirements.

In general, SAP sits most comfortably in the Internal Services area, however SAP can also be used to provide transactional interfaces which are customer facing. Consideration needs to be given to the ease and speed at which such interfaces can be changed, and whether interfaces support the look and feel of British Councils on-line presence.

SAP is currently being rolled out in the context of the FABS program. The financials functions rollout will be completed imminently, and the Campus functionality is due to complete in 2010. While this rollout is taking place it is important to minimise the impact and any risk to the SAP environment, which means limiting additional programs of work that involves SAP.

Potentially SAP could also be used to implement relationship management, although more work is needed to explore the requirements in the context of the overall enterprise architecture.

4.3.2.6 Leveraging Microsoft Capabilities / Integration Framework

As described in 4.2.2 and 4.2.3 above, Microsoft technologies appear to be a good fit to provide the integration layer that connects the customer facing to internal services and provides a consistent set of common services, such as identity management.

In particular, many organisations are recognising that MOSS provides not only a framework for Collaboration, internal Content Management and Web Content Management, but also the ability to expose 'non-native' content through a common metaphor supported by platform functionality and behaviours (e.g. Discussion, Wikis).

4.3.2.7 Web 2.0

The new and emerging Web technologies clearly will have most impact on customer facing services.
The underlying concept of Web 2.0 is that the Web becomes the 'platform' and that user's gain control over their personal data and user experience.

This can be interpreted in a number of ways:
- Users contribute to content (e.g. Wiki's Blogs)
- Users can create their own browsing experience (customised web sites)
- Much richer end-user functionality (Web applications)

Exactly what this means to the British Council is still emerging, but the pragmatic approach is to ensure that Web 2.0 and other technologies that will come in the future can be integrated painlessly and effectively into solutions. Assuming the above is valid; this indicates that the British Council needs an architecture that has the following attributes:
- Based on open standards
- Integration framework to provide the underlying 'plumbing'
- Strong governance to ensure that solutions comply with architecture and standards

Applying one of the principles of re-use, *Technical Principle 2 - Maximising Microsoft Infrastructure Benefits,* the British Council should investigate how to leverage capability from MOSS. Although MOSS is primarily used today to provide internal collaboration functionality, its capabilities go beyond that. More research needs to be done, based on a deeper understanding of the business requirements.

4.4 Overview of Change

4.4.1 Maximise SAP Benefit

The British Council has made a significant investment in SAP. The initial FABS program is in the process of being rolled out to the businesses and this needs to be completed before any major new SAP programs are implemented. Completion of the FABS rollout is expected by 2010.

4.4.2 Simplify and Standardise Application Architecture

Currently individual businesses are responsible for choosing applications, and there is limited global governance to alter this behaviour, there is an ongoing risk of several systems being implemented which duplicate functionality. This may happen for example in the case of relationship management or content management. Different business units or geographies are independently assessing software requirements and piloting solutions. The British Council could gain significant benefit by ensuring that all the relevant businesses work together with GIS enterprise architects to ensure that there is consistency and collaboration between systems.

Some potential advantages of a standardised approach:

- Reduced acquisition costs – greater buying power if focussed on smaller number of suppliers
- Reduced development costs – develop the solution only once
- Reduced support costs – need to support less systems
- Consistent user experience
- Makes it easier to share information within and across departments

The areas that require the most urgent attention are:
- Web Content Management
- Relationship Management

Over time, strong enterprise architecture governance should be implemented, but this will require the buy-in from the businesses. In the short term, GIS should engage more closely with the business areas that are exploring emerging requirements, such as *content management* to determine if it is possible to move toward a standardised solution.

4.4.3 Create Common Application Services

Even assuming that the application domain is simplified and standardised, there are still common functions and information that should be shared across applications.

Many on-line components will need to use a core set of functions, for example 'search', and ideally these should be provided once only in a consistent manner across the organisation.

In order to support the rapidly changing on-line world, on-line components will need to be created and integrated with existing systems quickly and efficiently. This is likely to be an increasing important requirement over time. While it is possible to provide common application services in a point-to-point integration architecture, implementing 'light touch' integration framework can provide many significant benefits:

- An open, standards based framework into which components can be easily plugged and unplugged
- Loose coupling of components, ensure that components do not become interdependent – this includes both on-line and back-end components
- A core set of standard re-usable functions, for example identity management, search, auditing, provided as services with well defined service level agreements
- A clearly defined integration mechanism with existing applications

- A simple published repository of re-usable components and services
- A lightweight mechanism to manage and govern components, services and solutions

The benefits of adopting this approach are:
- Consistent end user experience when engaging across the organisation
- Consistent customer information across the organisation
- Maximise re-use, optimum use of resources
- Leverage maximum capability from existing investments, including the Microsoft and SAP platform
- Flexibility and agility, easy to make changes with minimum impact on existing services

Initial exploration indicates that the provision of a common *identity* would be a good place to start. An approach to this might be as follows:
1. Identify where identity services are currently used with the global business
2. Do deeper analysis of the data and processes involved with identity within one or two specific business areas, e.g. E&E
3. Create metadata model for *customer*, keep it simple initially
4. Validate model across business units, run simple scenarios to test validity
5. Implement architecture governance to apply the model[5]
6. Develop simple common identity service to support business specific requirements, working initially within one area of the business
7. Validate service against business process
8. Implement governance to implement common identity service

The development of such services should be underpinned by a good understanding of the business information and processes that define the requirement. An important activity is to identify the common areas of data, for example customer, and process for example user authentication and understand where these fit into the overall business model.

This will require an initial high level understanding across the business, together with a more detailed drill-down for one or two specific business areas, followed by validation across the rest of the organisation.

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[5] All new solutions must comply with model, develop plan to retrofit where there is a proven business case

4.5 Summary of Benefits

	Importance (1 = low, 5 = high)	Application Standardisation	Complete SAP Rollout	Common Application Services	Application Integration
Applications					
Prioritisation Rating		**21**	**20**	**20**	**15**
Difficulty (1 = easy, 5 = difficult)		2	3	3	3
Cost (1 = low, 5 = high)		4	3	3	3
Dependency Factor (1 = has dependents, 5 = no dependents)		1	1	2	3
Benefit					
Increase business efficiency	5	4	5	5	3
Reduce operational risk	3	4	5	3	2
Faster time-to-market	3	5	4	5	5
Flexible business relocation	3	5	4	3	3
Flexible delivery channel support	2	3	4	5	5
Flexible working (e.g. 3rd parties)	2	1	3	4	5
Better access to information	4	3	4	5	5
Improve service quality	3	3	4	4	3
Improve scalability	3	4	4	4	3
Reduce IT costs	5	5	2	3	5
Strengthen compliance & security	4	3	3	5	2
Reduce training needs	1	4	1	1	1
Value (Higher = more value)		144	141	156	137

Figure 11 - Enterprise Architecture Benefits Matrix – Application Domain

Figure 11 above illustrates the relative benefits attributed to the initiatives described in this document. It can be seen that based on the above assessment, application standardisation has the highest priority, followed closely by completion of SAP rollout and common application services.

Implementing application integration is less compelling; however it is likely to become more important over time and should therefore still be given consideration.

5.0   Detailed Description

5.1 Business Capability / High-level Process Model

The starting point for developing the application architecture is the business process model. While currently the business architecture is outside the defined scope of enterprise architecture within the British council, it is included in conceptual form because of its critical importance.

This model needs to be validated and developed in conjunction with the business.

Sector or Service Category	Service Consumer	Service	Primary Activity	High Level Processes
Arts	Customers	Arts	Art Promotion	Registration (Event)
				Events Management
		Creative Economy		
Education	Customers	Learning	Teaching English	Registration (Course)
				Budget Planning
				Course Management
				Teaching
			Scholarships	Scholarship Management
			Counselling	Educational Counselling
		Teaching	Teacher Training	
			Accreditation	
			Teaching exchange	Exchange Management (Teaching)
		Exams	Examinations	Registration (Exam)
				Exam Management
				Examining
		International Experience	Youth Exchange	Exchange Management (Youth)
			Training Exchange	Exchange Management (Training)
		Promotion	Education Promotion	
Science	Customers	Science	Science & Technology	Accessing UK Science
			Library	Library Management
Governance	Customers	Governance		(Enterprise Function - ESS)
		Development	Development Project Management	(Enterprise Function - ESS)
English	Customers			(Enterprise Function - E&E)
Common Services	Customers	Finance	Billing	Billing / Invoicing
			Payments	Payment Processing

			Product	Product Development	Product Design
				Product Lifecycle Management	Product Service Catalogue
				Marketing	(Enterprise Function - Marketing)
Enterprise Functions (UK based)	Customers, Partners and BC	Sector Teams (Supporting fulfilment)		English and Exams (E&E)	Supporting Tools
				Education, Science & Society (ESS)	
				Arts	Finding artists and art professionals
		Partnership Teams		Commercial & Business Partnerships	Franchising
				UK Directorate (UKD)	
		Service Teams		Marketing & Customer Services (MCS)	Marketing
					Relationship Management
					Customer Service
		Contracts and Projects			Procurement
					Winning projects
					Project Management
					Governance (Society)
Support Services	BC			Global IS	Procurement
					Service Management
				Global Estates	
				Facilities Management	
				Corporate Affairs	
				Corporate Planning & Performance	
				Legal	
				Accounting	
				HR	
				Programme Support Office (PSO)	

Table 2 - High-level Business Capability and Process Model

Considerable work needs to be done in collaboration with the business to refine this model; however, it currently serves as a placeholder.

5.2 Logical Domain Models

Microsoft   SAP   Bespoke   Other COTS   Not Defined

Customer Facing Services

On-line Access

Interaction Services
BLOGS | WIKI's | eMail | Chat

Transactional Services
Registration / Order Capture | On-line Training | Enterprise Feedback

Web Content Delivery Services
Media Streaming

Web Content Management Services
Web Authoring | Lifecycle Management | Performance Management

Face-to-face Access
Events Management | Learning Productivity Tools

Remote Access
Order Capture Validation | Customer Support | B2B Partner | B2B Supplier

Internal Services

Integration & Common Application Services
Identity Services | Search Services | Security Services | Audit Services | Service Management | Service Orchestration | Service Publication & Discovery | Service Repository | Service Governance

Collaboration Services (Collaboration Domain)
Mail & Messaging Services | Instant Messaging | Team Services | Intranet Content Management | Web Conferencing | Video Conferencing | Workflow | Archiving

Office & Productivity Services (Platform Domain)
Word Processing | Spreadsheet | Personal Database | Graphics & Presentation Tools | Media Rendering

Note, these capabilities are not contained within the Application Domain, but are included to show the overall applications landscape, and identify any dependencies and integration touch-points

ERP Services
Purchase Order Accounting | Contract Accounting | Sourcing Contract Reviews
Sales Order Processing | Project Accounting | Product Catalogue
Accounts Receivable | General Ledger | Order Management
Accounts Payable | Financial Reporting | Order Fulfillment
Billing Invoicing | Travel & Expenses | Stock Management

Exams & Teaching Centre Services
Course Registration | Exam Registration | Teaching Centre Management | Exchange Management

Relationship Management Services
Contact Management | Call Centre Mangement | Strategic Partner Management

Function Support Services
Asset Management | Human Resources | Payroll | Records Management | Library Management | IT Service Management

Corporate Performance Management Services
Corporate Performance Monitoring BI | KPI Dashboard

Information Services
Customer Information | Personal Information | Product & Service Information | Financial Information | Programme Information | Contract Information | Market Information | Employee Information | Management Information | KPI's Information

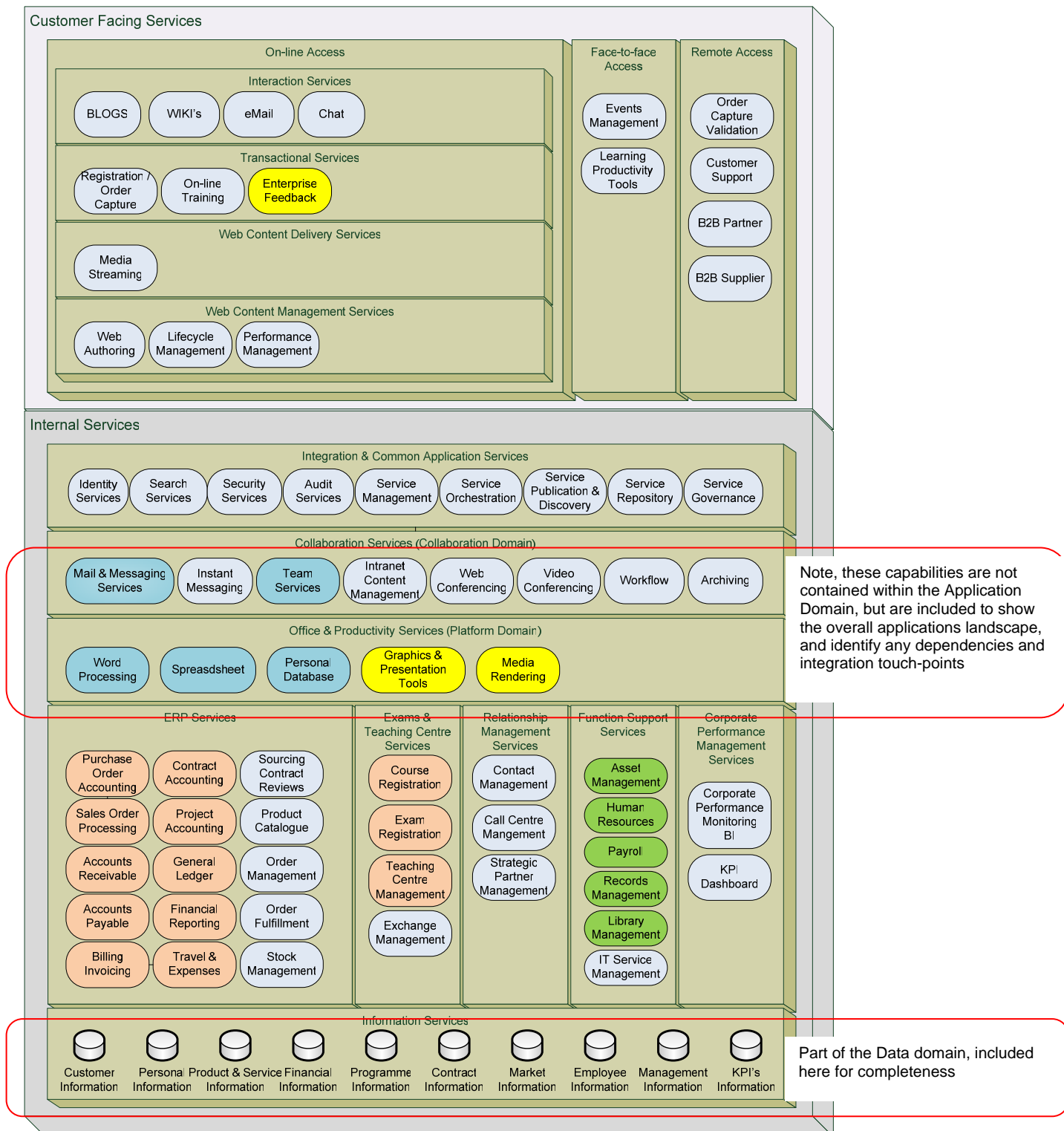*Part of the Data domain, included here for completeness*

Figure 12 - Logical Application Domain Model

The logical application domain model represented in Figure 12 shows the domain organised into the major functional areas. To avoid over complicating the diagram, Integration and common application services are shown as internal services, though in reality they can be considered as sitting between customer facing and internal.

5.2.1 Mapping Products to Application Services

Category	Group	Service	Product
Customer Facing Services	On-line Access	Interaction Services	Web 2.0 components
		Transactional Services	SAP plus other GUI
		Content Delivery	
		Web Content Management	To be identified
	Face-to-face access	Events Management	To be identified
		Learning productivity tools	Various
	Remote Access	Customer Support front end	To be identified
	B2B Access		Integration Framework
Integration & Common Services	Integration Framework	See 5.2.2 below	Initial lightweight implementation may not require specific product, but could be ,NET or MOSS
	Common Services	Identity Management	To be identified, could be DAP, directory based service
		Search	To be indentified
		Metadata management	MOSS
Internal Services	ERP / Financials	Package	SAP
	Exams & Teaching Centre Services	Campus	SAP
	Relationship Management Services		To be identified, potentially SAP or Microsoft or other product
	Function Support	Various	Internal bespoke systems
	Corporate Performance Management	BI	SAP
		Dashboard	To be identified

Table 3 - Mapping of Products to Application Services
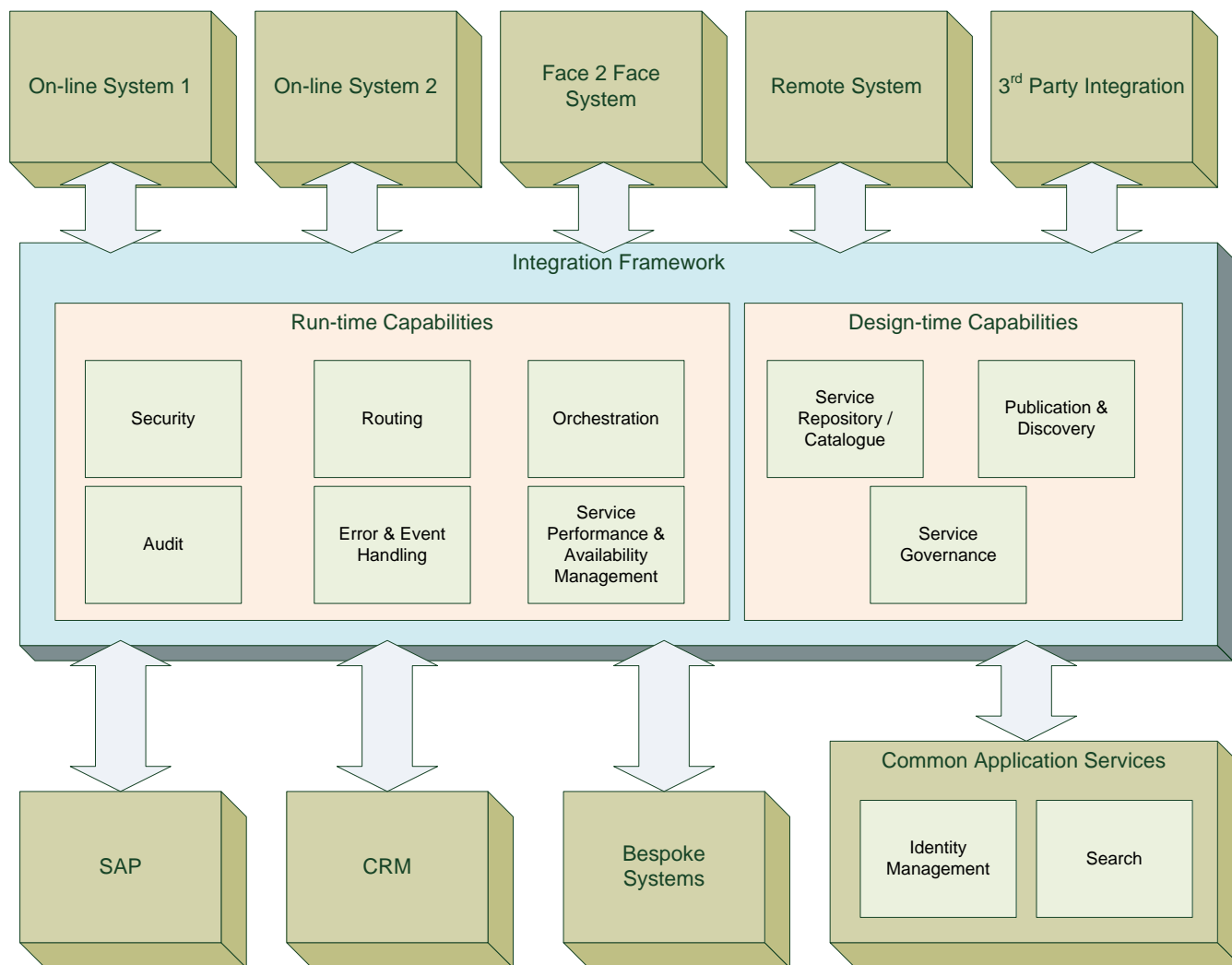
5.2.2 Integration Framework Model

Figure 13 - Integration Framework Model

Figure 13 above illustrates the typical capabilities of a mature integration framework. This model represents a potential desirable end-state; however, the initial requirements for the British Council are modest and it is not necessary to implement all of these capabilities in one go.

It is however important to ensure that there is an overall architecture vision which will lead to the target model if so desired.

The key requirements are:
- Clearly defined interface standards
- Security
- Service catalogue, to drive re-use and enable governance
- Basic service governance to ensure compliance with the model and standards

Initial common application services might include:

- Identity management
- Search
- Content management – metadata

5.2.3   Service governance Model

Experience has shown that it is essential to establish effective governance from the very beginning when implementing common application services. Failure to do this will typically lead to poor implementation of standards leading to inconsistency across the organisation and reduced benefit of re-use existing components.
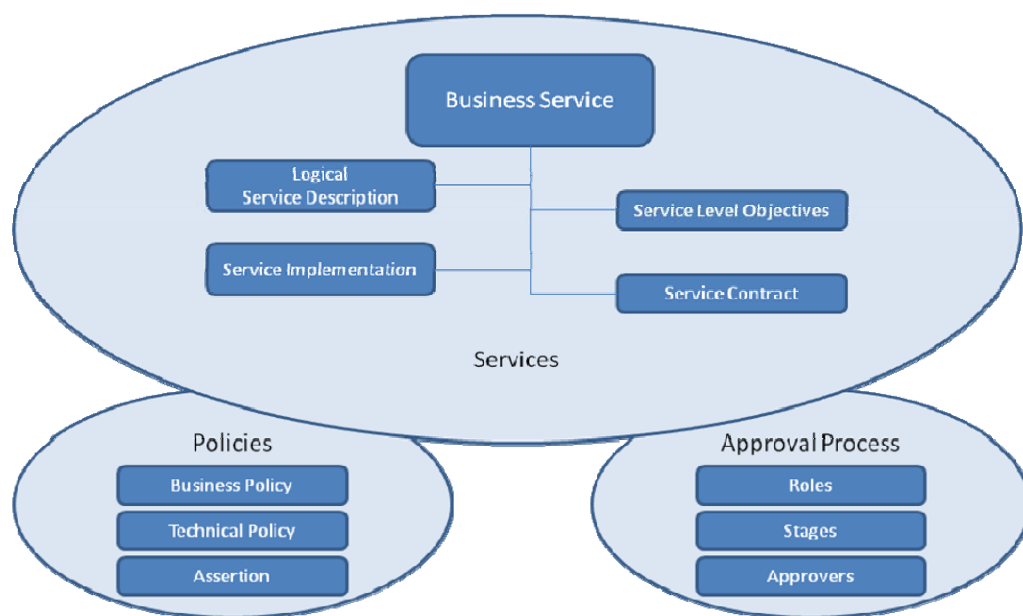

Figure 14 - Simple Service Governance Model

Figure 14 illustrates a model for service governance that could easily be implemented in part or whole by the Council.

The British Council does not need to implement heavyweight service governance, and at this stage, it is probably not appropriate to implement sophisticated tools to support this. The use of SharePoint as a repository for service governance artefacts is appropriate.

If over time, a significant volume of shared services are developed, it may be worth considering a service governance toolset.

5.2.3.1 Business Services

Ensure that the service is described clearly in business terms. This will enable prospective users of the service to determine if it is fit for their purposes.

Define the levels of service, for example hours of operation, performance that will be provided.

5.2.3.2 Policies
Determine which rules and policies a service must be compliant with before it can be released into the production environment.

Policies may in turn contain specific assertions that can be thought of as specific tests to ensure a service conforms to architectural and business requirements.

5.2.3.3 Approval Process
How will the service be specified, designed, built, tested and finally released into production? Who is responsible for signing off each stage of the service lifecycle?

Figure 15 below represents an example of how a service approval process might look. The important elements are the gates that sit between each stage, and the release mechanisms that ensure that services are not released into the production environment unless they are compliant with standards and other requirements.

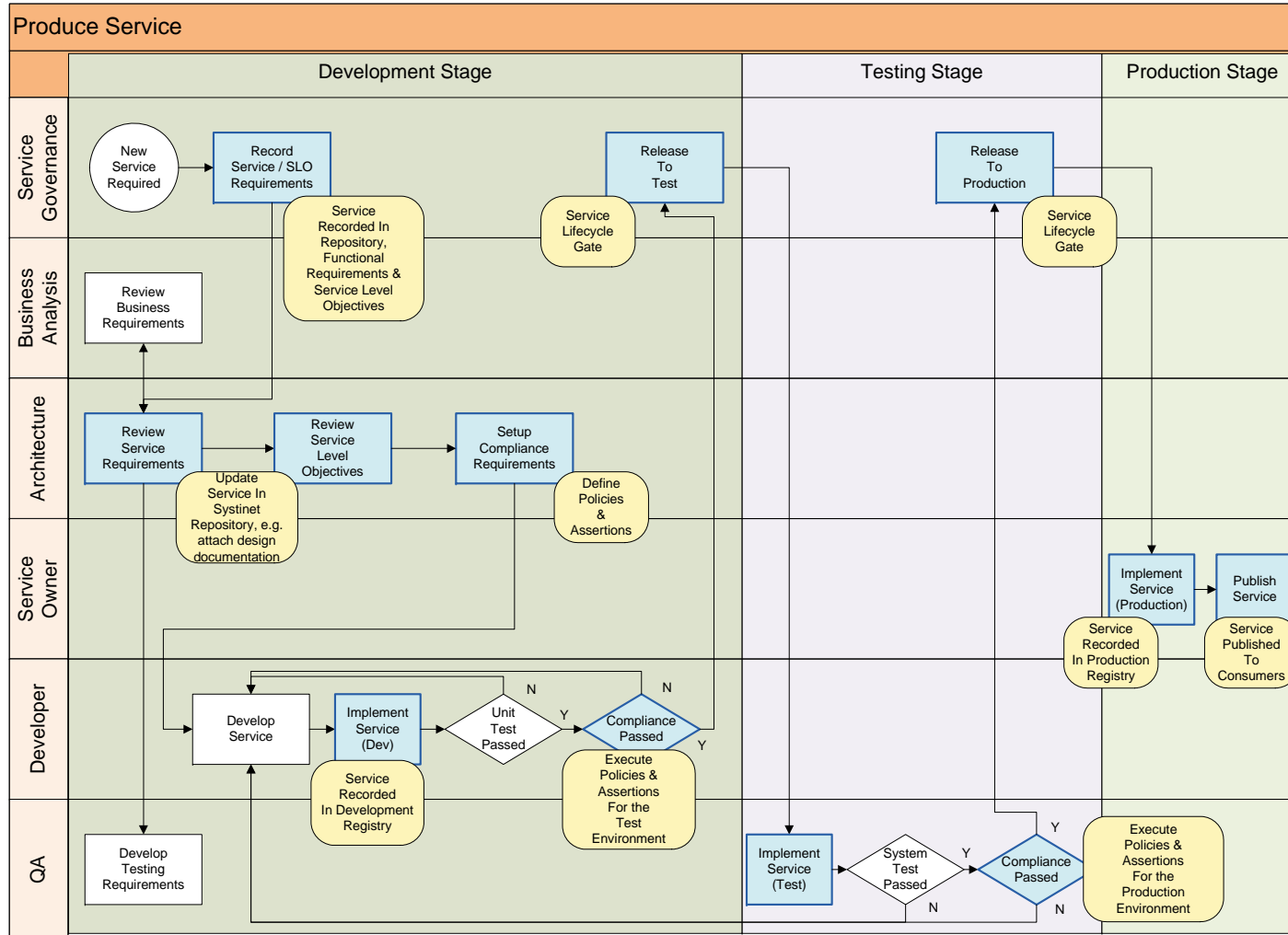**Figure 15 - Example Approval Process**

Figure 15 above represents an example of how a service approval process might look. The important elements are the gates that sit between each stage, and the release mechanisms that ensure that services are not released into the production environment unless they are compliant with standards and other requirements.

6.0   Making it Happen

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

6.1 Technology Choices

Describe the principle technology choices that will enable delivery of the capabilities described above

- SAP
    - o   Financials
    - o   Campus
    - o   BI
- Microsoft
    - o   Integration framework
    - o   Common services
    - o   General content management[6]
- Web Content Management
    - o   To be identified
- Relationship Management
    - o   To be identified

6.1.1   Technology decisions to be made

The key technology decisions that need to be made are:

- Selecting corporate Web Content Management system
- Selecting corporate relationship management system
- Selecting integration framework technology
- Selecting identity management technology
- Selecting search technology

6.2 Key Organisation Processes

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

- Enterprise architecture governance
- Solution lifecycle:
    - o   Business case development
    - o   Requirements analysis
    - o   Solution design
    - o   Solution procurement or development
    - o   Solution Testing
    - o   Solution implementation

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[6] General content management is part of the Collaboration Domain, but is included here because it may be related to web content management. The corporate content management solution is Microsoft MOSS.

6.3 Resources and Skills
The key resources required to implement the application domain are:
- Enterprise architecting
- Business requirements analysis
- Solution design

6.4 Provision Assumptions
It is assumed that the British Council will want to retain control over the Enterprise and in some cases solution architectures; however detailed implementation work could be outsourced to third parties where this is appropriate.

6.5 Milestones and Deadlines
The key milestones that impact the application domain 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
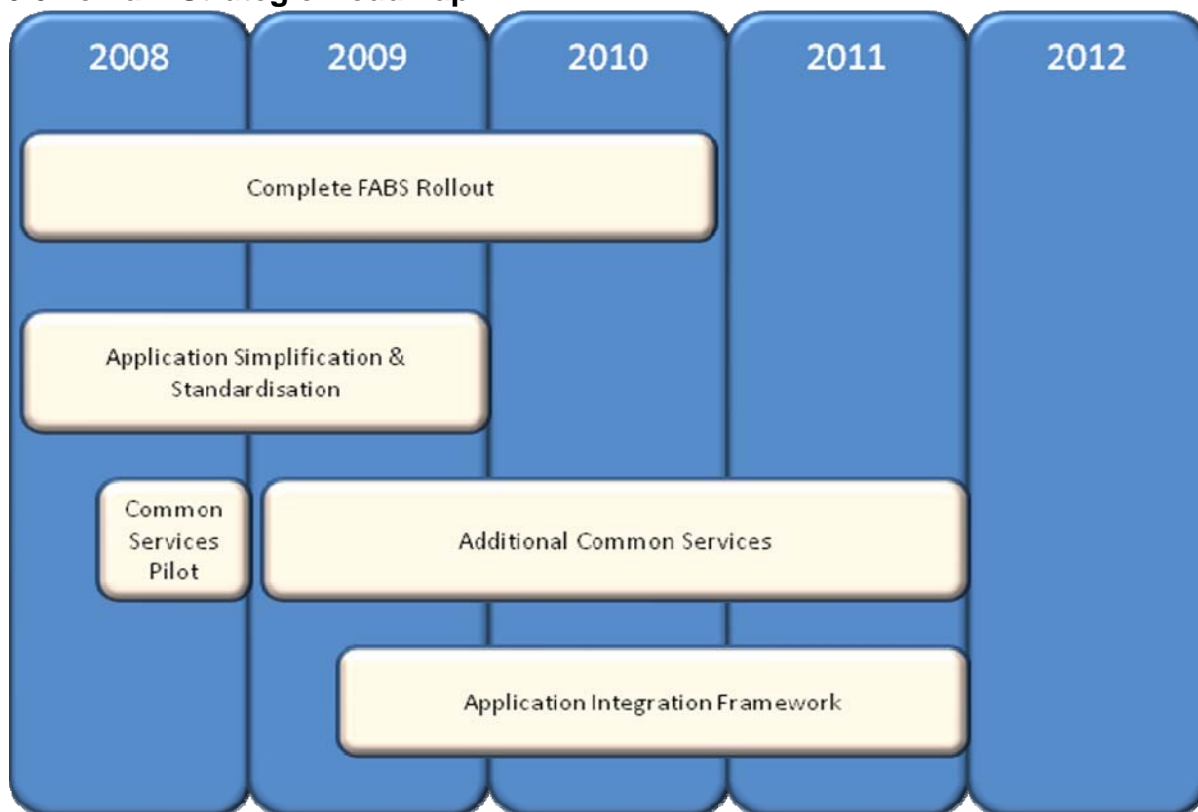
6.6 Domain Strategic Roadmap

Figure 16 - Application Domain Strategic Roadmap

6.6.1   Step 1 - Complete FABS Rollout

The current FABS / SAP rollout, due to finish in 2010 should be completed. During this period, any impact on the SAP environment should be limited to reduce risk to the business.
See section 4.4.1 for more information.

6.6.2   Step 2 - Implement Application Simplification / Standardisation

There is currently evidence of proliferation of application systems, especially in the areas of web content management and relationship management. Work with the businesses needs to take place to ensure that this does not continue, and that any procurement decisions are aligned to the British Council's enterprise architecture.
See section 4.4.2 for more information.

6.6.3   Step 3 - Pilot Common Services

A small number of services have been identified that are required by a number of areas within the business. These include identity management and global search capabilities. It would be beneficial to implement these as common application services.
See section 4.4.3 for more information.

6.6.4   Step 4 - Implement Lightweight Application Integration Framework

Currently the British Council does not have a formalised integration mechanism with the consequence that integration takes place in an ad-hoc manner. There will be benefits over time of implementing a formalised framework for application integration, though this can initially be very lightweight.

6.7 Domain Technical Roadmap

The technical roadmap is based on current understanding of the domain architecture. As such, it represents an initial view, but should not be taken as the target roadmap until further work is done with the business to establish key technology decisions in 6.1.1.

Detail products roadmaps will be developed as specific enterprise architecture initiatives are identified and turned into projects.

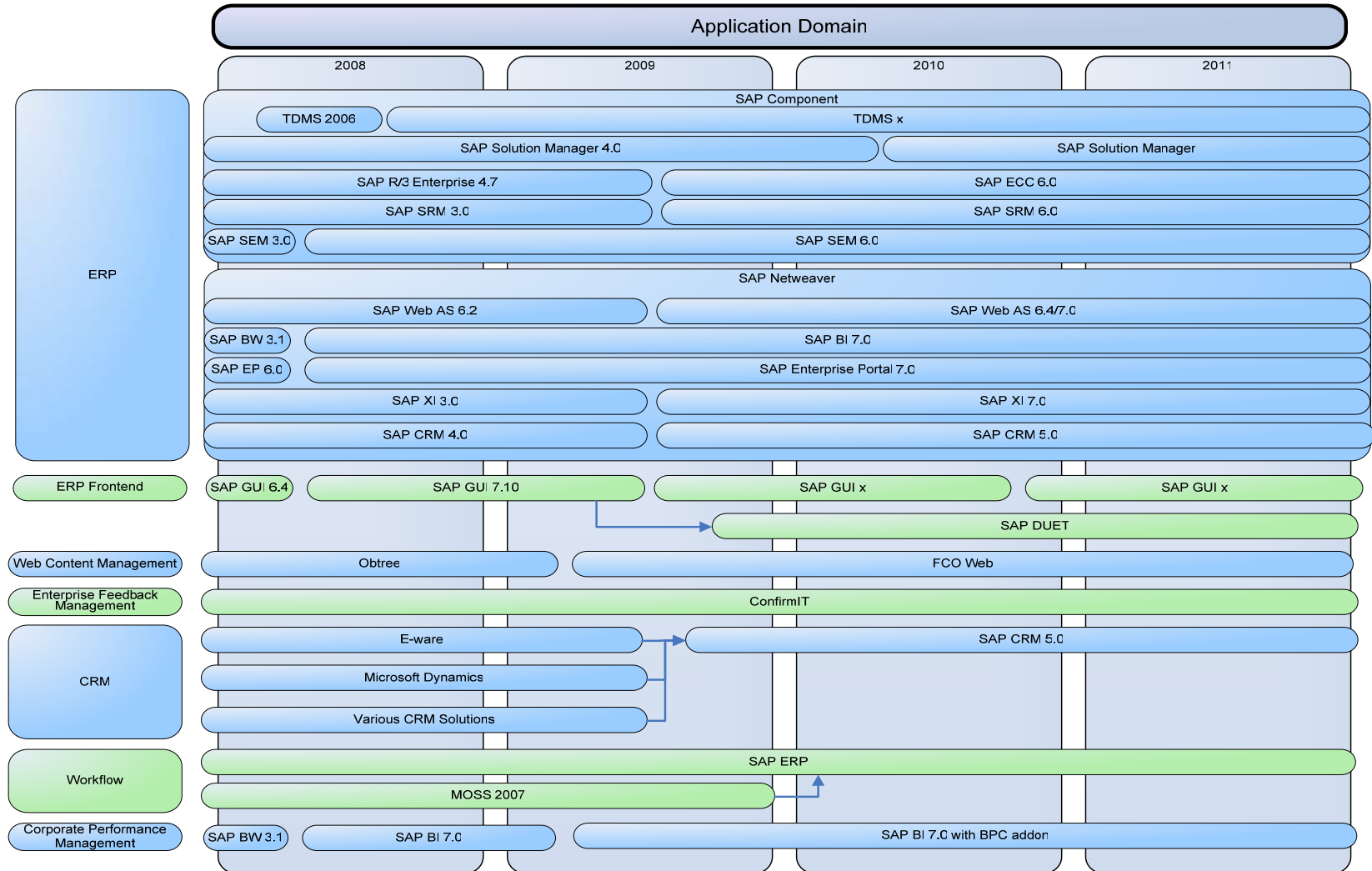In the meantime the current technical product roadmap is attached for reference but should be used with caution.

Figure 17 - Application Domain Product Roadmap

7.0   Appendix 1 – Principles Guiding the Application Domain

7.1   Business Principles

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

7.2   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 8 - Business Continuity

7.3   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 10 - Solution Characteristics

7.4   Implementation Principles

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

7.5   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

8.0   Appendix 2 – Application Domain Standards

For future use: This section will contain a list of application domain specific architecture standards