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June 2006

What is a reference model anyway?

Using the JISC/DEST eFramework and the DLF Services Framework as case studies

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What is a reference model anyway?

- two case studies
  - JISC/DEST eFramework
  - DLF Services Framework Working Group
- similarities and differences
- lessons learned?

e-Framework for Education and Research

http://www.e-framework.org/

- an international attempt to "*produce an evolving and sustainable, open standards based, service oriented technical framework to support the education and research communities*"
- on the basis that SOA provides flexibility, (cost) efficiencies in long term and avoid vendor lock-in
- collaboration between JISC (UK), DEST (Australia) and New Zealand (with intention to widen participation gradually – e.g. SURF?)
- (from a UK perspective) builds on JISC's E-Learning Framework (ELF) and the JISC Information Environment

ELF and the JISC IE

- E-Learning Framework
  - a service-oriented approach to building e-learning systems
    - unbundling of monolithic learning management systems into functional components (services)
    - based on open standards where possible
  - recognition that this work would have wider applicability (e.g. to research domain)… hence, becoming the e-Framework
- JISC IE
  - a national approach to information resource discovery provision (discovery to delivery – d2d)
    - based on open standards (OAI, RSS, SRU, OpenURL, etc.)

e-Framework (in a nutshell)

- terminology in e-Framework still evolving
- but essentially consists of
  - reference models, service patterns, service genres and service expressions
- a reference model is "*a service-oriented description of a collection of processes and workflows supporting at least one application, domain or business process*"
  - defined largely in terms of service patterns and service genres or service expressions

e-Framework and services

- service genre
  - abstract service
  - a function that provides a set of related behaviours
  - e.g. ‘search’
- service expression
  - a set of related behaviours that are implemented with a defined set of technologies
  - a concrete API
  - e.g. ‘SRU’
- service pattern
  - a service-oriented design – a choreographed collection of services

e-Framework reference models

- description of an e-Framework ‘reference model’ therefore includes:
  - name
  - domain of use
  - textual summary
  - use cases (documented using UML use cases and/or semi formalised textual description)
  - functionality (workflows), service choreography
  - descriptions of the set of service genres or service expressions that make up the reference model
  - applicable standards
  - …

DLF Services Framework

- a working group of the Digital Library Federation
- central question: what business(es) are research libraries in and what processes and functions are needed to serve that mission?
- what collection of processes make up a research library?
- not designing and implementing a system; but articulating a services perspective
- primary aim is to help libraries and their users understand how library services fit into new digital environment

DLF Service Framework model

Process Decomposition

- business requirements
- business processes
- business functions

an identifiable segment of an organization's overall mission (e.g. d2d)

an identifiable portion of a business requirement (e.g. discovery)

an identifiable portion of a business process (e.g. search)

Service Orientation

- service genres
- service bindings
- deployed services

a conceptualisation of business functionality as a discrete piece of networked functionality

DLF Service Framework model

Process Decomposition

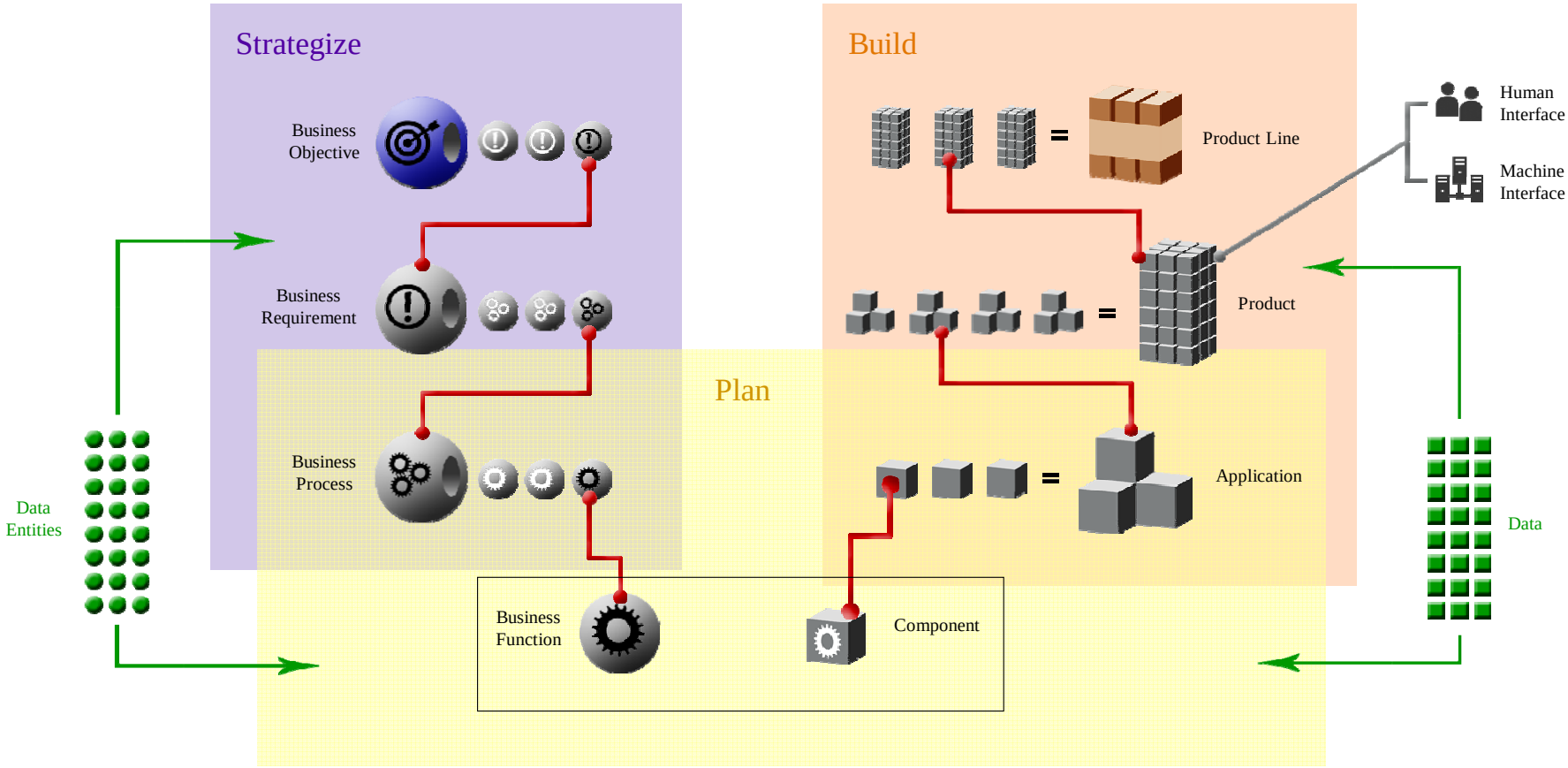
- business requirements
- business processes
- business functions

Service Orientation

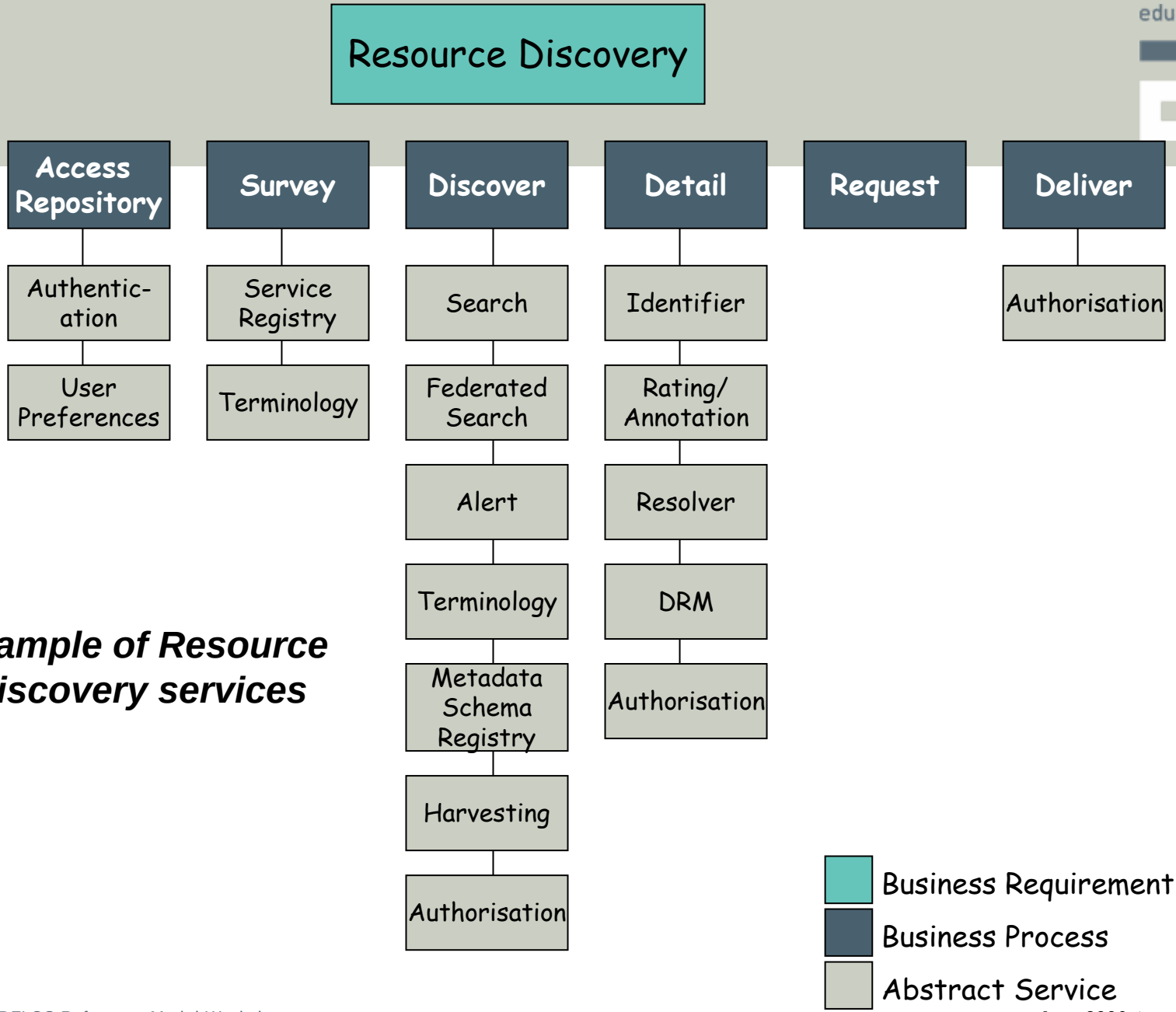
- service genres
- service bindings
- deployed services

moving from business process analysis to service architecture design is non-trivial

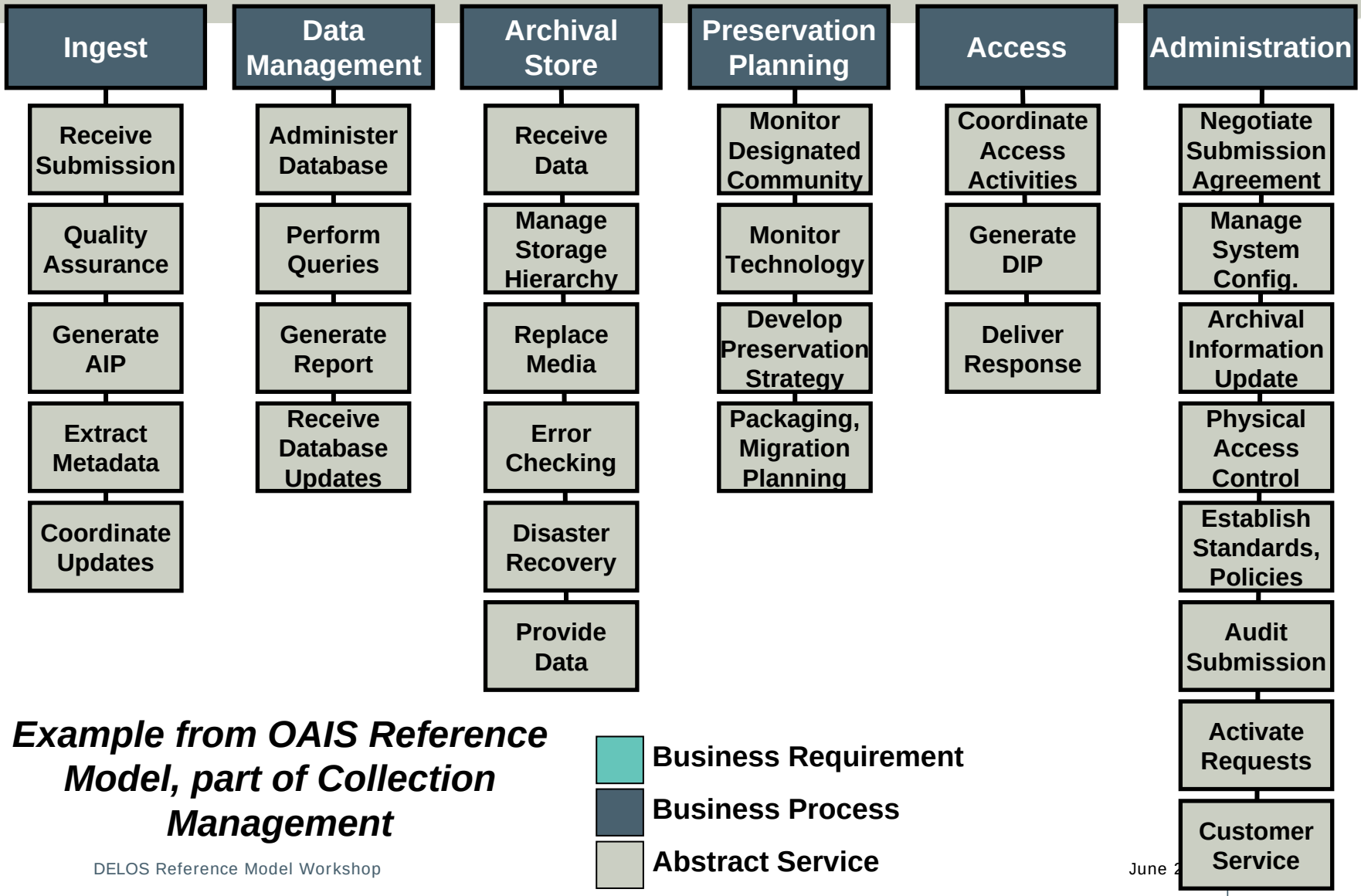
Alternative representation



(Lorcan Dempsey and colleagues at OCLC)


Resource Discovery
Access Repository
Survey
Discover
Detail
Request
Deliver
Authentic-ation
User Preferences
Service Registry
Terminology
Search
Federated Search
Alert
Terminology
Metadata Schema Registry
Harvesting
Authorisation
Identifier
Rating/ Annotation
Resolver
DRM
Authorisation
Authorisation
Example of Resource Discovery services
Business Requirement
Business Process
Abstract Service

Long-Term Preservation



Example from OAIS Reference Model, part of Collection Management

Business Requirement

Business Process

Abstract Service

DLF – where are we currently?

- Geneva Henry seconded from Rice University to coordinate activities for the WG
- initial focus on:
  - discovery to delivery (d2d)
  - collection management
- article for DLib Magazine Summer 2006
- original Working Group members
  - Lorcan Dempsey, OCLC (chair); Brian Lavoie, OCLC; MacKenzie Smith, MIT; Dale Flecker, Harvard; Krisellen Maloney, LoC; Andy Powell, Eduserv; Peter Brantley, CDL … Geneva Henry, DLF Dist. Fellow; David Seaman, DLF; Jim Michalko, RLG; Sayeed Chaudry, JHU; Dan Rehak, CMU

Similarities

- both activities take a service-oriented approach - i.e. they are both premised on the notion that exposing small units of functionality on the network is a “good thing”
- both try to define ‘abstract’ services (to allow more than one concrete implementation) but both struggle a little with how to do that
- both struggle to bridge the gap between ‘process’ modelling and ‘service’ modelling
- both approaches tend to apply ‘reference models’ to specific areas of digital library functionality – not to DLs as a whole

Differences

- the JISC/DEST eFramework tends to focus on ‘factoring’ out services
  - i.e. analysing monolithic systems and retro-fitting a suitable set of underlying services
- the DLF Service Framework is tending towards focusing on the ‘business process’ modelling side of things

Lessons learned?

- service orientation is conceptually difficult in anything other than trivial cases
- reaching consensus on terminology is hard
  - even more so internationally
  - and takes a long time
- bridging the gap between business process modelling and service oriented design is difficult
- no clear-cut choice of modelling language in either case
- both activities have had limited success so far at defining what a ‘reference model’ is! ☹