Towards an agreed cross-government services and information architecture

Working Document, April 2003

Contents

- Conceptual and logical views of cross-government technical architecture
- Intercept between centrally provided components (Office of the eEnvoy, OeE) and department provided
- XML to backend integration
- Front-end standards (eg. definition of requirements for consumption by the likes of the Online Government Store)

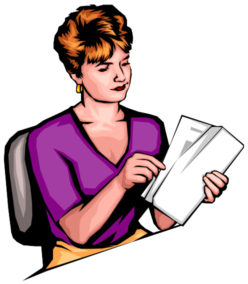
Background

- To work towards an overall cross-government architecture that supports intermediaries, back office interoperability, and smart use of common services and components

Vision

***For the Citizen**: a simple, easy interaction with government services through their channel of choice*

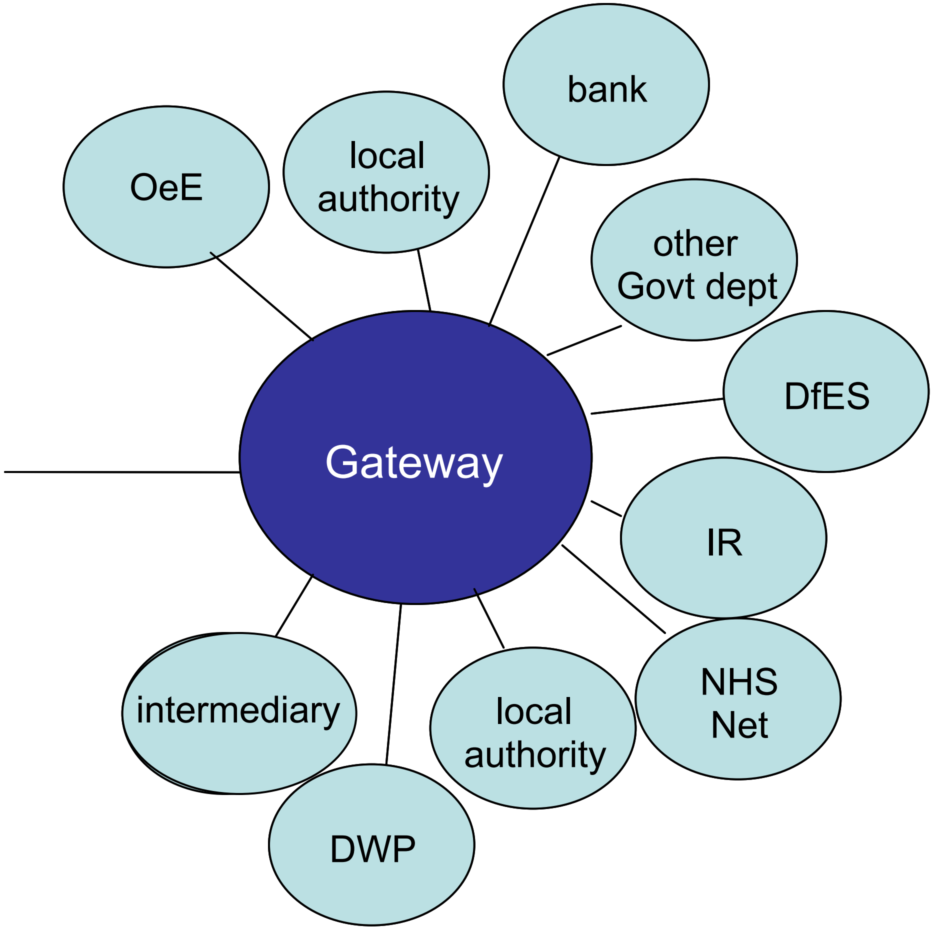
***For Government**: to provide a step-change in the delivery and perception of integrated government services, with commensurate cost-savings*



“My Services”

(illustration only)

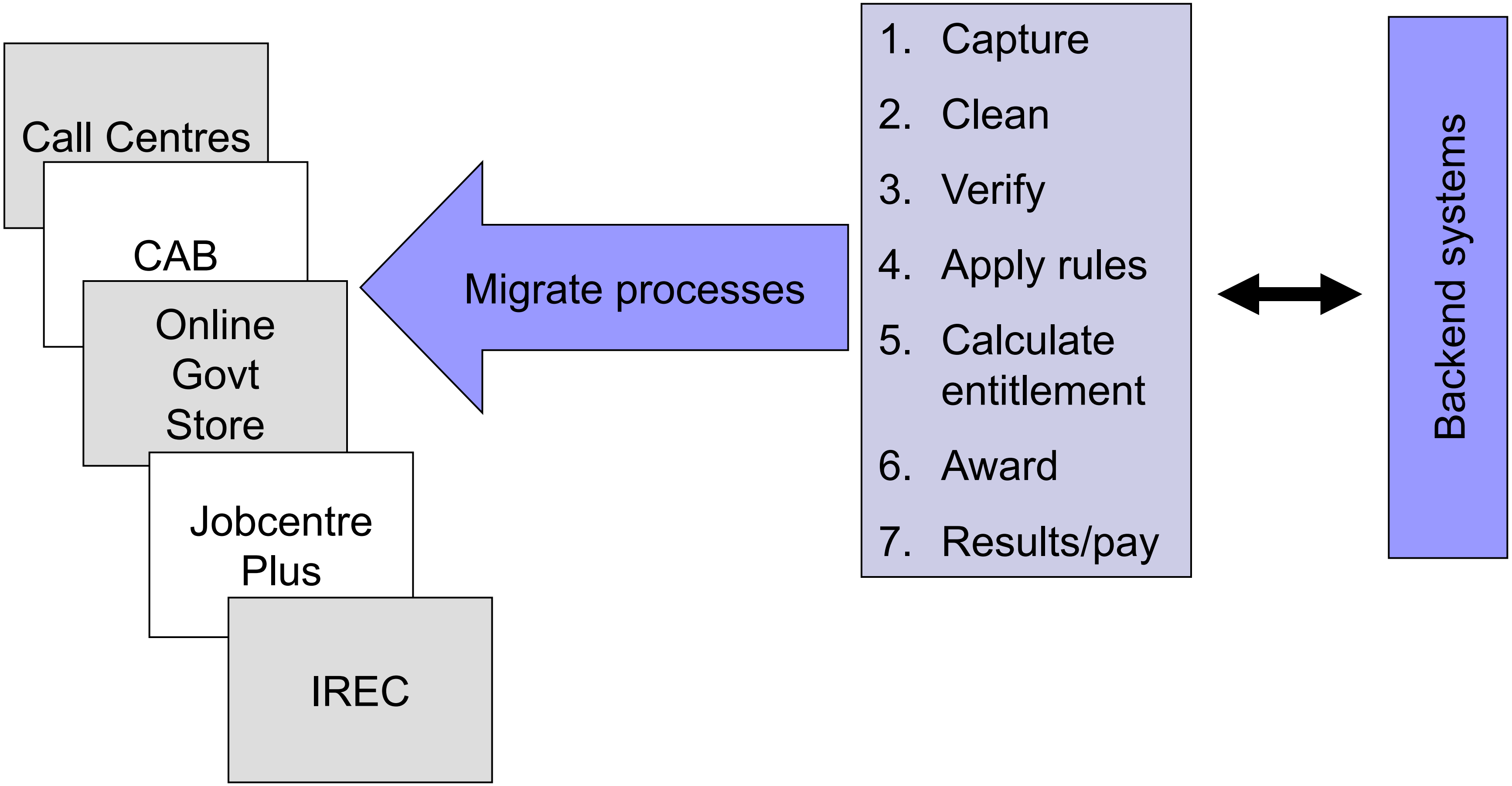
- Benefits Calculator and Claim
- My Pension Forecast and Planner
- Pay Parking Fine
- My Medical Records
- Complete Tax Return
- View Council Proceedings
- Schools Application Service
- Planning Application and Tracking
- My Council Tax
- e-Vote
- Report faulty street light



Business context - shifting the value-chain

Front Office Channels

Back Office



Call Centres

CAB

Online Govt Store

Jobcentre Plus

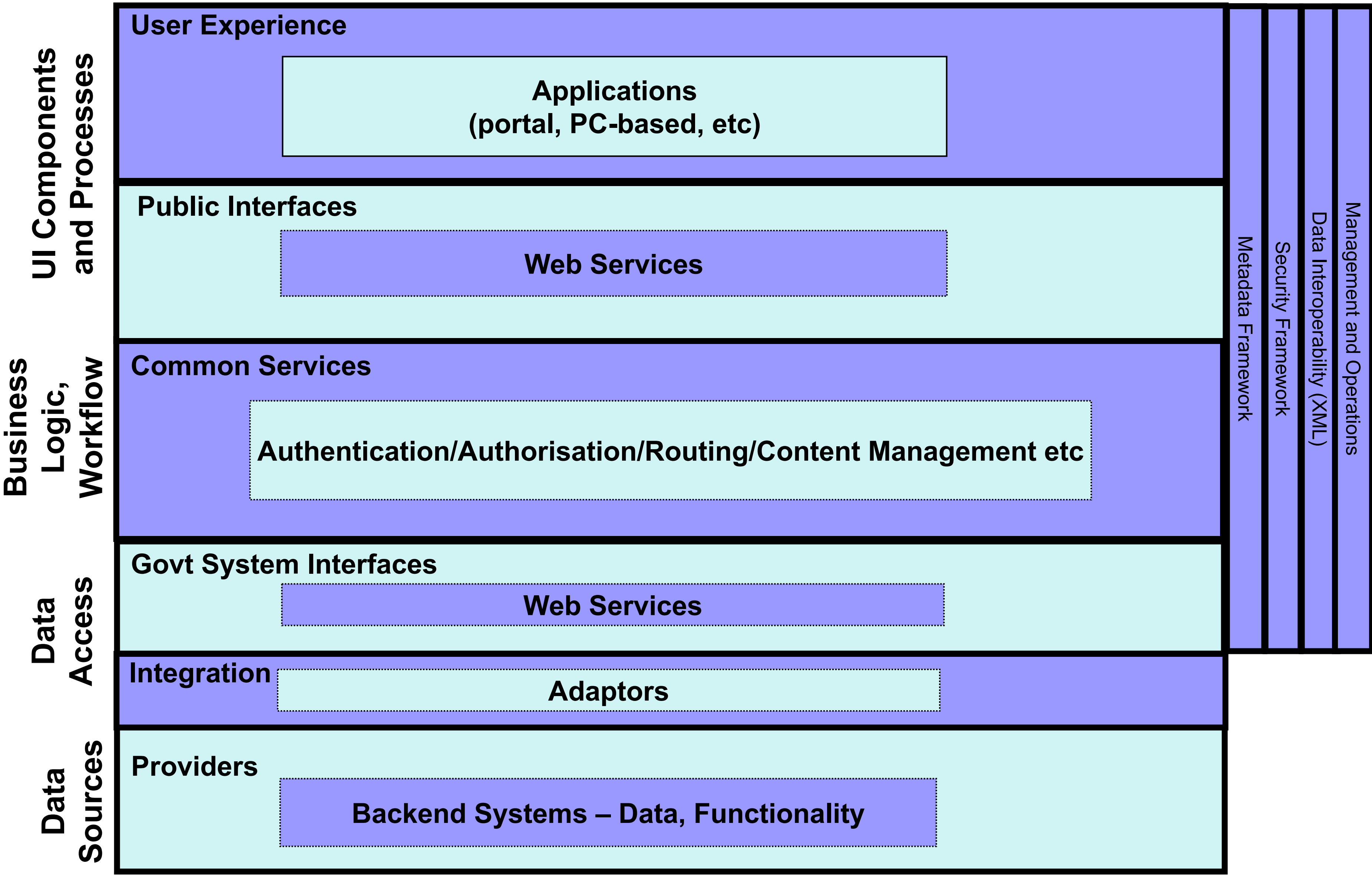
IREC

Migrate processes

1. Capture
2. Clean
3. Verify
4. Apply rules
5. Calculate entitlement
6. Award
7. Results/pay

Backend systems

High Level Overview – Conceptual Cross-Government Architecture



UI Components and Processes

User Experience

Applications (portal, PC-based, etc)

Public Interfaces

Web Services

Business Logic, Workflow

Common Services

Authentication/Authorisation/Routing/Content Management etc

Data Access

Govt System Interfaces

Web Services

Integration

Adaptors

Data Sources

Providers

Backend Systems – Data, Functionality

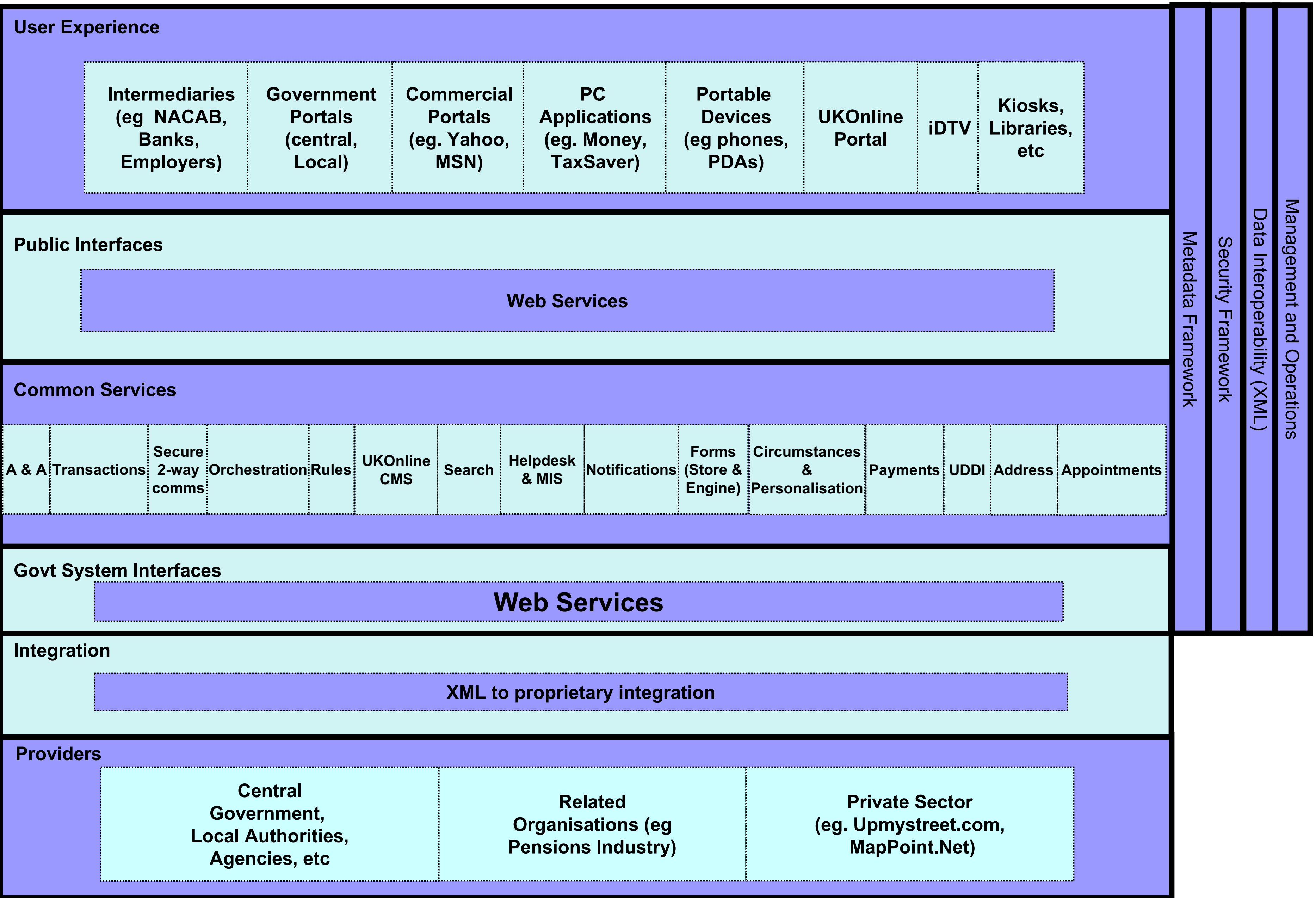
Metadata Framework

Security Framework

Data Interoperability (XML)

Management and Operations

Conceptual e-Government Architecture Overview



User Experience

- Intermediaries (eg NACAB, Banks, Employers)
- Government Portals (central, Local)
- Commercial Portals (eg. Yahoo, MSN)
- PC Applications (eg. Money, TaxSaver)
- Portable Devices (eg phones, PDAs)
- UKOnline Portal
- iDTV
- Kiosks, Libraries, etc

Public Interfaces

- Web Services

Common Services

- A & A
- Transactions
- Secure 2-way comms
- Orchestration
- Rules
- UKOnline CMS
- Search
- Helpdesk & MIS
- Notifications
- Forms (Store & Engine)
- Circumstances & Personalisation
- Payments
- UDDI
- Address
- Appointments

Govt System Interfaces

- Web Services

Integration

- XML to proprietary integration

Providers

- Central Government, Local Authorities, Agencies, etc
- Related Organisations (eg Pensions Industry)
- Private Sector (eg. Upmystreet.com, MapPoint.Net)

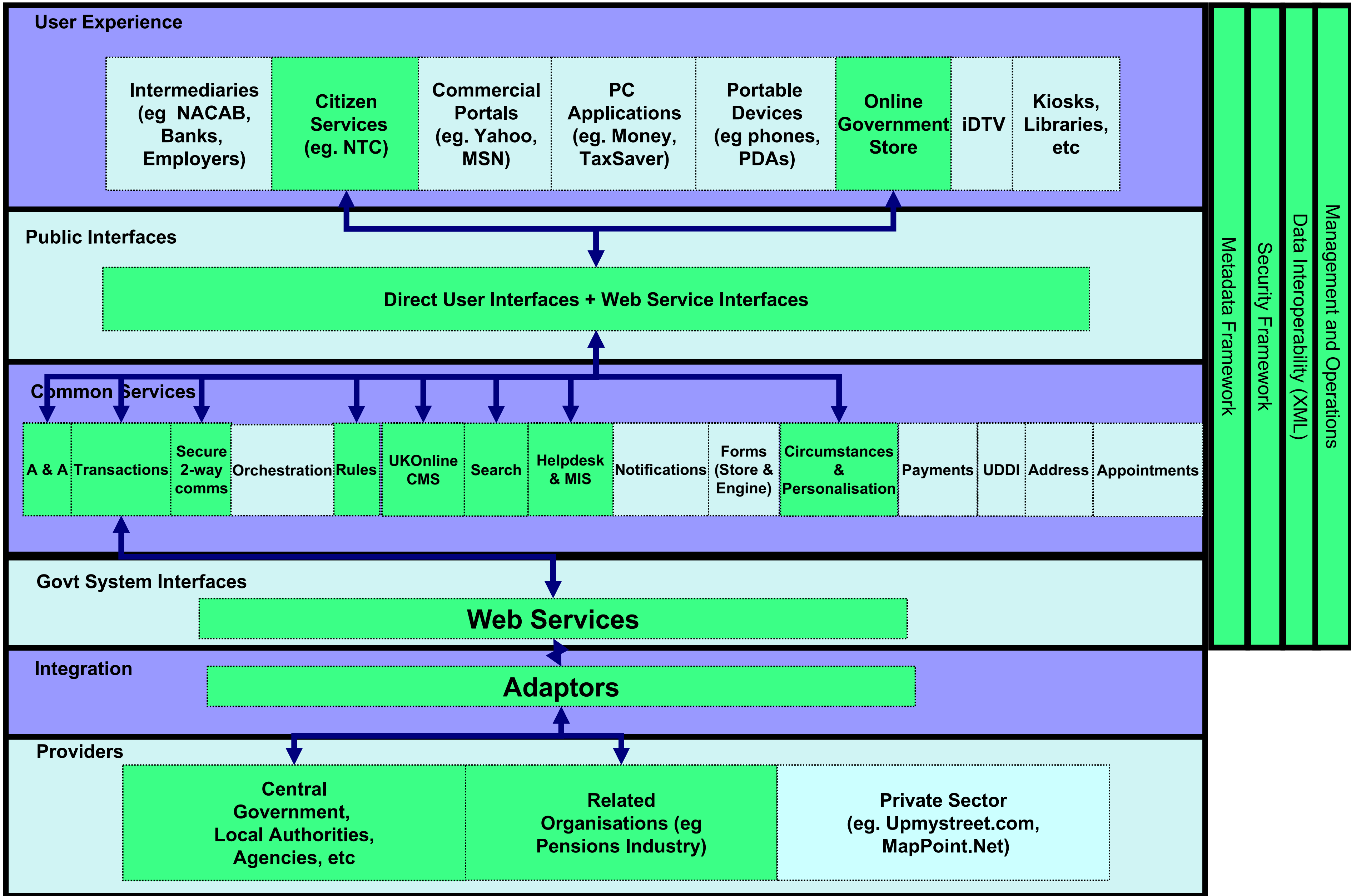
Metadata Framework

Security Framework

Data Interoperability (XML)

Management and Operations

e-Government Conceptual Architecture Use Illustration



User Experience

Intermediaries (eg NACAB, Banks, Employers)

Citizen Services (eg. NTC)

Commercial Portals (eg. Yahoo, MSN)

PC Applications (eg. Money, TaxSaver)

Portable Devices (eg phones, PDAs)

Online Government Store

iDTV

Kiosks, Libraries, etc

Public Interfaces

Direct User Interfaces + Web Service Interfaces

Common Services

A & A

Transactions

Secure 2-way comms

Orchestration

Rules

UKOnline CMS

Search

Helpdesk & MIS

Notifications

Forms (Store & Engine)

Circumstances & Personalisation

Payments

UDDI

Address

Appointments

Govt System Interfaces

Web Services

Integration

Adaptors

Providers

Central Government, Local Authorities, Agencies, etc

Related Organisations (eg Pensions Industry)

Private Sector (eg. Upmystreet.com, MapPoint.Net)

Metadata Framework

Security Framework

Data Interoperability (XML)

Management and Operations

Key Issues

- For the front-end delivery to work, Departments and the OeE need to agree standards (format and payloads) for web services exposed by departments both for specific content (OGS etc) and services (Gateway transaction)
- Departments then need to expose defined web service interfaces necessary to deliver the online content and services
- XML to existing system integration issues need to be resolved within the various departments to ensure consistency of delivery (and hence integration)
- Orchestration of processes both at the OeE level (cross-government orchestration of processes) and department level (cross-system) need to be defined and delivered for each specific new online service
- Agreement is needed as to where in the virtual architecture various components sit and whether they are centralised or federated – including the intercept between OeE components and departmental components

Web Services Standards

- Gateway will act as a web services broker, ensuring all web service calls can be made through the same common architecture and endpoints as message-based transactions
- Some common standards for web service delivery need to be defined (including eg. naming conventions, error handling responses and so on)
- The schema, meta content etc of the actual SOAP methods and calls needs to be defined for the interaction of content and services, with particular reference to the intermediary model

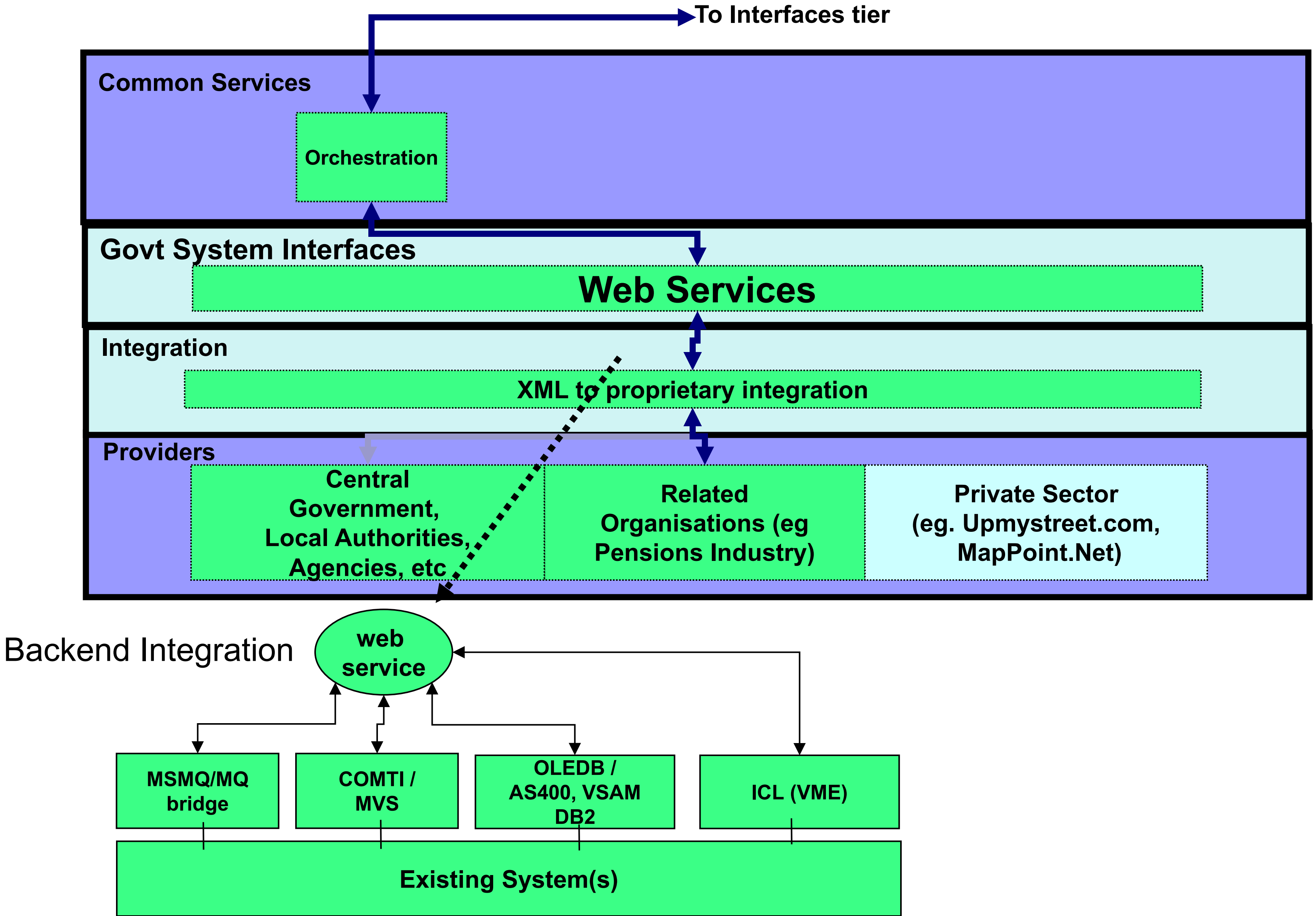
Web Services Delivery

- OeE and Departmental Services need to define the roadmap of web services that need to be delivered in order to support the defined content and services (pensions, benefits, etc)
- … they then need to be delivered

XML to Proprietary Integration

- Three principal elements:
  - custom adaptors (specific integration tools that map between eg. Mainframe and XML) and then expose as web services
  - web services interfaces hosted on the existing proprietary platform and exposing data and methods through native XML/SOAP
  - associated process logic to ensure data and application integrity

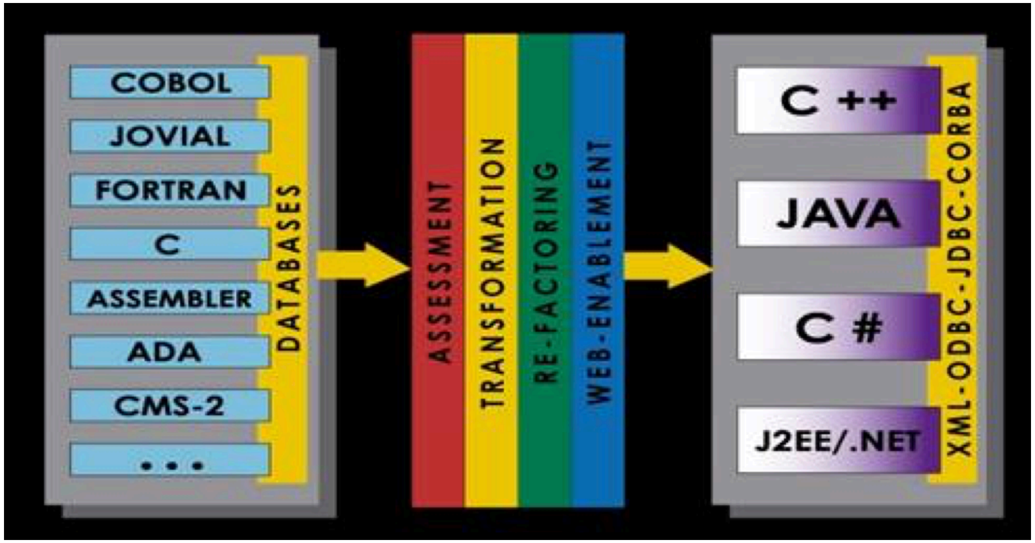
XML to Proprietary Integration



XML integration

	Interface With Legacy Application			
	Legacy Platform Proprietary API	*Standards-based API*	*XML*	*WS*
Legacy Platform No Longer Viable	Migrate existing code to modern platform and expose capabilities as a web-services; use screen scrape approach; or scrap the application and build a completely new one.			
Legacy Platform Is Viable	Write application that simply calls API and maps its functions & parameters to web-service methods and properties	Write application or utilise integration tool that produces web-services	Write application or utilise integration tool that produces web-services	Use the web-service directly or via COTS packages that add functionality.

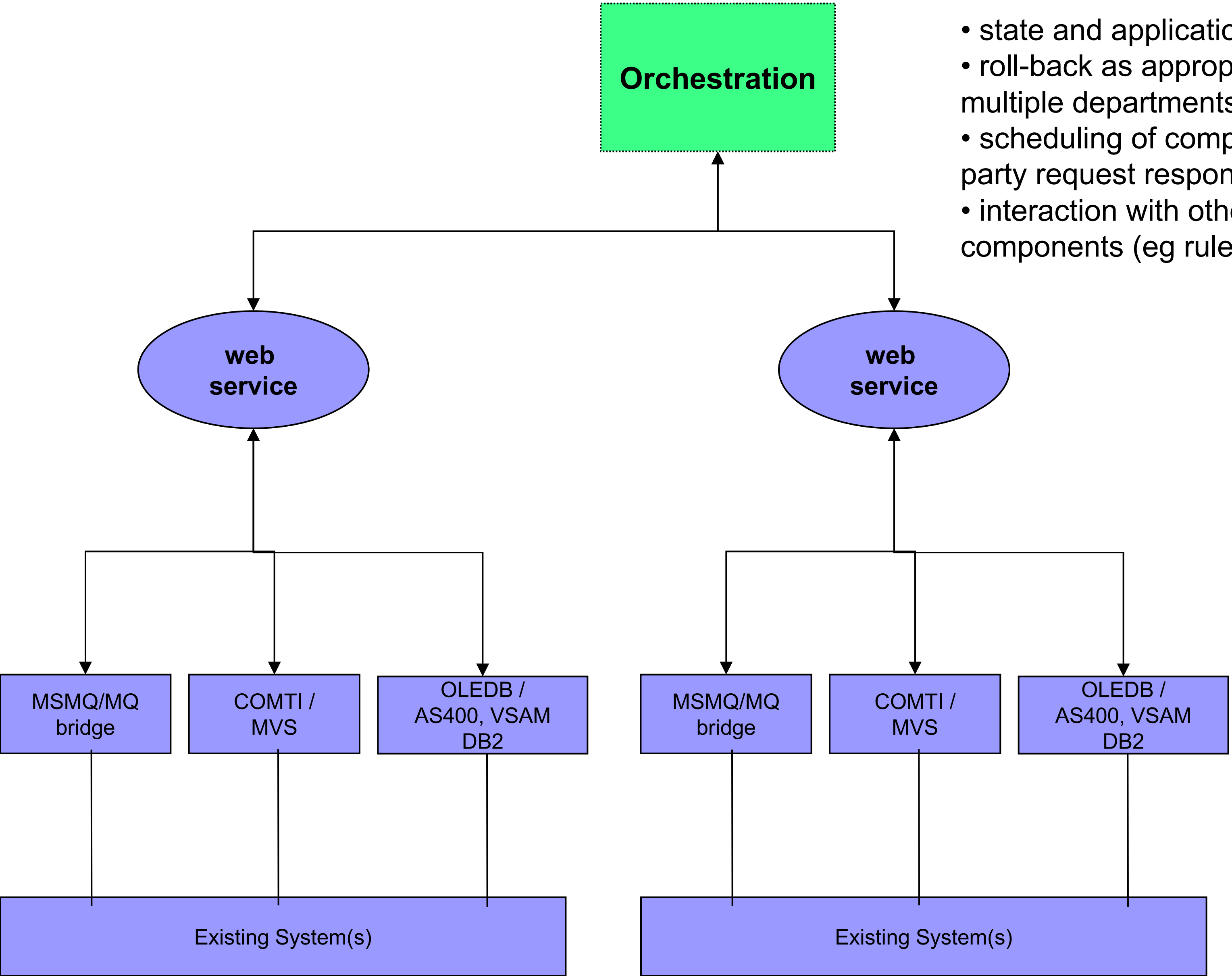
Legacy to open roadmap



Data and Application Orchestration

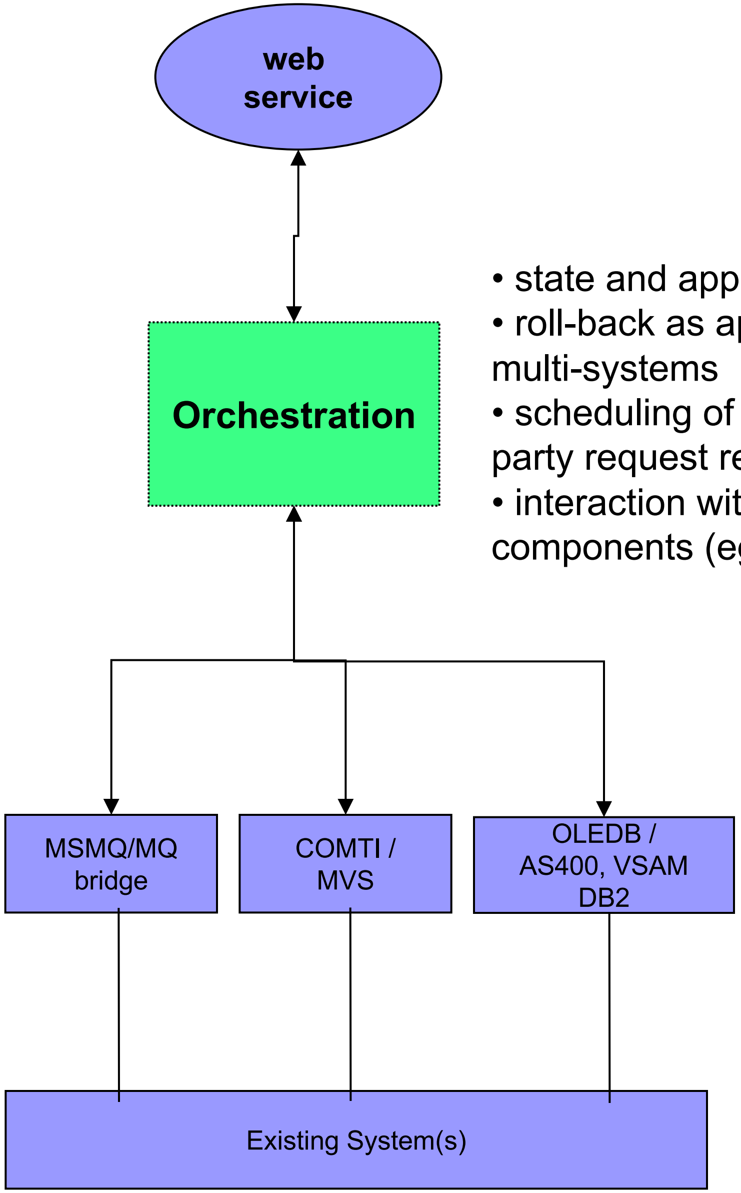
- Joined-up and multi-step interactions on franchise and intermediary delivery need orchestration to:
    - ensure data and application integrity across existing backend systems
    - ensure complex, multi-party transactions possess data and application integrity
- Some of this is logically performed at the Common Services tier (“middle office”), for processes that span more than one back-end entity
- Local orchestration within and across specific backend systems may also be needed in the back-office tier to ensure application-specific data integrity

Data and Application Orchestration – Cross Government



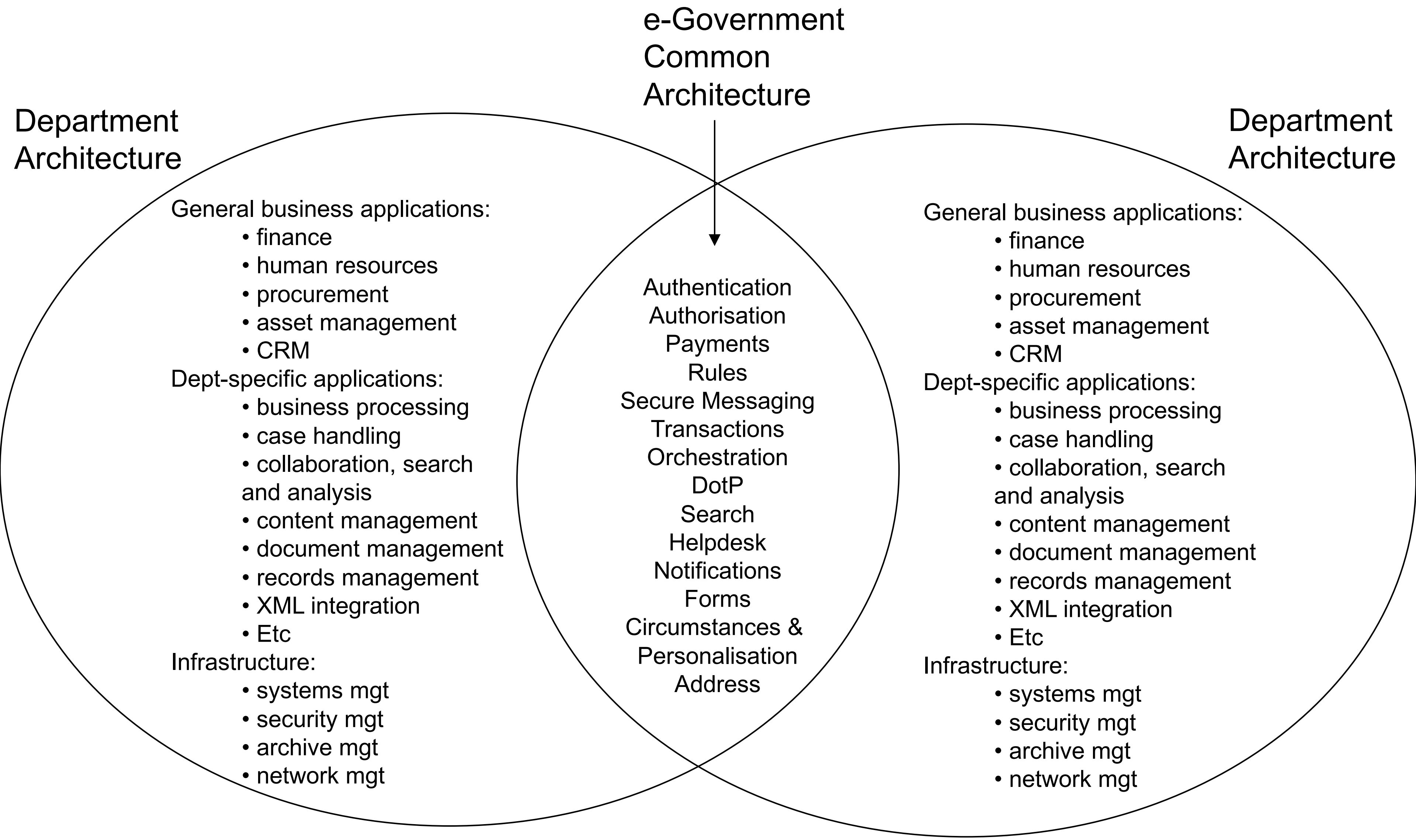
- state and application logic
- roll-back as appropriate across multiple departments
- scheduling of complex, multi-party request responses
- interaction with other components (eg rules engine)

Data and Application Orchestration – Departmental



- state and application logic
- roll-back as appropriate across multi-systems
- scheduling of complex, multi-party request responses
- interaction with other components (eg rules engine)

Central / Department Architectures Intercept – potential conceptualisation



e-Government
Common
Architecture

Department
Architecture

General business applications:
- finance
- human resources
- procurement
- asset management
- CRM

Dept-specific applications:
- business processing
- case handling
- collaboration, search and analysis
- content management
- document management
- records management
- XML integration
- Etc

Infrastructure:
- systems mgt
- security mgt
- archive mgt
- network mgt

Authentication
Authorisation
Payments
Rules
Secure Messaging
Transactions
Orchestration
DotP
Search
Helpdesk
Notifications
Forms
Circumstances &
Personalisation
Address

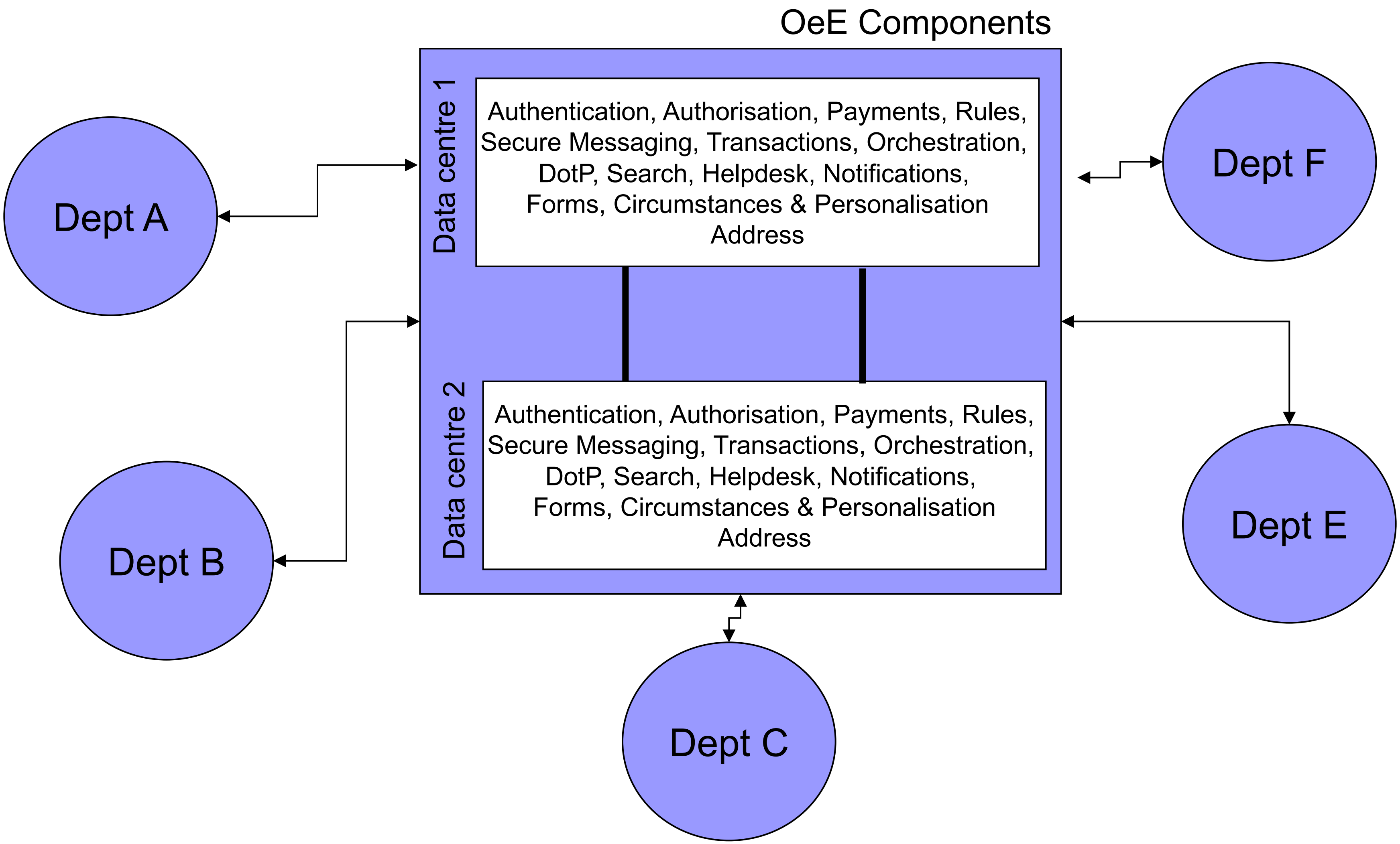
Department
Architecture

General business applications:
- finance
- human resources
- procurement
- asset management
- CRM

Dept-specific applications:
- business processing
- case handling
- collaboration, search and analysis
- content management
- document management
- records management
- XML integration
- Etc

Infrastructure:
- systems mgt
- security mgt
- archive mgt
- network mgt

Logical to Physical – Option 1 (centralised model)



OeE Components

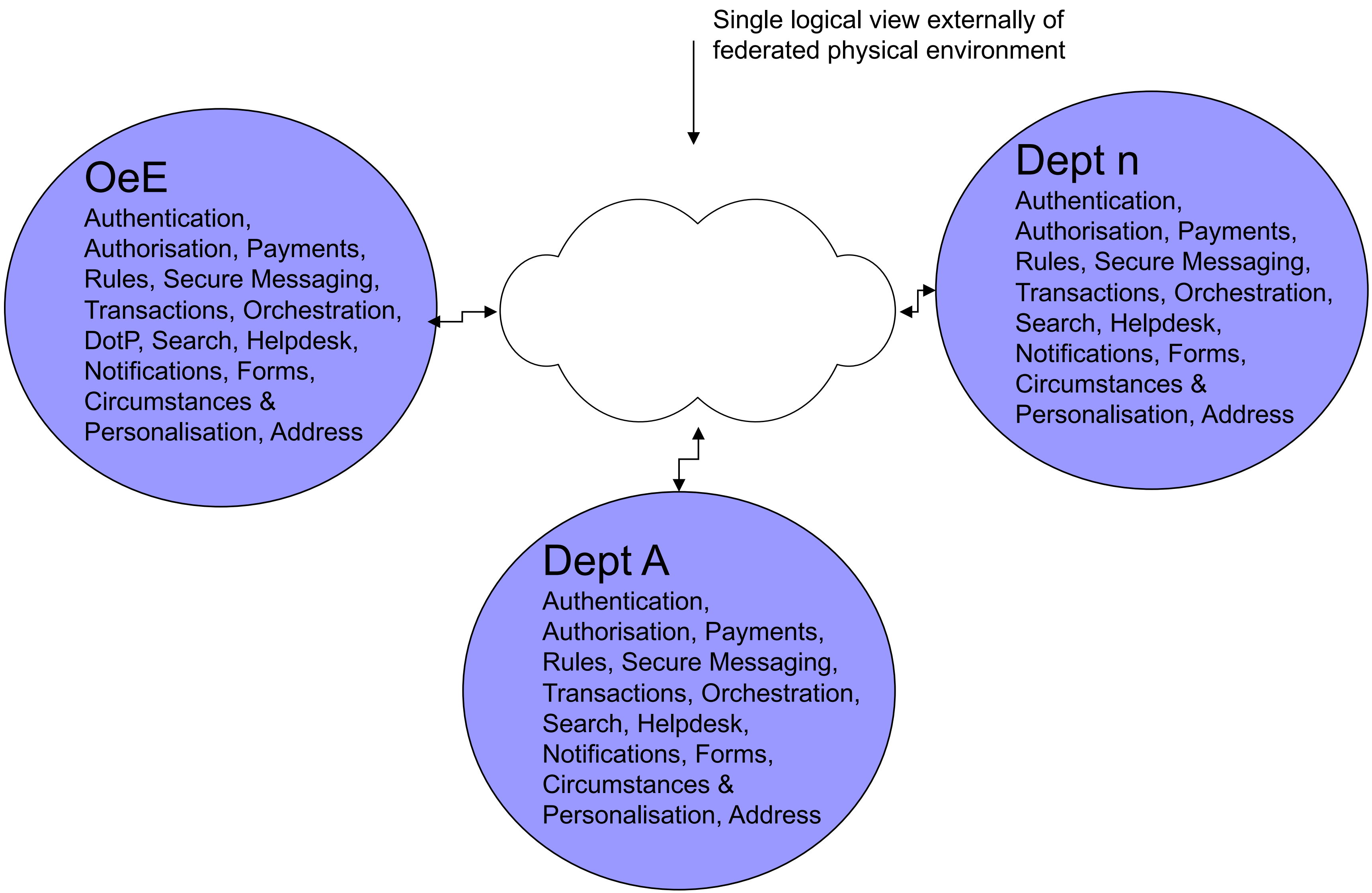
Data centre 1

Authentication, Authorisation, Payments, Rules, Secure Messaging, Transactions, Orchestration, DotP, Search, Helpdesk, Notifications, Forms, Circumstances & Personalisation Address

Data centre 2

Authentication, Authorisation, Payments, Rules, Secure Messaging, Transactions, Orchestration, DotP, Search, Helpdesk, Notifications, Forms, Circumstances & Personalisation Address

Logical to Physical – Option 2 (federated model)



Single logical view externally of federated physical environment

OeE

Authentication, Authorisation, Payments, Rules, Secure Messaging, Transactions, Orchestration, DotP, Search, Helpdesk, Notifications, Forms, Circumstances & Personalisation, Address

Dept n

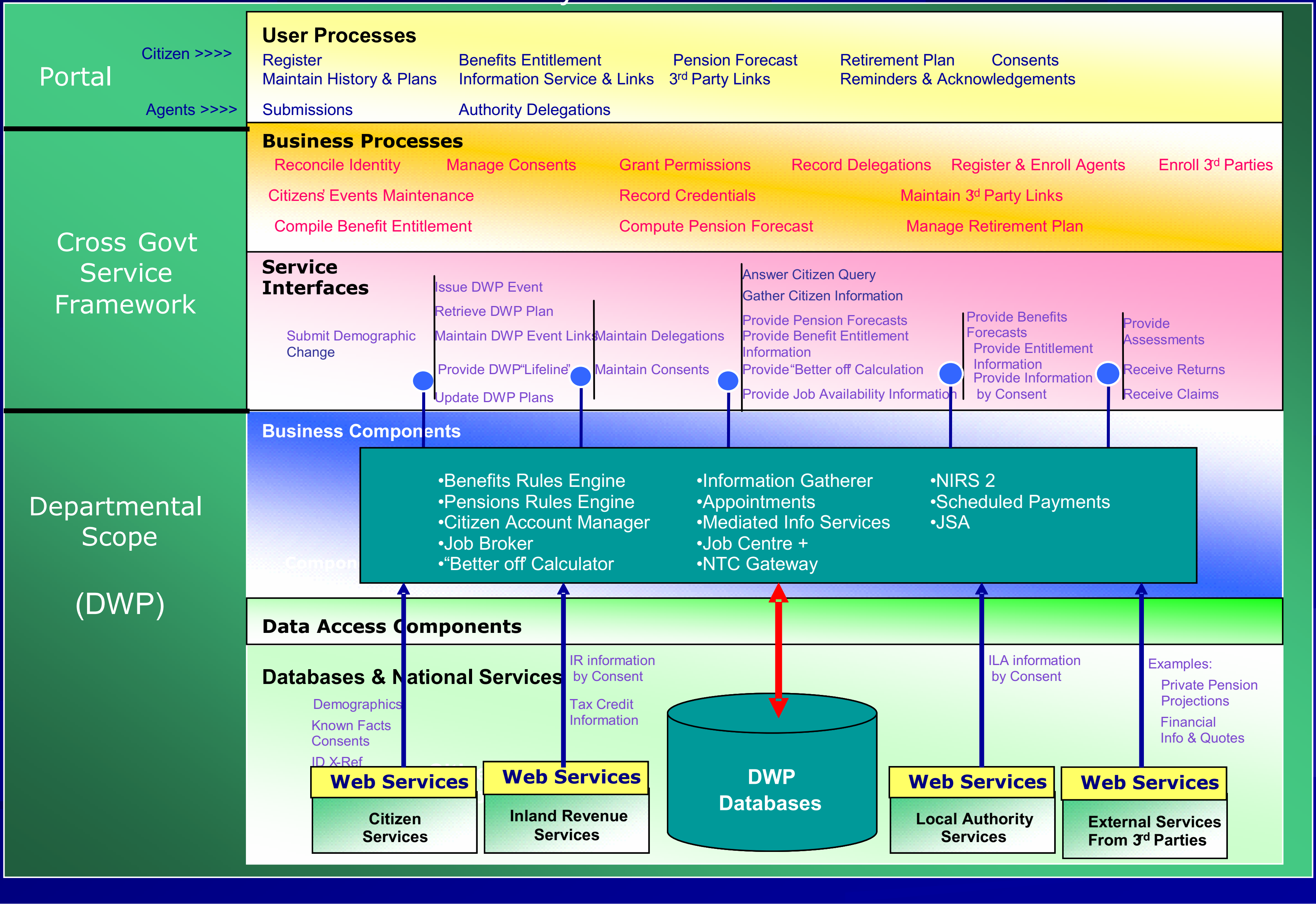
Authentication, Authorisation, Payments, Rules, Secure Messaging, Transactions, Orchestration, Search, Helpdesk, Notifications, Forms, Circumstances & Personalisation, Address

Dept A

Authentication, Authorisation, Payments, Rules, Secure Messaging, Transactions, Orchestration, Search, Helpdesk, Notifications, Forms, Circumstances & Personalisation, Address

DWP Illustrative

e-Government Layered Architecture – DWP View



Portal

Citizen >>>>

Agents >>>>

Cross Govt Service Framework

Departmental Scope

(DWP)

User Processes

Register

Maintain History & Plans

Submissions

Benefits Entitlement

Information Service & Links

Authority Delegations

Pension Forecast

3rd Party Links

Retirement Plan

Consents

Reminders & Acknowledgements

Business Processes

Reconcile Identity

Manage Consents

Grant Permissions

Record Delegations

Register & Enroll Agents

Enroll 3rd Parties

Citizens Events Maintenance

Record Credentials

Maintain 3d Party Links

Compile Benefit Entitlement

Compute Pension Forecast

Manage Retirement Plan

Service Interfaces

Submit Demographic Change

Issue DWP Event

Retrieve DWP Plan

Maintain DWP Event Links

Provide DWP"Lifeline"

Update DWP Plans

Maintain Delegations

Maintain Consents

Answer Citizen Query

Gather Citizen Information

Provide Pension Forecasts

Provide Benefit Entitlement Information

Provide"Better off Calculation

Provide Job Availability Information

Provide Benefits Forecasts

Provide Entitlement Information

Provide Information by Consent

Provide Assessments

Receive Returns

Receive Claims

Business Components

- •Benefits Rules Engine
- •Pensions Rules Engine
- •Citizen Account Manager
- •Job Broker
- •"Better off" Calculator
- •Information Gatherer
- •Appointments
- •Mediated Info Services
- •Job Centre +
- •NTC Gateway
- •NIRS 2
- •Scheduled Payments
- •JSA

Data Access Components

Databases & National Services

Demographics

Known Facts

Consents

ID X-Ref

IR information by Consent

Tax Credit Information

ILA information by Consent

Examples:

Private Pension Projections

Financial Info & Quotes

Web Services

Citizen Services

Web Services

Inland Revenue Services

DWP Databases

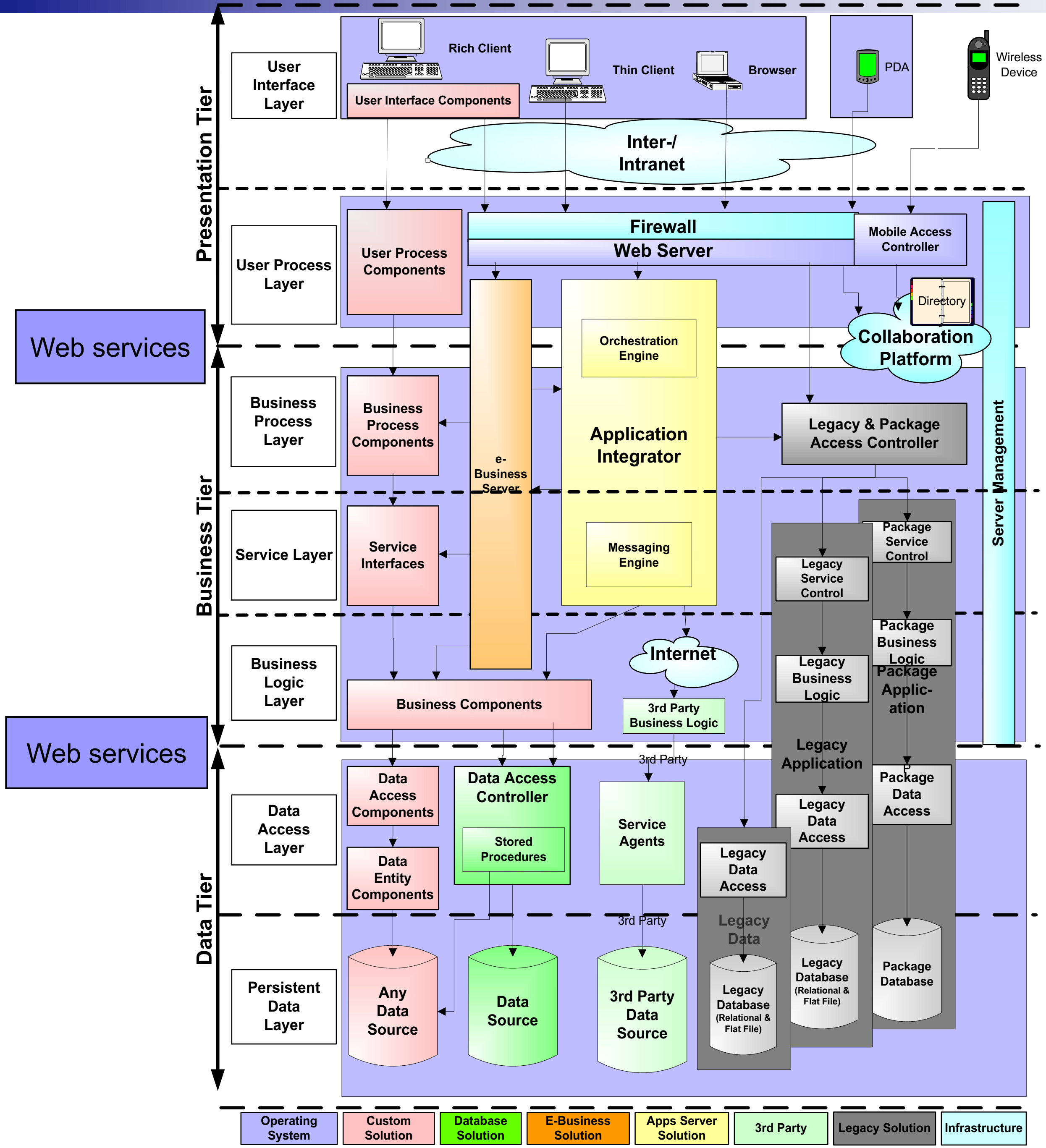
Web Services

Local Authority Services

Web Services

External Services From 3rd Parties

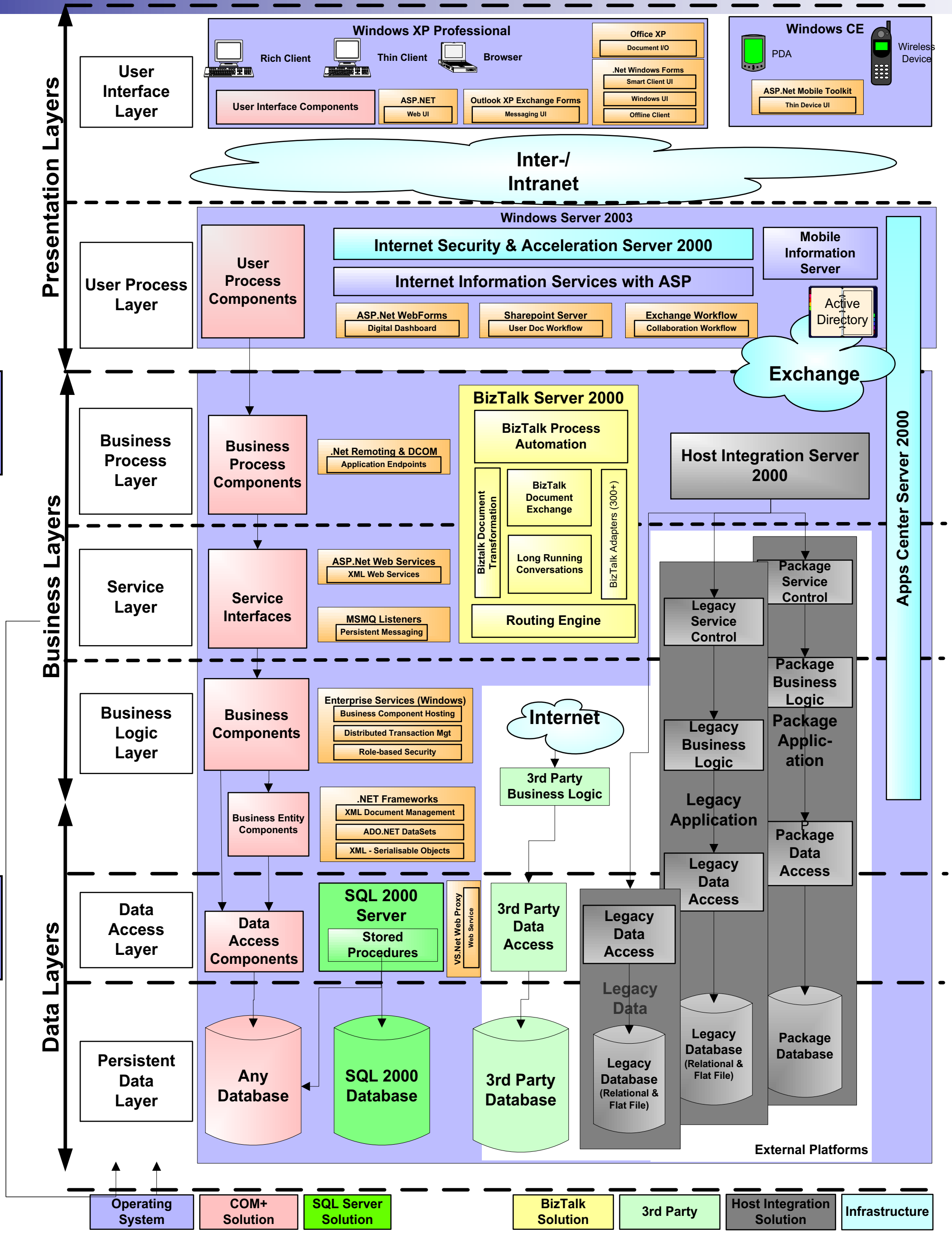
E-Government Application Architecture
(Deployed within a layered Architecture)



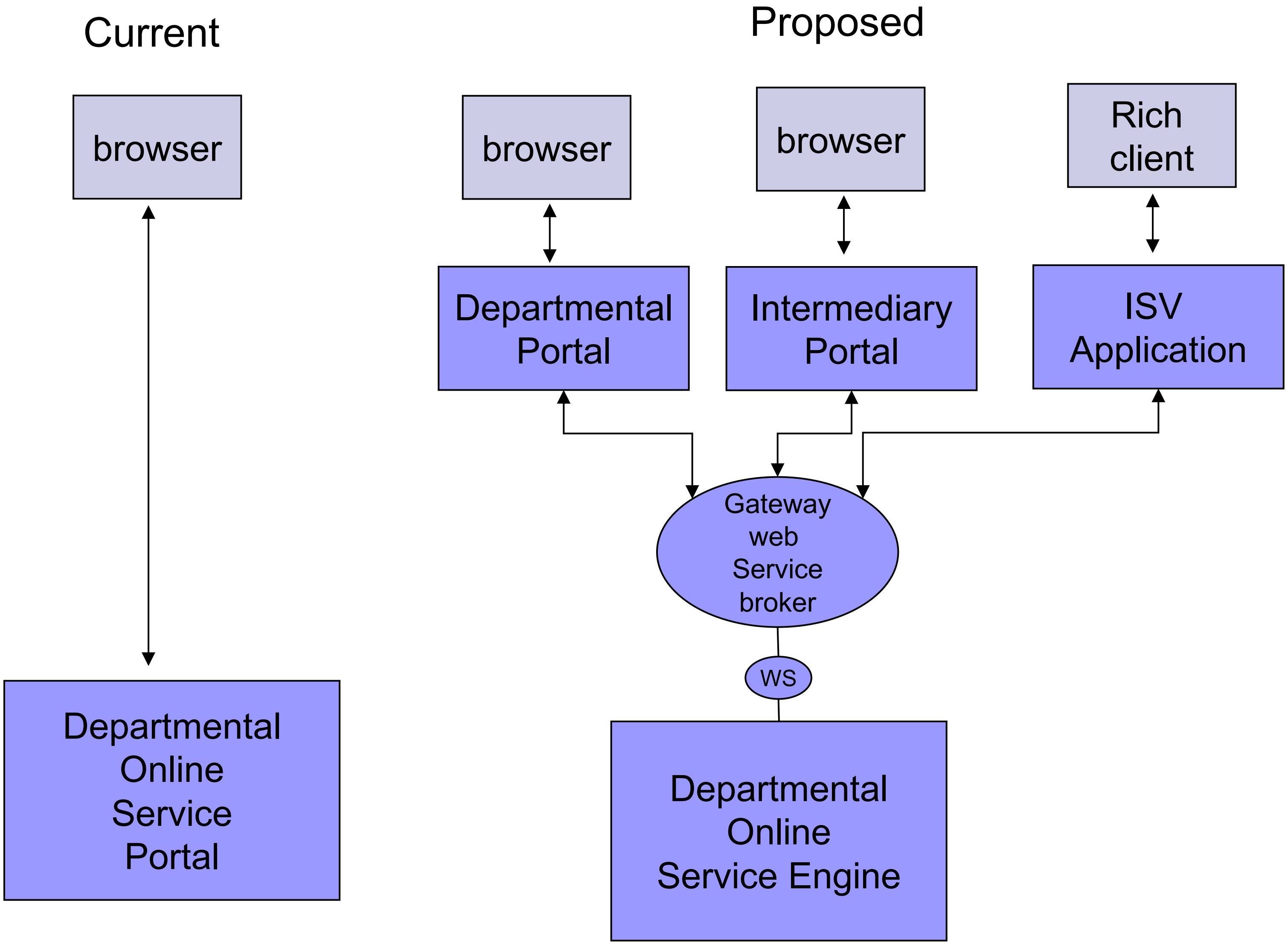
.NET Enterprise Servers
(Deployed within a layered Architecture)

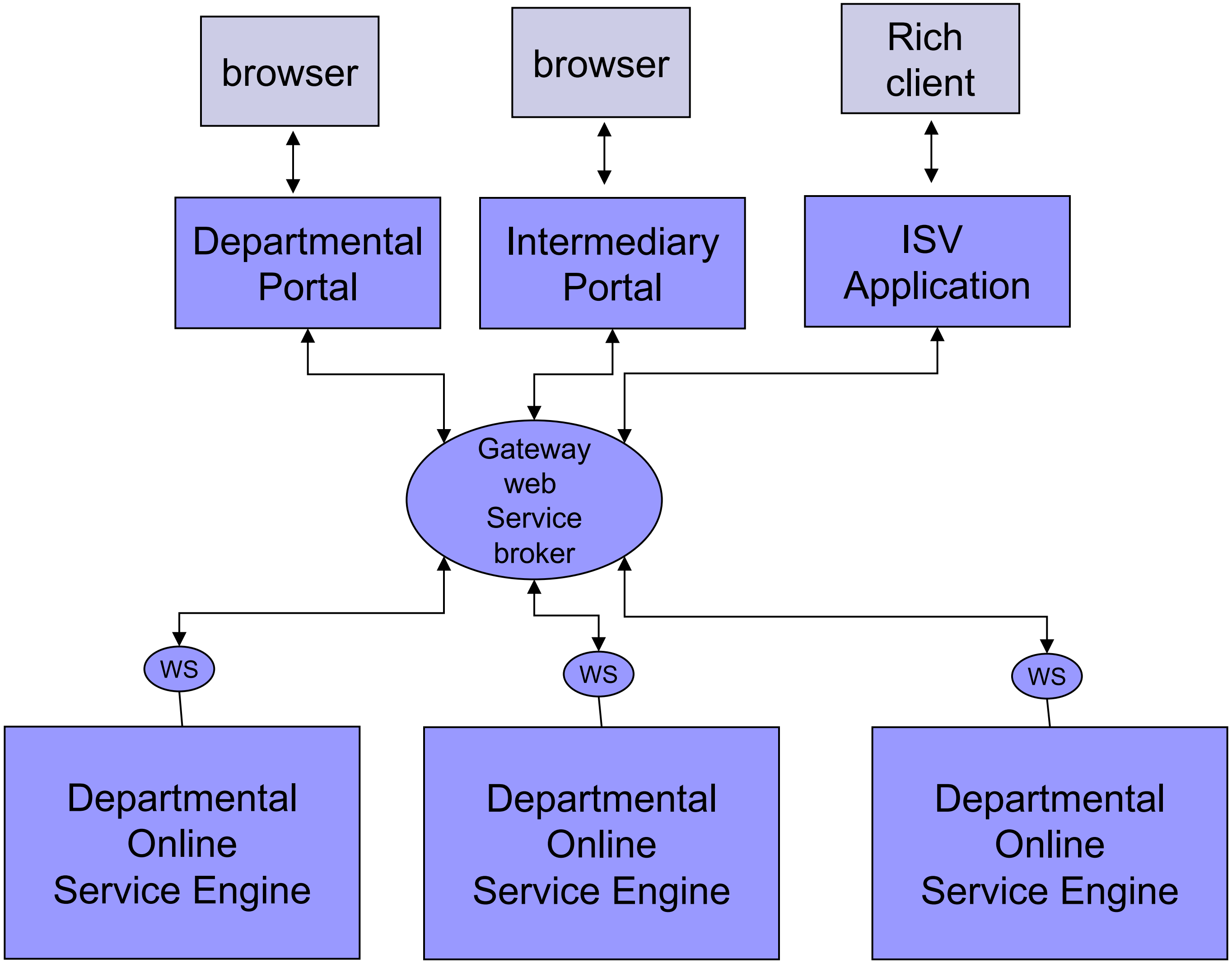
Web services

Web services



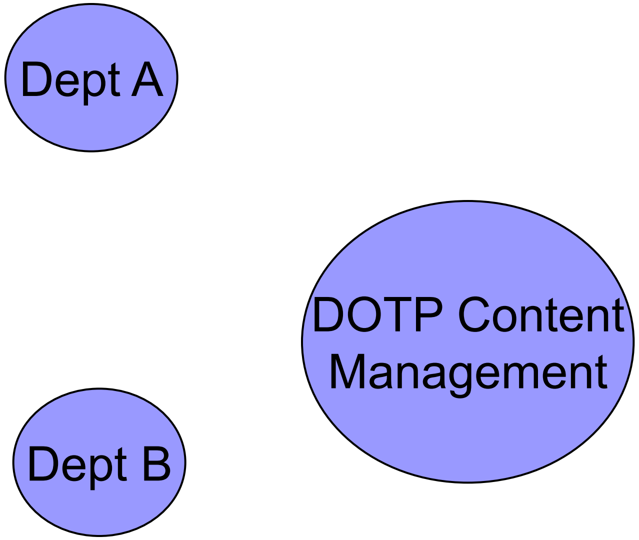
Web Service Approaches



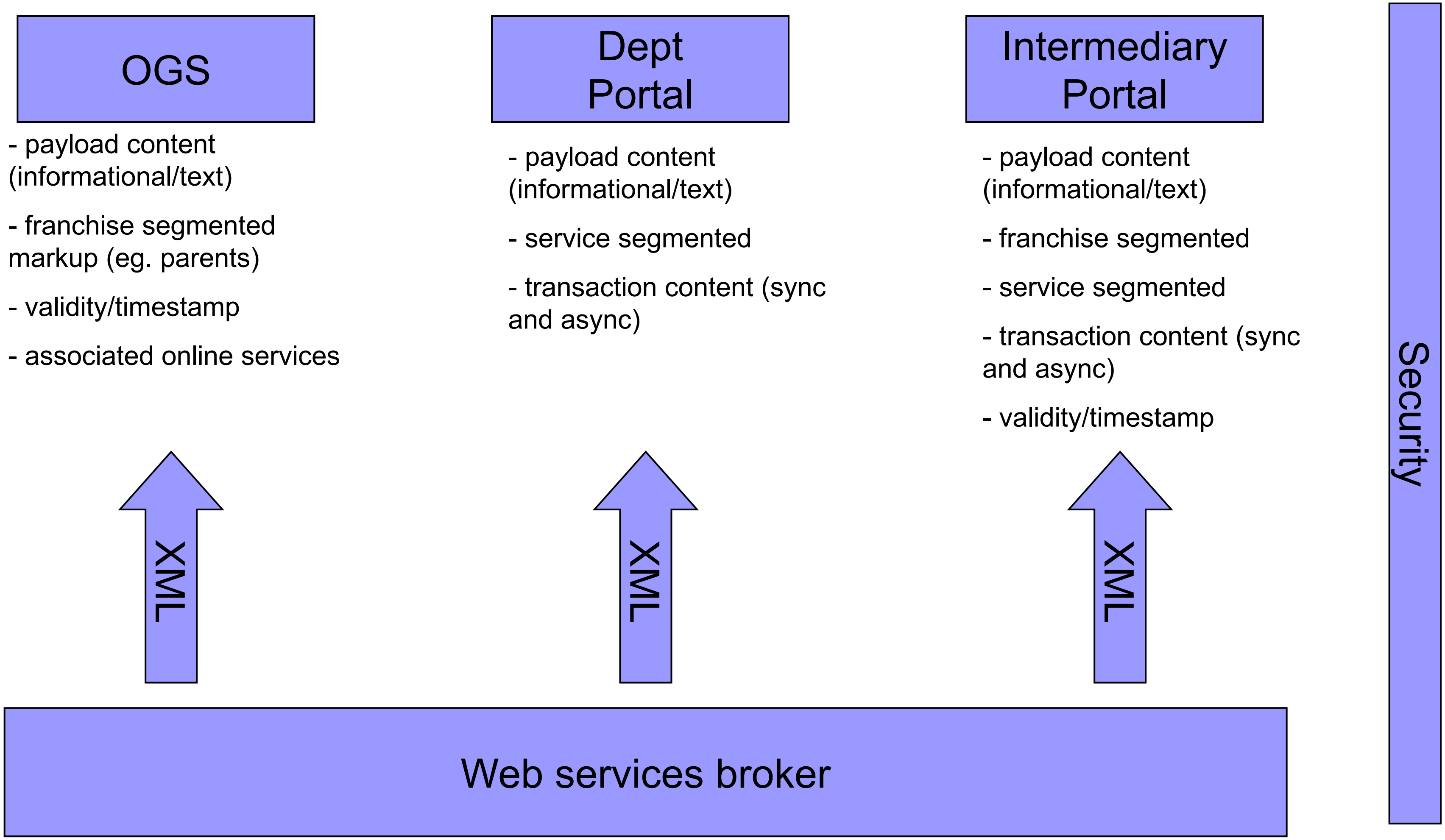


browser
browser
Rich client
Departmental Portal
Intermediary Portal
ISV Application
Gateway web Service broker
WS
WS
WS
Departmental Online Service Engine
Departmental Online Service Engine
Departmental Online Service Engine

Online Government Store (OGS) Models



Web Service requirements



OGS

- payload content (informational/text)
- franchise segmented markup (eg. parents)
- validity/timestamp
- associated online services

Dept Portal

- payload content (informational/text)
- service segmented
- transaction content (sync and async)

Intermediary Portal

- payload content (informational/text)
- franchise segmented
- service segmented
- transaction content (sync and async)
- validity/timestamp

XML

XML

XML

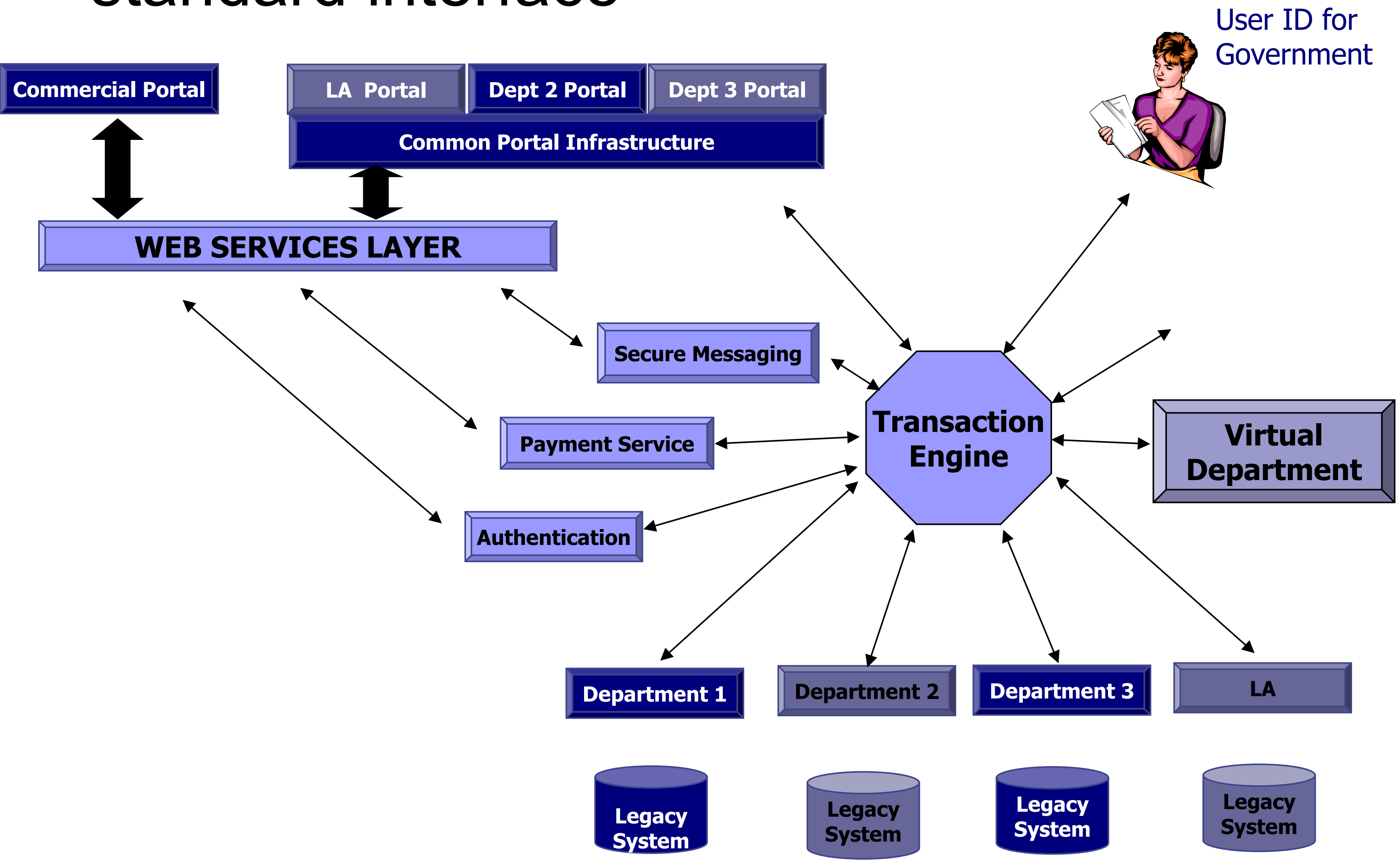
Web services broker

Security

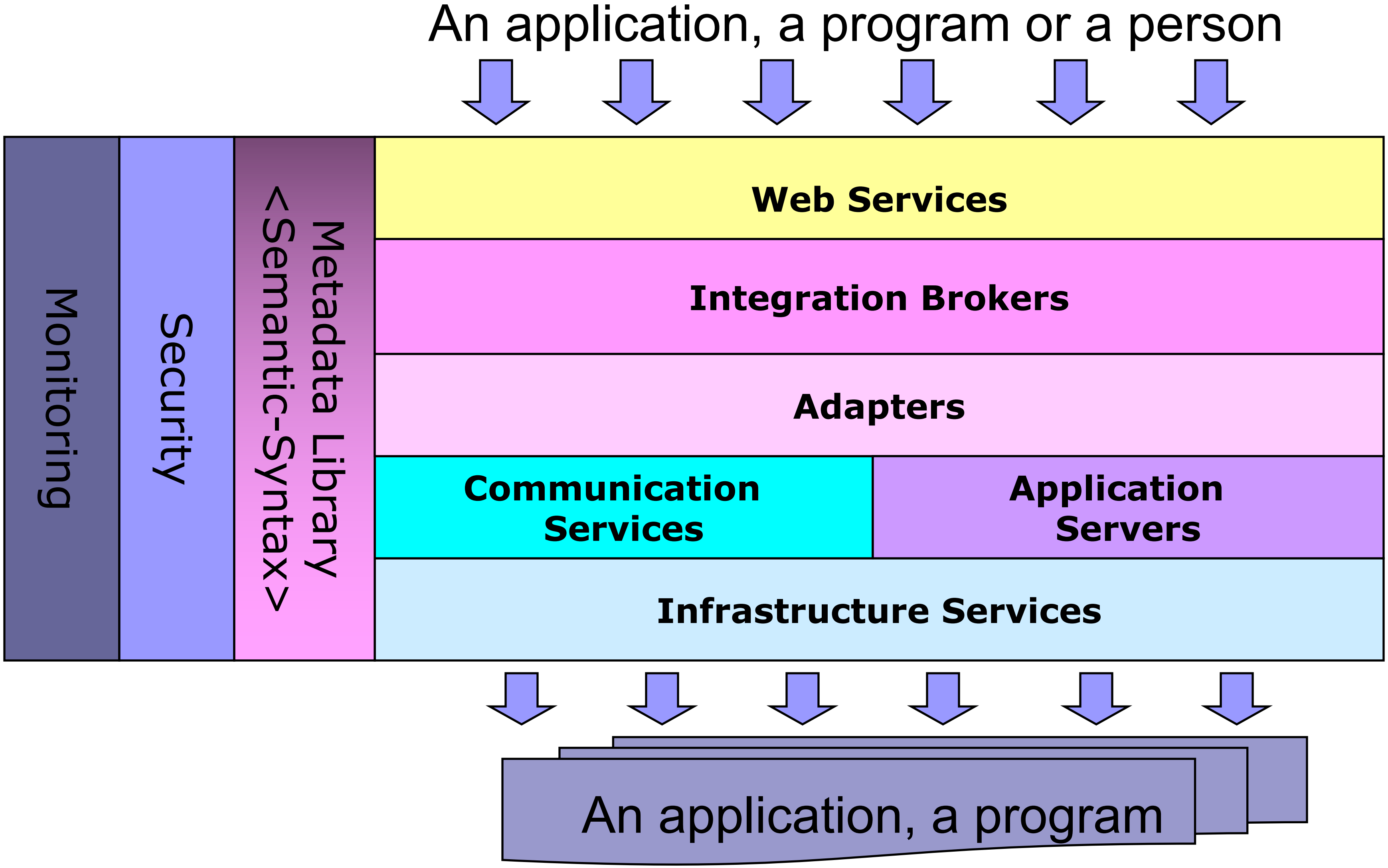
Living Examples

- Government Gateway
- Sandvik Tooling
- US Navy

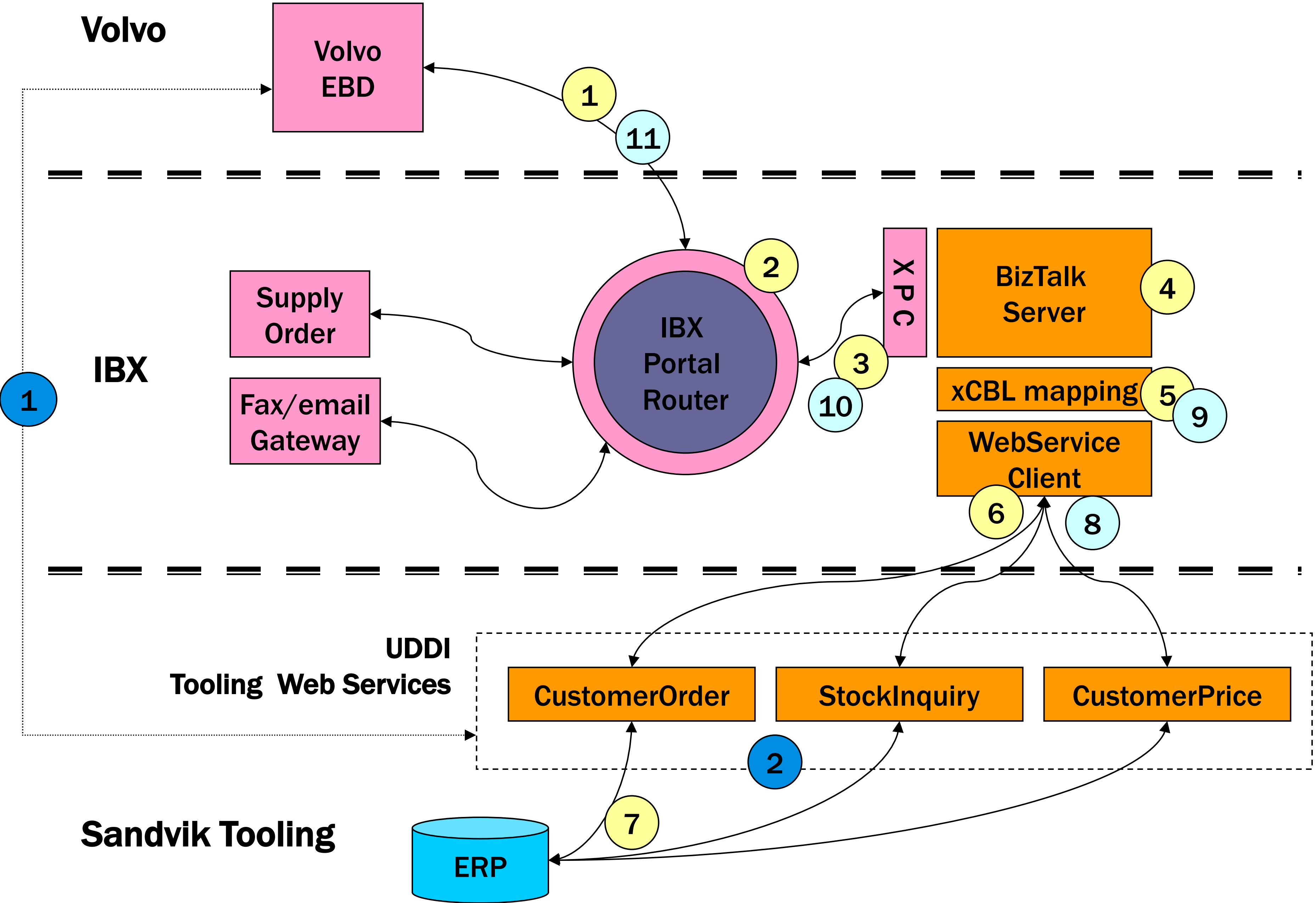
Government Gateway – Web Services as standard interface



Sandvik Framework



Web Services in use at Sandvik



US Navy Case Study - US Navy Reserve Mobilization

- Problem:
  - multiple manual entries of data, partially manual processes, and inconsistent processes across different organizations at different sites led to data inconsistency & errors
  - an important legacy system did not meet new security and inter-operability requirements (NMCI)
  - no “visibility” in status of processes
- Solution:
  - rapidly develop an application that connects processes across different organizations & make information available as web services
  - rebuild a legacy application in new technology (ASP.NET)
  - provide status reporting/tracking
  - “expose” information as a web services whenever there was probability that other applications could use the information