

Federal Enterprise Architecture (FEA)

XML and Web Services across the Federal Government

An Overview of Vision and Progress

Bob Haycock

Program Manager, FEA-PMO

December 2002

Federal Enterprise Architecture - Program Management Office
(FEA-PMO)

Table of Contents:

- ◆ Introduction to E-Government
- ◆ Overview of the Federal Enterprise Architecture (FEA)
- ◆ XML and Web Services in the Federal Government
- ◆ Questions

E-Government represents a new role for Information Technology (IT) in the Federal Government

- ◆ **The Vision:** an order of magnitude improvement in the federal government's value to the citizen; with decisions in minutes or hours, not weeks or months.

- ◆ **E-Government Definition:** the use of digital technologies to transform government operations in order to improve effectiveness, efficiency, and service delivery.

- ◆ **The Principles:**
 - Citizen-Centered, Results-Orientated, Market-Based
 - Integral components of President's Management Agency
 - Simplify and Unify

The E-Government Initiative is Focused on Results that Matter to the Citizen

- ◆ **The E-Gov Initiative is making government more responsive to citizens. Electronic commerce and Internet technology have made daily tasks easier and quicker and the U.S. government is working to do the same for U.S. citizens.**
- ◆ The E-Gov Initiative gets agencies to use **modern, trustworthy** technologies to become more **productive** and **respond** faster and better to the needs of American citizens.
- ◆ The E-Gov initiative gets agencies to use e-business tools to lessen paperwork burdens.
- ◆ The E-Gov initiative provides tools for all levels – local, state and federal – of government to work better together.
- ◆ Under the E-Gov Initiative, U.S. government websites are already providing an **easier, smarter, faster** way citizens to get the services and information they want. And there are more exciting innovations to come.

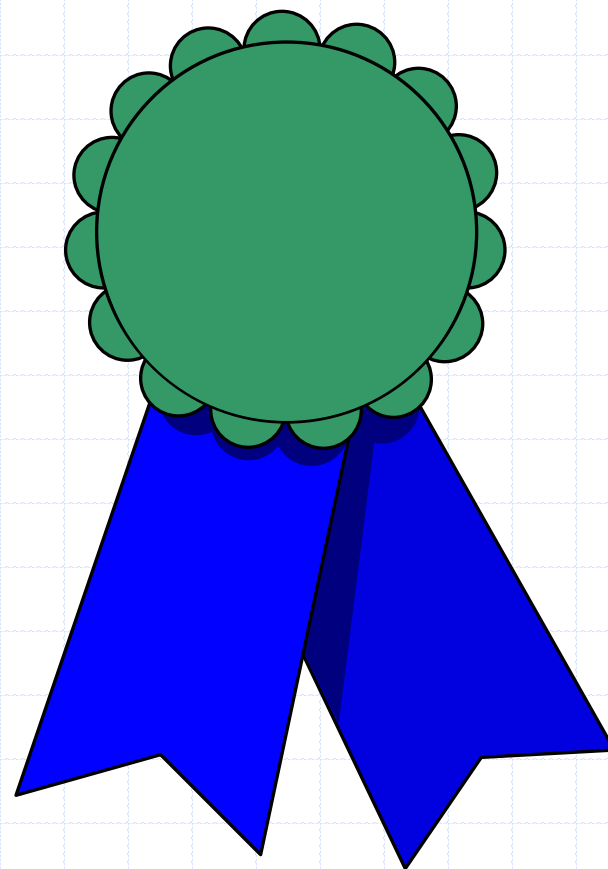
Getting to Green

Each Cabinet-level Department and Agency is Rated Quarterly

◆ **Agency E-government Progress**

- Modernization Blueprint -- Enterprise Architecture
- Business Cases -- Capital Planning and Investment Control
- IT Program Management
- IT Security

◆ **Agency is a Solution Partner in Multi-agency E-Government Initiatives (3 of 4 Citizen-centered groups)**



Where is the Federal Government Heading?

- ◆ Developing a modernization blueprint
 - Component-based enterprise architecture that addresses the business lines, data, information, and technology necessary to meet our missions.
 - CIO Council/OMB Analysis identifying internal/external interrelationships and interdependencies at each layer
 - Within and across departments
- ◆ Privacy and security are key components of this architecture
- ◆ Eliminate investments in redundant IT capabilities
- ◆ Shared investments that leverage common components to drive mission improvement
 - Common business functions
 - Vertical or horizontal integration needed to perform

Table of Contents:

◆ Introduction to E-Government

◆ The Federal Enterprise Architecture (FEA)

◆ XML and Web Services in the Federal Government

◆ Questions

The Federal Enterprise Architecture is a business-focused framework for cross-agency, Government-wide improvement

- ◆ **The Federal Enterprise Architecture (FEA) is providing OMB and Federal agencies with a new way of describing, analyzing, and improving the Federal Government and its ability to serve the citizen**
- ◆ **The FEA will eliminate the organizational obstacles that have historically hindered improvement** without forcing reorganization
- ◆ **The FEA is a business-focused approach and is not just for IT**
- ◆ **The FEA provides a common framework for improving a variety of key areas:**

Citizen Centered:

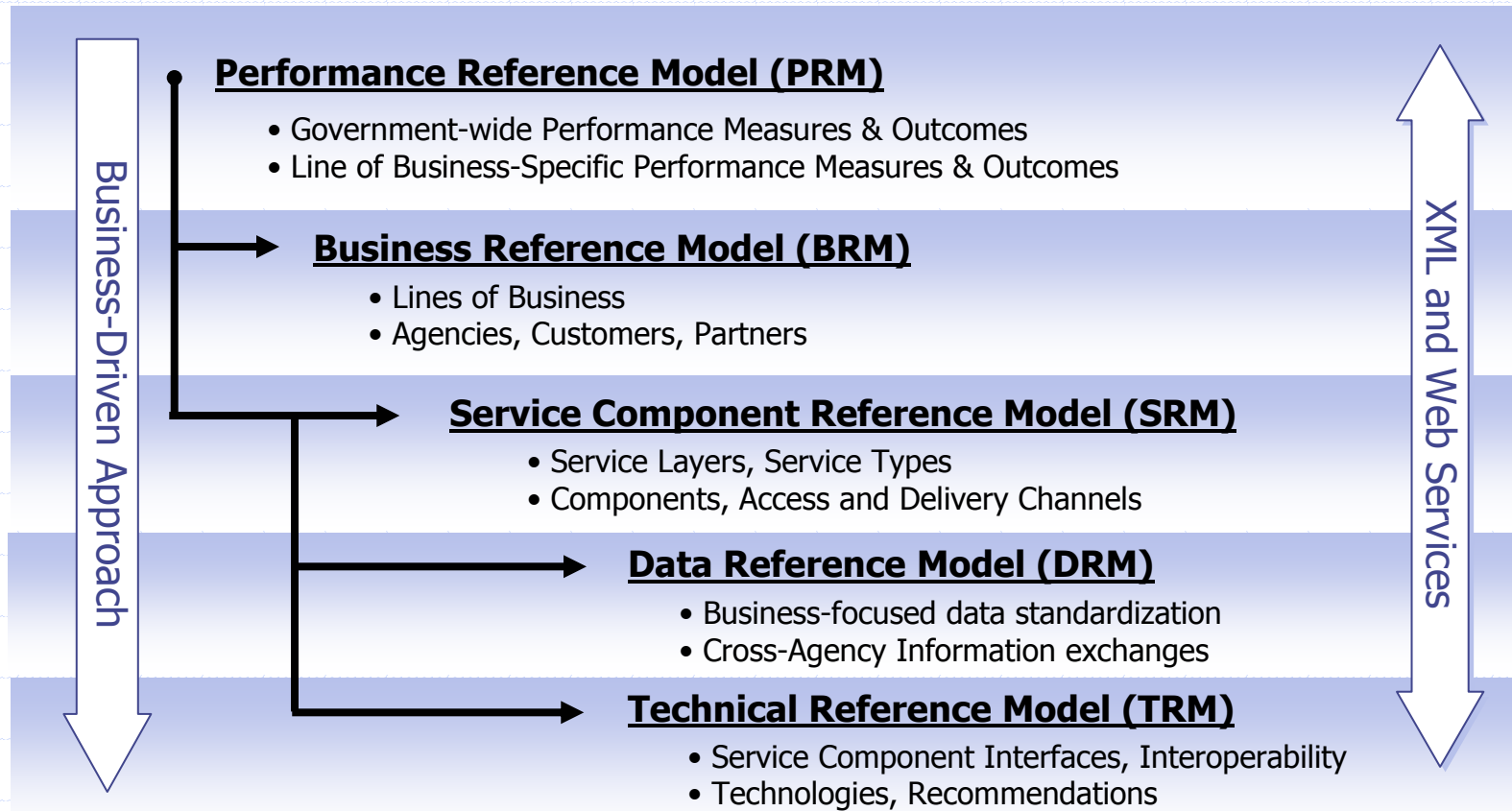
- Budget allocation
- **Horizontal and vertical information sharing**
- Performance measurement and budget/performance integration

Business Line Focus:

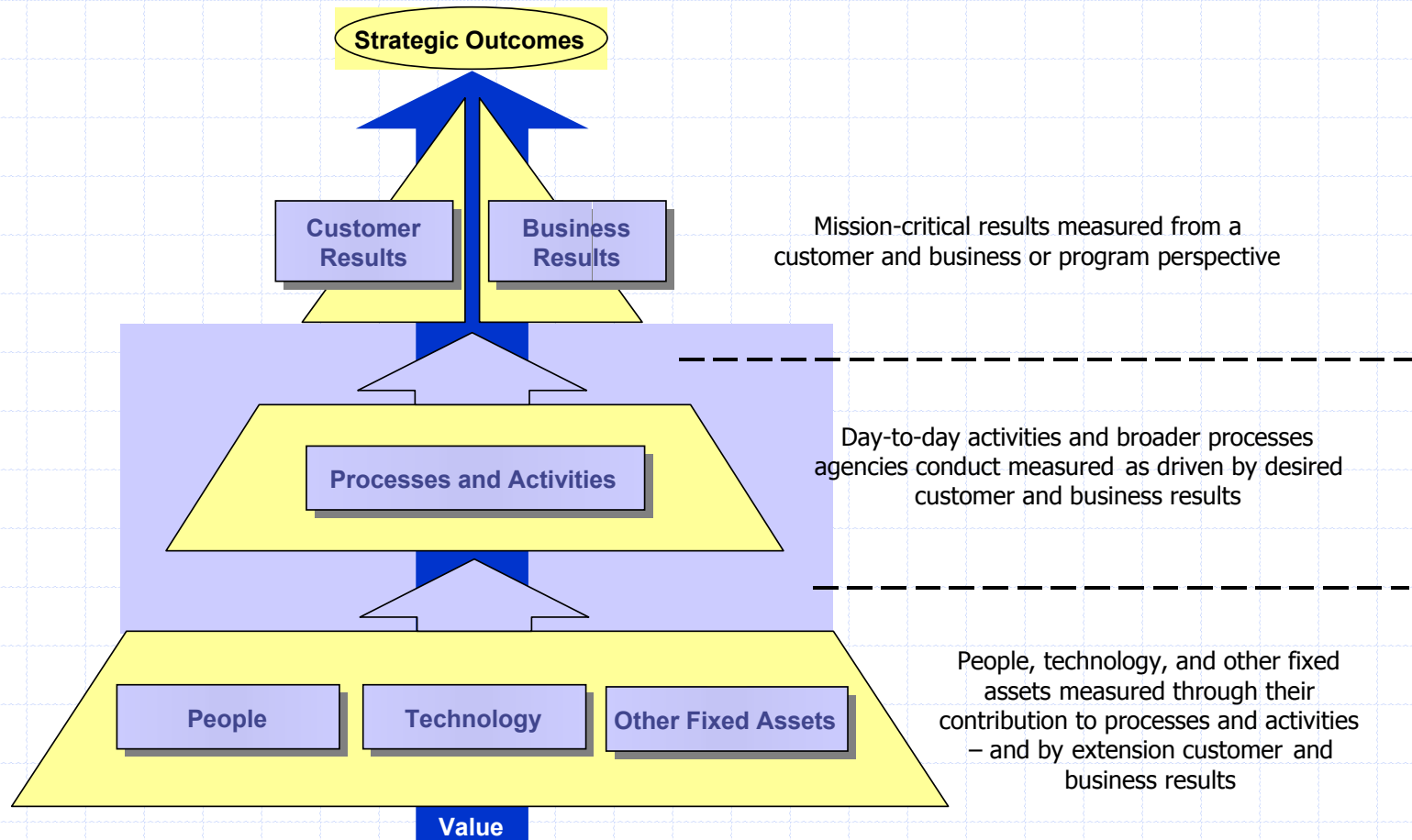
- **Cross-agency collaboration**
- Improved service to the citizen
- **e-Government**
- Component Based Architecture
- and more

The FEA is being constructed through a collection of inter-related “reference models” designed to facilitate cross-agency collaboration, and horizontal / vertical information sharing

Federal Enterprise Architecture (FEA)



The Draft FEA Performance Reference Model (PRM) consists of six measurement categories that address cross-cutting drivers of performance and span internal/external perspectives and outputs and outcomes

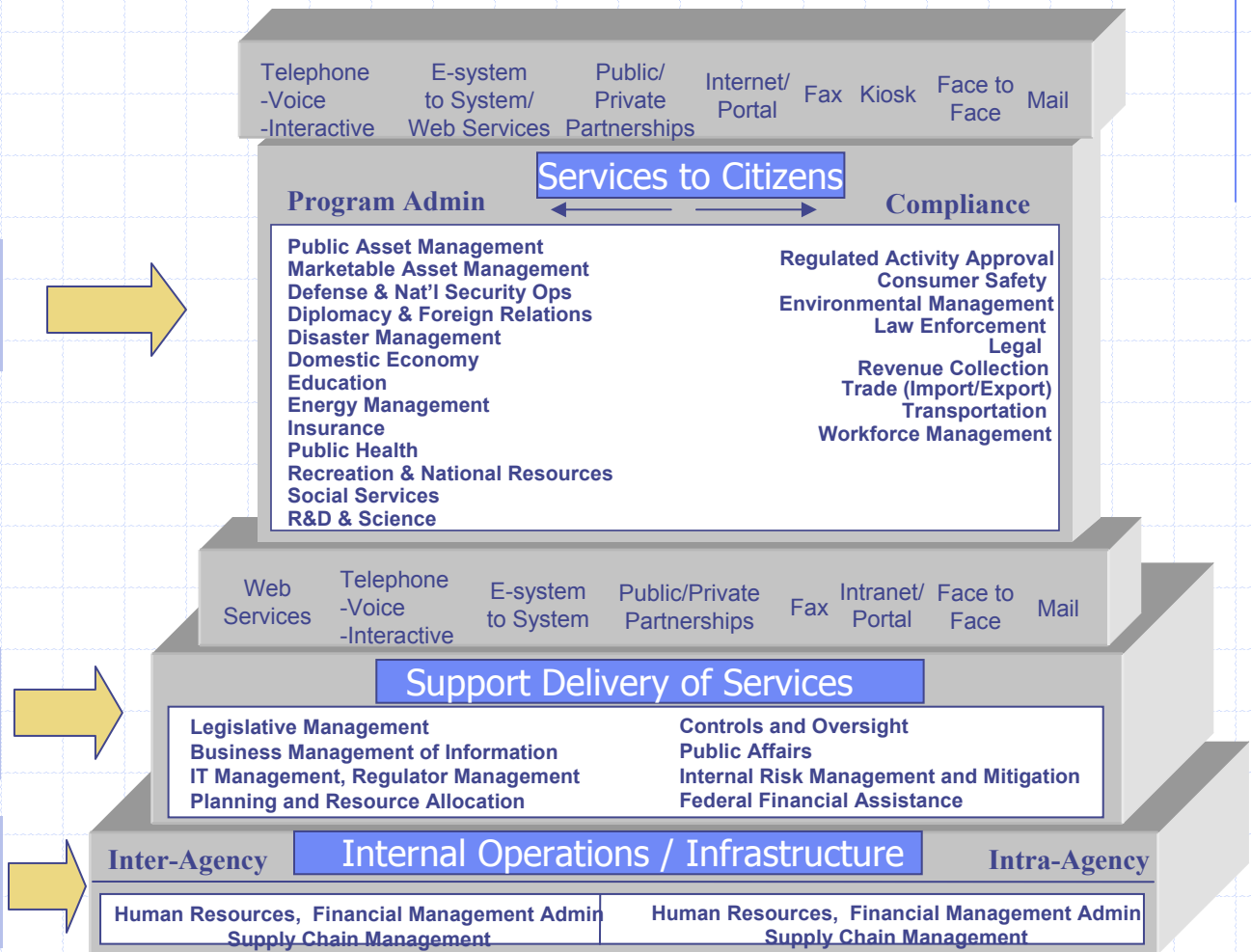


The FEA Business Reference Model (BRM) is a function-driven framework for describing the Lines of Business performed by the Federal Government independent of the Agencies that perform them

On average 10 Cabinet Departments and agencies per Line of Business

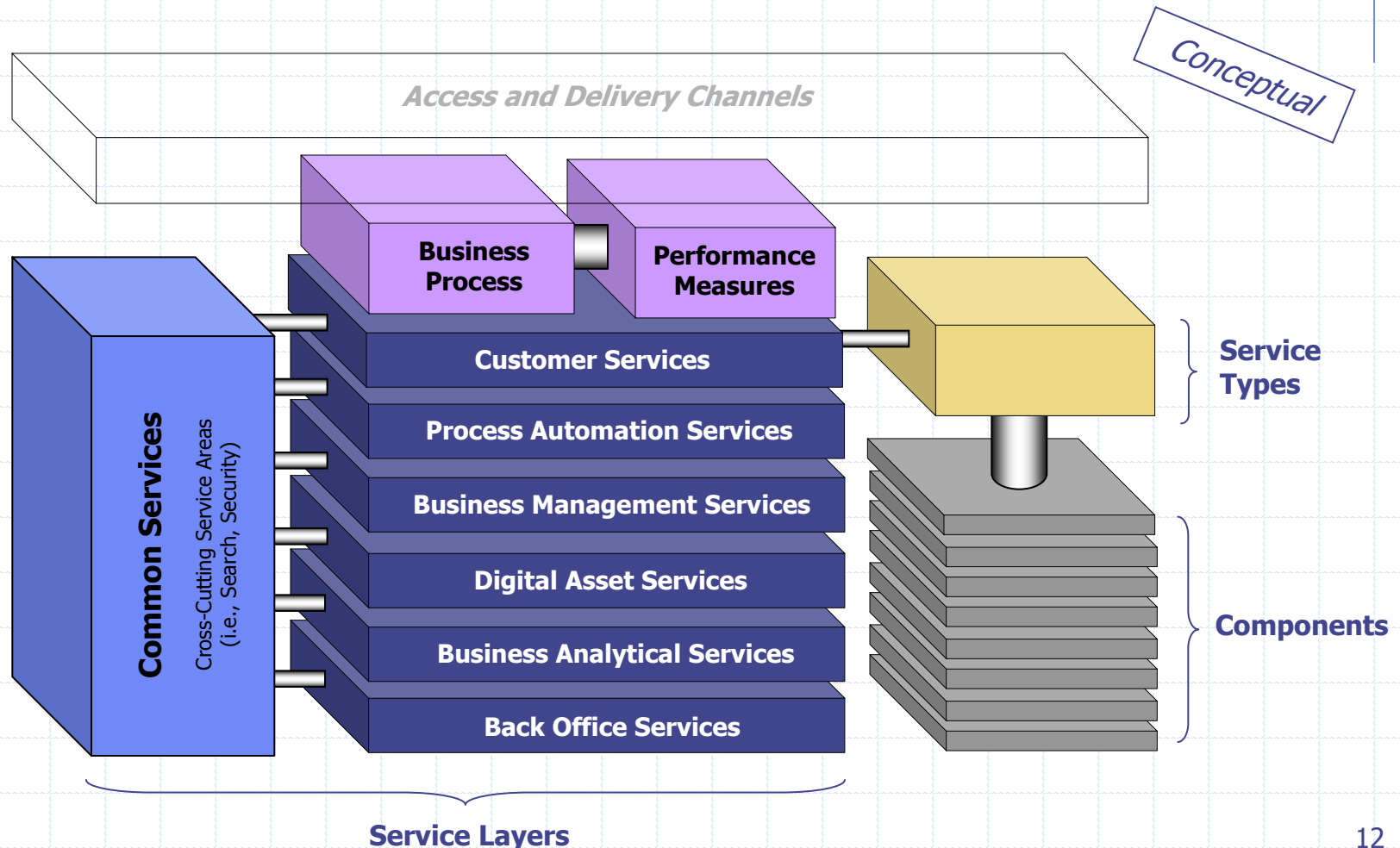
On average 21 Cabinet Departments and agencies per Line of Business

All 24 Cabinet Departments and agencies per Line of Business

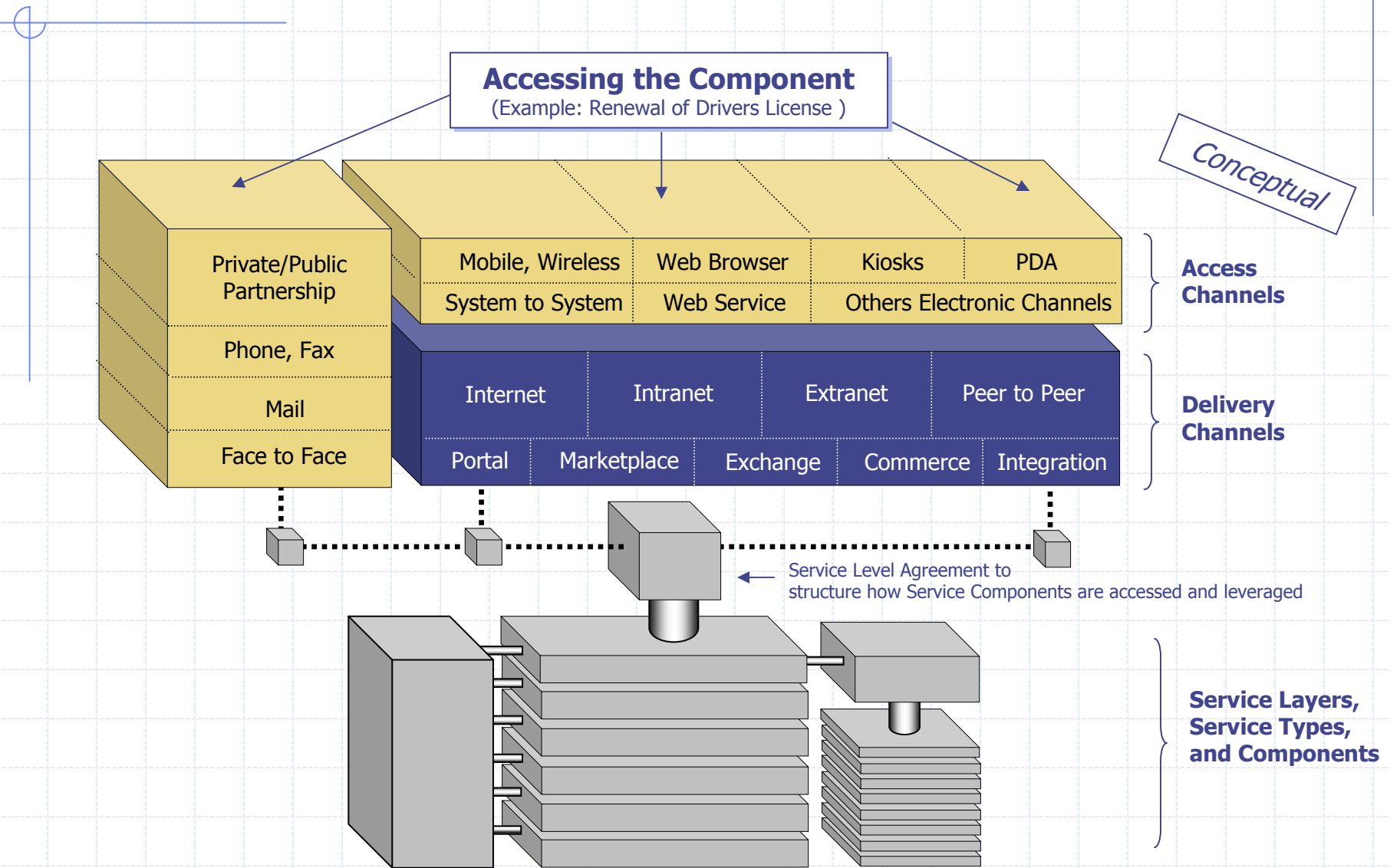


The Draft FEA Service Component Reference Model (SRM) – to be released for agency review shortly - consists of seven Service Layers with supporting Categories and Component Areas.

The SRM is structured across horizontal and vertical service areas that can provide – independent of business function – a leverageable foundation for reuse of applications, application capabilities, components, functions, and business services.

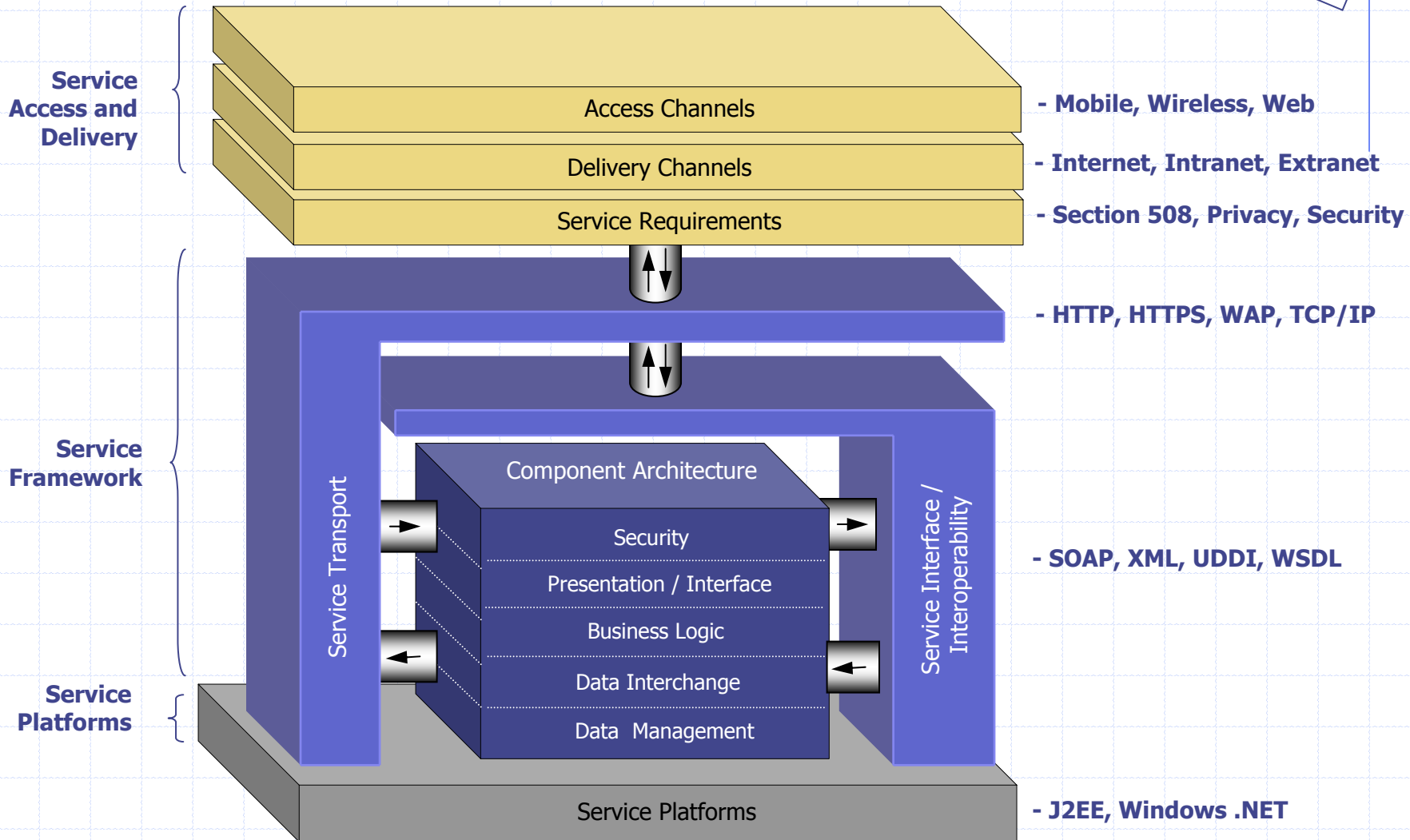


The SRM is supported by multiple Access and Delivery Channels that provide a foundation for accessing and leveraging capabilities



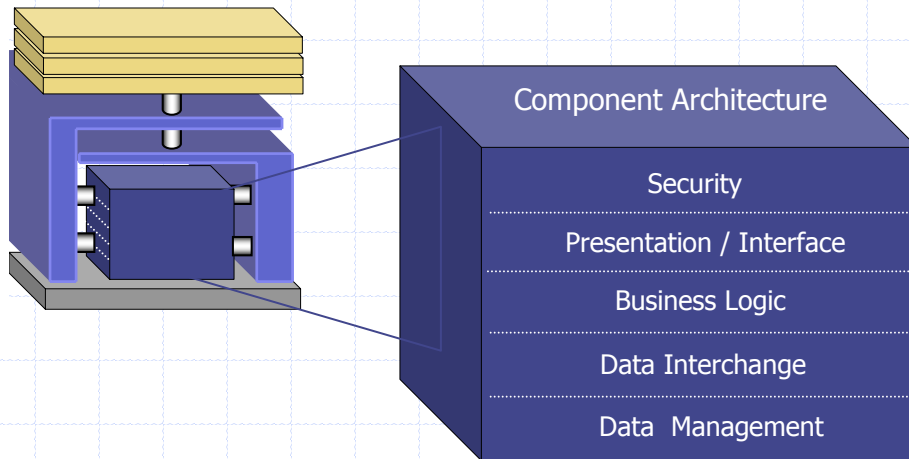
The Draft FEA Technical Reference Model (TRM) will provide an effective means by which Service Components can be leveraged, built, and deployed across the Federal Government...

Conceptual



... as well as provide guidance and technology recommendations supporting the development and implementation of Service Components that embrace a Component-Based Architecture

Partial List



Security

- X.509
- NIST / FIPS 186
- Secure Socket Layers (SSL)

Presentation / Interface

- HTML
- JSP, ASP, ASP.Net
- DHTML, CSS, XHTMLMP

Data Management

- XBRL, JOLAP, OLAP
- JDBC, ODBC
- ADO, ADO.Net

Data Interchange

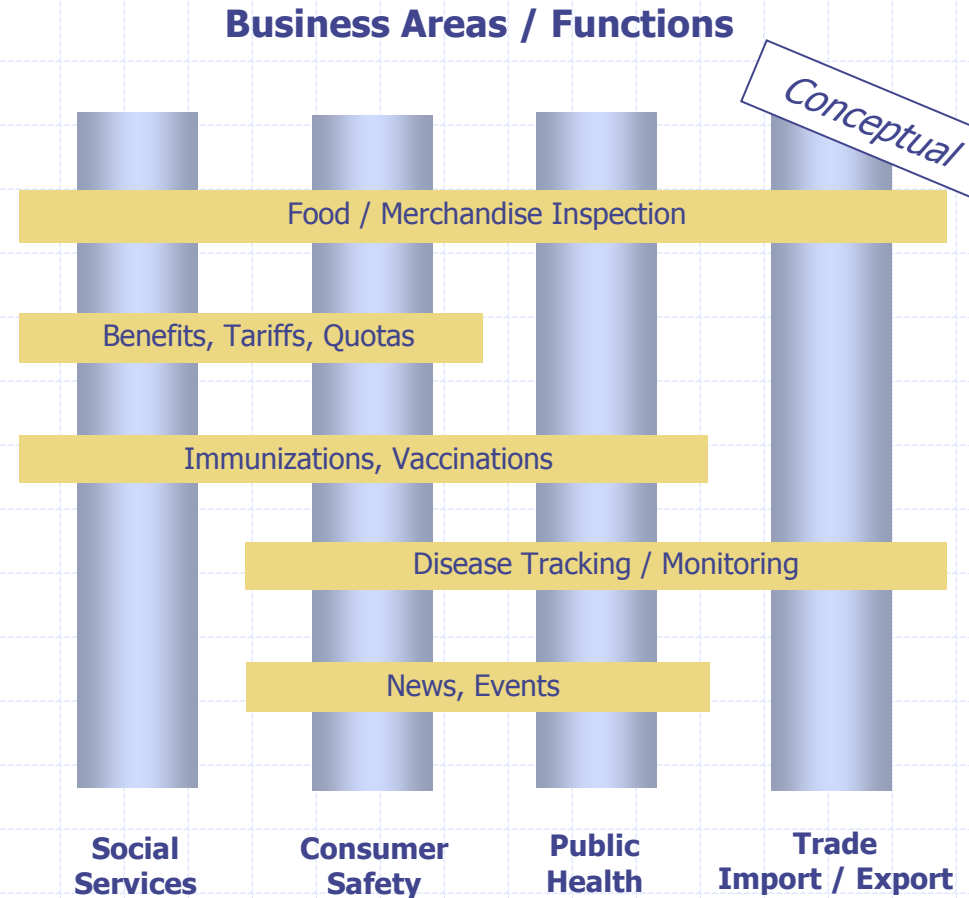
- XML
- ebXML
- RDF, WSUI
- XSLT

Business Logic

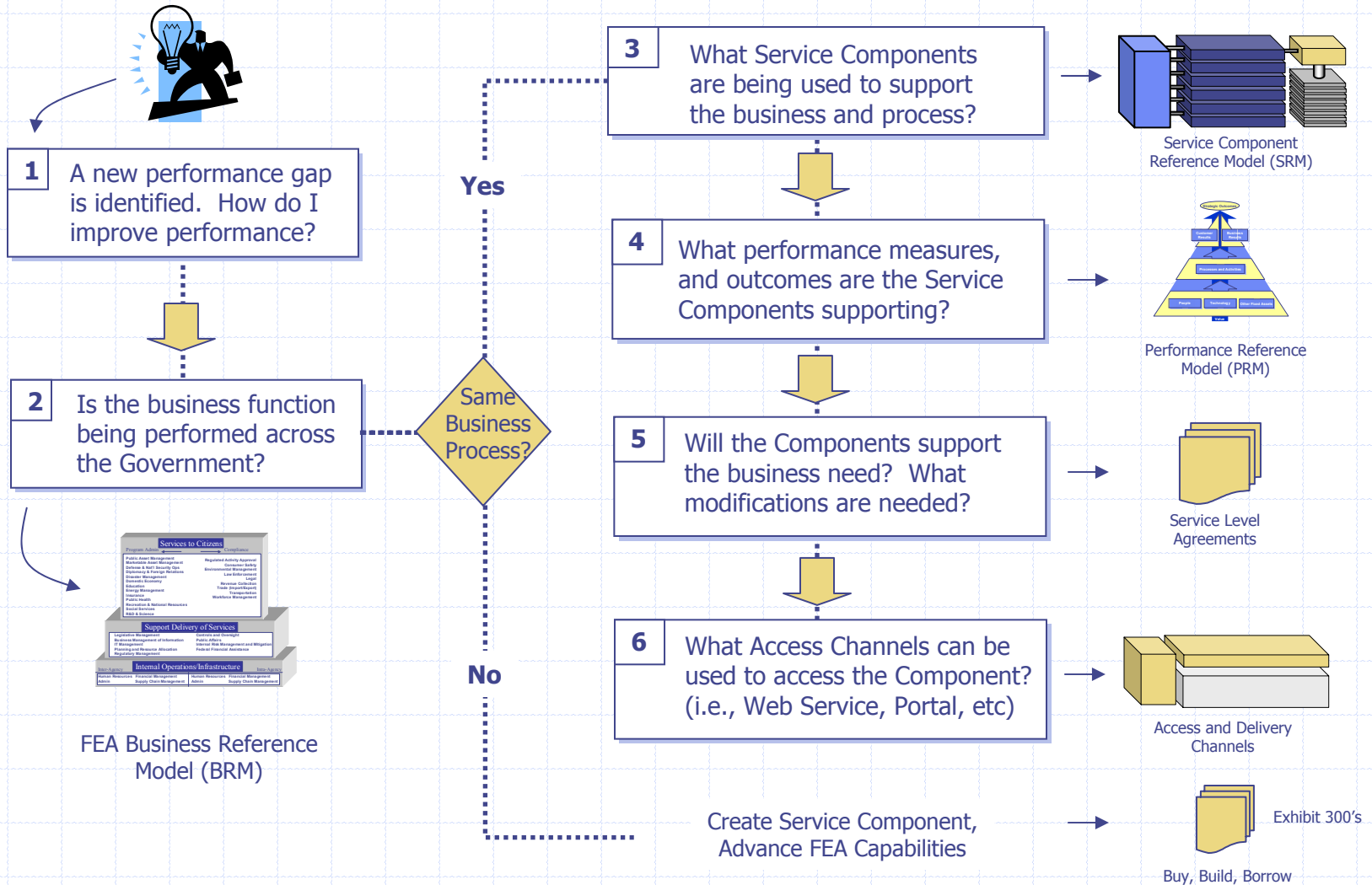
- Java/J2EE (EJB)
- C, C++, JavaScript
- COM/COM+, C#
- Visual Basic

The draft FEA Data Reference Model (DRM) is envisioned to support the classification of data across horizontal and vertical business areas / functions

- ◆ Will **heavily leverage XML** and interoperability principles
- ◆ Classifications of data will form the basis for the definition of **business-driven XML Schemas**
- ◆ Will leverage **industry vocabularies**
- ◆ XML Schemas will be stored within a central repository (e.g., XML.Gov, FEAMS)
- ◆ Security and data privacy are TOP priorities, records management
- ◆ State and local government collaboration is essential



Collectively, the FEA reference models support investment and e-Government planning by providing frameworks in which agencies can leverage existing services, technologies, and components across the Federal Government...



... and provide a framework to support the creation and integration of cross-agency initiatives and business solutions

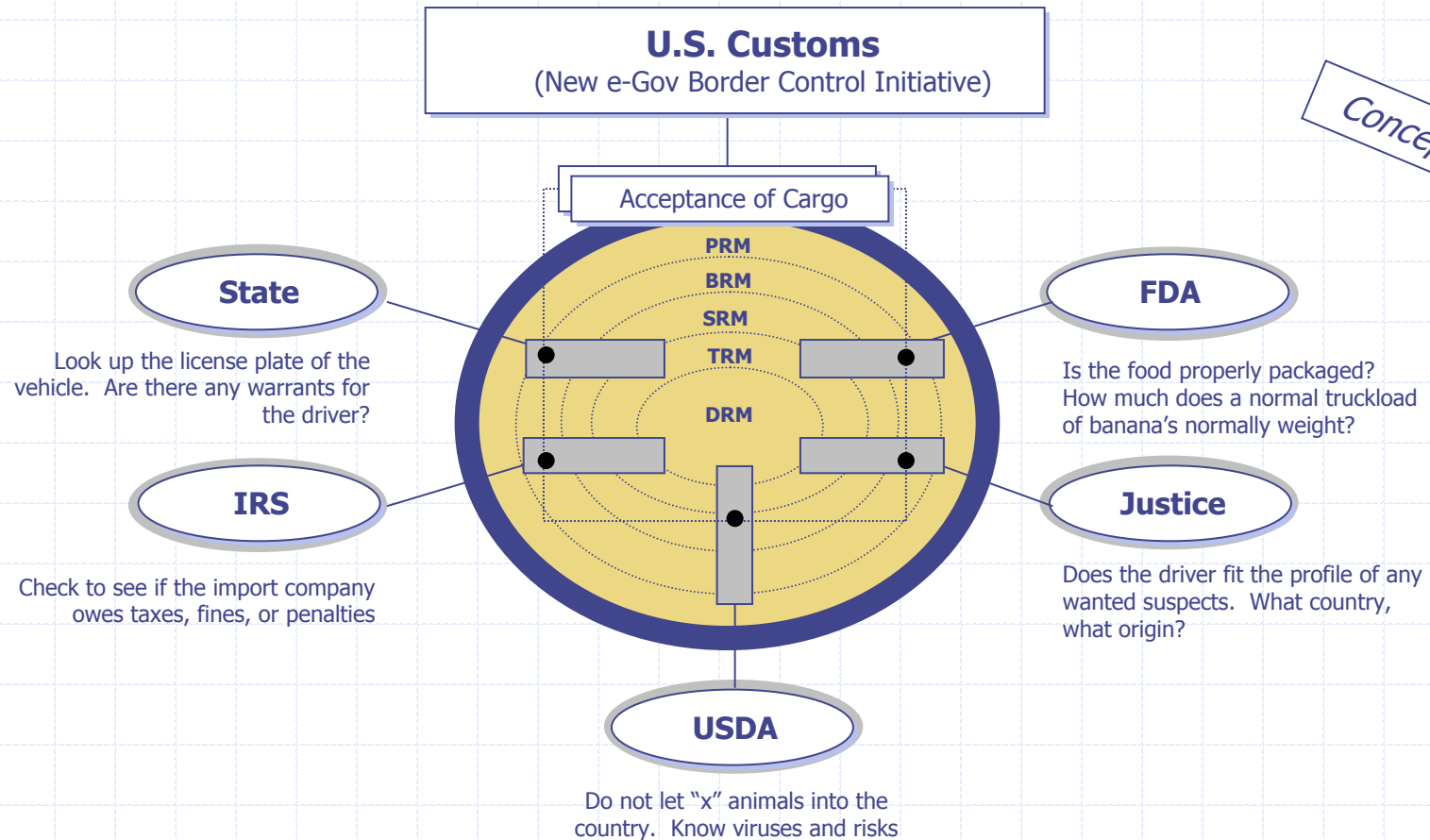


Table of Contents:

- ◆ Introduction to E-Government
- ◆ The Federal Enterprise Architecture (FEA)
- ◆ XML and Web Services in the Federal Government
- ◆ Questions

With over 135 XML and Web Service standards... getting started was an enormous challenge!

GOLD SPONSORS:

eXcelon™

SilverStream™



INTERWOVEN™

Borland®

SEVER SPONSORS:

PARASOFT

tme™
the mind electric

CCIO CompTIA
Business Computing

XML-WEB SERVICES ONE CONFERENCE + EXPO

PRODUCED BY:



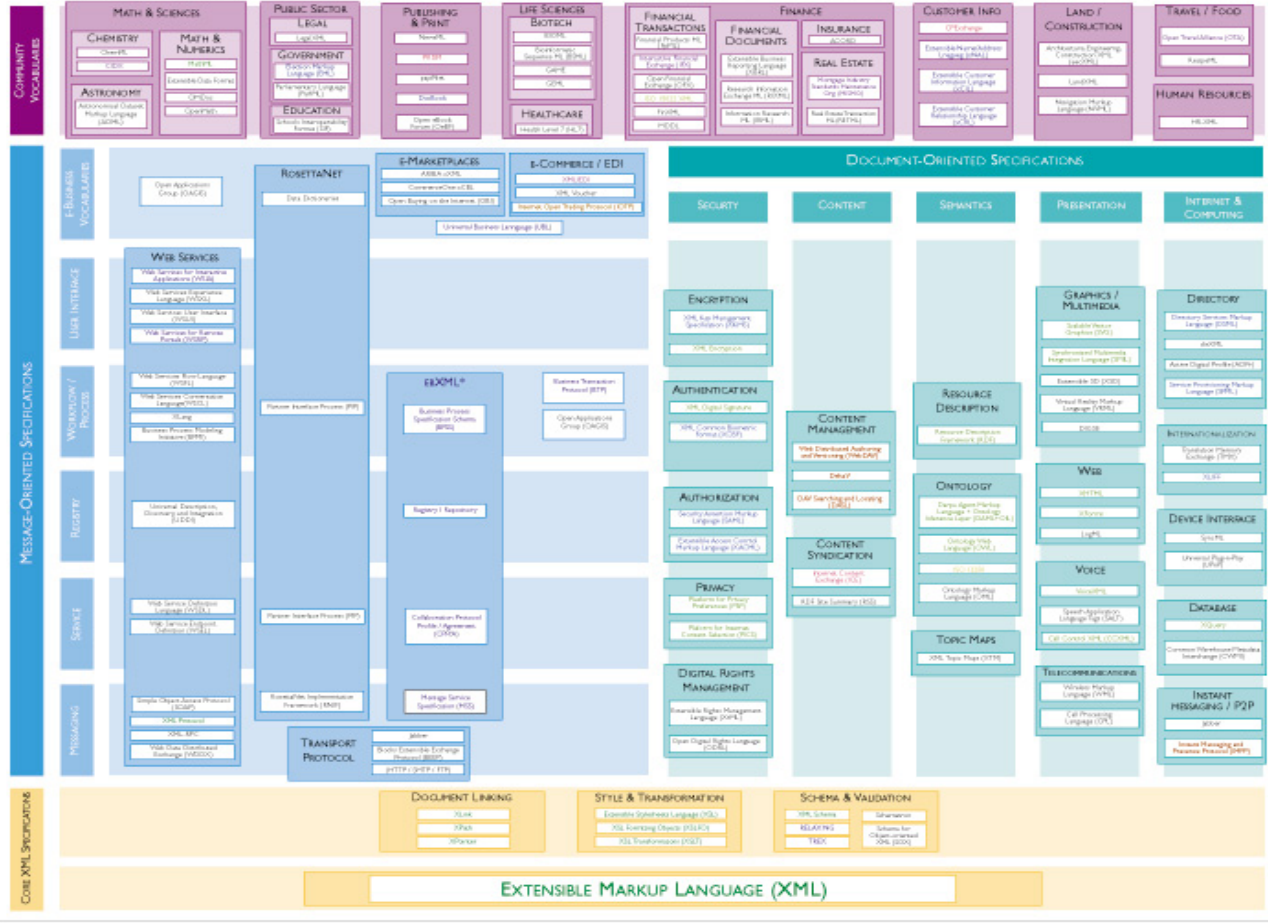
Application Development Trends

Aspen®

© 2002 Zaphink LLC
All rights reserved. All trademarks are the property of their respective owners.
Zaphink Document ID: ZTI-010

KEY XML SPECIFICATIONS AND STANDARDS

© Zaphink 2002



LEGEND OF SPECIFICATIONS:

- Data Interchange Standards Association (DITA)
- IEEE
- Internet Engineering Task Force (IETF)
- International Organization for Standardization (ISO)
- Organization for the Advancement of Structured Information Standards (OASIS)
- World Wide Web Consortium (W3C)
- Other: *Other specifications are jointly managed by OASIS and UNICOM

ABOUT THIS POSTER

With over 135 XML standards in existence, it's hard to agree on what they all do and on what we have in the future. Zaphink's extensive review of the key standards mapping the industry today and how they relate to each other.

The standards landscape is constantly shifting and this poster provides the best way to see it all in a single glance.

The XML standards landscape can be divided into four main sections: the standards that establish the basis for all XML-based technologies; the standards that allow machines to communicate with each other; the standards that help provide meaning to the vast amount of content and data that is being created; and the standards that help provide meaning to the vast amount of content and data that is being created.

In this poster we have represented over 135 of the key specifications in a way that is easy to understand. We have done our best to accurately represent the standards in this poster but with the landscape changing rapidly this information is subject to change in the future.

Please submit feedback, corrections, suggestions or comments to info@zaphink.com

The Federal Government has established multiple working groups, leadership forums, and committee's to manage this "game changing" technology

XML and Web Service Activity:

- ◆ Federal CIO Council
 - Architecture and Infrastructure Committee (AIC)
 - Industry Advisory Council (IAC)
 - XML Working Group
 - Web Services Working Group
- ◆ Office of Management and Budget (OMB) – Mark Forman
 - Federal Enterprise Architecture Program Management Office (FEA-PMO)
 - FEA Reference Models
 - Solution Architects Working Group (SAWG)
- ◆ General Accounting Office (GAO)
- ◆ The 24 Presidential Priority E-Gov Initiatives
- ◆ NASCIO, State and Local Governments
- ◆ Communication and Outreach:
 - Mark Forman on Web Services
 - Education and Training
 - Participation in Standards Organizations
 - XML Industry Collaboration and Component Registries
 - XML.Gov, FEA-PMO.Gov

Specifically, the Federal CIO Council has reorganized its Architecture and Infrastructure Committee (AIC) to include a group dedicated to the championing of XML and Web Service initiatives

Structure of AIC:

Proposed

- ◆ Architecture Policy
 - Supporting the ongoing maintenance and updates to the Federal Enterprise and associated reference models

- ◆ Component Architecture
 - Update and maintain the library of hardware, software, and service-components used by agencies

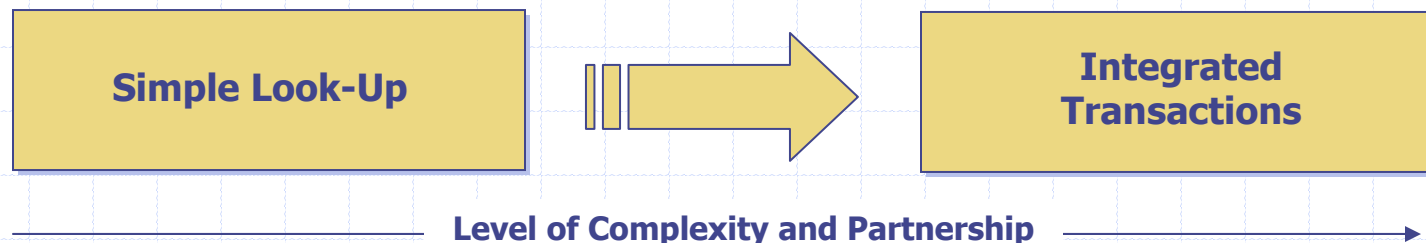
- ◆ Leveraging Technologies
 - Evaluate and recommend new / emerging technologies such as XML and Web Services

So what are Web Services in the Federal Government?

Web Services - Working Description:

- ◆ A web-accessible automated transaction that is integrated into business processes across multiple organizations or applications
- ◆ Invoked through web service interfaces (e.g. SOAP, WSDL, UDDI) with interoperability, business process or workflow management, and functional service components built around common objects (see, e.g., Gartner, T-15-5270, 14 March 2002)

Classification of Government Web Services



XML and Web Service technologies are now included in multiple sets of government guidance, recommendations, and voluntary standards to support the implementation of new initiatives

Extensible Markup Language (XML)

- ◆ XML is a platform independent, universal language used to support the structuring and integration of documents and data on the web. XML is a flexible set of standards for tagging/classifying information so that it can be easily read and interpreted by people and data exchange systems. Reference: <http://www.w3.org/xml>

Universal Description, Discovery and Integration (UDDI)

- ◆ UDDI is the “yellow pages” of XML Web Services. UDDI is a platform independent, open framework for describing and integrating business services over the Internet. Reference: <http://www.uddi.org>

Simple Object Access Protocol (SOAP)

- ◆ SOAP is an XML-based messaging technology standardized by the World Wide Web Consortium (W3C), which specified the necessary rules for locating XML Web Services, integrating them into applications, and communicating between them. Reference: <http://www.w3.org/TR/soap12-part1/>

Web Services Description Language (WSDL)

- ◆ WSDL is an XML document that describes a set of SOAP messages and how they are exchanged. WSDL uses an XML structure to describe message formats based on XML Schema. Reference : <http://www.w3.org/TR/wsdl>

Web Service can assist in streamlining and connecting multiple business lines across the Federal Government

Sample List

Services to Citizens

Disaster Management

- Location of Assets
- Predictive Modeling Results
- Availability of Hospital Beds

Immunization Management

- Vaccine Inventory
- Demand Forecasting
- Availability, Locations

Trade (Import/Export)

- Cargo Receipts
- Stock Lookup
- Rejected Cargo

Support Delivery of Services

Strategic Planning

- Access to Capability
- Decision Support
- Data Availability & Analysis

Information Collection

- Whether, Geospatial Data
- Criminal Records
- Labor, Census Stats

Project Planning

- Remote Engineering
- Real-time Monitoring
- Access to IC / data

Internal Operations / Infrastructure

Financial Management

- Debt Collection
- Payment Processing
- Collection, Reporting

Benefits / Grant Management Supply Chain Management

- Benefit Availability
- Straight-thru Processing
- Aggregate Reporting
- Demand Forecasting
- Supplier/ Buyer Integration
- Automated Order Processing

Some fundamentals for our success in applying Web Services are:

- ◆ Identify common functions, interdependencies, interrelationships, and evaluate barriers to information sharing
- ◆ Implement in a way that addresses both the opportunities and risks of a “networked” environment
- ◆ Leverage technologies to achieve benefits of interoperability while protecting societal values of privacy and intellectual property rights, etc.

Web Services can provide the basis for the rapid assembly and expansion of cross-agency initiative and inter/intra governmental business services

New Initiative

FEDERAL ASSET SALES

Agency: (multiple)
Service Layer: Back Office Services
Service Type: Asset / Materials Mgmt
Component: Asset Cataloging
 Asset Identification
Access Channel: Web Browser
 Wireless
Delivery Channel: Internet (HTTPS)

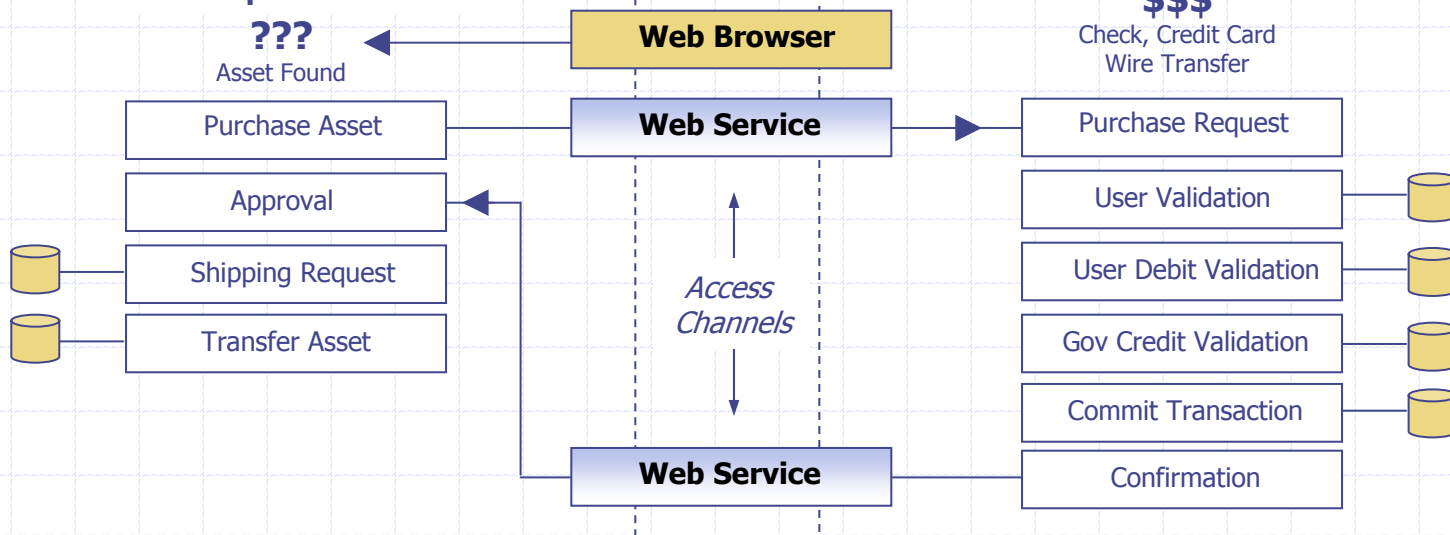
Existing Capability

Conceptual

PAY.GOV

Agency: Department of Treasury
Service Layer: Back Office Services
Service Type: Financial Management
Component: Debt / Payment Collection
Access Channel: Web Service
Delivery Channel: Internet (HTTPS)

Conceptual Process



There are several fundamentals that will contribute to the success of Web Services across the Federal Government

- ◆ Identify common functions, interdependencies, interrelationships, and evaluate barriers to information sharing
- ◆ Implement in a way that addresses both the opportunities and risks of a “networked” environment
- ◆ Leverage technologies to achieve benefits of interoperability while protecting societal values of privacy and intellectual property rights, etc.
- ◆ Focus on small accomplishments vs. the “big-bang” approach
- ◆ **Most importantly... establish partner agreements with stakeholders in the business value chain**

In addition, there are several challenges and obstacle the Federal Government must consider / overcome

- ◆ **Hype, Confusion, and Definition** – many different definitions of Web Services, using Web Services for the wrong reasons
- ◆ **Performance and Scalability** – HTTP processing is slower than traditional transaction mediums (i.e., Corba, JMI, DCOM)
- ◆ **Integrity** – reliability and availability of Web Service value chain
- ◆ **Security** – data transmission, confirmation, encryption
- ◆ **Configuration Management** – modifications of Web Services in a value chain, propagation of changes and configurations
- ◆ **Interfaces** – service level agreements, partnerships, agreements
- ◆ **Data Ownership** – authority, permissions

The Federal Government has (and is) piloting multiple projects that leverage XML and Web Service technologies...

Sample List

Pilot No.	Purpose	Database	VoiceXML	Query
1 (Fall 2001)	EPA Emergency Response	FileMaker 5.5 (Apple Computer)	Tellme, Inc.	ZIP Code (Area Code-to-ZIP Code Default)
2 (Spring 2002)	Federal "Blue Pages" Directory	MS Access-NextPage NXT 3	Tellme, Inc.	Government Function
3 (Fall 2002)	Public Directory Listings	Qsent	Real Soft, Inc.	Name, Address, Phone Number, Geography, etc.
4 (in process)	Public & Government Directory Listings	Qsent & Agency XML Web Services	Real Soft, Inc.	Name, Address, Phone Number, Geography, etc.
5 (in process)	EPA Facility Data Accuracy Improvement and Data Collection	Osent & EPA Facility XML Web Services	Real Soft, Inc. and Partners	Name, Address, Phone Number, Geography, etc.

Table of Contents:

- ◆ Introduction to E-Government
- ◆ The Federal Enterprise Architecture (FEA)
- ◆ XML and Web Services in the Federal Government
- ◆ Questions