



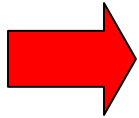
The Potential of Web Services and Enterprise Portals for Data Administrators

Section 3

Web Services Directions for Data Administrators



Session Topics



- **Web Services Evolution**

- Phase 1: 1999-2001
- Phase 2: 2002-2004
- Phase 3: 2005 and beyond

- **EAI and Web Services Directions for Data Warehouses**



Web Services Market Evolution

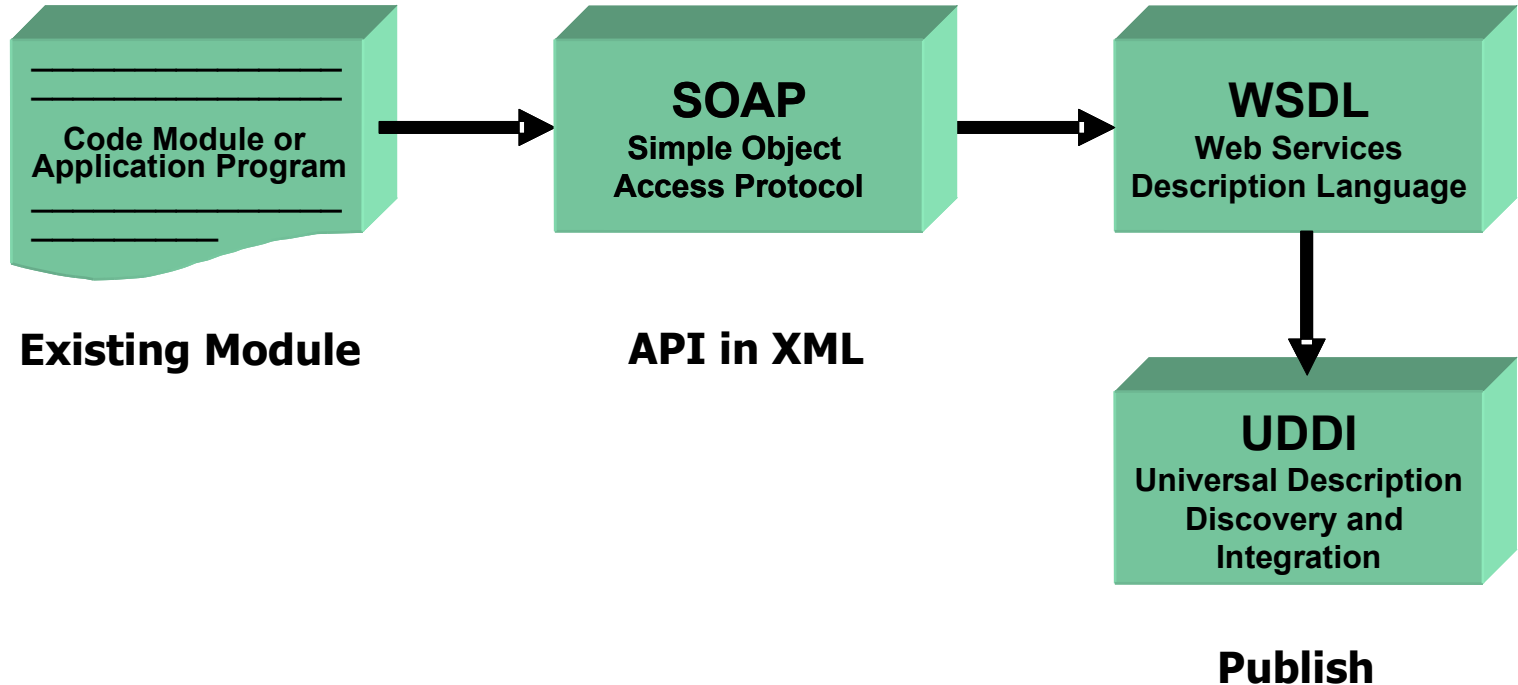
■ **Phase 1: 1999-2001**

- SOAP, WSDL and UDDI Specs Developed

■ **Initial Web Services Development Tools**

- IBM WebSphere Studio
Application Developer (Nov 2001)
- Microsoft Visual Studio.Net (Feb 2002)
- Software AG EntireX (Aug 2001)
- Borland JBuilder 6 (Jan 2002)
- Oracle JDeveloper 4 (Jan 2002)
- + Many Others ...

Phase 1 Web Services Languages



- WSDL points to SOAP on Server
- UDDI publishes Web Service to Directory



Phase 2 WS Market Evolution

- Phase 2: 2002-2004
 - Business Web Services Appear (Gartner)
- 2002: B2C Web Services
 - EG. Microsoft "My Services" (was Hailstorm)
- 2003: UDDI Registry Adoption
 - Private UDDI Registries support Private Exchanges
- 2004: Web Services Business Models
 - 40% Financial Services Transactions
 - 35% Online Government Services (Gartner)
 - New Revenue Generation Models
 - EG. ASP Delivery of Web Services as "Information Utility"



EXAMPLE: Microsoft “My Services”

- .NET Profile: *Important*
 - Name, nickname, special dates, picture, address
- .NET Contacts:
 - Electronic relationships/address book
- .NET Locations: *Important*
 - Electronic and geographical location and rendezvous
- .NET Alerts: *Important*
 - Alert subscription, management, and routing
- .NET Presence: *Important*
 - Online, offline, busy, free, which device(s) to send alerts
- .NET Inbox: *Important*
 - Inbox items like e-mail and voice mail, including existing mail systems
- .NET Calendar: *Important*
 - Time and task management



EXAMPLE: Microsoft “My Services”

- .NET Documents:
 - Raw document storage
- .NET ApplicationSettings:
 - Application settings
- .NET FavoriteWebSites:
 - Favorite URLs and other Web identifiers
- .NET Wallet:
Important
 - Receipts, payment instruments, coupons, and other transaction records
- .NET Devices:
Important
 - Device settings, capabilities
- .NET Services:
Important
 - Services provided for an identity
- .NET Lists:
 - General purpose lists



Phase 2 Web Services Issues

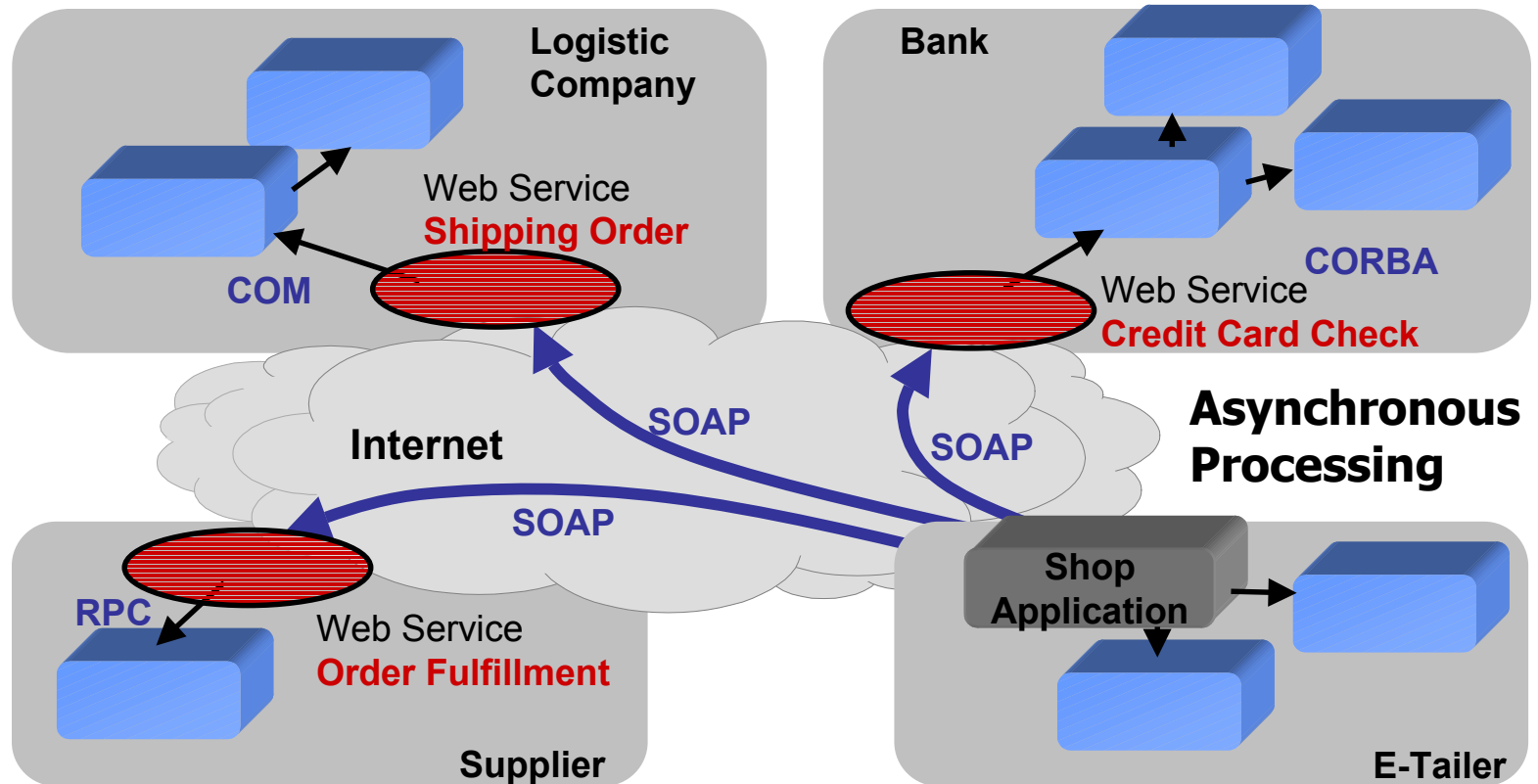
- Quality of Service
 - Performance; Error Management etc
- Network Reliability and Security
 - Authentication (Service Provider and Requestor)
 - Data Encryption; Non-Repudiation
- Real-Time Messaging
 - Synchronous and Asynchronous Messaging
- Transaction Recovery
 - Multi-part and multi-enterprise transaction recovery
- Billing Mechanisms
 - Pay-per-Use or Monthly/Annual Subscription Fee



Phase 2 Web Services Issues

- Network Vendors to Address Issues:
- Grand Central
 - Centralized Hub Topology
 - Transactional Stability, with network monitoring
- Flamenco Networks
 - Server proxy for multipoint network
 - Transactional Stability, with network monitoring
- Kenamea
 - “Last Mile: delivery for many device types
 - EG. For Supply Chain Network Management

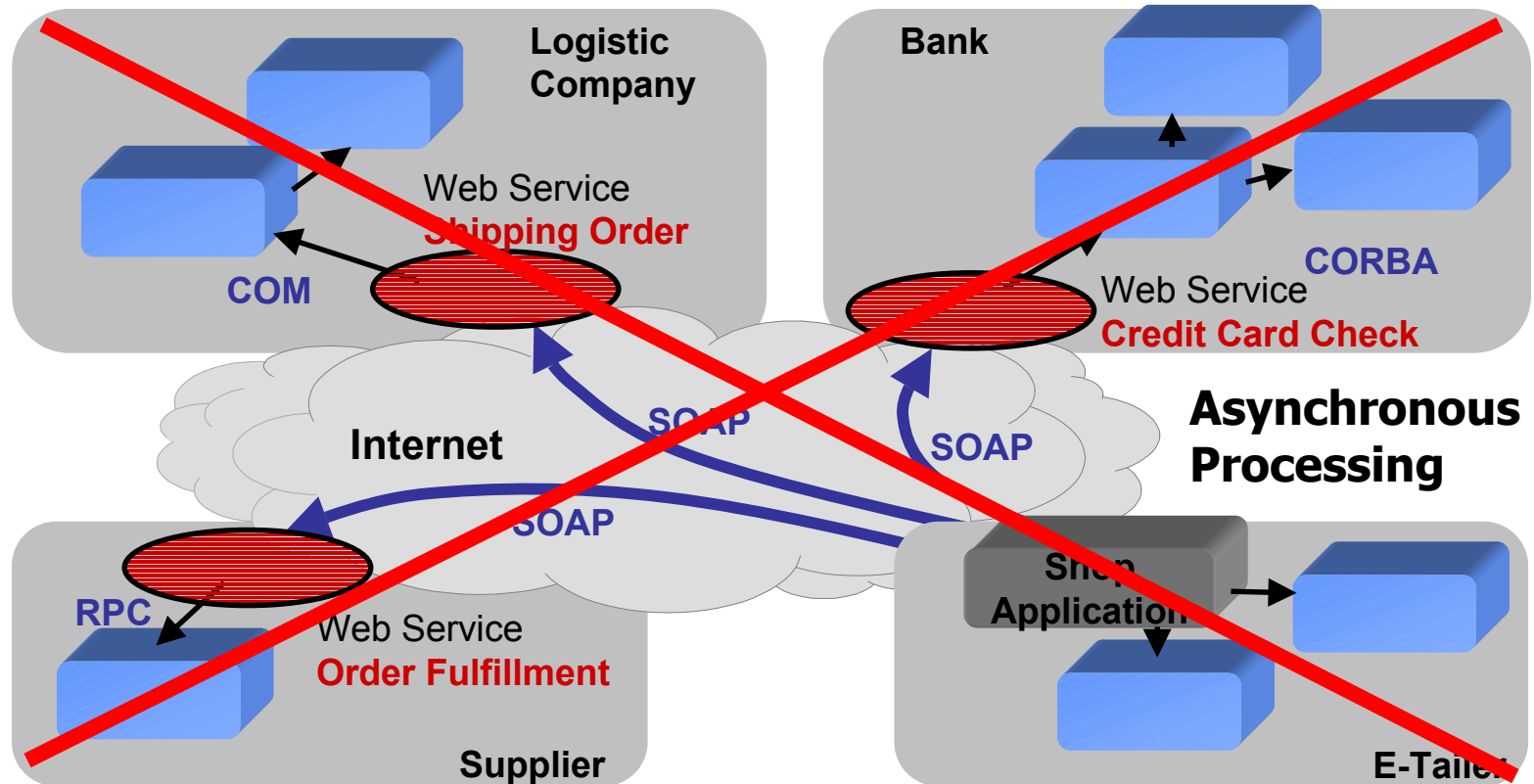
What Errors Can Occur?



- **Bank: Invalid Credit Card or Insufficient Credit?**
- **Supplier: Out of Stock Products – Backordered?**
- **Logistics: Supplier or Customer Location?**

Card Number or Credit Limit Error

RESULT: LOST BUSINESS



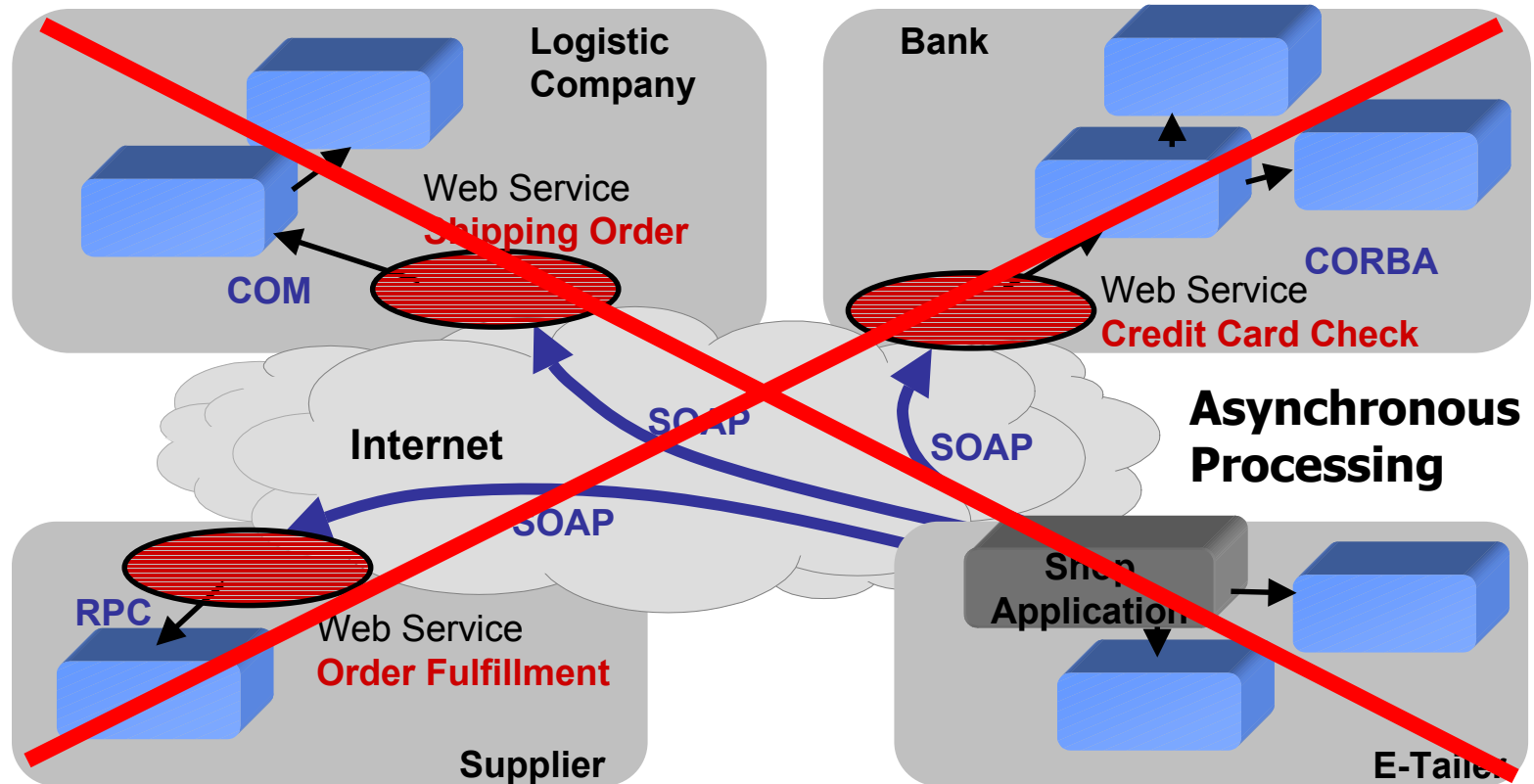
- 1. Bank Rejects Credit Card (Invalid or Limit)
- 2. Action: Cancel Order if Card Rejected
- 3. Notify Customer of Reason for Cancellation

Source: Software AG

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Products Out of Stock Error

RESULT: LOST BUSINESS



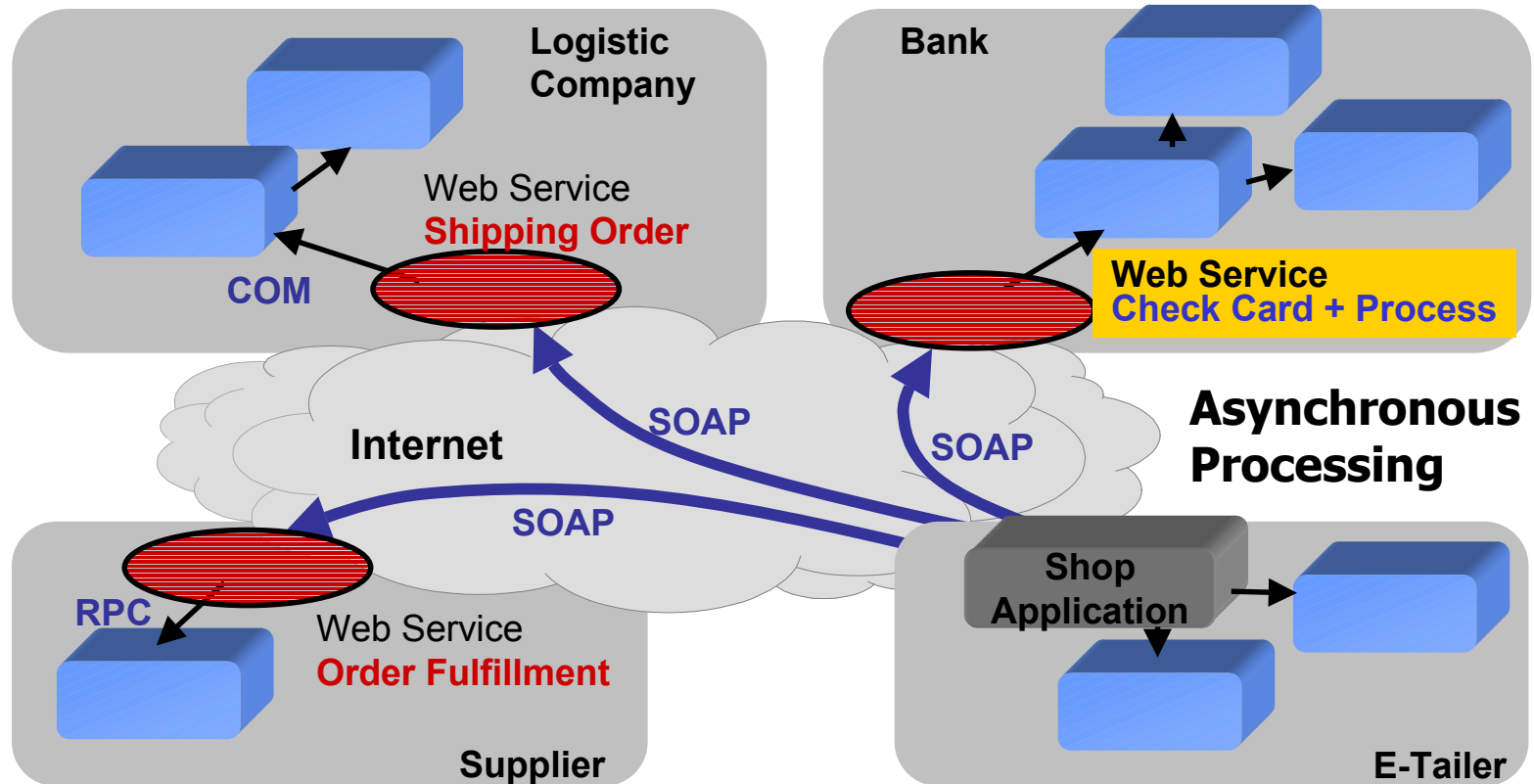
- 1. Bank Accepts Credit Card: Deposits Total Order Amount
- 2. Order Products from Supplier: Out of Stock Error
- 3. Bank Processes Credit: Reverses Payment
- 4. Customer Notified of Reason for Cancellation

Source: Software AG

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Real-Time Error Management

RESULT: SATISFIED CUSTOMER



- 1. Bank Authorizes Credit Card (also checks limit)
- 2. Supplier Fulfills Available Products; Adjusts Order Amount
- 3. Bank Processes Adjusted Payment (less Backorders)
- 4. Shipping Order Placed for Supplier Pickup
- 5. Customer Notified of Part Shipment, with Backorders Later

Source: Software AG



Phase 2 Web Services Languages

- **SOAP-DSIG**

- *SOAP Digital Signatures*: XML protocol developed by IBM for digitally signing and securing SOAP messages

- **WSIL**

- *Web Services Inspection Language*: Complements UDDI by facilitating the discovery of available Web Services on Web Sites, but which may not yet be listed in a UDDI Registry

- **WSFL**

- *Web Services Flow Language*: XML protocol being developed by IBM for submission to W3C. WSFL defines workflows for integration of Web Services

- **WSCM**

- *Web Services Component Model*: Being defined by OASIS for the composition and presentation of Web Services



Phase 2 Web Services Languages

- **ebXML**

- *Electronic Business XML*: Specifies XML protocol for EDI
 - Defines ebXML Registry entries (similar in concept to UDDI), with ebXML message envelope formats, business process definitions (via UML) and other process invocation details

- **BizTalk**

- *BizTalk Server*: Microsoft BizTalk supports XML messaging and B2B integration
 - Uses BizTalk message envelope format, Business Process Orchestration, and XML Transformation Data Mapping

- **HTTPR**

- HTTPR is proposal for reliable transport over HTTP

- **XML-Signature**

- Specifies representation and verification of digital signatures

- **XML-Encryption**

- Specifies encryption of digital content



Phase 2 WS Language Resources

- **SOAP-DSIG** <http://www.w3.org/TR/SOAP-dsig/>
- **WSIL – Web Services Inspection Language:**
<http://www-106.ibm.com/developerworks/webservices/library/ws-wslover/>
- **WSFL – Web Services Flow Language:**
<http://www-3.ibm.com/software/solutions/webservices/documentation.html>
- **WSCM – Web Services Component Model:** <http://www.xml.org/>
- **ebXML – Electronic Business XML:**
<http://www.xml.org/>
<http://www.ebxml.org/>
- **BizTalk – BizTalk Server:** <http://www.microsoft.com/biztalk/>
<http://www.biztalk.org/>
- **HTTPR** <http://www.w3.org/>
- **SAML – Security Assertion Markup Language** <http://www.xml.org/>
- **XML-Signature** <http://www.w3.org/>
- **XML-Encryption** <http://www.w3.org/>



Phase 3 WS Market Evolution

- **Phase 3: 2005 and beyond**

- Public UDDI Registries Appear

(Gartner)

- 2005: Public B2B Web Services Exchanges
- 2005: Dynamic Web Services



Phase 3 Web Services Issues

- What revenue models will be applicable?
- How does service provider address pricing?
- Does service provider host their service or outsource the hosting?
- How is billing handled?



Phase 3 Terminology

■ **Asset Owner**

- Person or entity that owns a particular Web service and associated intellectual property pertaining to the software resource

■ **Hosted Service Provider**

- Type of asset owner. Usually companies that have a software asset enabled for Web services
- Use business-model-like subscription and deployable environment to be hosted and managed
- Role best suited for small ISVs who delegate actual hosting of service to an entity more adept at managing the infrastructure and quality of service issues associated with such a role

■ **Independent Service Provider**

- Usually companies that wish to establish their own environment for Web services
- May create a private UDDI node to publish those services to the Web. Role is best suited for enterprise customers



Phase 3 Terminology

■ **Service consumer**

- Requesting application or service provider that will consume at least one, fee-based software service (function/operation)

■ **Service broker**

- Role addressed by possibly two companies, such as:
 - Any business entity interested in exploring the opportunities around directory services or yellow pages for reusable software components
 - A vendor who can provide necessary UDDI and hosting assets needed to provide a public UDDI service (green pages)

■ **Service provider**

- Entity that implements hosting environment for asset owner
- May be same as asset owner, as for independent service provider
- Responsible for deployment environment and provisioning aspects related to making a fee-based Web service available for sale

■ **Software Asset Mall (SAM)**

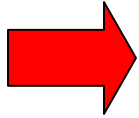
- Business entity that provides deployment and hosting facilities for two or more asset owners (hosted service providers)
- Operator of mall will collect revenue based on a combination of possible service fees: hosting charges, transaction surcharges and access registration



Session Topics

- **Web Services Evolution**

- Phase 1: 1999-2001
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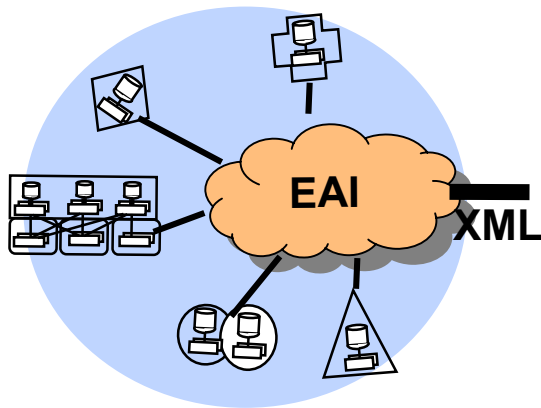


- **EAI and Web Services Directions for Data Warehouses**

Web Services Steps

Step 1 : EAI

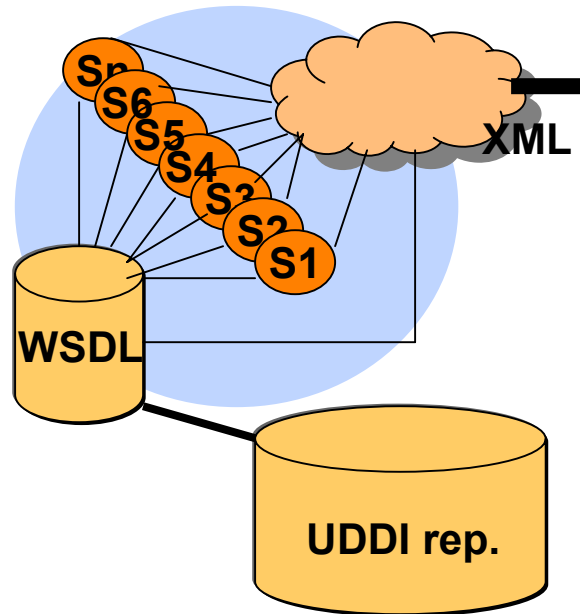
Result : Internal consolidation



Benefit: one point of access to all internal information

Step 2 : Web services

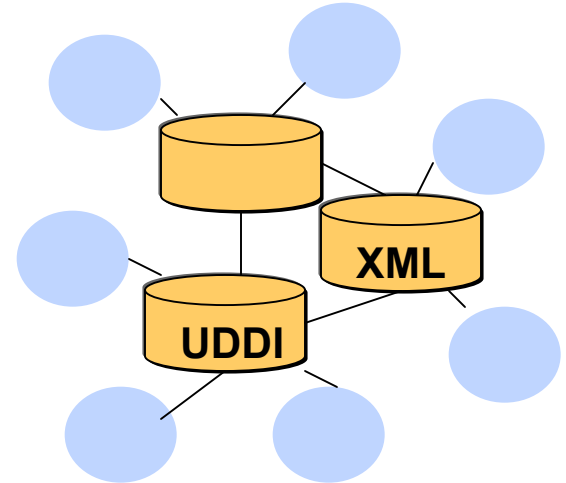
Result : Service offering



Benefit : standardized service offering based on standards

Step 3 : Collaboration

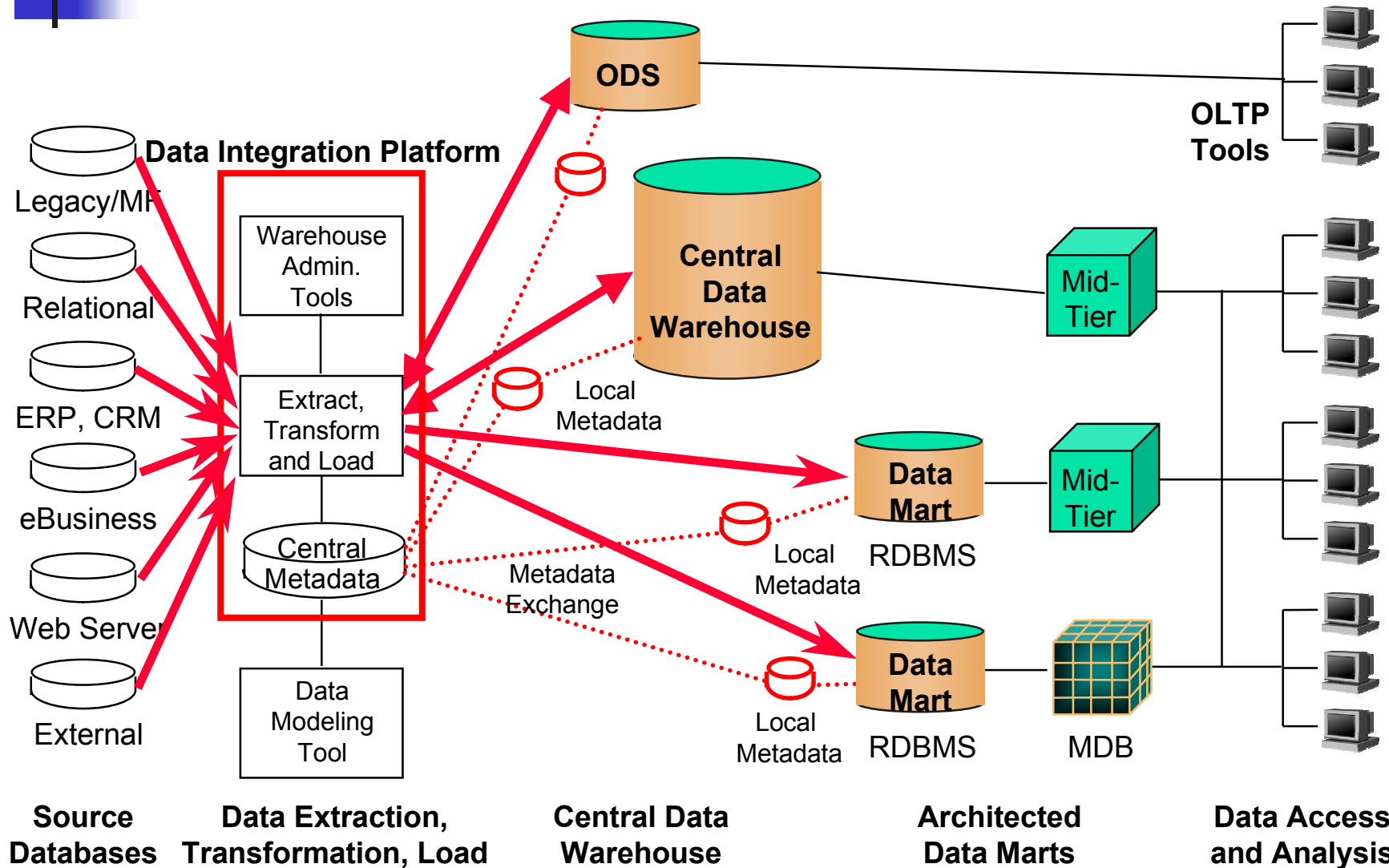
Result : Total e-business



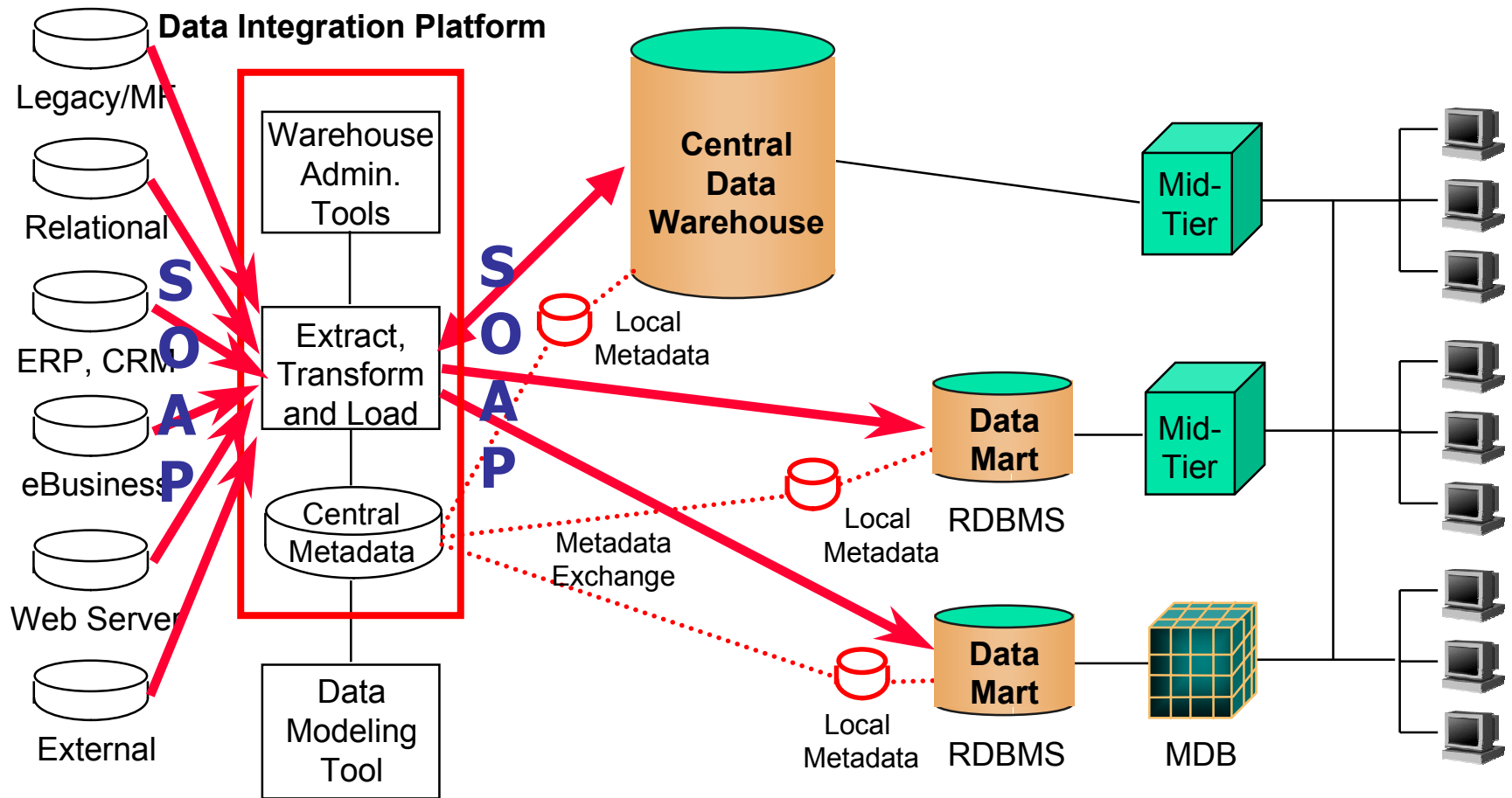
Benefit : business from everywhere

Source: Software AG

Recommended DW Architecture



Data Warehouse Integration via ETL Hub using SOAP, WSDL, UDDI Web Services



Source Databases Data Extraction, Transformation, Load

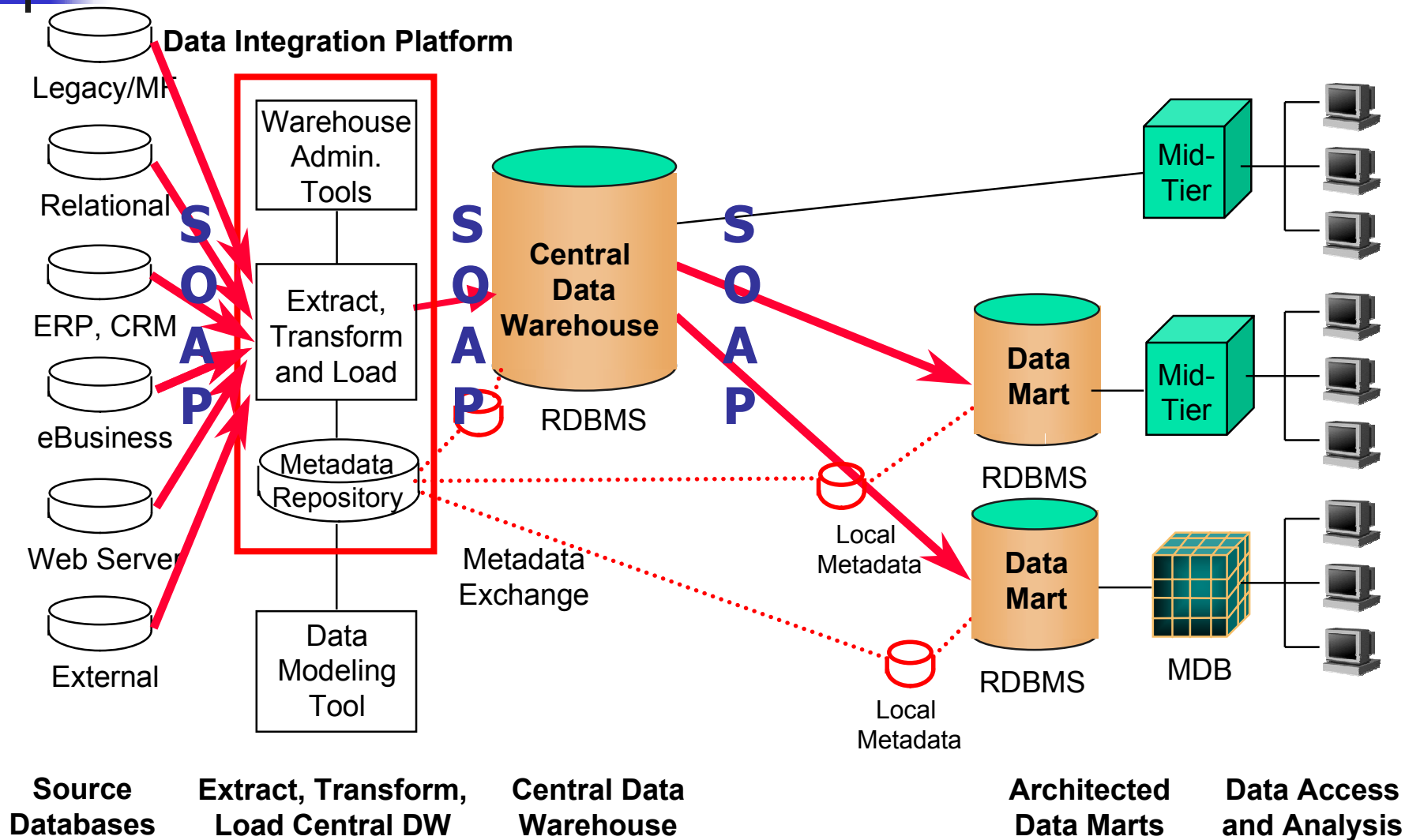
Central Data Warehouse

Architected Data Marts

Data Access and Analysis

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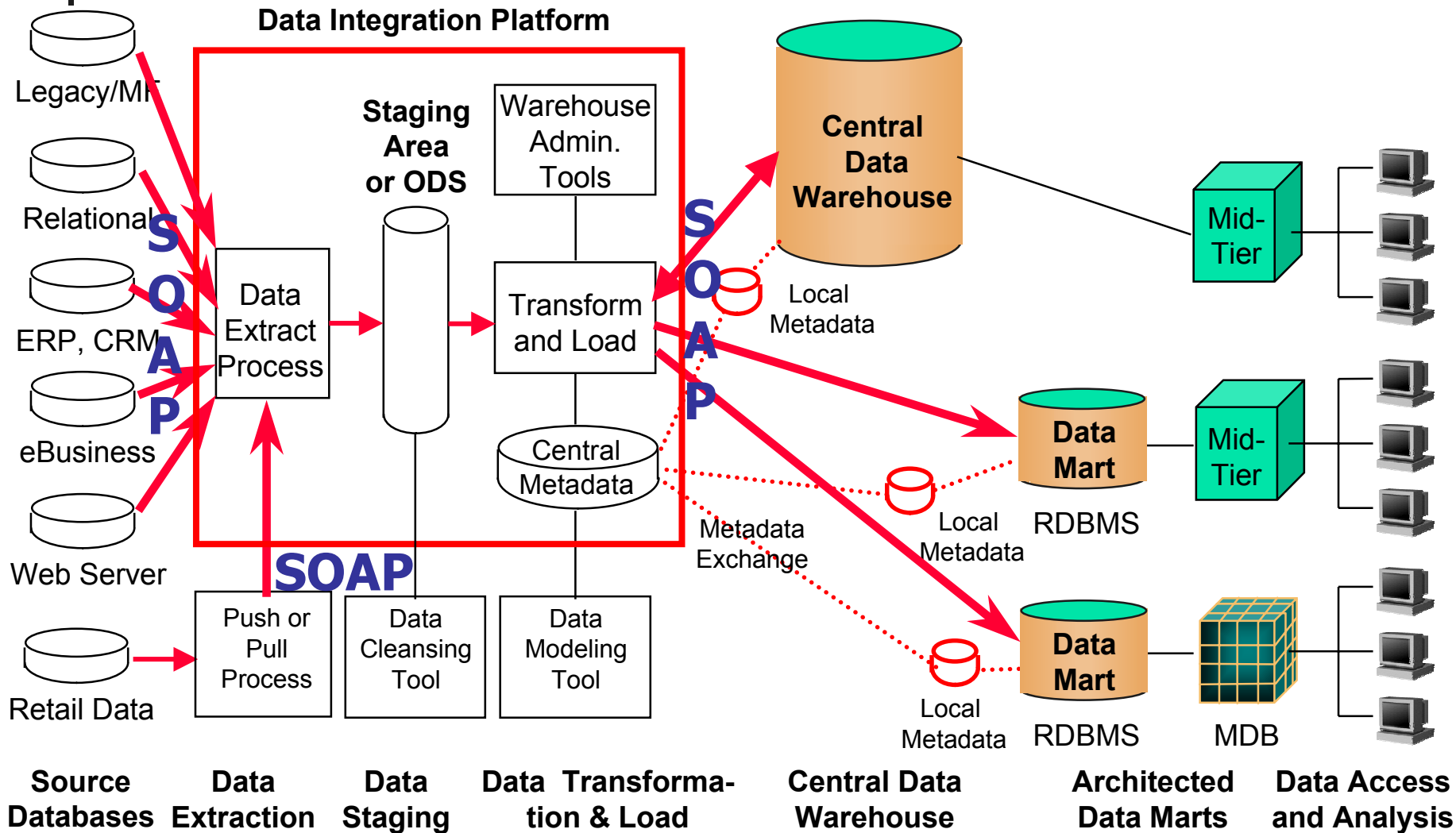
Data Warehouse Integration via DW Hub using SOAP, WSDL, UDDI Web Services



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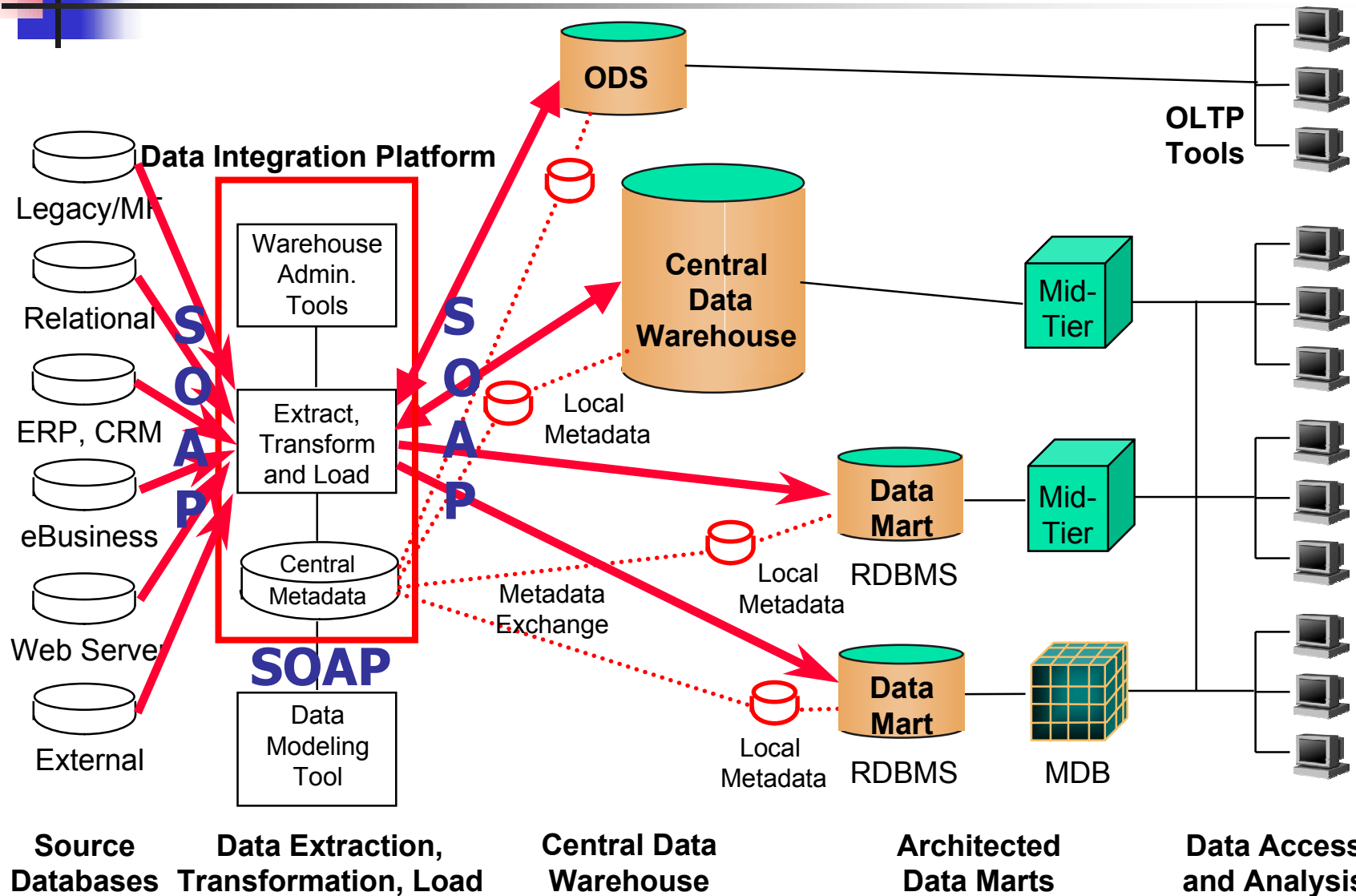
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Source Data Integration in Staging Area using SOAP, WSDL, UDDI Web Services



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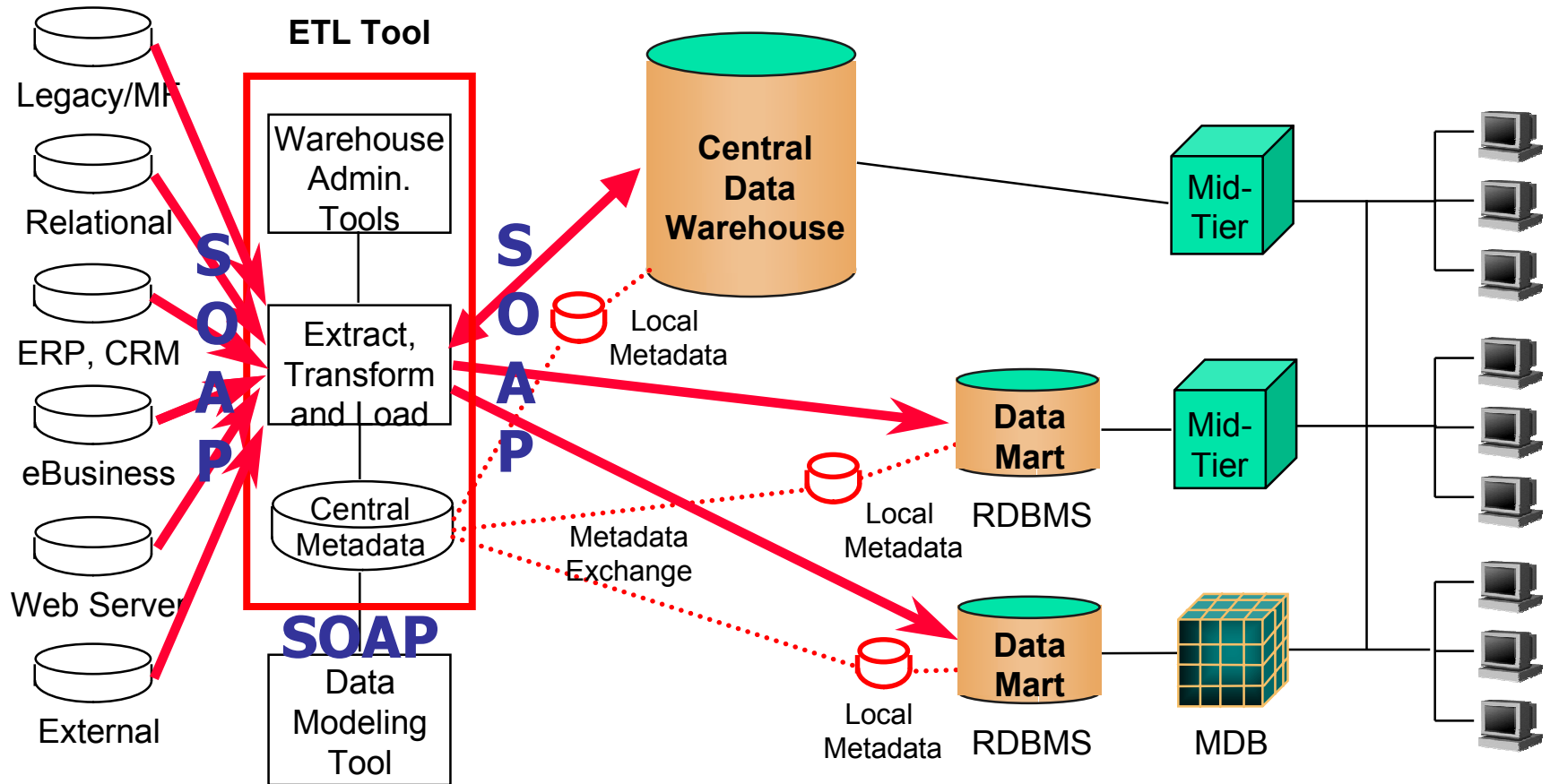
Operational Data Store as DW Source using SOAP, WSDL, UDDI Web Services



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Integrating ERP Packages in DW using SOAP, WSDL, UDDI Web Services



Source Databases **Data Extraction, Transformation, Load**

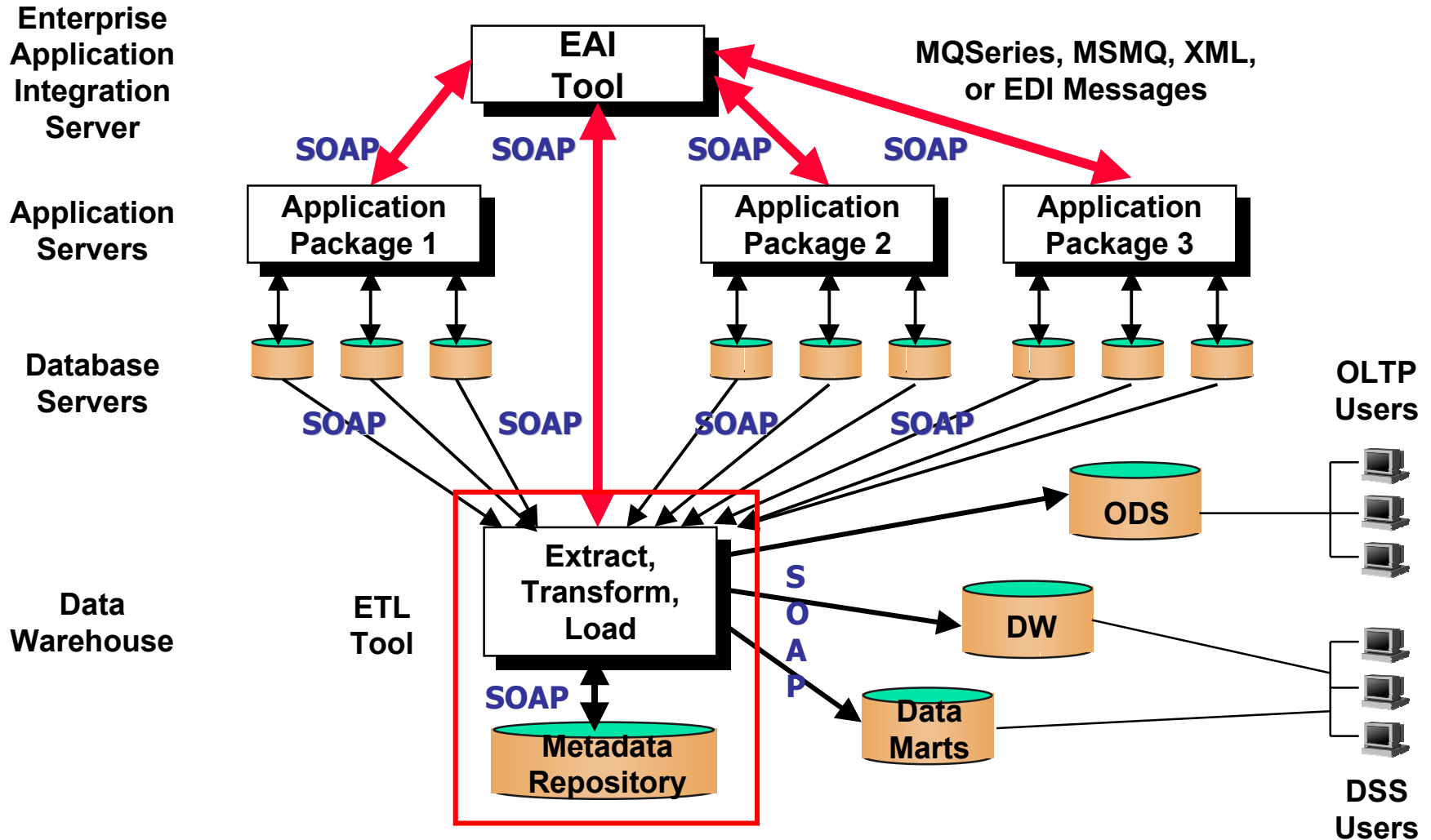
Central Data Warehouse

Architected Applications

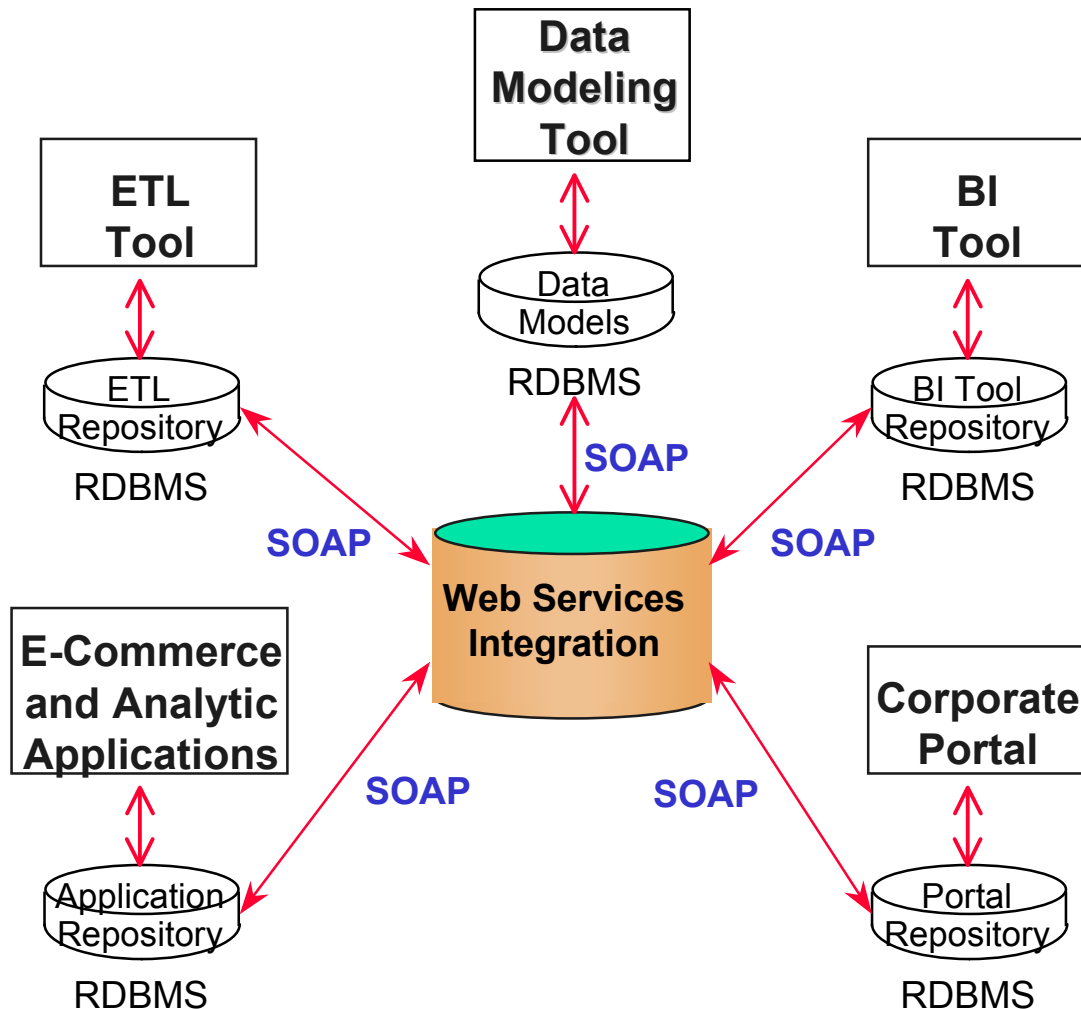
Data Access and Analysis

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DW Analytics using SOAP, WSDL and UDDI Web Services



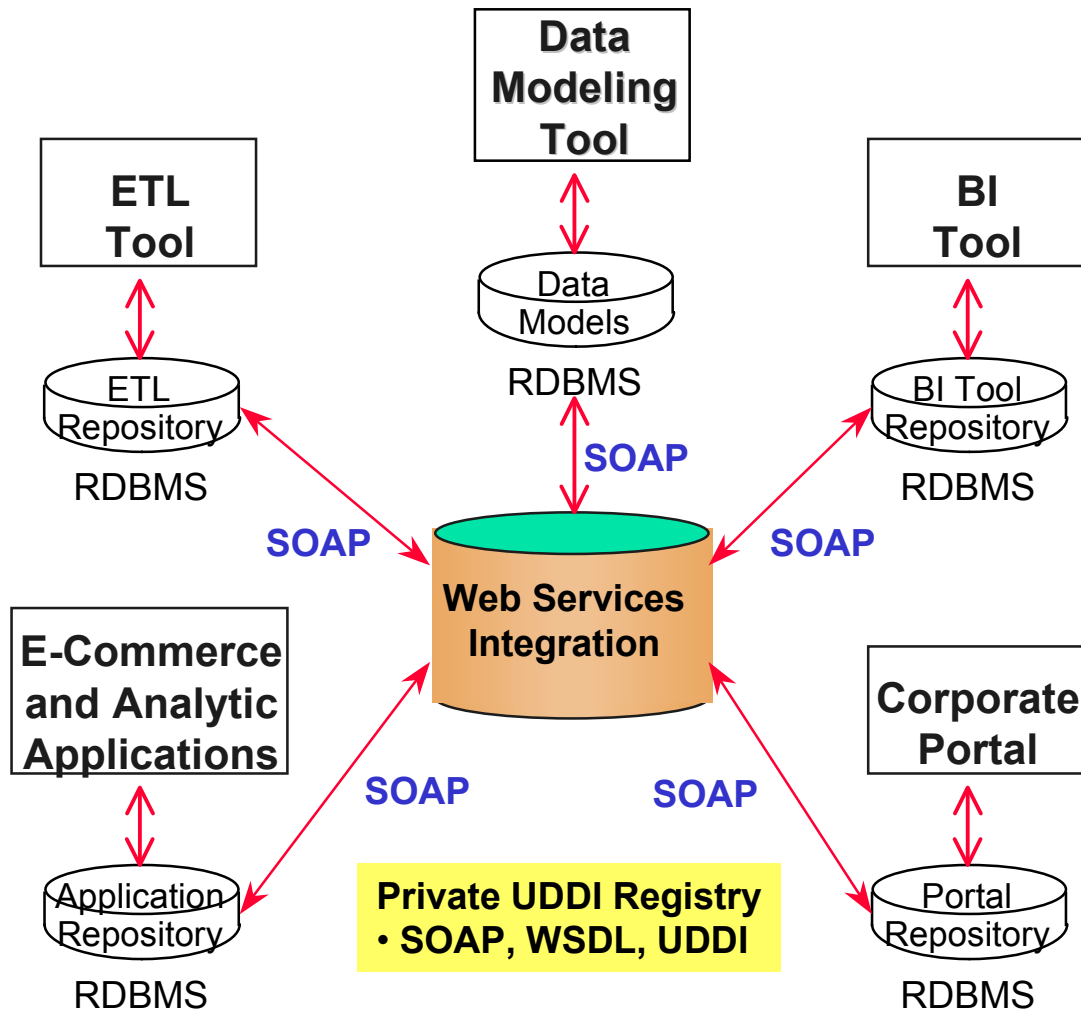
Metadata Integration using SOAP, WSDL and UDDI Web Services



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Enterprise Portal Evolution Based on Web Services



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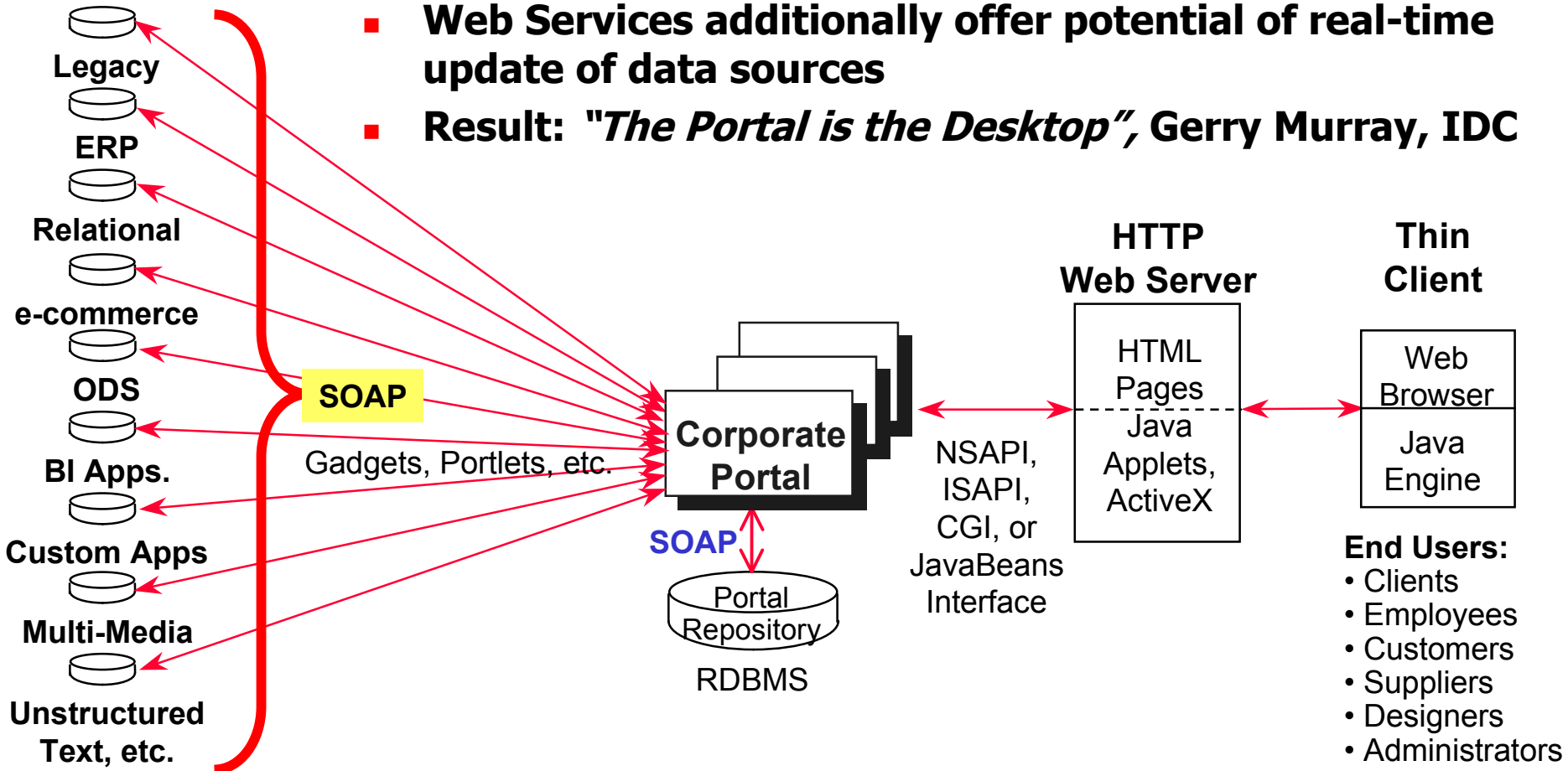


Web Services in Portals

- **Aggregate Web Services into Portals and Provide Access from Any Device**
 - Provide a Single Point to Access Web Services
 - Allow Users to Personalize Web Services they Access
 - Access Web Services from Any Device, Anywhere
 - Provide Single Sign-On across Web Services

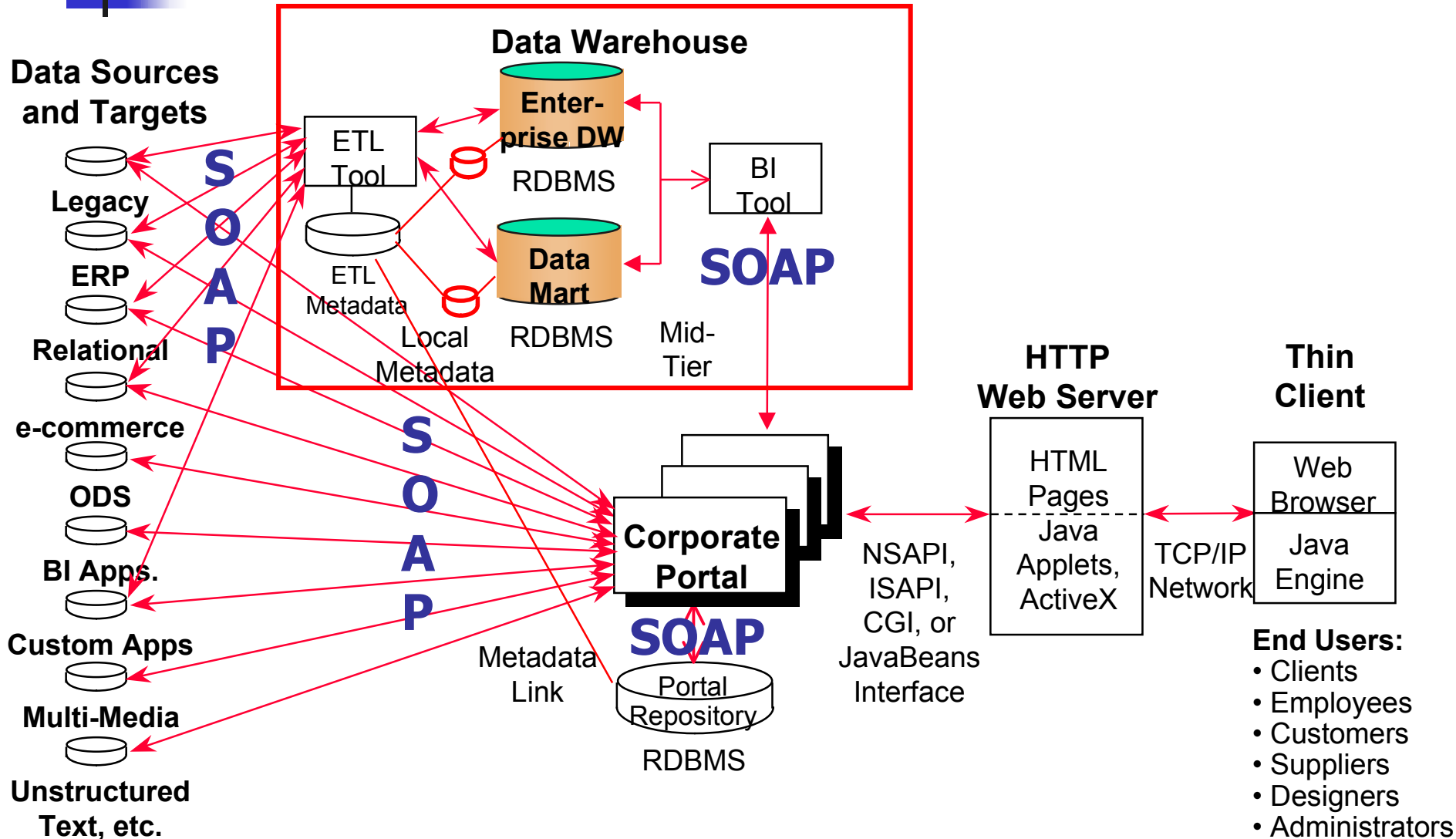
Corporate Portal using SOAP, WSDL and UDDI Web Services

Data Sources and Targets



- Corporate Portal provides Single Sign-On for Web Services to many data sources
- Web Services additionally offer potential of real-time update of data sources
- Result: *"The Portal is the Desktop"*, Gerry Murray, IDC

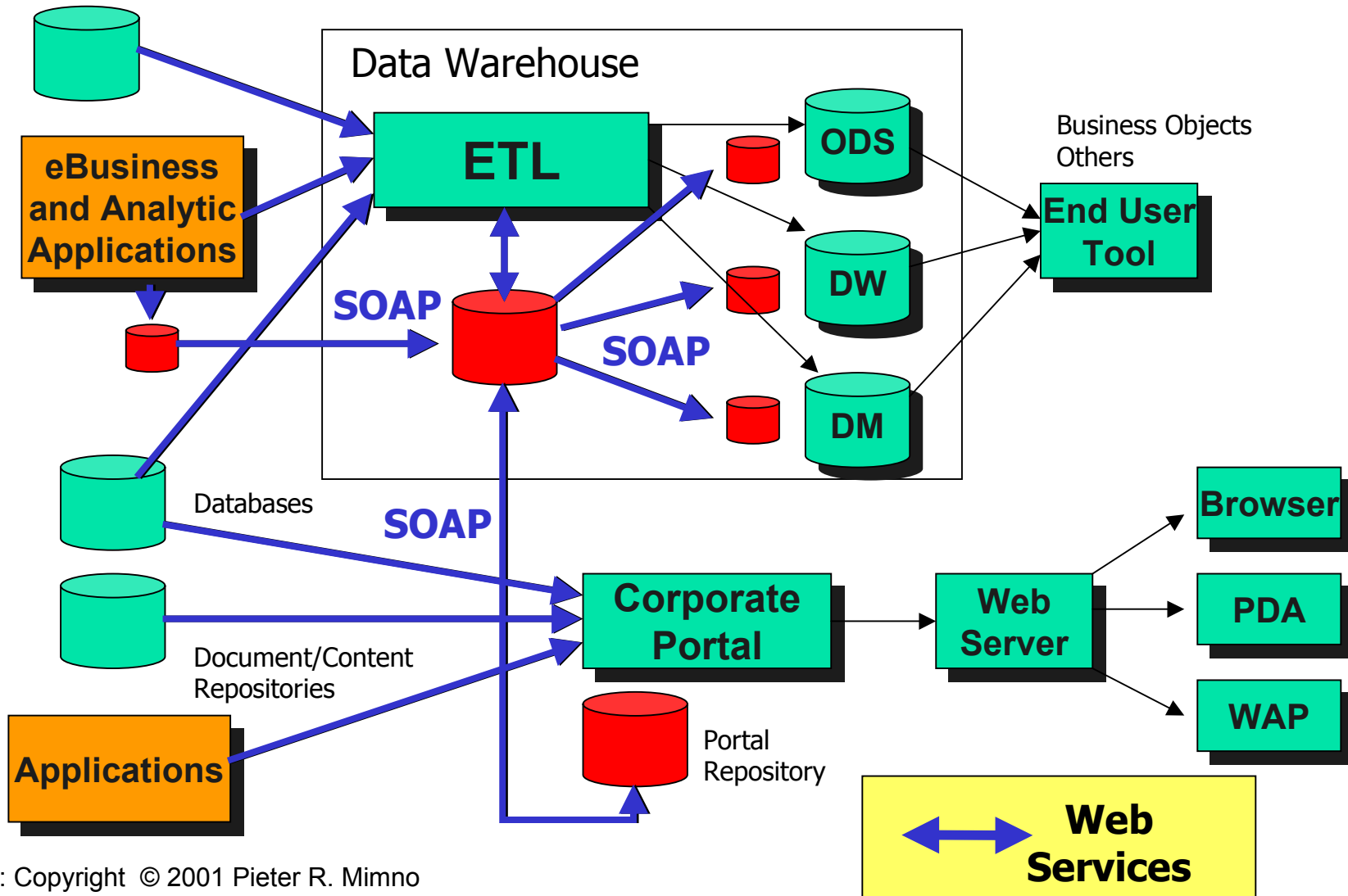
Corporate Portal Front-End to DW using SOAP, WSDL and UDDI Web Services



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Business Intelligence Portal Evolution using SOAP, WSDL and UDDI Web Services

Data Sources



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Directions of BizTalk, ebXML and Web Services for Data Warehouses

- **Which will be the Winner?**
 - None ... Or All?
- **BizTalk already uses SOAP**
 - Will likely be Web Services delivery vehicle
 - Will likely also accept ebXML messages
 - ebXML Products to interoperate with BizTalk?
- **BizTalk, ebXML and Web Services**
 - All expected to be interoperable
- **Implications for Data Warehouses?**
 - EAI and Web Services support are responsibility of ETL, ERP and other software vendors
 - BizTalk, ebXML and Web Services Interoperability:
 - Offers Protection from Obsolescence?



SUMMARY OF SOAP ALTERNATIVES

SOAP Alternatives for Data Warehouses

- DW Integration via ETL Hub
- DW Integration via DW Hub
- Source Data Integration
- Operational Data Source
- Integrating ERP Packages in DW
- SOAP for DW Analytics
- Metadata Integration for SOAP
- Corporate Portal Front-End to DW
- SOAP using Corporate Portal

SOAP Using Web Services for Data Warehouses

- Follows in Afternoon Session



SUMMARY OF WEB SERVICES DIRECTIONS

- **Web Services Evolution**

- Phase 1: 1999-2001
- Phase 2: 2002-2004
- Phase 3: 2005 and beyond

- **EAI and Web Services Directions for Data Warehouses**