Electronic Invoice with UBL and DB2 Pure XML

Gianfranco Cesareo
IBM Software Group
Public Sector Industry Solutions
g_cesareo@it.ibm.com
+393357506618

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Will the Italian government be the 2nd in Europe with a law for mandatory electronic invoice to Public customers?

- "l'emissione, la trasmissione, la conservazione e l'archiviazione delle fatture emesse nei rapporti con le amministrazioni dello Stato, anche ad ordinamento autonomo, e con gli enti pubblici nazionali, anche sotto forma di nota, conto, parcella e simili, **deve essere effettuata esclusivamente in forma elettronica**" nel rispetto della normativa attuale (dlgs. 20 febbraio 2004, n. 52, e codice dell'amministrazione digitale – Dlgs. 7 marzo 2005, n. 82)
- Per conoscere le modalità operative occorrerà aspettare un decreto del Ministero dell'Economia, di concerto con il Ministero per le riforme nella Pubblica Amministrazione da emanare entro il 31 marzo 2008
- Passati tre mesi da quel momento, la PA non potrà più accettare fatture che non siano in formato elettronico, e soprattutto, non potranno più pagare se le fatture non arriveranno in quel formato
- Per quanto riguarda la PA locale, la competenza è delle Regioni, per le quali le nuove disposizioni costituiscono "principi fondamentali in materia di armonizzazione dei bilanci pubblici e di coordinamento della finanza pubblica e del sistema tributario" (articolo 117 della Costituzione). Si dovrà perciò attendere le decisioni di ciascuna singola regione e delle due province autonome

Digital signature is required

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XML Solves Business Problems Today

- **Business to Business Integration**
  - Platform independent transport mechanism

    Purchase order triggers transactions flowing over a service oriented architecture

- **Forms and Document Processing**
  - Government and legal industry require digital signature

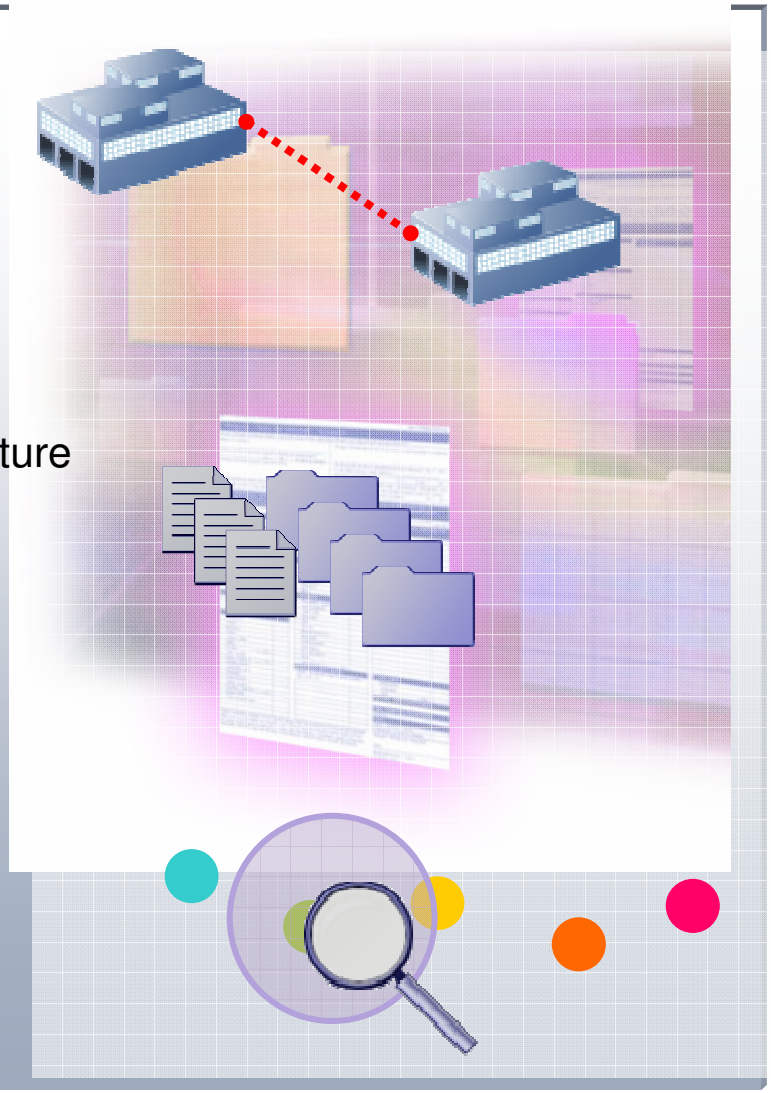
    Tax forms require signature & change year to year

  - Documents often contain sub-documents

    Literary materials contain books, chapters, and sub-chapters

- **Business Insight**
  - Universal representation from multiple sources

    Claims adjustor reviews damage estimates from multiple garages with consideration of original format



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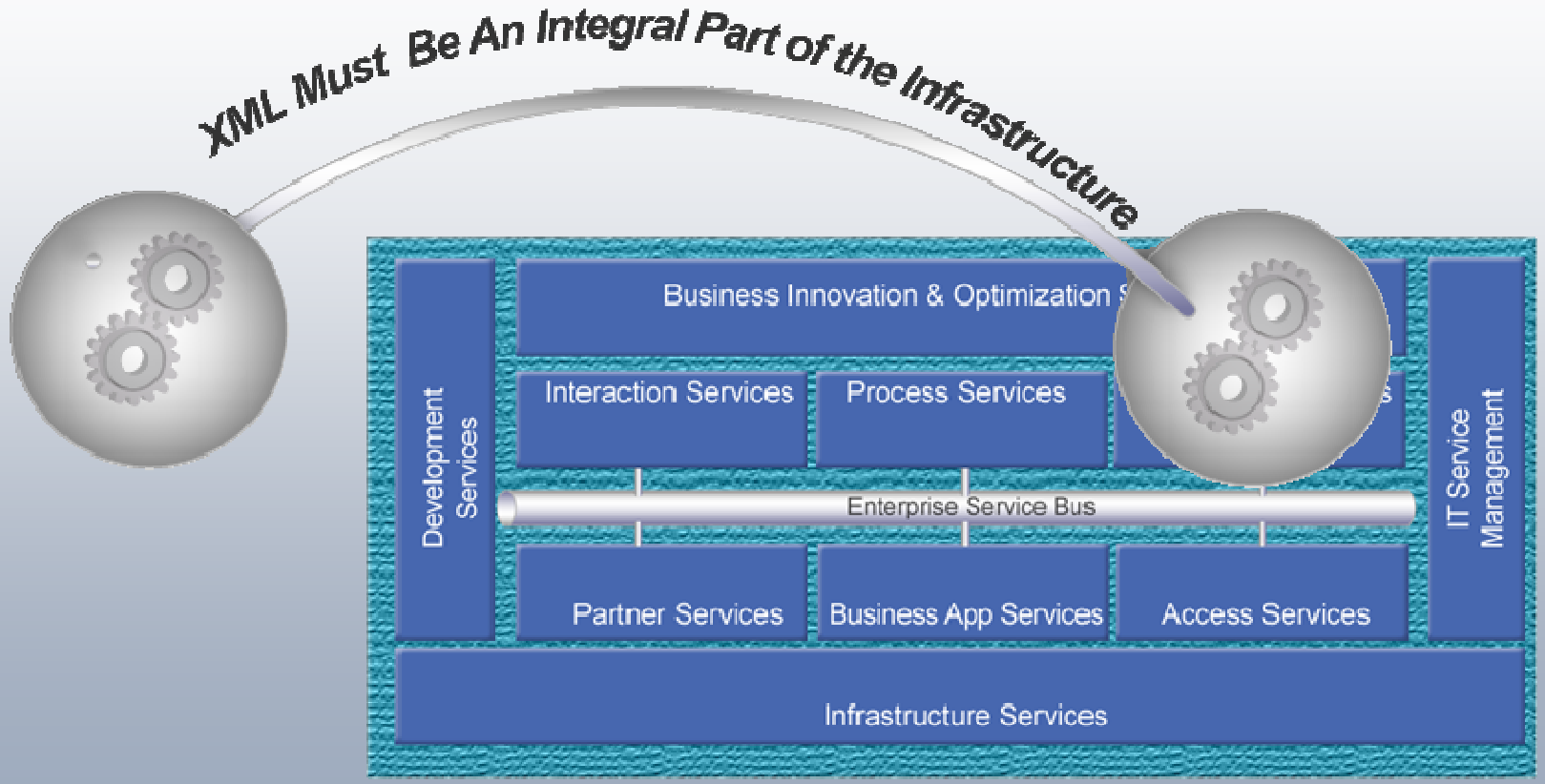
XML - the Fabric of Services Oriented Architectures



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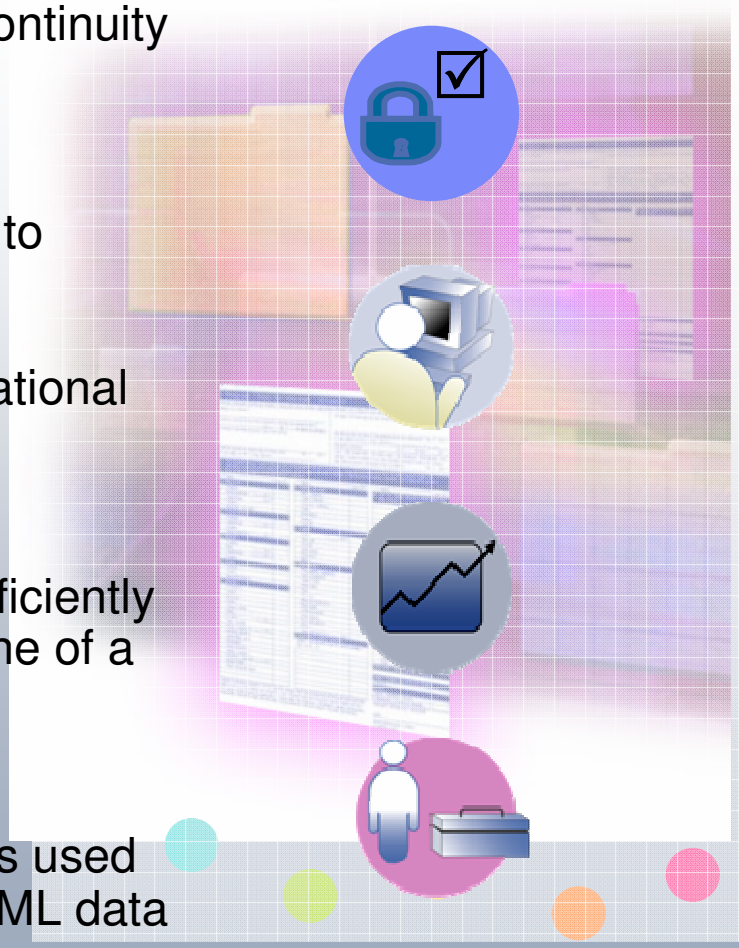
XML Data Needs Relational Maturity

Complementing XML Processing

- ***Enhanced XML Data Protection***
  - Backup and recovery features to ensure continuity
  - Database security features
- ***Simplified XML Data Access***
  - Centralized storage and access of difficult to retrieve data
  - SQL or XQuery for data retrieval
  - Ability to join XML data with it's related relational data
- ***Improved Search Speed***
  - Ability to search documents quickly and efficiently using the proven search optimization engine of a mature database
- ***Optimized Investments***
  - Existing technology infrastructure and skills used to store and manage both relational and XML data



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IBM Leads in Data Server Innovation

68 patents applied for in DB2 9 alone

Over 3,000 data management patents

Innovation Milestones

1968

First Hierarchical Data Server

IBM designs IMS starting in 1966 for the Apollo space program

1980

First IBM Relational Data Server

IBM releases RDBMS for System/38 implementing the Relational model first published by Dr. Edgar Codd

2006

First Multi-Structured Data Server

IBM introduces DB2 9 - first to support both relational and XML structures managed by a single data server

Continuous IBM innovation

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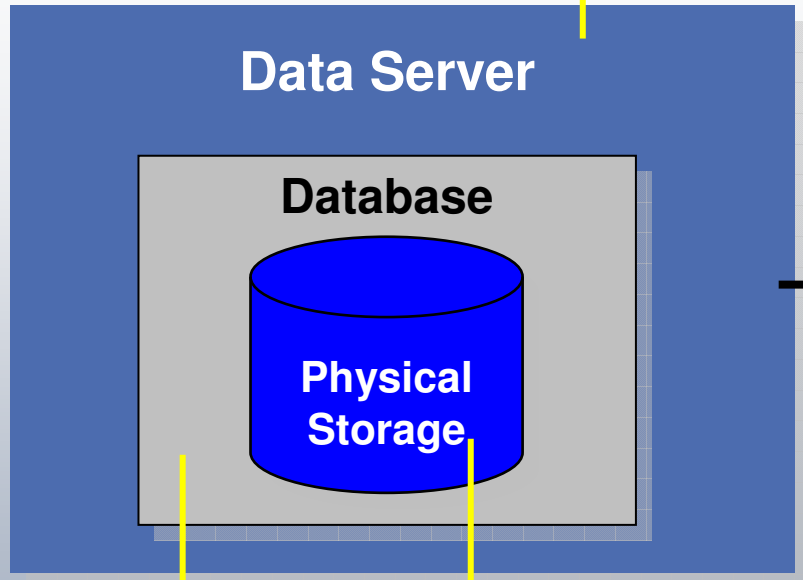
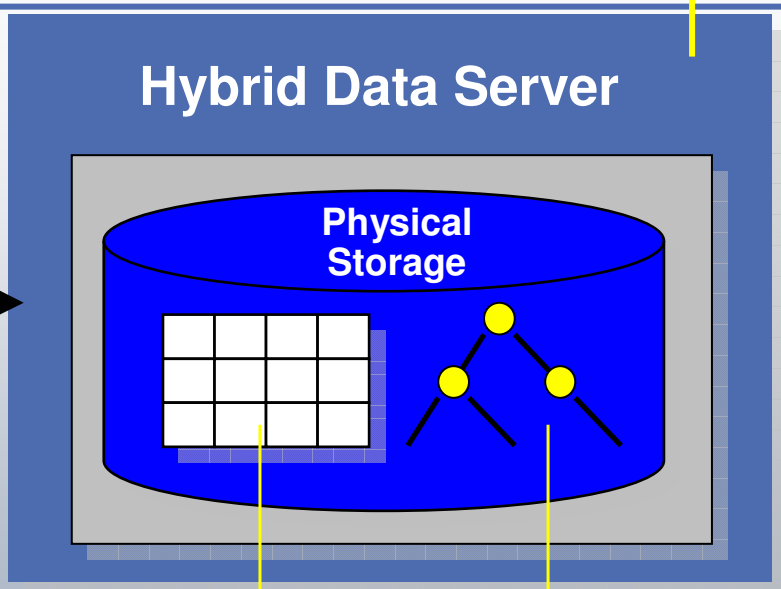
A New Generation Data Server for A New Generation of Applications

Data Server
Services that manage, secure and provide access to the database.

Hybrid Data Server
DB2 supports both relational and pureXML® storage and provides all the necessary services to support both data structures.





Database
Logical view of storage
- *Tables*
- *Views*

Physical Storage
Database files

Relational Storage
Data stored in a row and column format

pureXML® Storage
Data stored in a pre-parsed hierarchical format, not as a single text object (CLOB)

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DB2 9 – A Pure XML, Relational Hybrid

XML Developer

"I see a sophisticated XML repository that also supports SQL."

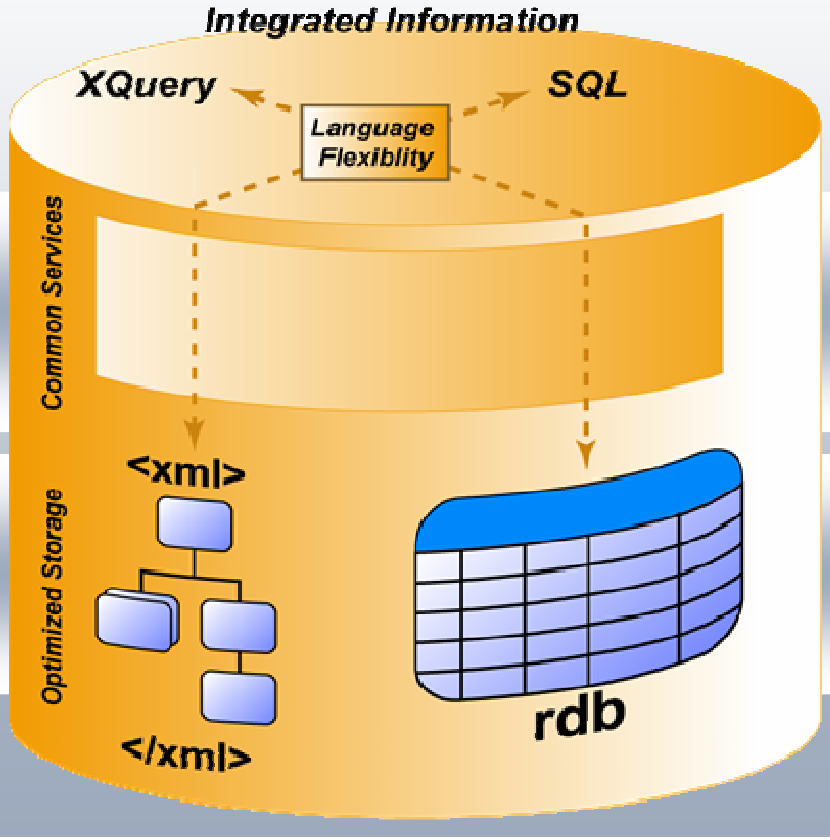
Familiar Programming Models

SQL Developer

"I see a sophisticated RDBMS that also supports XML."

Mature Services

Optimized Storage Models



Familiar Tooling

Optimized Performance & Scale

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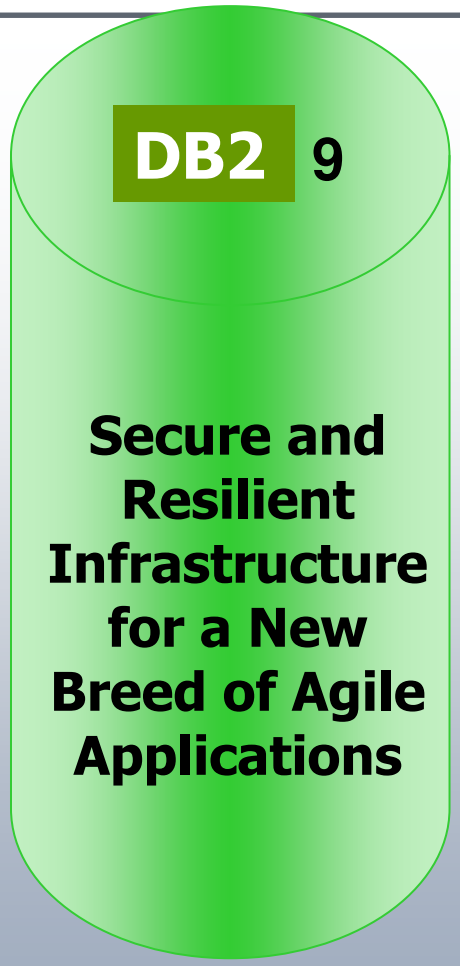
DB2 9 – Summary of pureXML Support

- XML as a native data type
- Pure XML storage and indexing
- XQuery and SQL/XML support
- XML schema repository
- Schema validation
- Application Support (Java, C/C++, .NET, PHP, etc.)
- Visual Tooling, Control Center enhancements
- Annotated schema shredding
- DB2 utilities: Import/Export, HADR, etc.
- …and more



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Business Benefits of DB2 9 with pureXML Technology

- **Lower Development Costs**
  - Reduce code and development complexity
  - Improve developer productivity

  → ***Speed solution development and gain cost savings***

- **Greater Business Agility**
  - Easily accommodate changes to data and schemas
  - Update applications rapidly and reduce maintenance costs

  → ***Respond quickly to dynamic conditions and get faster time to value***

- **Improved Business Insight**
  - Access "hidden gems" (data) in unexploited documents
  - Realize unprecedented application performance

  → ***Gain competitive advantage via higher quality information delivered at higher speeds***

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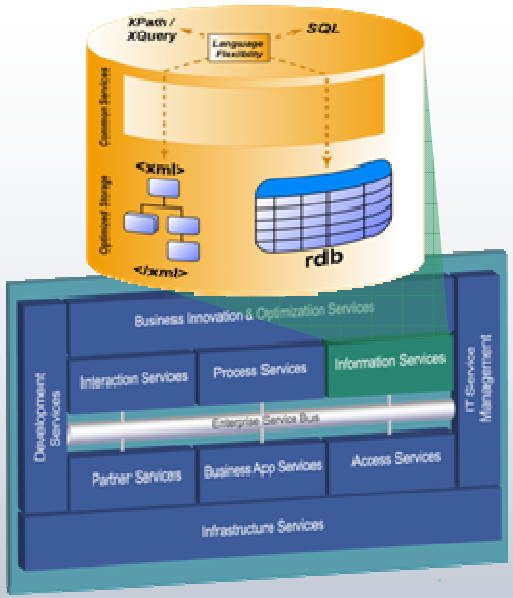
DB2 9: Early Adopter Feedback

storebrand



Proto-type results using DB2 9 based SOA solution

Task	with relational server	with DB2 9 pureXML
Development of search & retrieval business processes	CLOB: 8 hrs Shred: 2 hrs	30 min.
Relative lines of I/O code (65% reduction)	100	35
Add field to schema	1 week	5 min.
Queries	24 - 36 hrs	20 sec - 10 min
Query non-shredded XML element	1 week	½ day

Business Benefits

- Quickly create customized products that customers want
- Expected to process five times more business
- Fast, easy access to richer product & client information

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Why IBM?

- ***Deep industry expertise, patented methodologies and technologies refined in thousands of projects***
- ***Robust enterprise-wide operating environment, optimized for performance and efficiency***
- ***Leadership in all key information management segments – data servers, enterprise content management, information integration, master data management***
- ***Industry solutions and business models that accelerate results***
- ***The industry's most extensive partner network***

"In this high-stakes gamble for the information management market…IBM has officially put its competitors on notice. ***IBM has a strong hand; its IOD strategy outpaces other vendors' information management strategies****."*

– Forrester Research, 2006

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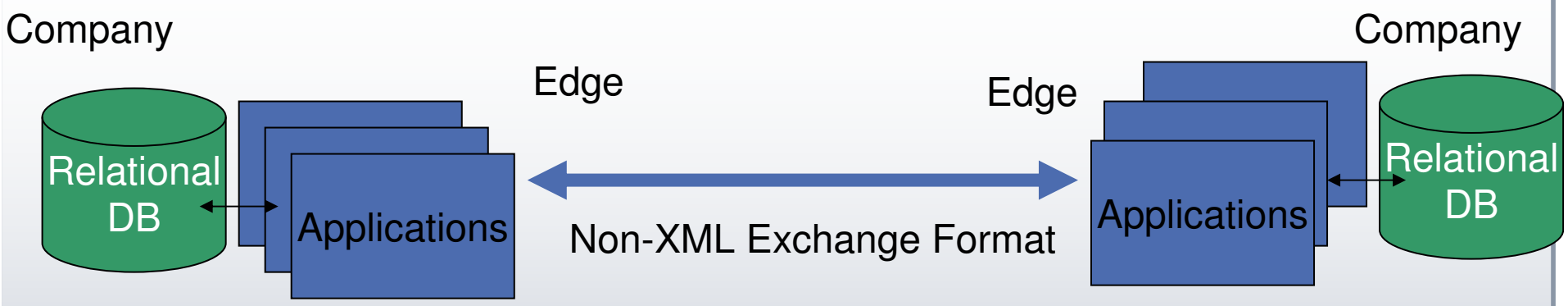
Data Exchange
Stage 1 - Before XML



- Company data is stored in Relational Databases
- Layers of Data and Application specific coding exist to:
  - Process the incoming exchange formats
  - Store the incoming data in databases
  - Modify data in the databases due to incoming data
  - Produce the output exchange formats to send to other systems

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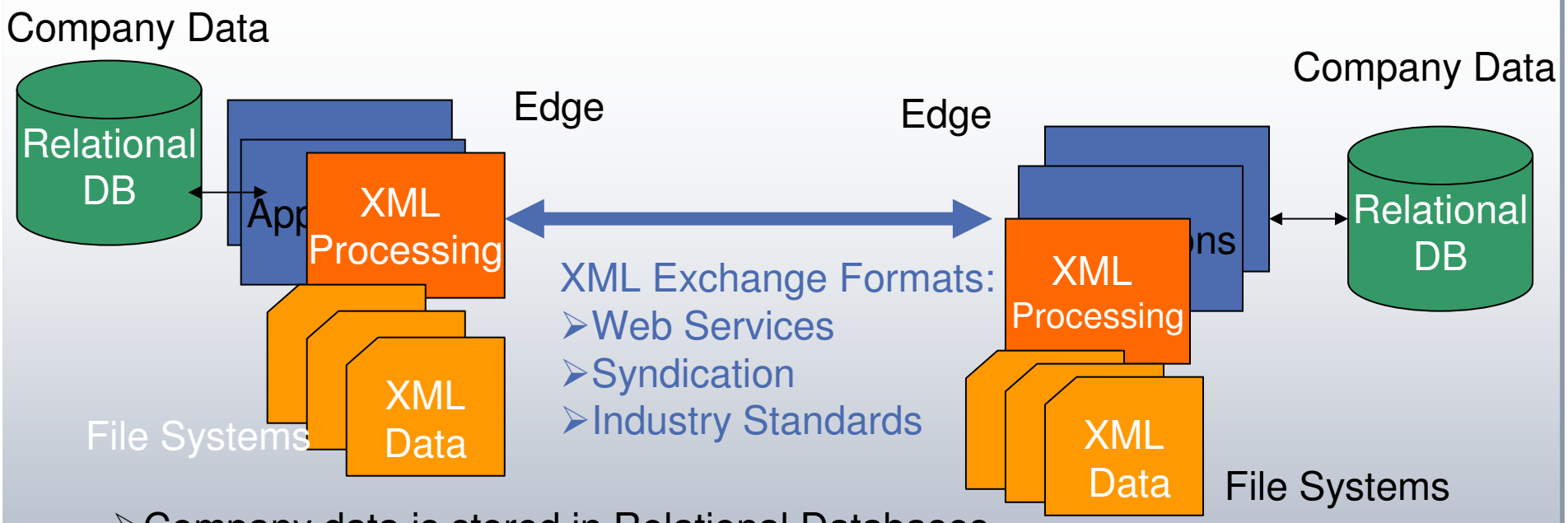
Data Exchange
Stage 2 - After XML



- ➢Company data is stored in Relational Databases
- ➢Exchange data is often stored in file systems or other database systems
- ➢New layer of universal data tools and application specific coding is created:
  - ➢ to process incoming and outbound XML at the edges
  - ➢ to interoperate with existing applications that work with the databases
  - ➢ to store XML exchange data at the edges

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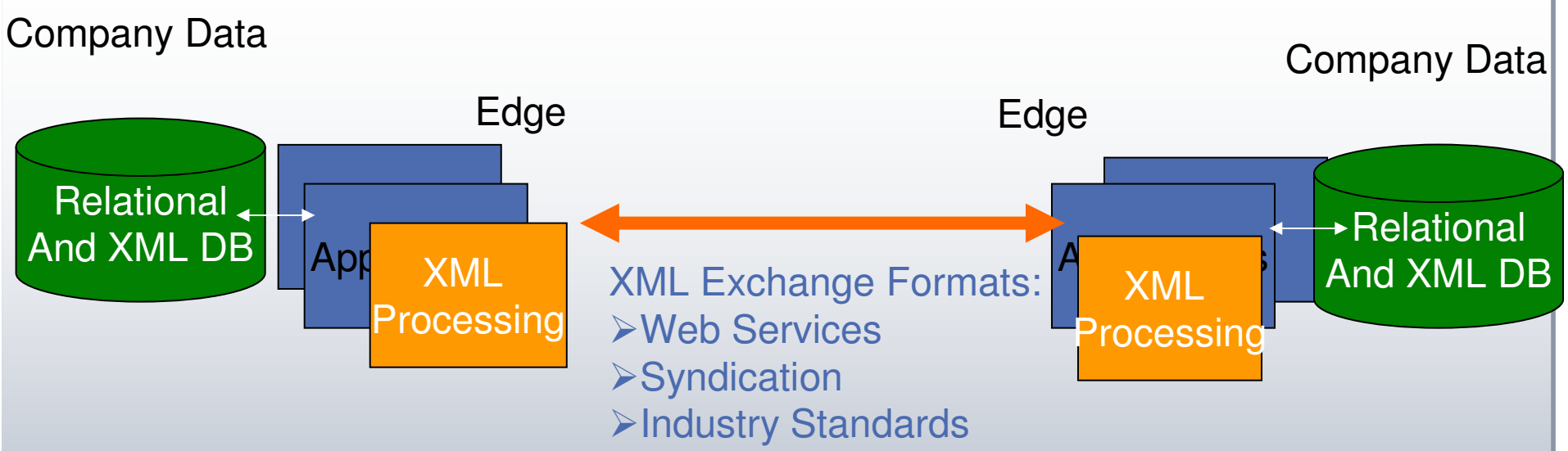
Data Exchange
Stage 3 – With XML DB



Core and Exchange data are stored in XML Database to:

➢Provide common integrity, recovery, security, management interfaces and mechanisms

Universal data tools and application specific coding can:

- ➢ process incoming and outbound XML at the edges as well relational data
- ➢ interoperate with existing applications that work with the relational using common
- ➢ interfaces
- ➢ store and query XML and relational data in the databases

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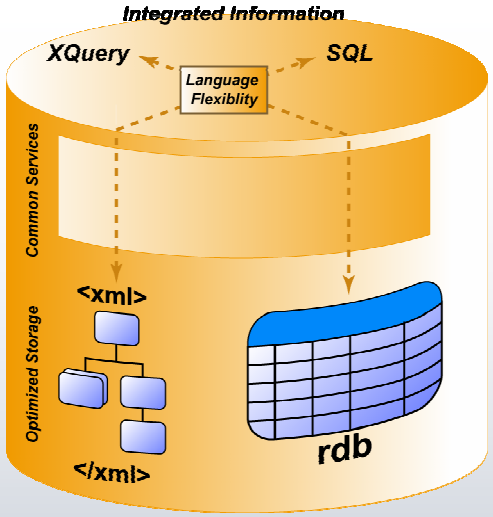
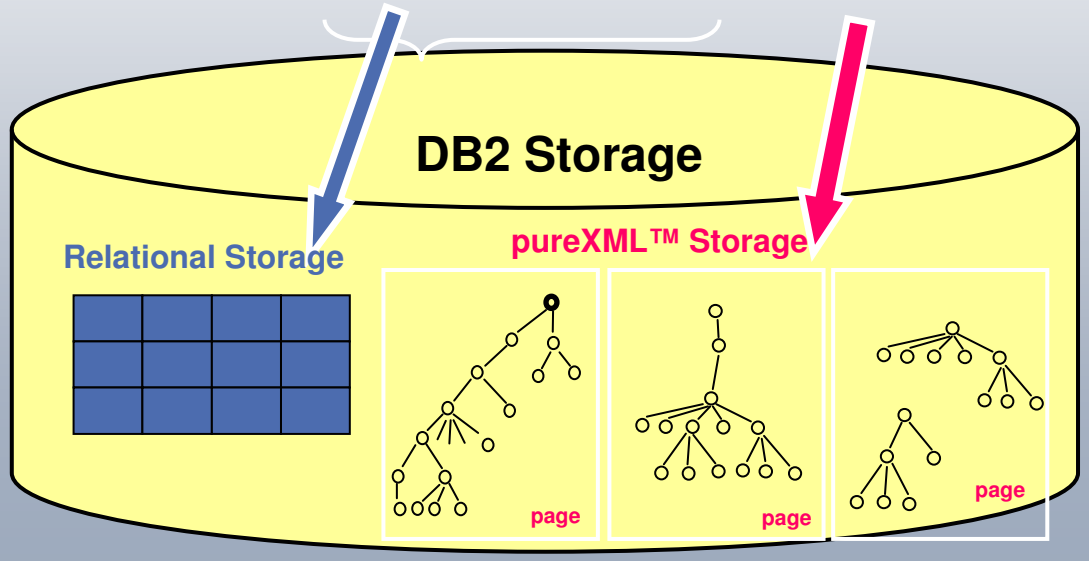
pureXML™ in DB2 9



- Hierarchical XML data storage & processing
- No fixed XML schema per XML column
  - Well formed XML
- Schema validation is optional & per document
- XML indexes for specific elements/attributes
- XQuery and SQL/XML Integration

create table dept (deptID char(8),…, deptdoc xml);



Ready for IBM DB2 data server software

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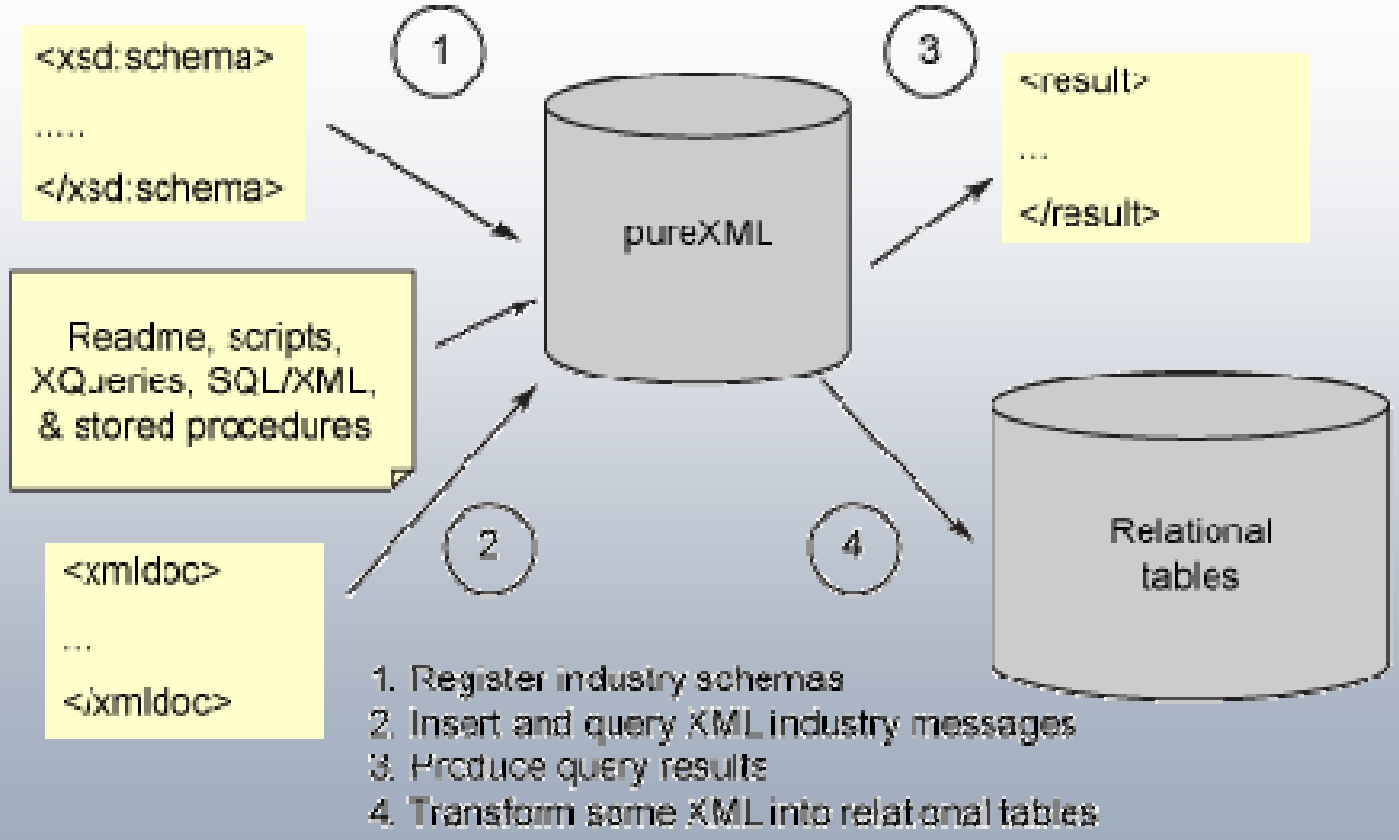
IBM created alphaWorks industry Formats and Services with pureXML: a demonstration of end-to-end XML data exchange



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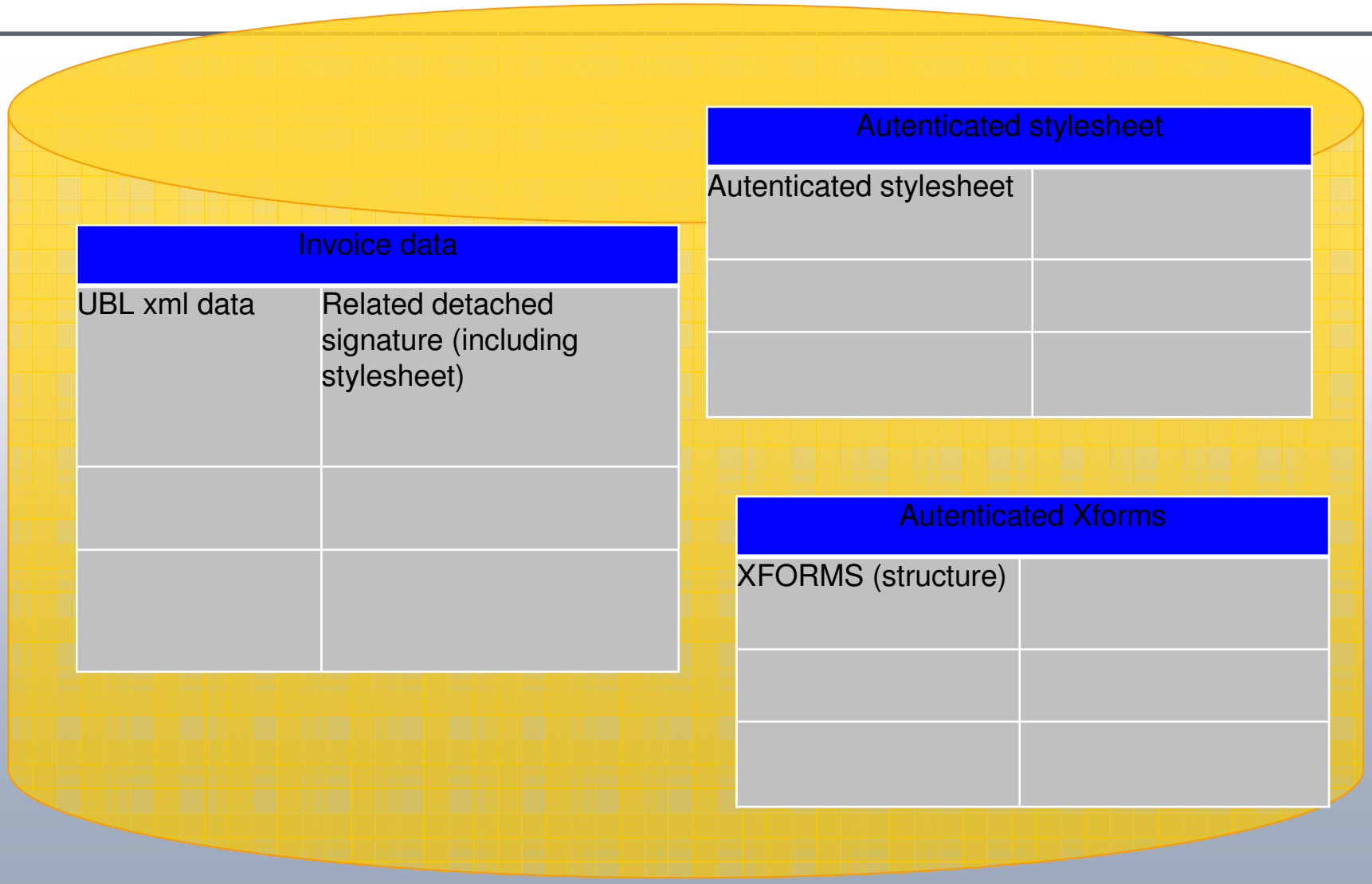
Example of data structure (detached signature)



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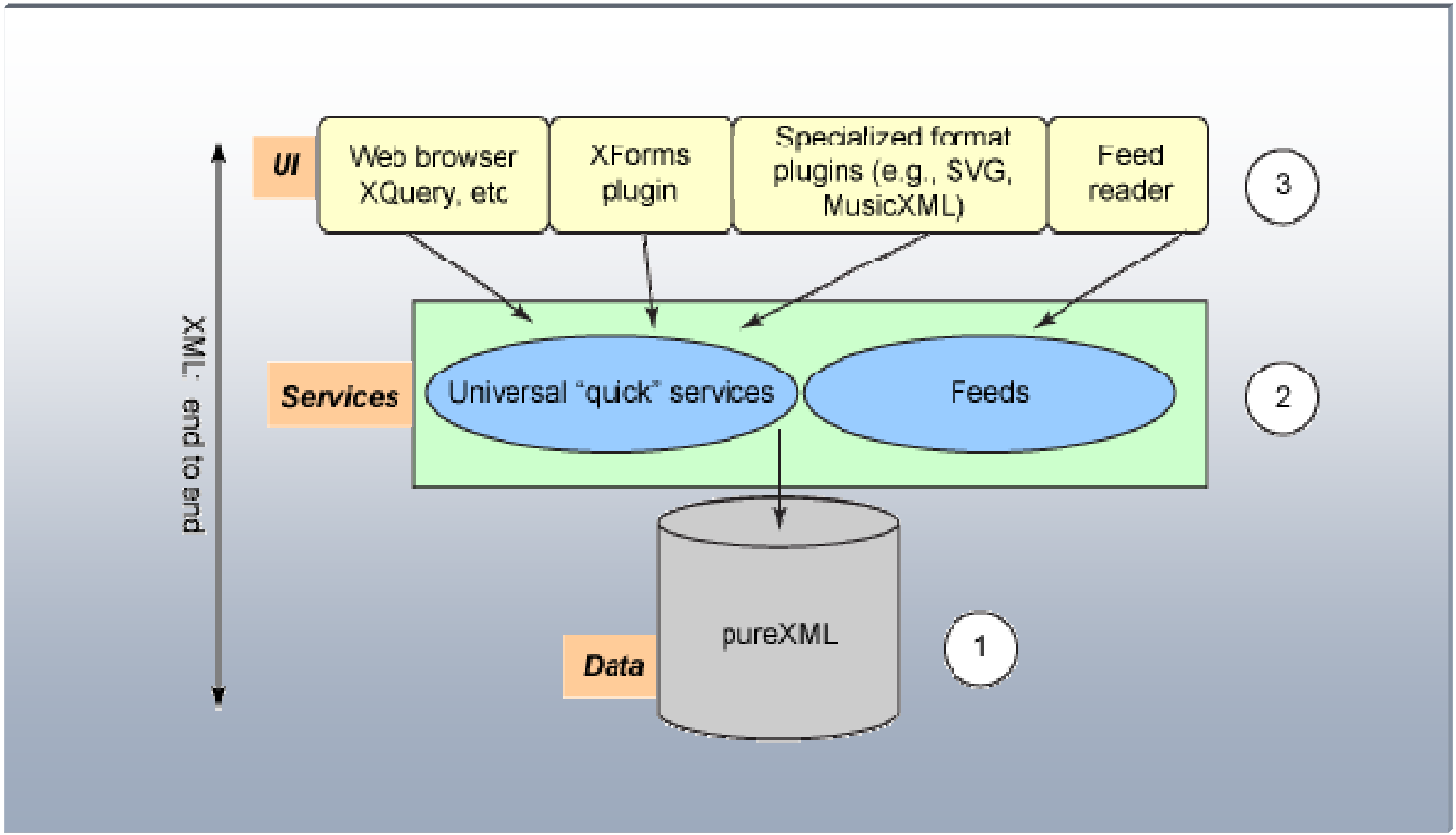
DB2 pureXML Industry Format Demos approach is based on a services layer



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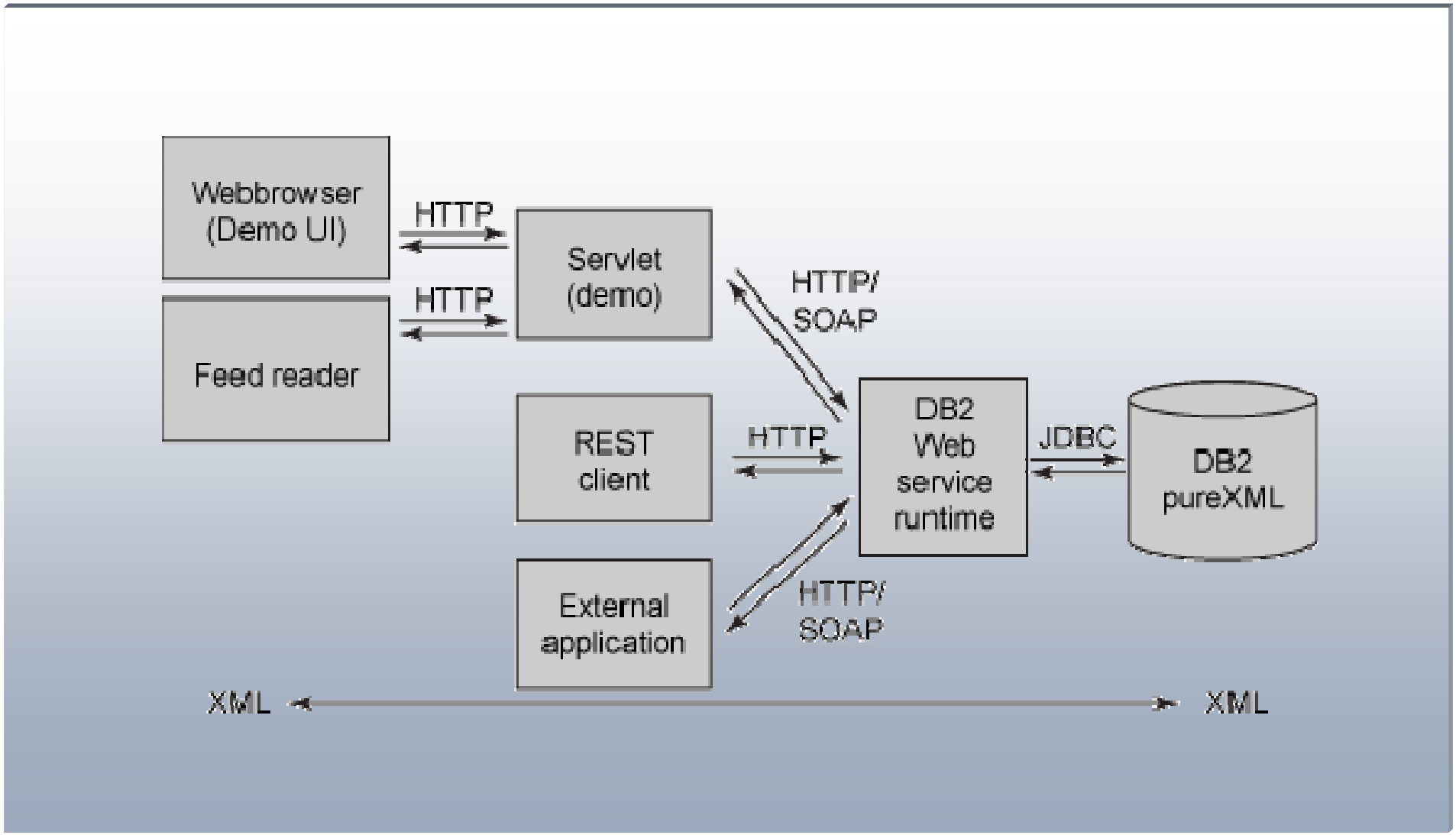
Demo architecture



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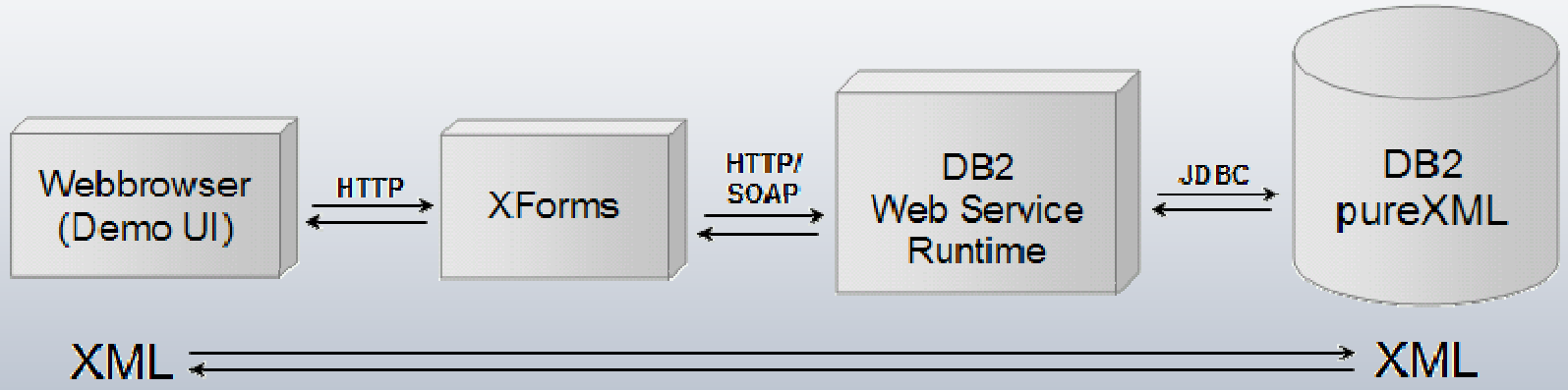
XFORMS demo architecture



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What is XForms?

- XForms
  - Not an acronym, that's the full name
- First published by the W3C (World Wide Web Consortium) in 2003
  - Version 1.0 is the latest recommendation, but version 1.1 is in the works
- A language for the "next generation of Web forms" - W3C
  - Original intent was to improve HTML forms
  - Grew beyond this once they began to understand the complexity of forms
  - Meant to be used conjunction with other languages
- W3C XForms Specification
  - http://www.w3.org/TR/2006/REC-xforms-20060314/

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Financial Demo

ACORD

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ACORD is a trademark of ACORD Corporation.

This demo is specific for the ACORD standard, an XML document standard in the insurance business.
Click here for further information.

FIXML

This demo is specific for the FIXML standard, an XML document standard in the financial business.
Click here for further information.

FpML

FpML is a trademark of the International Swaps and Derivatives Association, Inc.

This demo is specific for the FpML standard, an XML standard protocol for complex financial products.
Click here for further information.

MISMO

This demo is specific for the MISMO standard, an XML document standard in the mortgage industry.
Click here for further information.

MDDL

This demo is specific for the MDDL standard. The XML specification is used to enable the interchange of information necessary to account, to analyze, and to trade financial instruments of the world's markets.
Click here for further information.

UBL

This demo is specific for the OASIS UBL schemas which are defining a set of standard XML business documents such as purchase orders and invoices.
Click here for further information.

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Demo Overview

DB2 pureXML(TM) Demo

- UBL -

IBM

Data Management

- **Insert** a new UBL document into the database
- **Query** the documents of the UBL database
- **Delete** a document from the UBL database
- **Restore** the initial set of UBL documents
- **Validate** a new UBL document

Atom Feeds

- **On-the-fly Feeds**
  - **Create** the link to a dynamic Atom Feed
- **Predefined Feeds**
  - **Prepare** a predefined Atom Feed
  - **Get** a predefined Atom Feed
  - **Delete** a predefined Atom Feed

Forms

The forms demos use the **CRUD** webservices provided by the demo.

- **XForms Demo** for UBL

Technical Information

- **Architecture** of the demo
- Invoke the Web Service methods directly through the **HTTP binding**
- Generate the **WSDL** for the UBL Web Service

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Demo Overview

DB2 pureXML(TM) Demo

- UBL -

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Query the documents of the UBL database

Retrieve a document:

Invoice_kaw_5_abc
Invoice_441_new_abcd
481_new2
IBM-Invoice-1.xml
IBM-Invoice-printable.xml

retrieve

Query document(s) with XQuery:

Click here for a list of sample queries.

execute

Internally the information are stored in a table named 'UBL':

UBL		
ID	DOCUMENT	COMMENT

The ID will be generated automatically by the database.

➔ Back to main selection

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Demo Overview

DB2 pureXML(TM) Demo

- UBL -

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INVOICE - FATTURA

Seller
Venditore
IBM ITALIA S.p.A.
Circonvallazione Idroscalo s.n.c.
Segrate
20090 Milano
MI IT
CF 01442240030
PIVA IT10914660153

Consignee
Consegnatario

Invoice number
Nr. Fattura
F37635

Invoice date (tax point)
Data Fattura (scadenza)

Seller's reference
Rif.to Venditore

Buyer's reference
Rif.to Acquirente

Purchase order date
Data Ordine

Buyer
Acquirente
HAL S.p.A.
Via Robotica 13
00143 Roma
RM IT

Buyer bank
Banca d'appoggio Acquirente

Country of origin
Paese di origine

Country of destination
Paese di destinazione

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XForms and DB2 pureXML Demo: UBL Invoice

- Home
- Demo
- Why XForms
- Renderers/Browsers
- About XFG
- Details
- DB2 Industry Bundles

Introduction

The purpose of this demonstration is to illustrate an end-to-end exchange of XML data from an XForms based browser to a DB2 database with full XML support. We want to show you how quickly and easily it is to create XForms documents and have them talk to a DB2 database where XML instance data can be stored, retrieved or further queried.

Let's Get Started

Select a UBL document type.

UBL_Invoice

Select "Next" to proceed.

Next

BL Invoice pureXML/XForms Home | XForms | DB2 | DB2 pureXML | DB2 pureXML Demo

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XForms and DB2 pureXML Demo: UBL Invoice

ument Key: 401

Invoice

ID Versione UBL	2.0
ID Profilo	ITLSC
ID	O00677
Data Emissione	2007-04-30
Codice Tipo Fattura	0

Aggiungi Nota

Data Scadenza Imposizione	2007-04-30
Document Currency Code	EUR
Line Count Numeric	14

OrderReference

ID	20/MV/2007
Sales OrderID	O7001365
Data Emissione	2007-04-12

AccountingSupplierParty

WebsiteURI	www.cubeblok.it

Party

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Industry Bundles with pureXML

How you can Started:
Samples for Industries with pureXML

Google *pureXML alphaWorks*
http://www.alphaworks.ibm.com/tech/purexml

Select Download Now

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