

# XML/XSLT

CIS 8020 Systems Integration

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September 2009

# Agenda

- A brief introduction of XML
  - XML's role in integration
- A tutorial on XSLT processing
- Exercise/assignment
  - Write an XSLT file to transform RSS
- Development tools

# XML (Extensible Markup Language)

- XML family standards/specifications
  - XML
  - XSD (XML Schema)
  - XSLT
  - XSL (XSL-FO)
  - XPath, XLink, XPointer
  - XQuery
  - ...

# XML Terms

- Node
  - Element node
  - Text node
  - Attribute node
- Element
  - Root element
- Schema

# XML's Roles

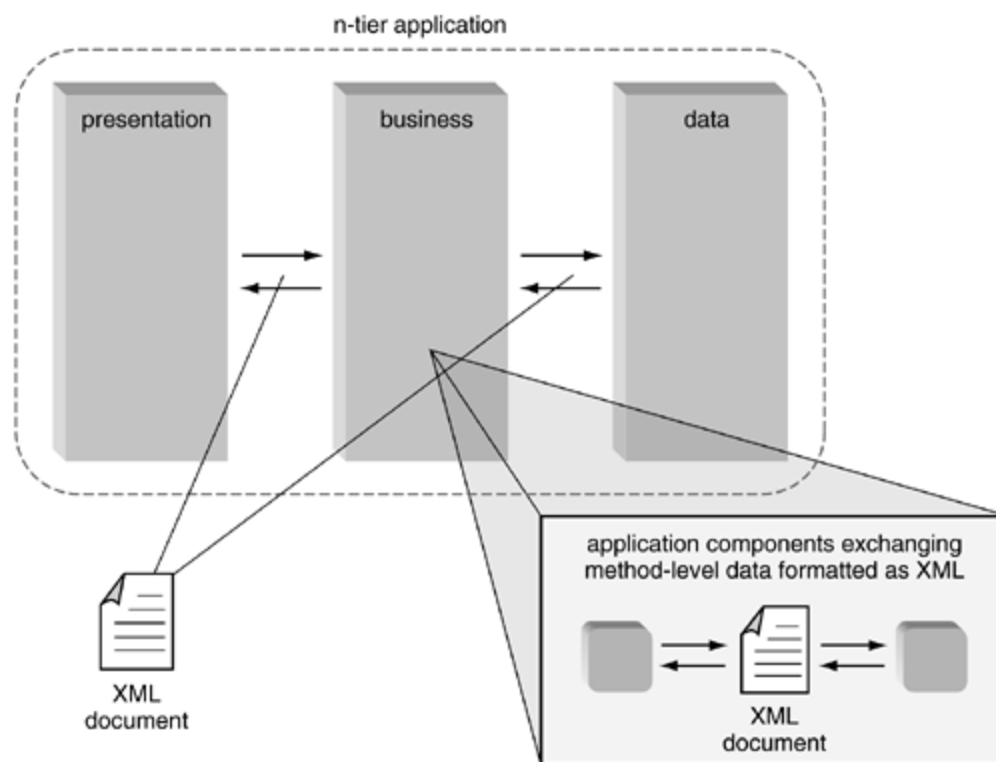
- XML can be used for
  - Document representation
    - Document: OOXML, XHTML
    - Resource: OWL, RDF
    - Content: OPML
    - Vector graphics: SVG
  - Data structure/storage
    - Configuration file: web.config, httpd.conf
    - Database: XML databse, XML data type
    - Object serialization
  - Exchanging data/message
    - Content syndication: RSS, Atom
    - Commutation protocol: SOAP, WSDL, WAP
  - Interface representation
    - User interface: XUL, XAML

# What does XML do?

- “XML provides a common data-exchange format.” (An open and self-describing data format.)
- “XML’s power resides in its simplicity.”
- “XML also adds a foundation that other standards can build on.”
- “XML does not make a good message format for information exchange, ... using native XML demands a huge overhead.”
- “XML needs middleware (and, conversely, middleware most likely needs XML).”

# XML's Role in Integration (1)

- XML as a data transport format within applications



# XML's Role in Integration (2)

- XML as a data transport format between applications

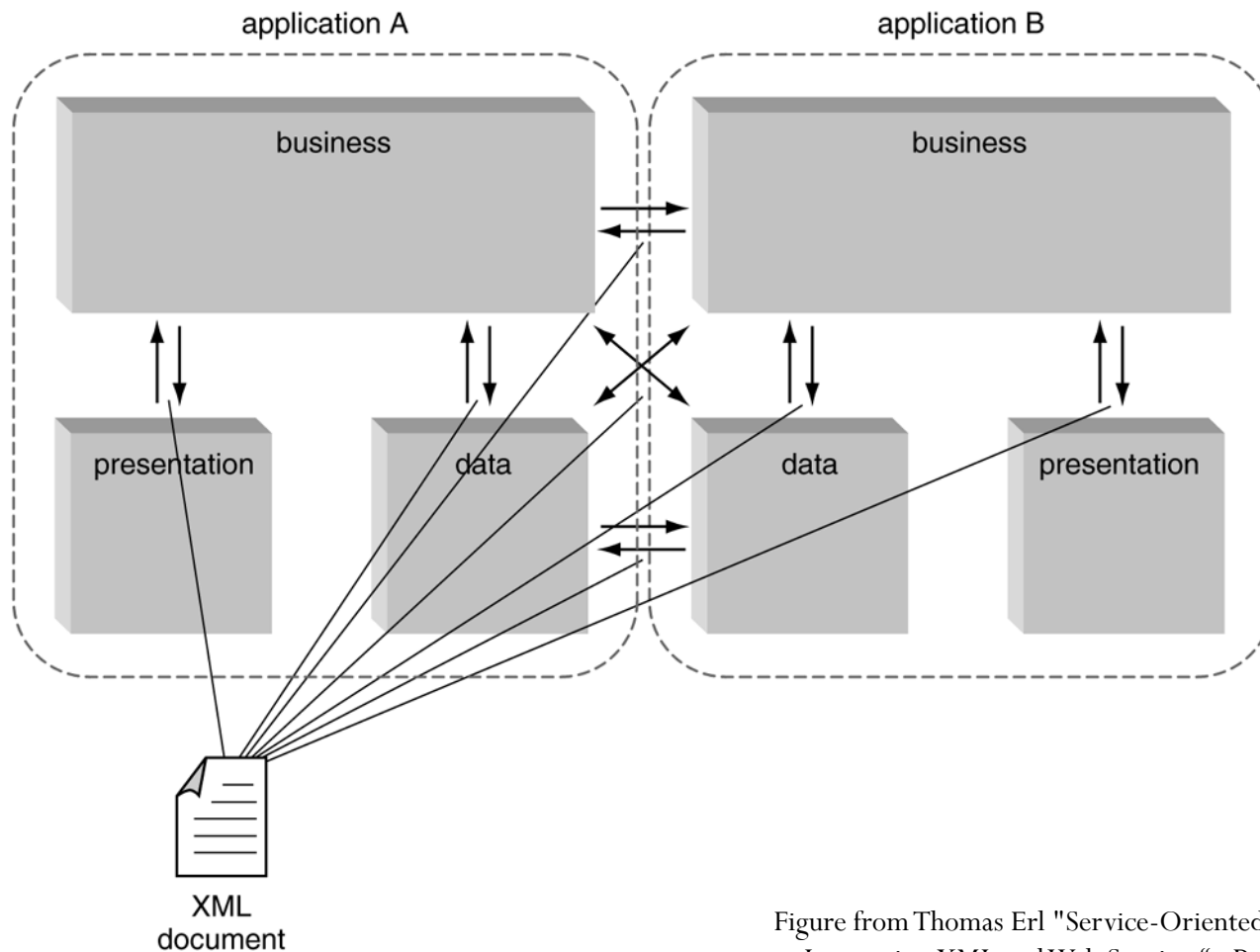
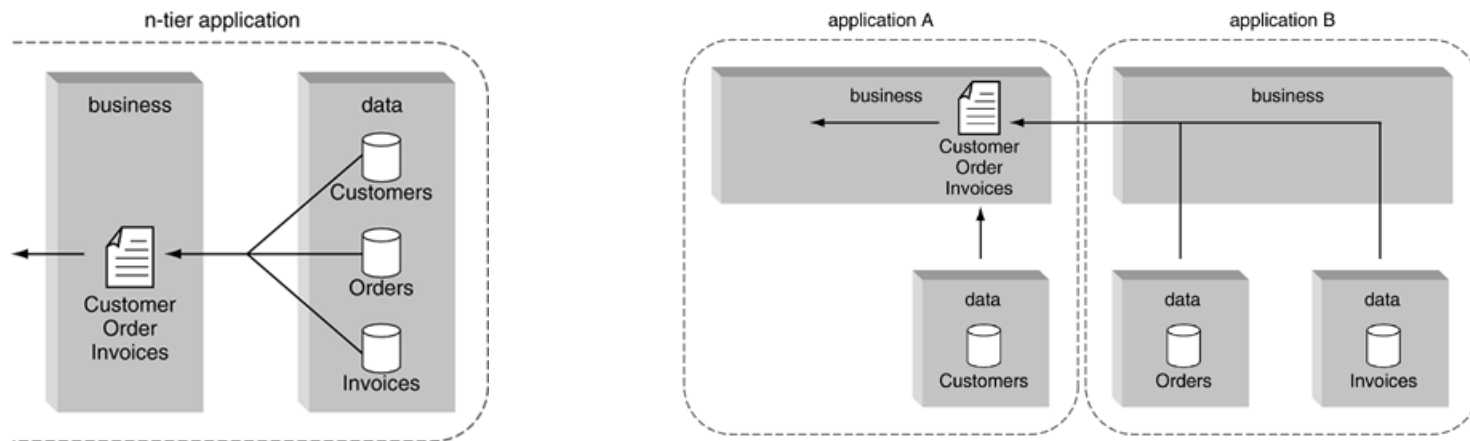


Figure from Thomas Erl "Service-Oriented Architecture: A Field Guide to Integrating XML and Web Services", Prentice Hall 2004

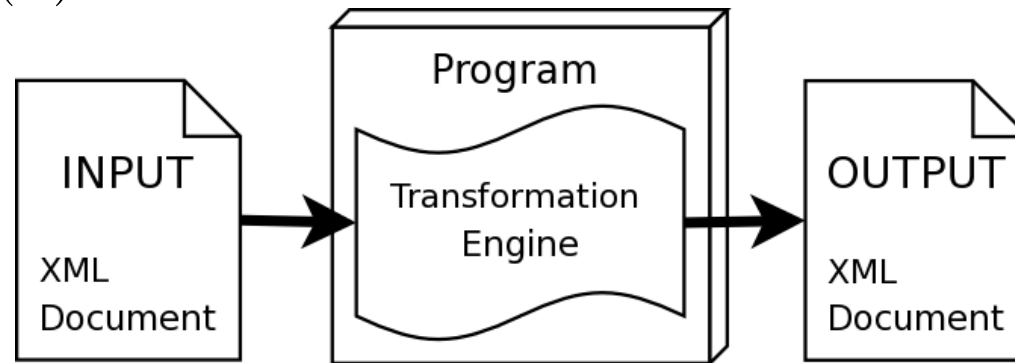
# XML's Role in Integration (3)

- XML as a data bridge within/between applications (data level integration)



# Integration based on XML Transformation

- XML transformation is to change the representation format (schema) of XML content to another representation format
  - XML to XML (see example: GDS and TripIt)
  - XML to (X)HTML



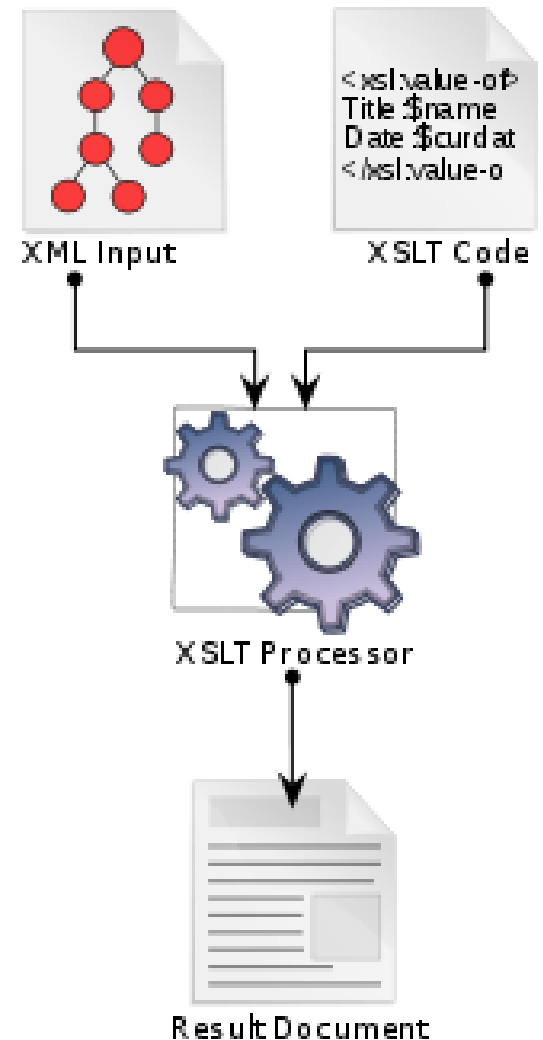
- Common tools
  - XSLT
  - Visual Mapping

# XSLT

- XSLT is a declarative XML-based language used for the transformation of XML documents
  - Developed by W3C
- Common use
  - translate XML messages between different XML schemas (message transformation)
  - make changes to documents within the scope of a single schema
  - convert XML data into HTML or XHTML documents for web display (presentation level integration)
  - create printed output, typically by transforming the original XML into XSL Formatting Objects

# XSLT Basics

- The XSLT processor takes an XML source document and an XSLT stylesheet, and produces an output document
- The XSLT stylesheet contains a collection of templates
  - Template: rules that defines how to handle a node matching a particular pattern (XPath)
- The processor can be on the server side or the client side



# A Brief Tutorial on XSLT

- A simple tutorial from W3Schools
  - <http://www.w3schools.com/xsl/>
- Key basics
  - Transformation rules based on templates
  - Templates defined by node matching patterns (XPath)
- For more on XSLT 2.0
  - <http://www.w3.org/TR/xslt20/>

# XSLT continued

- Default/built-in template
- Namespace
- Parameters and variables
- Functions

# A Tutorial on XPath

- A simple tutorial from W3Schools
  - <http://www.w3schools.com/xpath/>
- Key basics
  - A basic XPath expression is very much like a file/directory path

# Tools

- Common developer tool features
  - Auto-completion, intellisense
  - Support multiple views (source, tree, grid, etc.)
  - Node/element operations
  - Output preview
  - Validation and debugging
  - Visual editing tools
- Is visual mapping more effective?
  - “I am tired of spending hours and hours fighting with the visual mapping tool only to discover that no combination of links and functoids will create the mapping output I need.”
    - Scott Banwart (<http://rogue-technology.com/blog/?p=459>)

# Free XML/XSLT Editors and Tools

- XML editor
  - Notepad++
  - XML marker
  - XMLFox
- With XSLT support
  - XMLPad
  - Treabeard
  - XML Notepad 2007
  - EditiX Lite
- Online tools
  - <http://www.shell-tools.net/index.php?op=xslt>
  - <http://www.w3schools.com/xsl/tryxslt.asp?xmlfile=catalog&xsltfile=catalog>

# Advanced XML Mapping Tool

- These tools usually provide advanced (visual) tools; and are not free
- Altova MapForce and StyleVision
  - <http://www.altova.com/mapforce.html>
  - <http://www.altova.com/stylevision/xslt-html.html>
- Stylus Studio
  - [http://www.stylusstudio.com/xml\\_mapper.html](http://www.stylusstudio.com/xml_mapper.html)
- BizTalk
  - <http://www.microsoft.com/biztalk/en/us/messaging.aspx>

# Tools from MSDNAA

- Visual Studio 2008
  - Features:  
<http://www.code-magazine.com/articleprint.aspx?quickid=0712162>
  - Get a profiler:  
<http://www.microsoft.com/downloads/details.aspx?FamilyId=F43314ED-95B7-435F-95C5-0E326E64543B>
- Expression Web 2
- BizTalk 2009
  - BizTalk map
- SQL Server 2008

# Exercise/Assignment

- Your blogs on [blogspot.com](http://blogspot.com) can be published as an Atom feed.
- Develop XSLT files to transform it to
  - HTML
  - RSS
- You can either do this by
  - directly writing XSLT files, or
  - using a visual mapping tool and generating XSLT files.

# More Readings

- XML based protocols and languages
  - <http://www.w3.org/2000/03/29-XML-protocol-matrix>
  - [http://en.wikipedia.org/wiki/List\\_of\\_content\\_syndication\\_markup\\_languages](http://en.wikipedia.org/wiki/List_of_content_syndication_markup_languages)
  - <http://www.service-architecture.com/xml/articles/>
- XML for e-business
  - <http://www.ebxml.org/faq.htm>
  - <http://www.ibm.com/developerworks/xml/library/x-ebxml/>
  - <http://www.developer.com/xml/article.php/2234201/ebXML-An-Electronic-Business-Scenario.htm>
  - [http://posc.org/ebiz/xml\\_edi/edi2xml.html](http://posc.org/ebiz/xml_edi/edi2xml.html)