



XML (eXtensible Markup Language)

- **Aniket Prabhune :**
 - XML, Origin of XML, Features of XML, XML Models, A Typical XML System, XML Applications, Example
- **Josh Steele:**
 - Schemas, XSL/XSLT, Linking Languages (Xlink, Xpath, Xpointer), XML Uses (MathML, XML-Data, XHTML, WIDL), Example



XML

- "The eXtensible Markup Language (XML) is the **universal format for structured documents and data on the Web.**" – <http://www.w3.org/XML/>
- Next generation of document delivery methods on the Web.
- XML is a cross-platform, software and hardware independent, **tool for transmitting information.**



Origin of XML

- Development of XML started in 1996
- W3C Recommendation in 1998
- New but not immature !
- SGML an ISO standard since 1986
- HTML development started in 1990
- XML: Best parts of SGML guided by HTML



Need for XML

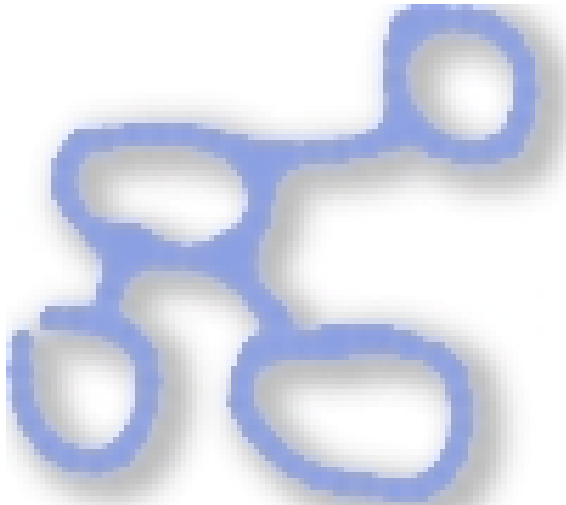
- XML is also a “document description meta-language” like SGML
- SGML is “more powerful ancestor” of XML
- SGML: difficult to learn and use, expensive
- XML: easy to learn and use, less expensive



XML Features

- **XML is for structuring data**

- Spreadsheets, address books, financial transactions, technical drawings, etc
- Set of rules
- Not a programming language
- Makes it easy for computer to generate and read data and ensure that the data structure is unambiguous





XML Features

- **XML looks a bit like HTML but is different !**
 - Both are markup languages that use tags and attributes
 - XML – not a replacement for HTML
 - XML: describe data – what data is ?
 - HTML: display data – how data looks ?
 - Ability to define own tags, attributes and document structure
 - Rules for XML are very strict





XML Features

A
b
c

- **XML is a text format**
 - Data Storage: Binary or Text
 - Text: + Easy to refer
+ Easy to debug
- **XML is Verbose by Design**
 - XML files are larger than binary formats
 - Inexpensive Disk space, compression programs, communication protocols



XML Features

- **XML is a family of technologies.**
 - XML 1.0
 - Xlink
 - XPointer and XFragments
 - CSS (Cascaded Style Sheet)
 - XSL/XSLT
 - DOM
 - XML Schemas 1 and 2





XML Features

- **XML is modular**

- XML allows you to define a new document format by combining and reusing other formats

- **XML Namespaces:**

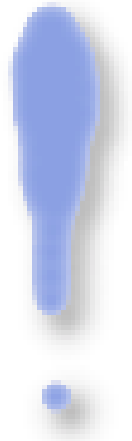
- to eliminate name confusions
- Collection of element type and attribute names
- Identified by a unique name :
URI





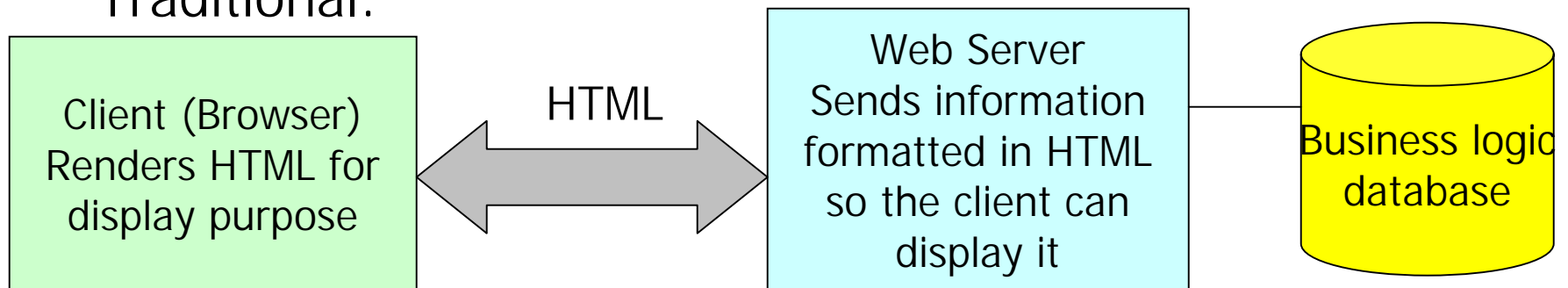
XML Features

- **XML is well-supported, license-free and platform-independent**
 - Large and growing community of tools and engineers experienced in the technology
 - License-free
 - Vendor independent

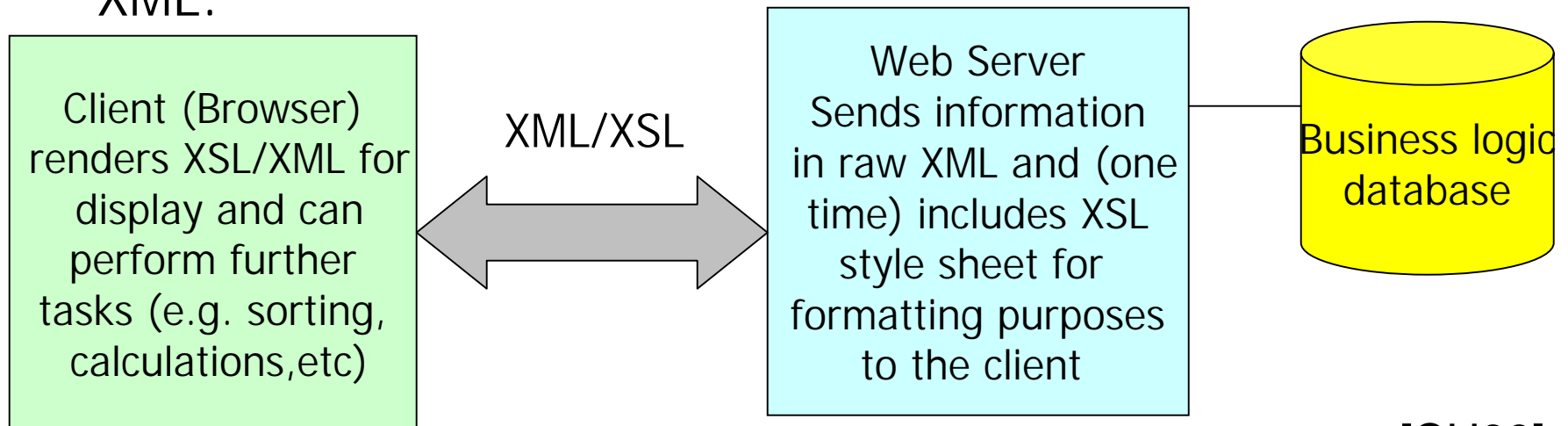


Information Exchange Models

Traditional:



XML:

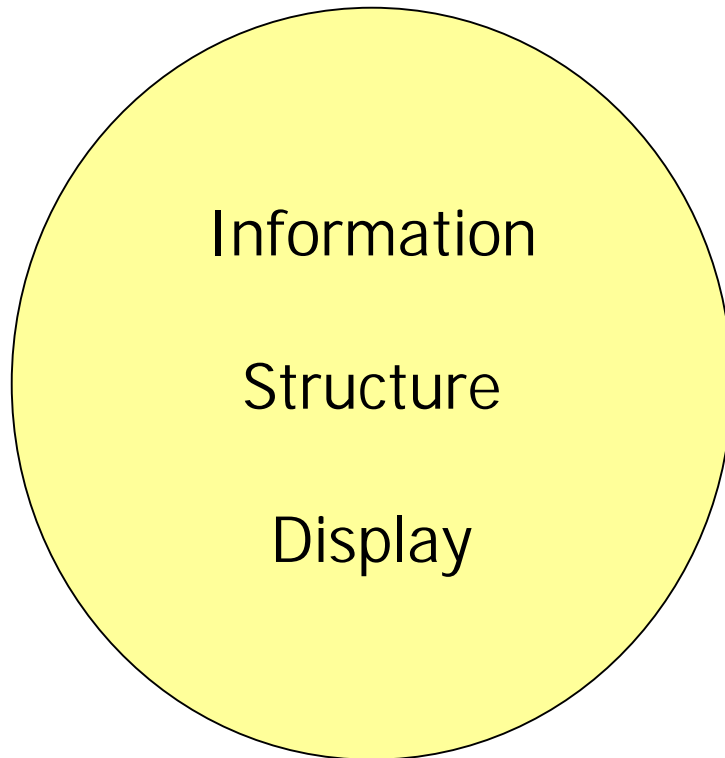


[CH99]

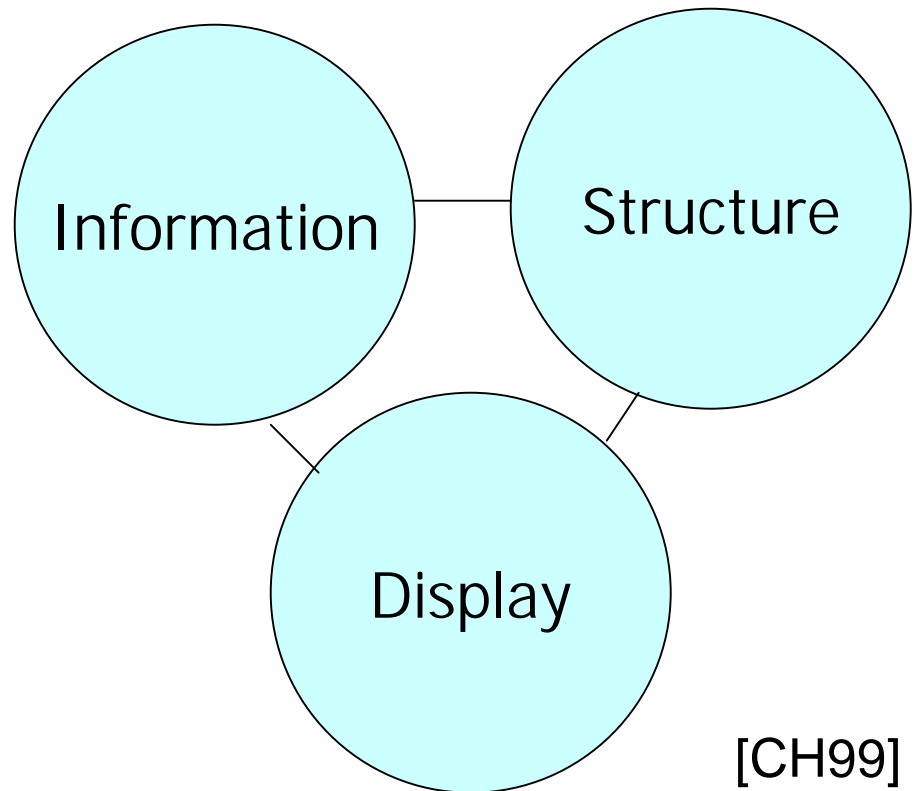


Document Models

Traditional:

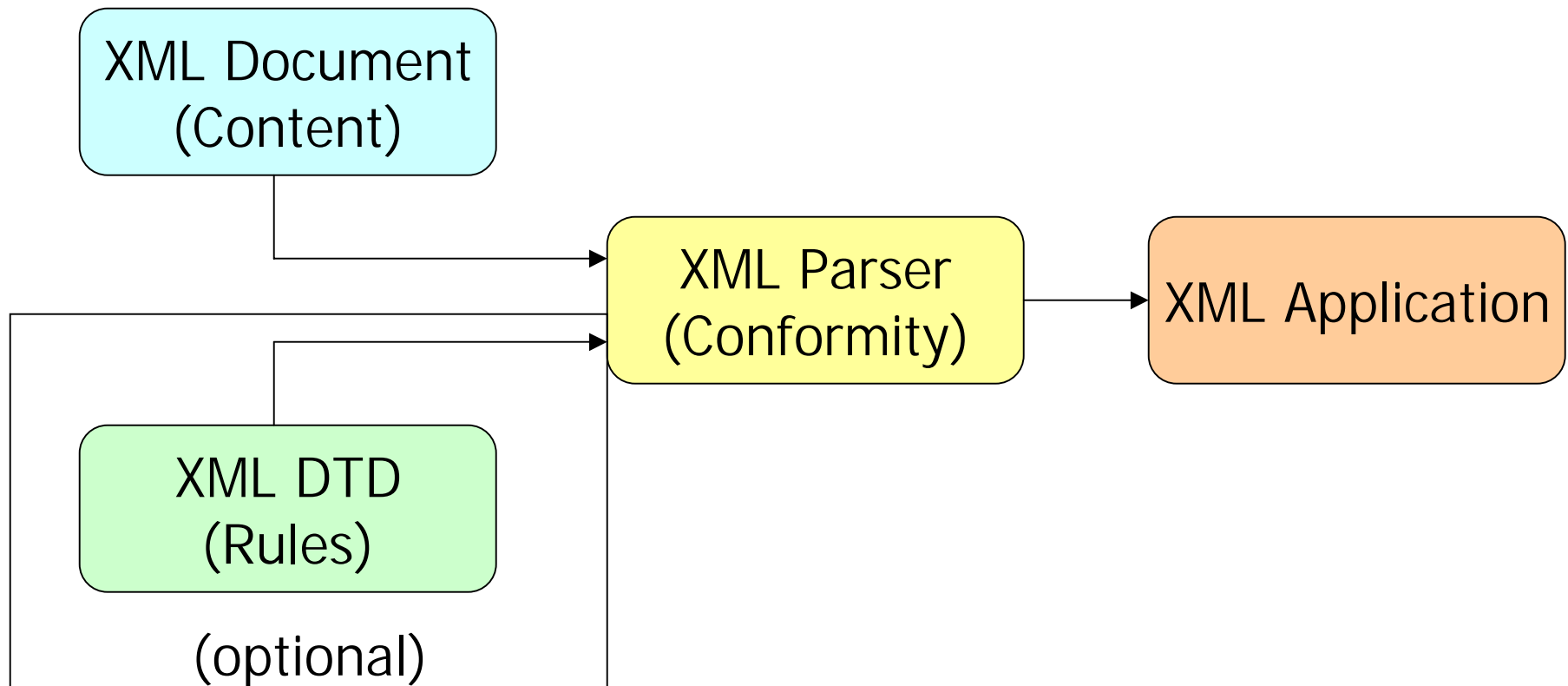


XML:



[CH99]

A Typical XML System





XML Document (Content)

- Actual Data to be processed
- Rich description of information using XML syntax
- Based on entities containing:
 - Content: Actual Information (author of book, price of book, number of pages, etc)
 - Content is encased in markup



DTD (Document Type Definition)

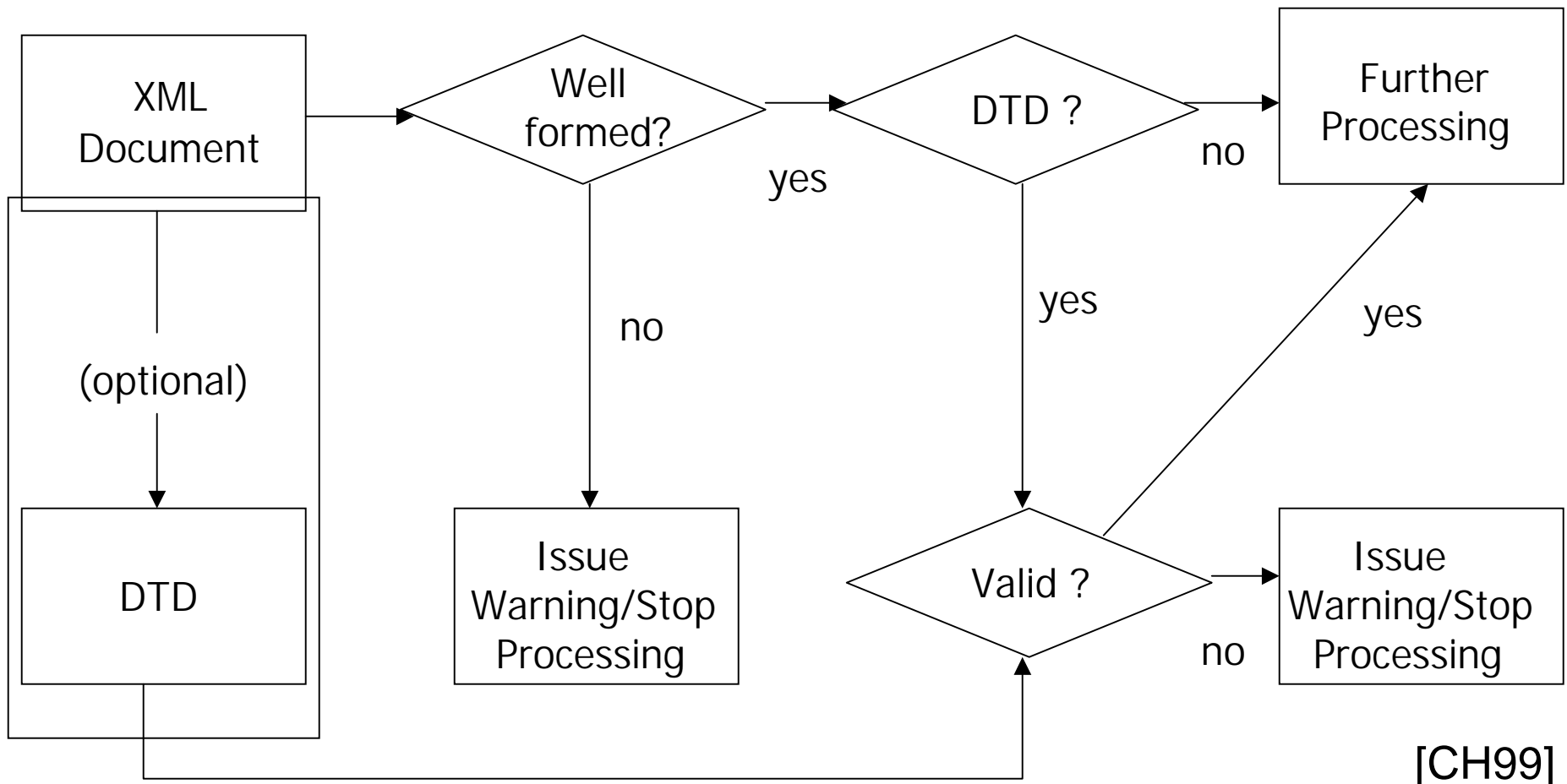
- Ensuring the structure of data
- Piece of code that defines the allowable structures in an XML Document
- Advantages of using DTD:
 - Check your XML document for validity
 - Share your data easily over the web
- Valid XML documents
- Well-formed XML documents



XML Parser

- A software engine that performs the actual check on the data to make sure:
 - It is syntactically correct (well formed)
 - It conforms to the DTD (valid) if you choose to include a DTD
- Replicates the structure of the information in memory, ready for customized processing through an XML application
- Included with Most Browsers

How a Parser Interprets XML ?




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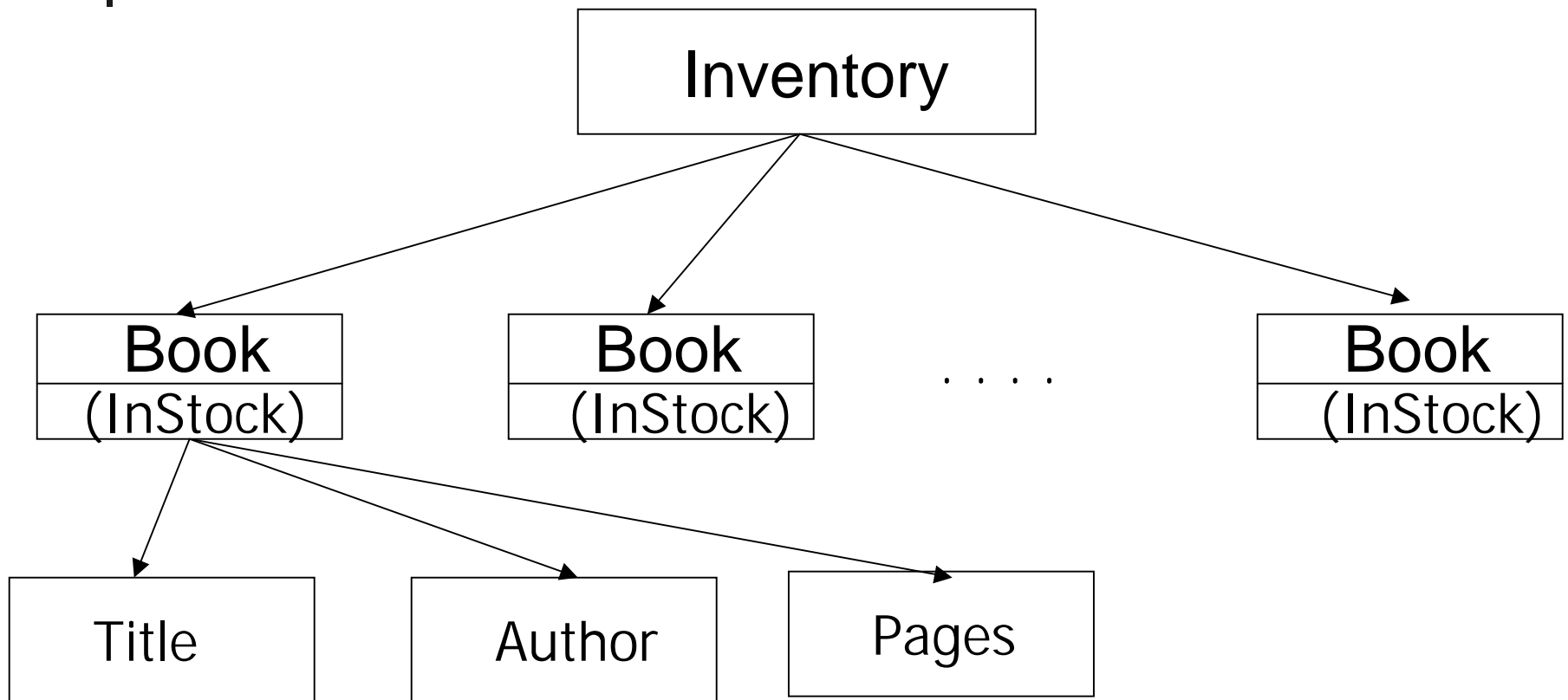


XML Applications

- What you make as a programmer !
- Typically processes information encased in XML Documents
 - E-Commerce
 - Online Banking
 - Web Services
 - Creating other markup languages
 - Advanced Search Engines
 - Agents
 - Almost Anything !



Example





Example (DTD)

```
<<my_structure.dtd>>
```

```
<!ELEMENT INVENTORY (BOOK)+>
```

```
<!ELEMENT BOOK (TITLE,AUTHOR,PAGES)>
```

```
<!ATTLIST BOOK InStock (yes|no) #REQUIRED>
```

```
<!ELEMENT TITLE (#PCDATA)>
```

```
<!ELEMENT AUTHOR (#PCDATA)>
```

```
<!ELEMENT PAGES (#PCDATA)>
```



Example (XML Document)

```
<<my_information.xml>>
<?xml version="1.0"?>
<!DOCTYPE INVENTORY SYSTEM "my_structure.dtd">
<?xml-stylesheet type="text/css" href = "my_display.css"?>
<!-- Beginning of Document Body -->
<INVENTORY>
  <BOOK InStock="yes">
    <TITLE>TCP/IP</TITLE>
    <AUTHOR>Comer</AUTHOR>
    <PAGES>245</PAGES>
  </BOOK>
  <BOOK InStock="no">
    . . .
  </BOOK>
</INVENTORY>
<!-- End of Document Body -->
```



Example (CSS)

<<my_display.css>>

```
TITLE
{
  display:block;
  margin-top:12pt;
  font-size:20pt;
  font-style:italic;
  color: Blue;
}
AUTHOR
{
  display: block;
  margin-left:20pt;
  color: Red;
  font-size:20pt
  font-weight: bold;
} . . .
```

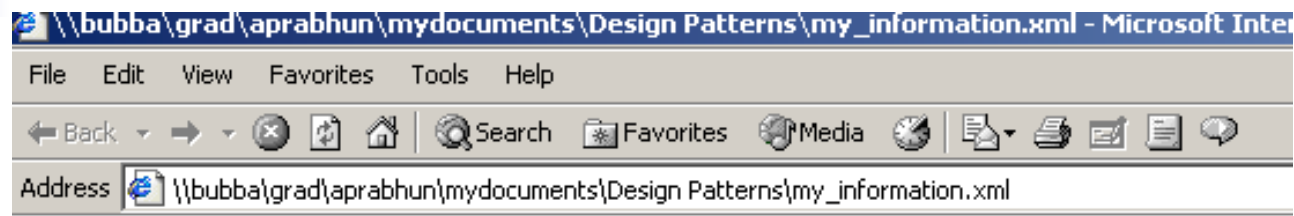
property

value

[TB00]



Output



TCP/IP

Comer

245

Moby Dick

Herman Milville

223



References

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- [PL00] Phillips, L.,A., “Using XML”, QUE, 2000
- [CH99] Ceponkus A., Hoodbhoy, F., “Applied XML”, Wiley, 1999
- XML Tutorials:
 - www.projectcool.com/developer/xmlz/
 - <http://wdvl.com/Authoring/Languages/XML/>
 - <http://www.w3schools.com/xml/>
- XML Mailing Lists:
 - www.w3.org/XML/#discussion
 - www.oasis-open.org/cover/lists.html#discussionLists



XML JOKE !!!!!!!



- When should you use XML ?
- When you want a *buzzword* on your resume !