

UNIVERSITY OF ENGINEERING & MANAGEMENT, KOLKATA

Course Name : Database Management System



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Module 1: Object-Relational Data Model and XML

Object-Relational Data Models

- Relational model: flat, “atomic” values
- Object Relational Data Models
 - Extend the relational data model by including **object orientation** and constructs to deal with added data types.
 - Allow attributes of tuples to have complex types, **including non-atomic values such as nested relations**.
 - Preserve relational foundations, in particular the **declarative access to data, while extending modeling power**.
 - Provide **upward compatibility** with existing relational languages.

XML: Extensible Markup Language

- Defined by the WWW Consortium (W3C)
- Originally intended as **a document markup language not a database language**
- The ability to specify new tags, and to create nested tag structures made XML a great way to exchange **data**, not just documents
- XML has become the basis for all new generation **data interchange formats**
- A wide variety of tools is available for parsing, browsing and querying XML documents/data

What is XML?

- XML stands for eXtensible Markup Language
- XML is a markup language much like HTML
- XML was designed to store and transport data
- XML was designed to be self-descriptive
- XML is a W3C Recommendation

XML Does Not DO Anything !!

Maybe it is a little hard to understand, but XML does not DO anything.

This note is a note to Tove from Jani, stored as XML:

```
<note>  
  <to>Tove</to>  
  <from>Jani</from>  
  <heading>Reminder</heading>  
  <body>Don't forget me this weekend!</body>  
</note>
```

The XML above is quite self-descriptive:

- It has sender information.
- It has receiver information
- It has a heading
- It has a message body.

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But still, the XML above does not DO anything.

XML is just information wrapped in tags.

Few explanations of XML

Output of the previous XML using any server connection possible:

Note

To: Tove

From: Jani

Reminder

Don't forget me this weekend!

Few explanations of XML

The Difference Between XML and HTML

- XML and HTML were designed with different goals:
- XML was designed to carry data - with focus on what data is
- HTML was designed to display data - with focus on how data looks
- XML tags are not predefined like HTML tags are

Few explanations of XML

XML Does Not Use Predefined Tags

- The XML language has no predefined tags.
- The tags in the example above (like <to> and <from>) are not defined in any XML standard. These tags are "invented" by the author of the XML document.
- HTML works with predefined tags like <p>, <h1>, <table>, etc.
- With XML, the author must define both the tags and the document structure.

Database Engine

- Storage manager
- Query processing
- Transaction manager

Storage Management

- **Storage manager** is a program module that provides **the interface between the low-level data stored in the database and the application programs and queries submitted to the system.**
- The storage manager is responsible to the following tasks:
 - Interaction with the OS file manager
 - Efficient storing, retrieving and updating of data

Storage Management

- Issues:
 - Storage access
 - File organization
 - Indexing and hashing

Thank You

