Exposé Lecture in Budapest

XML Techniques for E-Commerce

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Content (1 Semester-hour, combined lecture and practice):

Day 1: Lecture on theory (XML, namespaces, DTD basics) (2 hours)
Day 2: Introductory lecture on schemas (1 hour) and Lecture on XPath, XSL and FO (1 hour)
Day 3: Practice: Creating and validating XML files (1 hour), creating a new stylesheet for conversion to HTML, and enhancing a provided stylesheet for conversion to PDF (1 hour)
Day 4: Java APIs for XML manipulation (1 hour) and programming a small example in Java (1 hour)
Day 5: Lecture on higher E-Commerce standards based on XML (2 hours)

Practical parts

In the practical parts a small "E-Commerce project" will be created:

- An order for a product comes in formatted in XML (created by students according to schema/DTD partially given, partially created by them)
- From this an online view must be created through XSL for online order status inquiries
- Additionally a written invoice must be created from it (again with XSL) to be sent to the customer (really a PDF file to be printed/sent by E-Mail/…)
- Products, address, etc. must be extracted from the order through a program to be added to the legacy system for actually fulfilling the order. The date of expected delivery must be inserted (which comes from the legacy system) into the file. The resulting file is then programmatically converted to HTML and PDF using the previous stylesheets.

This will be partially simulated (e.g. the legacy system will be provided as a small Java application) and be incomplete in the sense, that the obviously needed web server, webpages, etc. for a complete system are left out. This would only complicate the environment and detract from the focus on the actual use and handling of XML in the time available.

Required environment:

1. Computers with JDK 1.4+ installed
2. Possibility to install additional programs
    a. Trial version of XML Spy will be used for editing/validating XML files
    b. Apache FOP for conversion to PDF (Java libraries)
3. Beamer in the computer room to show slides during the practical parts

Basic knowledge required by students:

1. Very basic HTML knowledge
2. Programming in Java (for day 4 only)

Detailed content of the lectures

Lecture 1: XML + Namespace

- Structure of XML files
- Well-formedness
- Different elements (attributes, CDATA, PI, …)
- Ideas behind DTDs
- Defining elements, attributes, entities, …
- Validity
- Namespaces

Lecture 2: XML Schemas

- Idea behind schemas
- Simple types
- Attributes, attribute groups
- Complex types
- Element declaration
- Standard datatypes
- Defining new datatypes

Lecture 3: XSL

- XPath
  - Different steps/axes
  - Node tests and predicates
  - Sequences and ranges
  - Expressions and some selected functions
- XSLT
  - Document structure and serialization
  - Creating text
  - Inserting content by value-of
  - Creating attributes and elements
  - Templates ("functional programming")
  - Loops and conditions ("imperative programming)
- FO
  - Page structure and some elements

Lecture 4: XML manipulation in Java

- Overview on relevant Java APIs and what they are there for (JAXP, JAXB, ...)
- Parsing XML: Manually, SAX, DOM Level 3
- Manipulating XML with DOM: Traversing and modifying content
- Serializing XML: Manually and through DOM Level 3
- Transformers

Lecture 5: Higher E-Commerce standards based on XML

- Business data interchange: ebXML
- Webservices: SOAP, WSDL, UDDI
- XML Security: XML Encryption, XML Signature
- XML Metadata standards: RDF, OWL