

## FuXML

Platform for Content --- Cross-Media-Publishing System

FernUniversität in Hagen  
University for  
Distance Education –  
Teleteaching

Michael Stepping

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# FernUniversität in Hagen

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- ◆ opened 1975, public university
- ◆ only single mode distance teaching university in Germany
- ◆ integral part of regular higher education system
- ◆ fully in line with conventional universities
- ◆ overall use of media in teaching and learning
- ◆ leading role in use of electronic media
- ◆ comprehensive Virtual University / mobile university
- ◆ basics-oriented and application-related research

## FernUniversitaet in former time

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- Lectures are split in lessons
- 8 lessons per semester
- Each around 40-80 pages
- Homeworks, Assignments
  
- Traditional: Paper sent via post-mail

## FernUniversitaet today

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- First Virtual Universities are developed since 1995
- Target is to map real University life to virtual environments
  - ◆ Lectures
  - ◆ Library
  - ◆ Enrollment office
  - ◆ Dean
  - ◆ ...

# Content

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- Content has to be enriched for Multimedia
- First version was simply PDF
  - ◆ (electronical but not multimedia)
- Multimedia added value has to be provided
- Since 1997 development of animations
  - ◆ Multimedia animations

# Animations

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- First versions of animations (Hyperwave, Toolbook, etc) are no longer usable.
- Tools are no longer available  
→
- Today's animations are mainly built in shockwave, flash, and java.
- The required Runtime Environments are available on most Windows PCs

## Content formats so far

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- A lot of proprietary formats have been used so far for electronic material:
  - ◆ Microsoft Word
  - ◆ Latex / Tex / ...
  - ◆ Starwriter
  - ◆ ...
- No long term stability
  - Conclusion:

## Content format

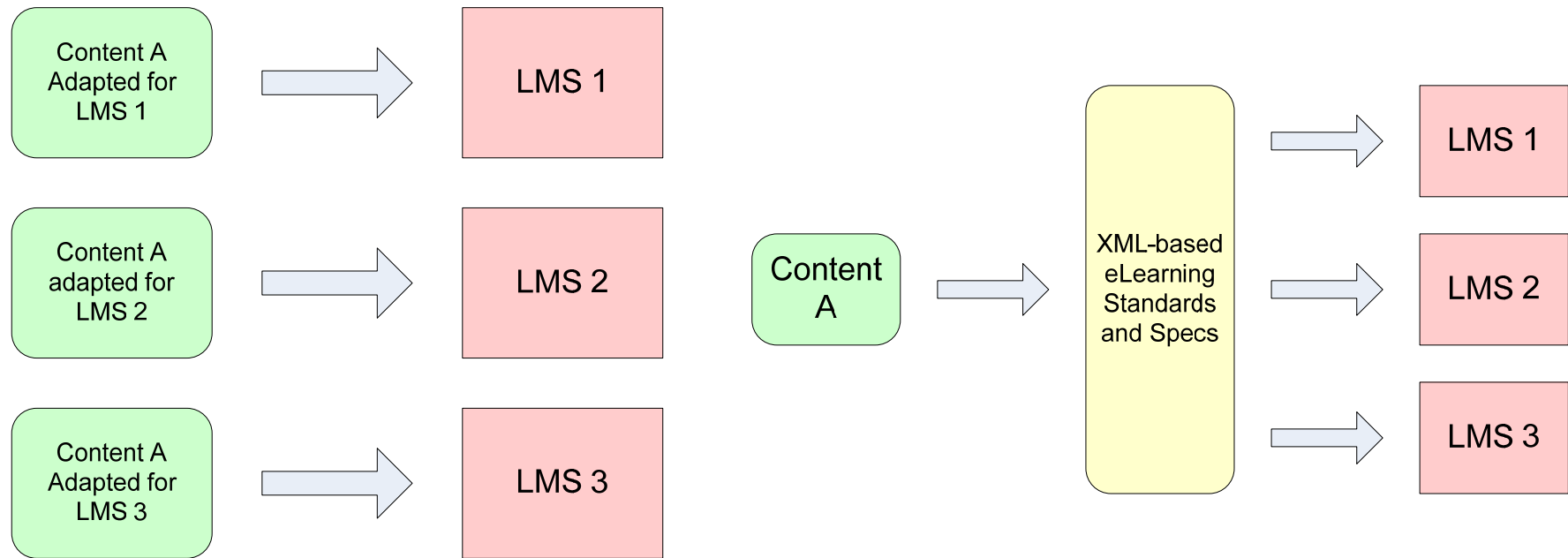
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- Conclusion:
- XML as format for content production:  
(Ascii-format, Unicode format, standardised, non-proprietary, long-term stability)
- Problem:
  - ◆ Document type definition (dtd) or today's
  - ◆ XML schema definition (xsd)
- → Development of openFuXML



# Document Type Definition

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w/o Interoperability

with Interoperability

# Document Type Definition

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Agreement for a common XML-Structure has been done in the CampusSource Initiative.

- ◆ Structure / Grammar for Learning content is ready.
  - ◆ Authoring systems have to be adapted
- DTD → XSD

# Inhalte – Erstellung – Bearbeitung - Verwendung

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*open*FuXML Toolbox  
(XML – Latex, HTML, PDF, XHTML)



## openFuXML

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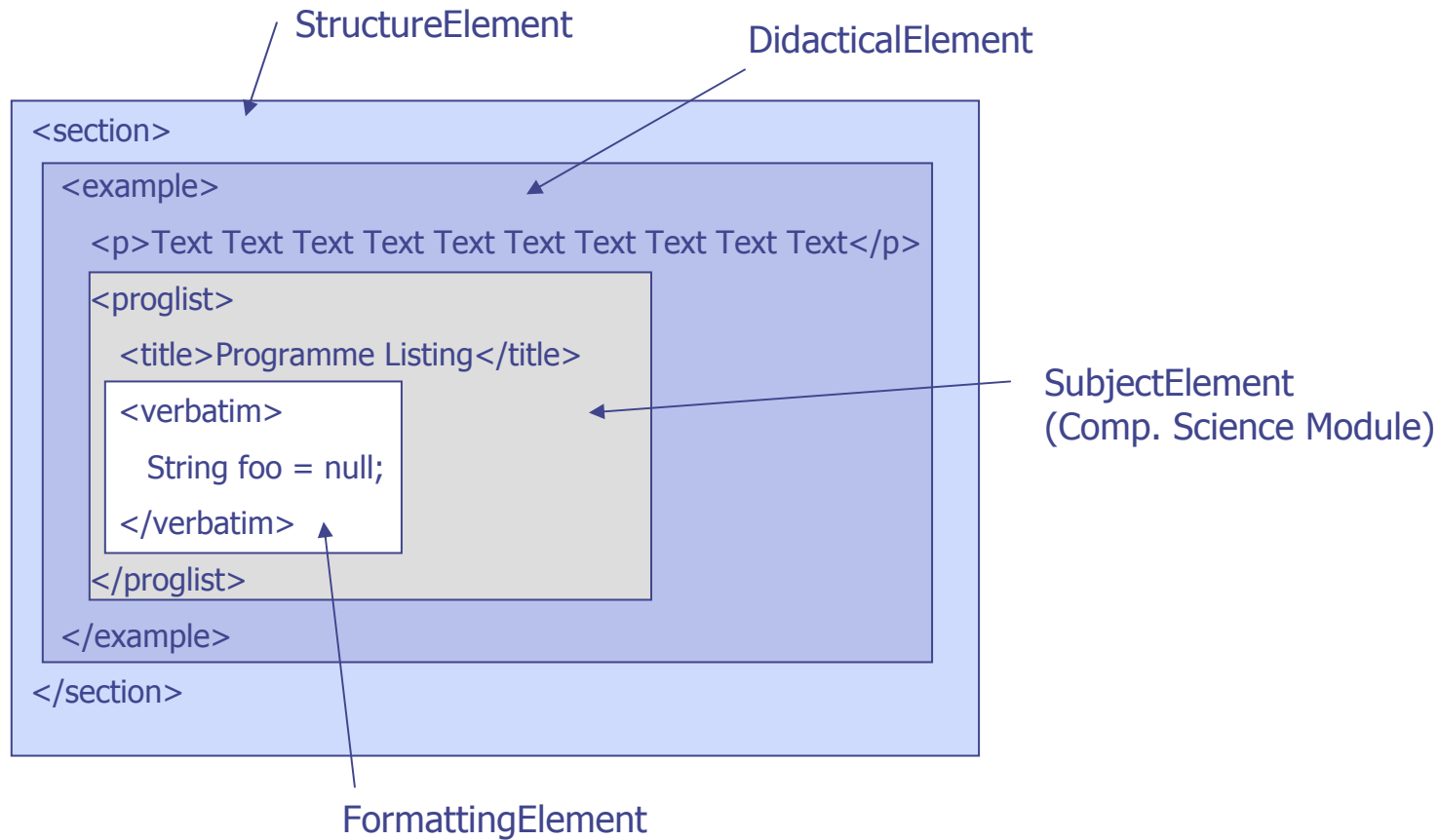
- Authoring-Environment using a flexible document schema
- Rendering Framework
- Open Source Product under the open Source GPL license

# Cross-Media-Publishing

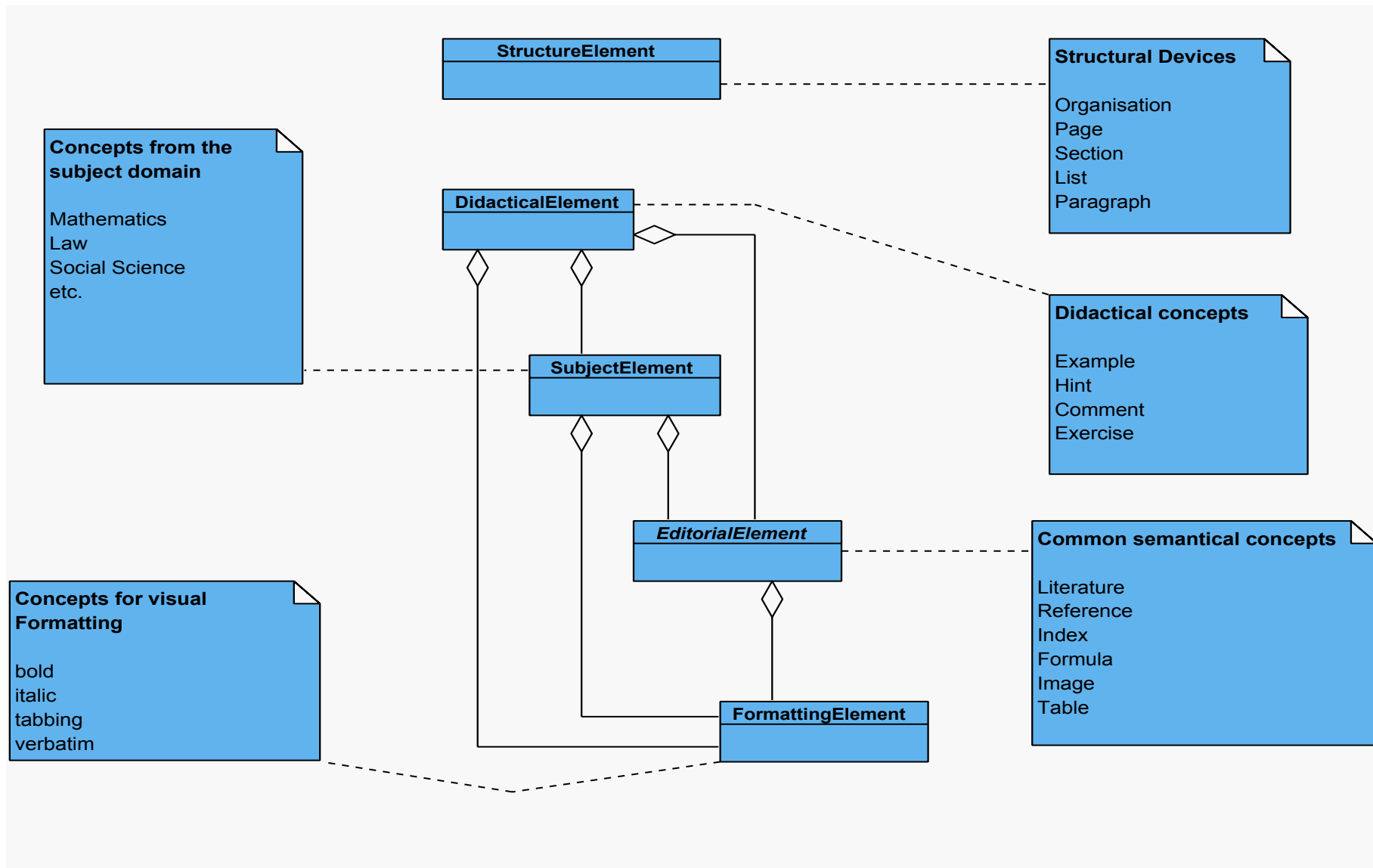
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- Advantage: One content in several output formats
- Advantage: Split of
  - ◆ content and
  - ◆ layout.
- Support of:
  - ◆ Numbering, footnotes, literature references, marginalia, mathematic formulas
  - ◆ Didactical elements
    - Logical, content (chapter, paragraph)
    - Timeline (lesson)
    - Assignment, Homework, example, solution

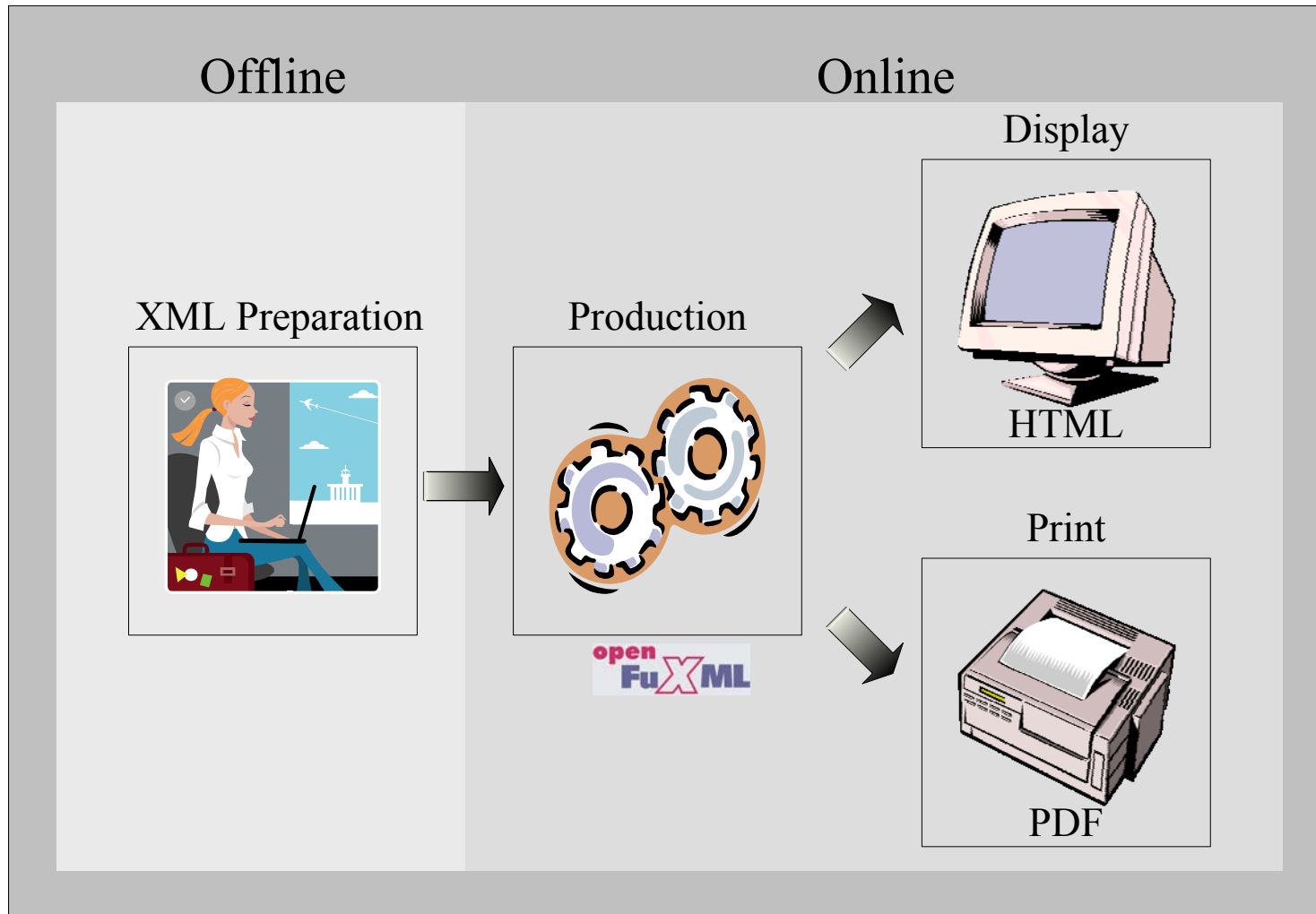
# Beispiel



# CampusSource DTD – cs.xsd



# openFuXML - System





## openFuXML output

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- Display:
  - ◆ PC-Display
  - ◆ Interactive CBTs
  - ◆ Mobile Phones
  - ◆ ....
- Print
  - ◆ Paper
  - ◆ CBT (Computer Based Trainings)
  - ◆ CD-ROM / DVD
  - ◆ ...

# XML Editor (e.g. XMetal)

Welche Wege lassen sich einschlagen, um die für das zu behandelnde Thema sachlich gebotene und für den eigenen Kenntnisstand geeignete Literatur zu finden? Ohne auf Vollständigkeit bedacht zu sein, werden im Folgenden fünf Strategien vorgestellt, die sich individuell und fallspezifisch kombinieren lassen, nämlich:

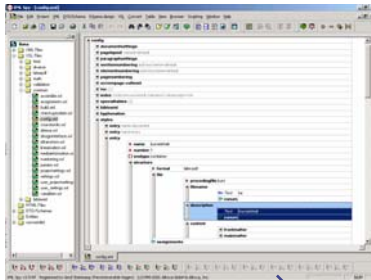
```
graph TD; A[SUCHSTRATEGIEN] --> B[soziale]; A --> C[dynamische]; A --> D[konventionelle]; B --> E[Systematisch I: EDV-gestützt]; C --> F[Systematisch II: in der Bibliothek];
```

Abb. 6.2-1:  
Suchstrategien (Quelle: eigene Darstellung)

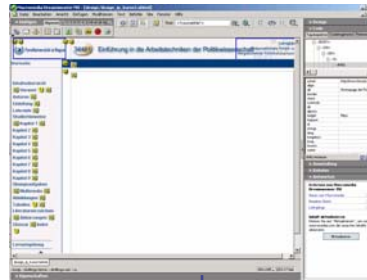
The screenshot shows the XMetal XML editor interface. The main window displays a text document with a paragraph and a diagram. The diagram, titled 'SUCHSTRATEGIEN', is a hierarchical tree structure. The root node is 'SUCHSTRATEGIEN', which branches into three nodes: 'soziale', 'dynamische', and 'konventionelle'. The 'soziale' node further branches into 'Systematisch I: EDV-gestützt'. The 'dynamische' node further branches into 'Systematisch II: in der Bibliothek'. The 'konventionelle' node has no further sub-nodes. To the right of the main window is a metadata panel with a table containing the following fields: 'kurs-nr', 'bezeichne', 'id', 'xml:lang', 'npr-teil', 'extern', and 'quelle'. Below the table is a section with 'Used' and 'All' tabs, and buttons for 'Change', 'Insert', and 'Apply'. The status bar at the bottom indicates 'Rules Checking On' and 'NUM'.

# System

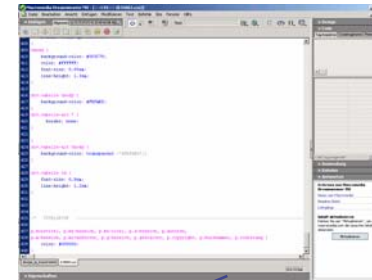
config.xml



template.html



styles.css



Layout

PDF

HTML

...

Rule based  
Rendering Engine

## Next development

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- Editor to-date: XMetal
- openFuXML 2 (Q2 2007):
  - ◆ Word 2003 professional
  - ◆ Word 2007
  - ◆ native XML-Support
  - ◆ Star-Office planned
  - ◆ ...

# Project CampusContent

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**Intentionally re-use of multimedia enriched material**

## Additional information

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[www.openfuxml.org](http://www.openfuxml.org)

[www.campussource.de](http://www.campussource.de)

Contact:

[Michael.Stepping@fernuni-hagen.de](mailto:Michael.Stepping@fernuni-hagen.de)

[Stefan.Gebhard@fernuni-hagen.de](mailto:Stefan.Gebhard@fernuni-hagen.de)

## Contact

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**CampusSource** Initiative  
at FernUniversität in Hagen  
Universitätsstraße 11  
58084 Hagen

Internet: <http://CampusSource.de>

## Demonstration

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- XMetal – XML-file of course Digital Image Processing (Bildtechnik)
- Browser (HTML) – Bildtechnik
- PDF – Bildtechnik
- Browser – Internet techniques – Animations as multimedia added value



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# Thanks for your attention!

Dr.-Ing. Michael Stepping  
FernUniversität in Hagen