

GITTA:
Geographic Information
Technology Training
Alliance

Robert Weibel and Eric Lorup

University of Zurich

Department of Geography

GIS Division



Content

- Motivation, Objectives, and Characteristics (Weibel)
- Didactical and Technical Design (Lorup)
- Conclusions and Outlook (Lorup)



Motivation

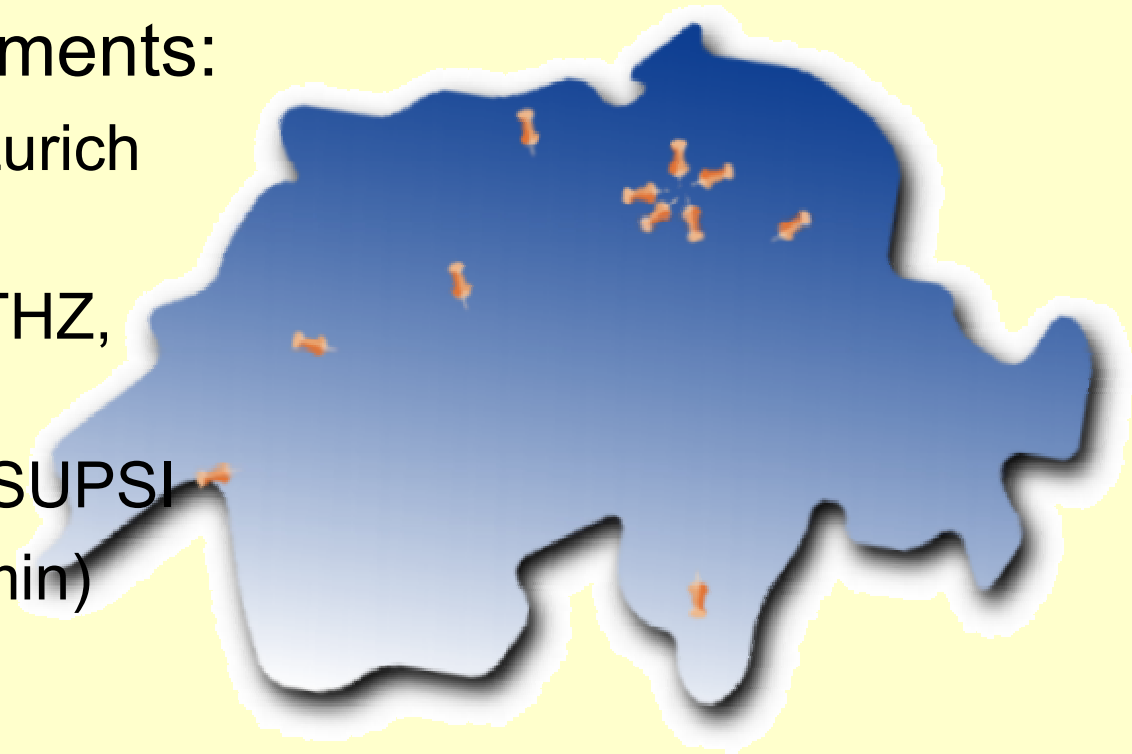
- Geographic Information Systems (GIS) are a core technology for the spatial sciences today.
- Interdisciplinary field where education could obviously benefit from a collaboration between educational institutions.
- GIS education mainly takes place in core disciplines (geography, geomatics/surveying, computer science).
- Increasing interest by students from other spatial sciences (biology, env. sc., earth sc.) → capacity problems
- As an IT field, GIS technology naturally lends itself to e-learning.



GITTA Partners

7 schools, 11 departments:

- State universities: Zurich (Lead), Fribourg
- Federal schools: ETHZ, EPFL
- UAS: FHBB, HSR, SUPSI
- KOGIS (federal admin)



Duration: 1.7.2001 –

7-May-02
31.12.2003

Robert Weibel & Eric J. Lorup



Key Characteristics

- Large consortium
- State universities, ETHZ/EPFL, UAS
- Consortium partners offer > 85% of capacity in GIS higher education in Switzerland
- Interdisciplinary: natural sciences, engineering, partially social sciences
- Multilingual



Objectives

- Gather diverse and geographically scattered knowledge in a coordinated virtual campus for GIS teaching, nationwide
- Exploit synergies, eliminate redundancies between partners
- Integrate GITTA modules in regular curricula to complement traditional teaching
- Replace ex-cathedra teaching by e-learning, where possible
- Use teachers' capacity primarily for coaching (face-to-face)
- Extend seat capacity, primarily in practicals
- Promote case-based teaching



Course Structure

- Covers multiple courses (3 semesters)
- Response to different needs
 - universities/ETH vs. UAS
 - theory vs. practically oriented teaching
- Modular design of course structure
 - **Basic level:** 4 credits, same for all participating institutions
 - **Intermediate level:** 4 out of 6 credits
 - **Advanced level:** specialized modules
 - **Case studies:** practically oriented, case-based teaching; various modules that can be used as practicals or stand-alone



GITTA Course Structure

Methods and Techniques

	Data Capture	Spatial Modeling	Data Mgt & Ex	Systems	Presenta-tion	Analysis
Advanced Level	A4 SDSS					
	A3 3D-GIS					
	A2 Multimedia					
	A1 Interoperability					
Case Studies	CS 6					
	CS 5					
	CS 4					
	CS 3					
	CS 2					
	CS 1					
Intermediate Level	I-DC	I-SM	I-DM		I-PR	I-AN
Basic Level	B-DC	B-SM	B-DM	B-SY	B-PR	B-AN

Levels and Modules

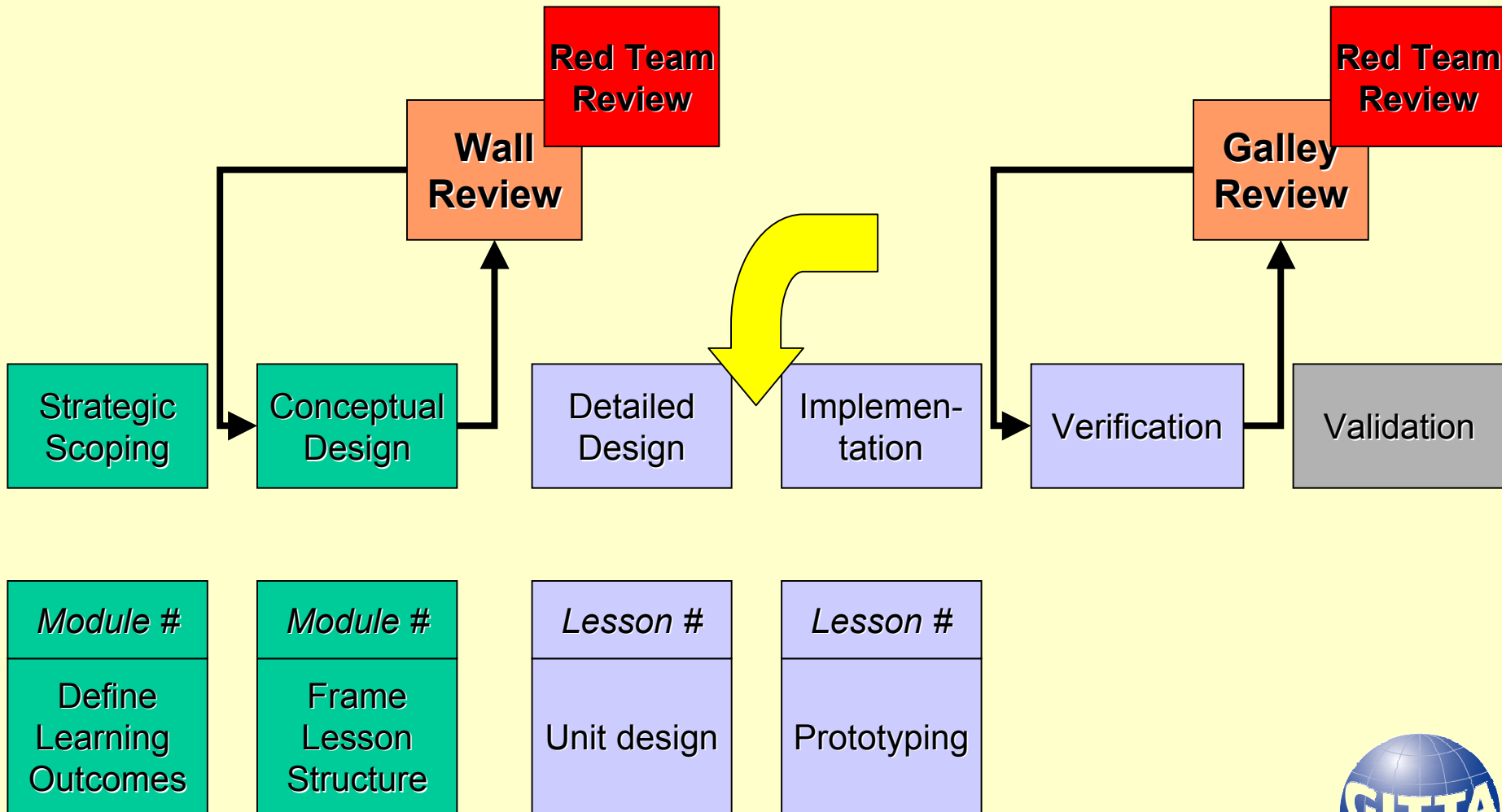


What helped and what didn't

- What helped:
 - project started in Phase II of SVC !!!
 - IT-related subject, graphics-oriented (maps!)
 - personnel is
 - used to interdisciplinary work
 - well versed in web technologies (!)
 - used to software development
 - is highly motivated
- What didn't help:
 - recruiting problems → initial delay of 3 months

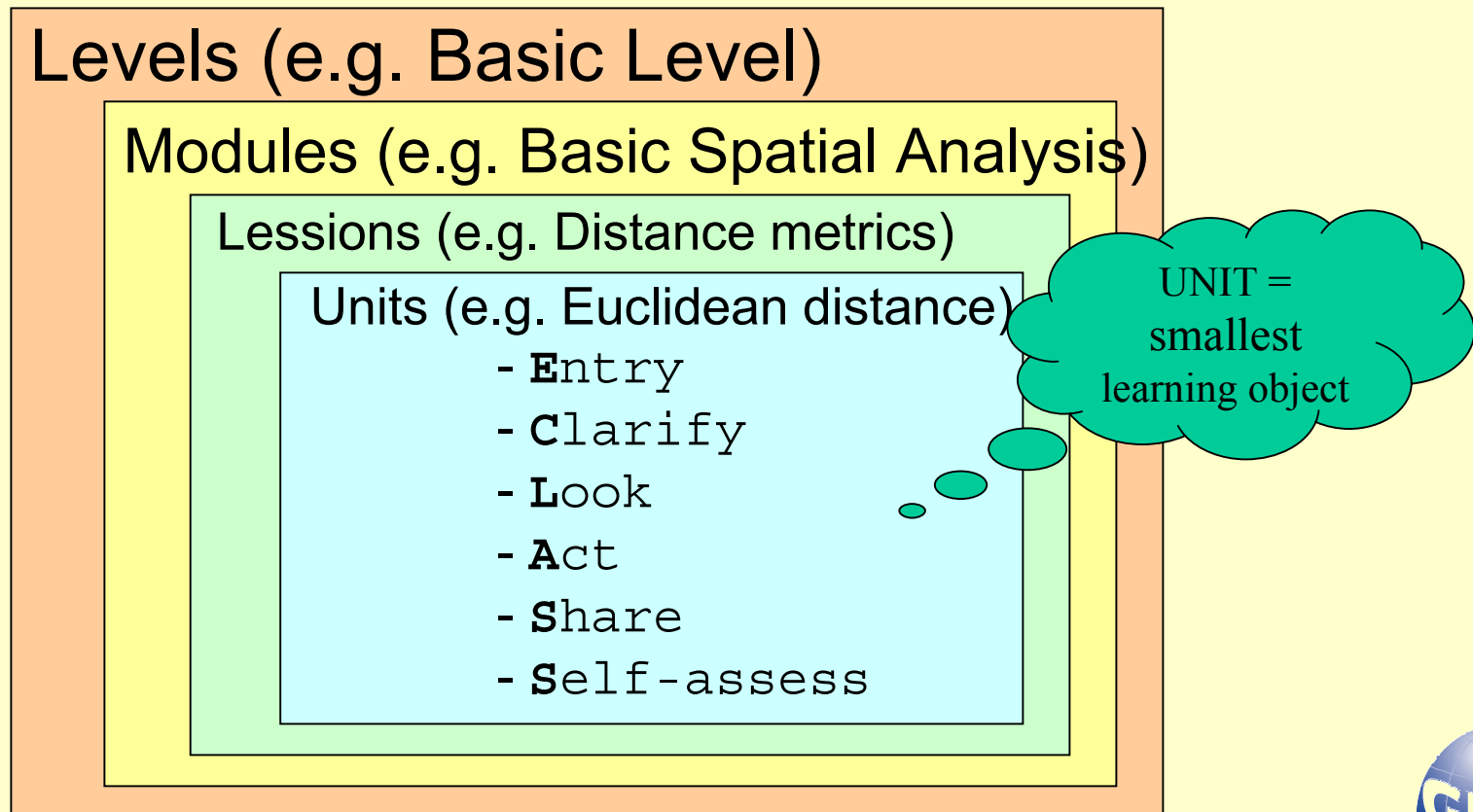


Design



Didactical Design

- Design Structure:

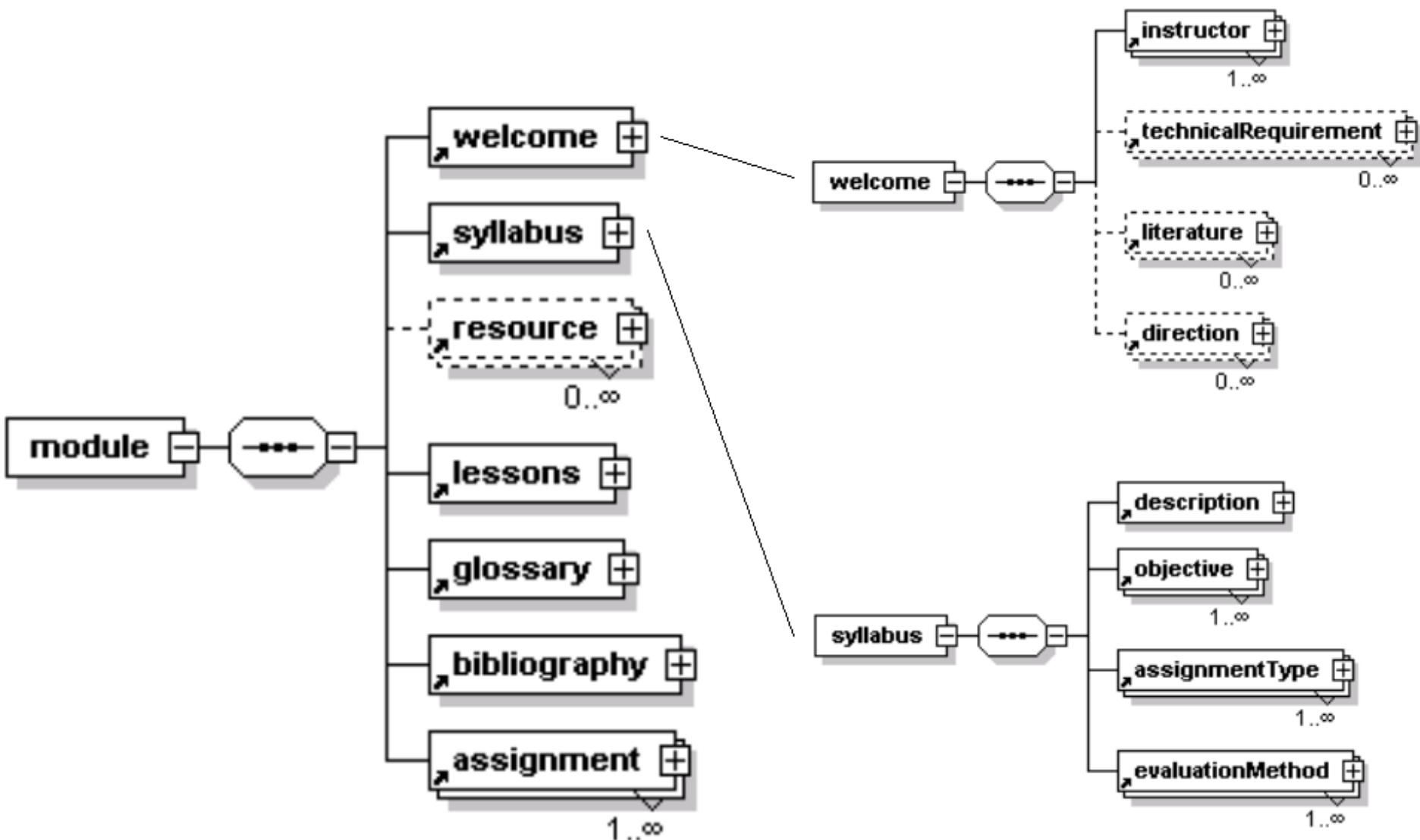


From Didactical to Technical Design

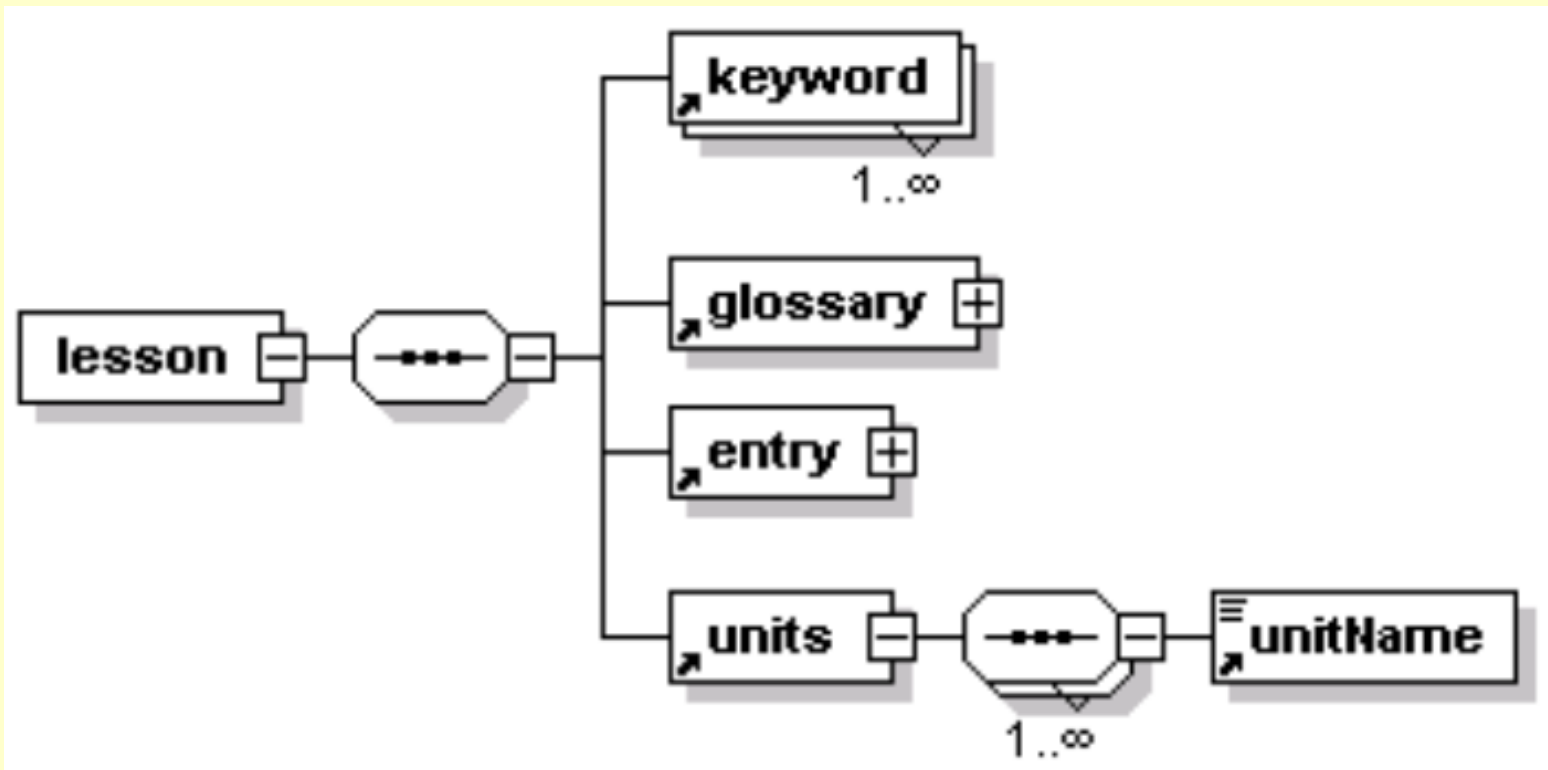
- XML
 - Clear separation of content and form
 - DTDs represent didactical structure (ECLASS)
 - XSL/XSLT (stylesheets) allow flexible formatting of output (HTML, PDF, RTF, WAP, ...)
- Technical infrastructure for authors
 - User friendly templates for content development



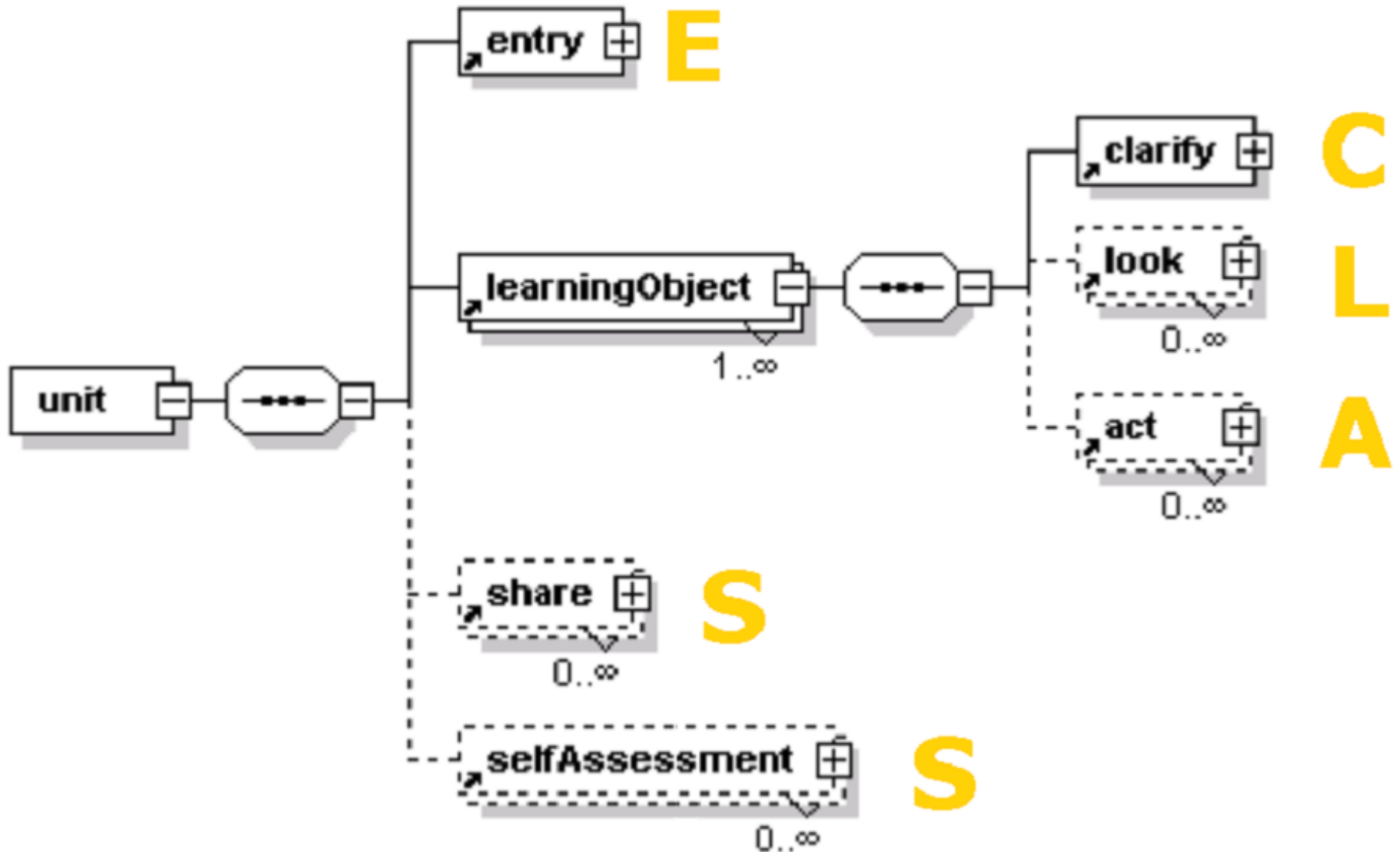
Module: DTD Structure



Lesson: DTD Structure



Unit: DTD Structure



XML – how the author sees it

```
<?xml-stylesheet type="text/xsl" href="../../../presentation/gittaUnit_HTML_demo.xsl" ?>
<unit>
  <entry>
    <explanation>
      <text> Whether the earth is treated as a sphere or as a spheroid, the transformation of its three dimensions
      depict locations of geographic objects without distortions in at least one of the spatial attributes or properties - shape, area, distance and
      conformality, distance, direction, scale and area are always result from the map projection process.
    </newLine/>
    </newLine/>
    Map projection and illustrate the map projections system that minimize area distortion.
  </text>
</explanation>
</entry>
  <learningObject>
    <clarify>
      <explanation>
        <text> If a map portrays areas over the entire map so that all map areas have the same proportion
        represent, the map is an equal area map. It is equal area projections that preserve area. Maps of United States commonly used the Albers
        Projections.
      </newLine/>
      </newLine/>
      The Albers Equal Area Conic Projection, Bonne Projection, Craster Parabolic Projection,
      Projection, Eckert VI Projection, Flat Polar Quatic Projection, Hammer-Aitoff Projection, Lambert Azimuthal Equal Area Projection, Mercator
      are common equal area projections.
    </text>
</explanation>
</clarify>
  <look>
    <remark>
      <text> The following figure is Albers Equal Area Projection. The First and second parallel is 30 and 60. Central Meridian
      is 46.952406. It is near to Bern.
    </text>
    <image>
      <image/>
    </image>
    <text>
      <newLine/>
      The area of circles portray the equal area.
    </newLine/>
    </newLine/>
    </text>
    <text> Zoom In View to Europe
    </newLine/>
    </text>
    <image>
      <image/>
    </image>
    <text>
      <newLine/>
      The following figure is Lambert Azimuth Equal Area Projection. The projection origin is 0,0 1
    </newLine/>
    </text>
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    </remark>
    </look>
  <act>
    <instruction>
      <text> Connect to the Internet Map Server using ArcExplorer3.0. Add the map service AlbersEqualArea. Change the
      the Circles. The projection origin is as follow. The First and second parallel is 30 and 60. Central Meridian is 7.439583 and latitude of p
      Measure the area of Switzerland. (Hint: Highlight the country theme by clicking on the ct98aleqar layer. Then zoom in Switzerland. Then
      Switzerland. The attribute of Switzerland will show. The Area attribute illustrates the area of the country according to this map. SQKM_
      according to the different reports.)
    </text>
</instruction>
</act>
</learningObject>
  <share>
    <task>
      <text> What is the area of Switzerland from official sources? Why the area different from the official sources to the area
      your opinion to the discussion board. Quality facts are not important. It is only for the purpose of Brainstorming among the eClassmates
    </text>
    </selfAssessment>
  </task>
  <text> If a map portrays areas over the entire map so that all map areas have the same proportional relationship to the areas on
  equal area map. True/False
</text>
</task>
</selfAssessment>
</unit>
```

Examples of different styles

Equivalence or Equal Area Projection

Whether the earth is treated as a sphere or as a spheroid, it is not possible to depict locations of geographic objects shape, area, distance and direction. Some different distortions result from the map projection process.

This unit will discuss especially area distortion in Map projection.

Equivalence

If a map portrays areas over the entire map so that all map areas have the same proportional relationship to the areas on the earth that they represent, the map is an equal area map. It is equal area projections that preserve area. Maps of United States commonly used the Albers Equal Area Conic Projections.

The Albers Equal Area Conic Projection, Bonne Projection, Eckert VI Projection, Flat Polar Quatic Projection, Mollweide Projection and Sinusoidal Projection are common equal area projections.

Graphical Presentation of Equivalence

The following figure is Albers Equal Area Projection. The latitude of projection origin is 46.952406. It is near to Bern.

Equivalence or Equal Area Projection

Objectives

Whether the earth is treated as a sphere or as a spheroid, the transformation of its three dimensional surface to a flat map, it is not possible to depict locations of geographic objects without distortions in at least one of the spatial attributes or properties - shape, area, distance and direction. Some different distortions of conformality, distance, direction, scale and area are always result from the map projection process.

This unit will discuss especially area distortion in Map projection and illustrate the map projections system that minimize area distortion.

Equivalence

If a map portrays areas over the entire map so that all map areas have the same proportional relationship to the areas on the earth that they represent, the map is an equal area map. It is equal area projections that preserve area. Maps of United States commonly used the Albers Equal Area Conic Projections.

The Albers Equal Area Conic Projection, Bonne Projection, Craster Parabolic Projection, Cylindrical Equal Area Projection, Eckert IV Projection, Eckert VI Projection, Flat Polar Quatic Projection, Hammer-Aitoff Projection, Lambert Azimuthal Equal Area Projection, Mollweide Projection and Sinusoidal Projection are common equal area projections.

Graphical Presentation of Equivalence

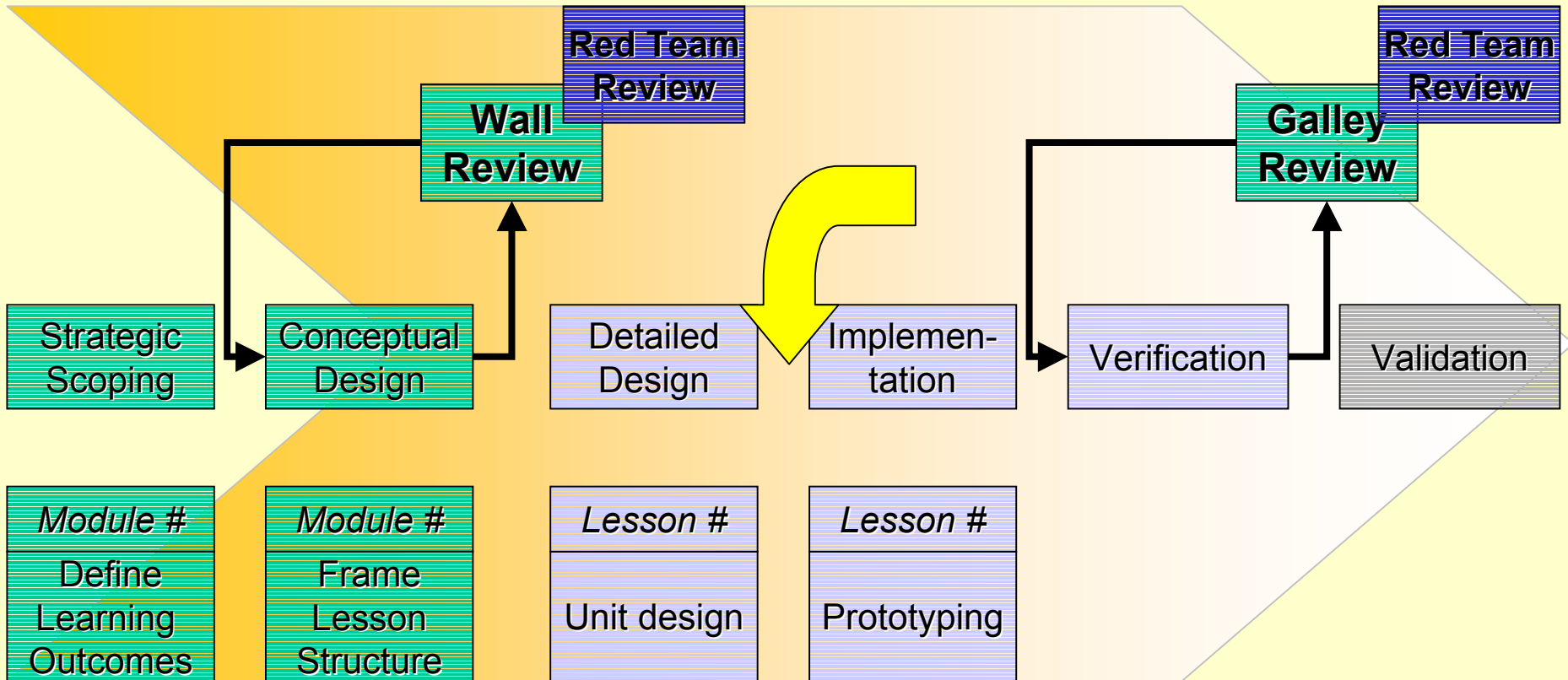
The following figure is Albers Equal Area Projection. The First and second parallel is 30 and 60. Central Meridian is 7.439583 and latitude of projection origin is 46.952406. It is near to Bern.

Conclusions

- Concurrent development of didactical and technical structures proved fruitful
- Authors appreciate the development tools provided and the clear cut rules for the creation of content



Outlook



Outlook

- Decision about E-Learning platform
 - Postponed due to advantage of flexible handling of XML-based content
 - Expected summer 2002
 - Quizzing raises need for administrative platform
 - CMS
 - OpenUSS, OLAT, ...



Questions ?



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