Euratlas :
From historical mapping to historical GIS

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SSHA 2010
Overview

- Periodical atlas concept
- Electronic historical atlases / Historical GIS
- Euratlas Periodical Historical Atlas of Europe
  - Before: Set of vector maps
  - After: Historical-Geographical database
- Applications
  - End-user historical GIS
  - Scientific usages / analyzes
The New Penguin Atlas of Medieval History

Irregular time intervals

+25yrs
+86yrs
+34yrs
+59yrs
+58yrs

Dates chosen according to « important » events
=> Arbitrary
Areas chosen to encompass modern political entities

Multiple dates represented on a single map
=> possible inconsistencies, hard to read
Periodical Historical Atlas

• Concept introduced by Christian Kruse
  • *Atlas zur Übersicht der Geographie und Geschichte der europäischen Staaten* (1841)

• Set of sequential maps
  • Political landscape at specific moment
  • Regular intervals
  • Same geographical area

• Contrasts with usual historical atlases
  • Irregular intervals / arbitrary dates (ex: New Penguin Atlas)
  • No specific time (ex: Grosser Historischer Weltatlas)

• Long-term, global and objective view of history
Electronic historical atlas & Historical GIS

- Bitmap images (ex: digitized paper maps)
  - Information available only to viewer, no structure
  - Zoom limited by resolution

- Vector maps
  - Basic structure: layers, shapes
  - Customizable view, zoom

- Geographical database (Historical GIS)
  - Data-model reflecting real-world
  - Automatic analyzes, combination with other data, interactive visualization, automatic labeling
Euratlas Periodical Historical Atlas

- 21 maps, year 1 to year 2000
  - 2 levels of administrative divisions
  - States and dependencies
  - Autonomous peoples
  - Fuzzy borders
  - Cities of various sizes
  - Physical features (rivers, mountains)
- Europe & Mediterranean basin
- Precision: 5km to 10km
- Vector drawings (CorelDraw)
Euratlas vector maps

- Countries: colored polygons
- Dioceses / provinces: lines inside countries
- Dependencies: 2-color polygons
- Cities: circles of various sizes
- Seas, mountains: polygons
- Rivers: lines of various widths
- Names layers (duplicated for zoom levels)
From vector maps to geographical database

- Interpret visual elements as data structure
  - Subdivisions boundaries → territories
  - Blend shape → fuzzy border, dependent states
- Data-model
  - Represent accurately political entities in a unified way
  - Simplicity, abstraction
- Names
  - No more on maps but linked to objects
- Georeferencing, map projection
Euratlas Georeferenced Vector Data

- Hierarchy of political entities
  - 2nd level administrative divisions (provinces)
  - 1st level administrative divisions (dioceses)
  - States / Dependent states
  - Supranational entities (HRE and EU)
- Other data (without explicit link)
  - Autonomous peoples
  - Cities
  - Fuzzy borders
  - Physical features: mountains, rivers, seas
Modeling dependencies

- Provinces may belong to 2 different states
  - Owner (always) – Sovereign state
  - Holder (optional) – Dependent state
- Sovereign state: at least 1 « owned » province
- Dependent state: only « held » provinces
Data model: diagram

Diagram shows a relationship between 'State' and '2nd-level division' where 'State' owns (sovereign) '2nd-level division' in a 1..n relationship.
Time

- Not really a temporal database
  - Events not represented
  - Static entities at specific moments (century)
  - Data for 21 centuries from year 1 to year 2000
- However, links exist between centuries
  - States ID (color) remains the same
  - Cities ID (location) also remains the same
  - No explicit temporal links for sub-national entities
Naming

- All entities/cities have local contemporary name
  - *Kingdom of the Franks* instead of *Carolingian Empire*
  - *Empire of Rhomania* (or *Roman Empire*) instead of *Byzantine Empire*

- Optional:
  - A short form (for labeling)
  - Several variants like modern forms

- Use original characters (except for Arabic)
Applications 1: Periodis Expert

- Software to navigate through the Euratlas data
- End-user GIS software
- Great flexibility to control data display
  - Independent layers
  - Automatic labeling
  - Scale-free zoom
  - Customizable maps / bookmarks
  - Exportation / printing
  - Advanced search functions
Applications 2 : Scientific usage

- Useful data for many scientific researches
  - Simple data model
  - Easy to combine with other data (GIS or not)
  - Ex : history, social sciences, genealogy, criminology, literacy, …

- History macrodynamics (Cliodynamics)
  - Quantitative analyzes
  - Macroscopic trends
Political stability analysis
Conclusion

- Development of historical GIS from simple maps
  - General data-model to represent all political territories
- Euratlas Periodical Historical Atlas
  - Shapefiles: Euratlas Georeferenced Vector Data
  - General user software: Periodis Expert
  - Free web version: Periodis Web
- Limitations / Future
  - Only one map per century
  - Dependency model too simple
  - Events chronology
Thank you!

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