XSLT

Map Programming

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University of West Bohemia (Plzen, Czech Republic)

CartoTalks, 15 November 2013, Vienna (Austria)

Outline

Geomatics in the UWB

- 1991 – study programme Mathematic Cartography – Doc. Ing. Jiří Pyšek, CSc.
- 1995 – Mathematic Cartography transformation to KMA FAV ZČU, creation of Geomatics – engineering study
- 2005 – Ph.D. study programme with support Research Institute Of Geodesy, Topography And Cartography
- 2010 – study programme Civil Engineering

- Bc. – Geomatics (attendance and combined form of study)
- Bc. – Civil Engineering – Spatial Planning (4Y)
- Mgr.
  - Surveying and GIS
  - Geodesy
  - Visualization of geoinformation
  - Land Cadastre and Civil Law
  - Surveying and Land Cadastre
- Ph.D. – Geomatics

Courses of Cartography Specialization

- Math. and physical geodesy, Adjustment calcul. 1, Databases 1, Spatial databases, Differential calculus, Cartographic polygraphy and reproduction
- Math. and physical geodesy, Databases 2, Mathematical cartography 2, Human geography
- Diploma thesis, Remote sensing, GNSS, Computer cartography, History of maps and mapping, Geodetic astronomy

+ another elective courses (Application of GIS, Web applications, Internet applications for geodata...)

Selected Research Fields

- Research of precise models of quasigeoids and geoids in the area of Central Europe
- Georeferencing and analyses of old maps in Bohemia, Moravia and Silesia
- Spatial Evidence of Cultural Heritage
- Ontologies, semantics and ML in geomatics and cartography
- Interpretation of thematic maps

Projects & Public Enlightenment

- NTIS
- GeoInfoNet & NeoCartoLink
- Plan4business
- OTN & SDI4Apps
- SDI-EDU
- TWG INSPIRE
- Historical Atlas of Plzen City
- Research project of National Heritage Institute
- ...

- Geomatics in projects
- GIS Day
- Support of high schools students (SOČ)
- Geoseminary
- Days of Open Doors
- Days of Science and Technics
- Information Stands (conferences)
- Alumni Meetings
- Sharing of information in public sources

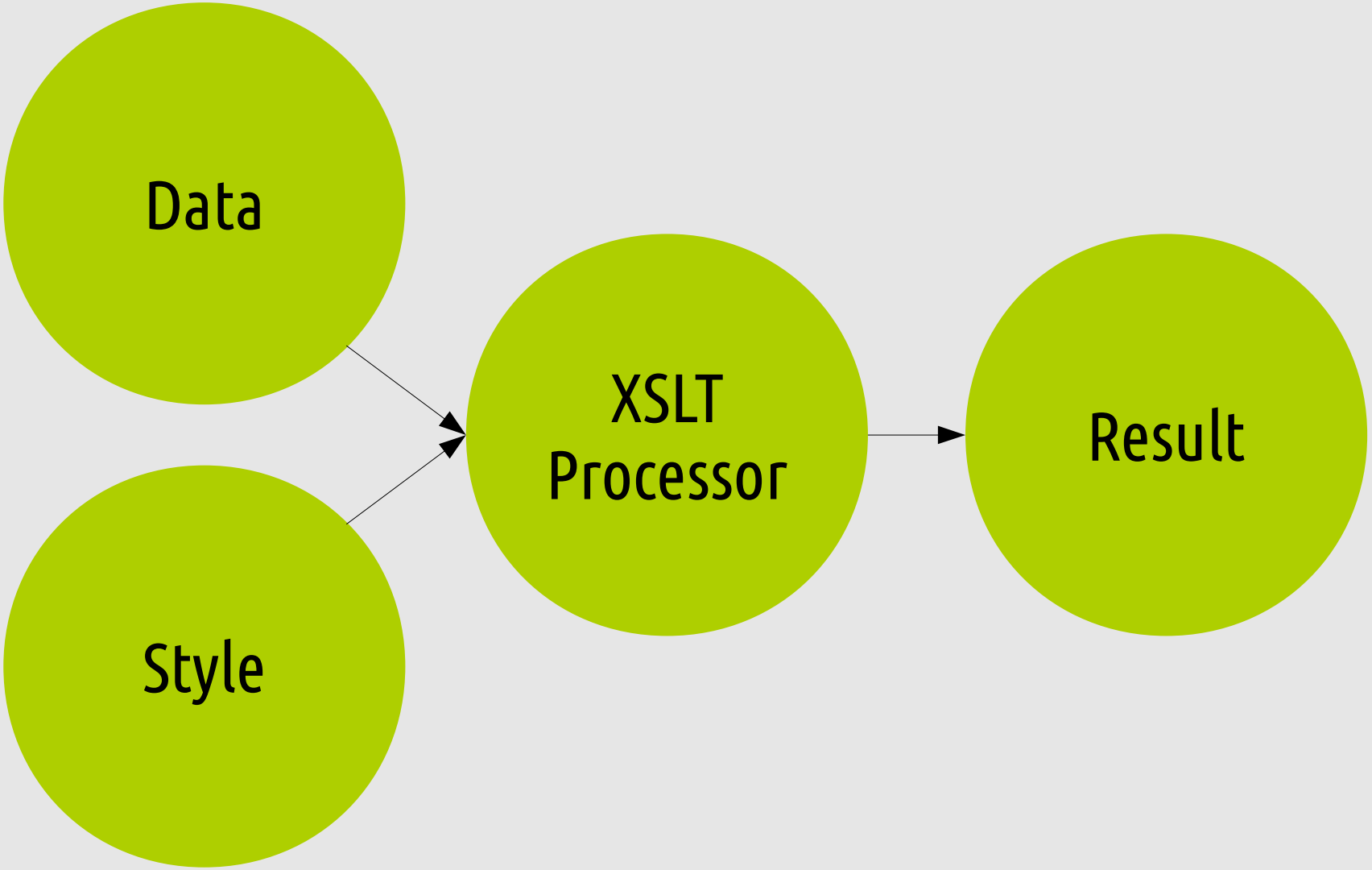
Programming maps

- To say how data sets look like?
- Separation of data and visualization
- Concept from sixties (IBM) → Geocommunity 50 years behind the times
- Support of the semantic web
- Between drawing and generating map (easier & more flexible)

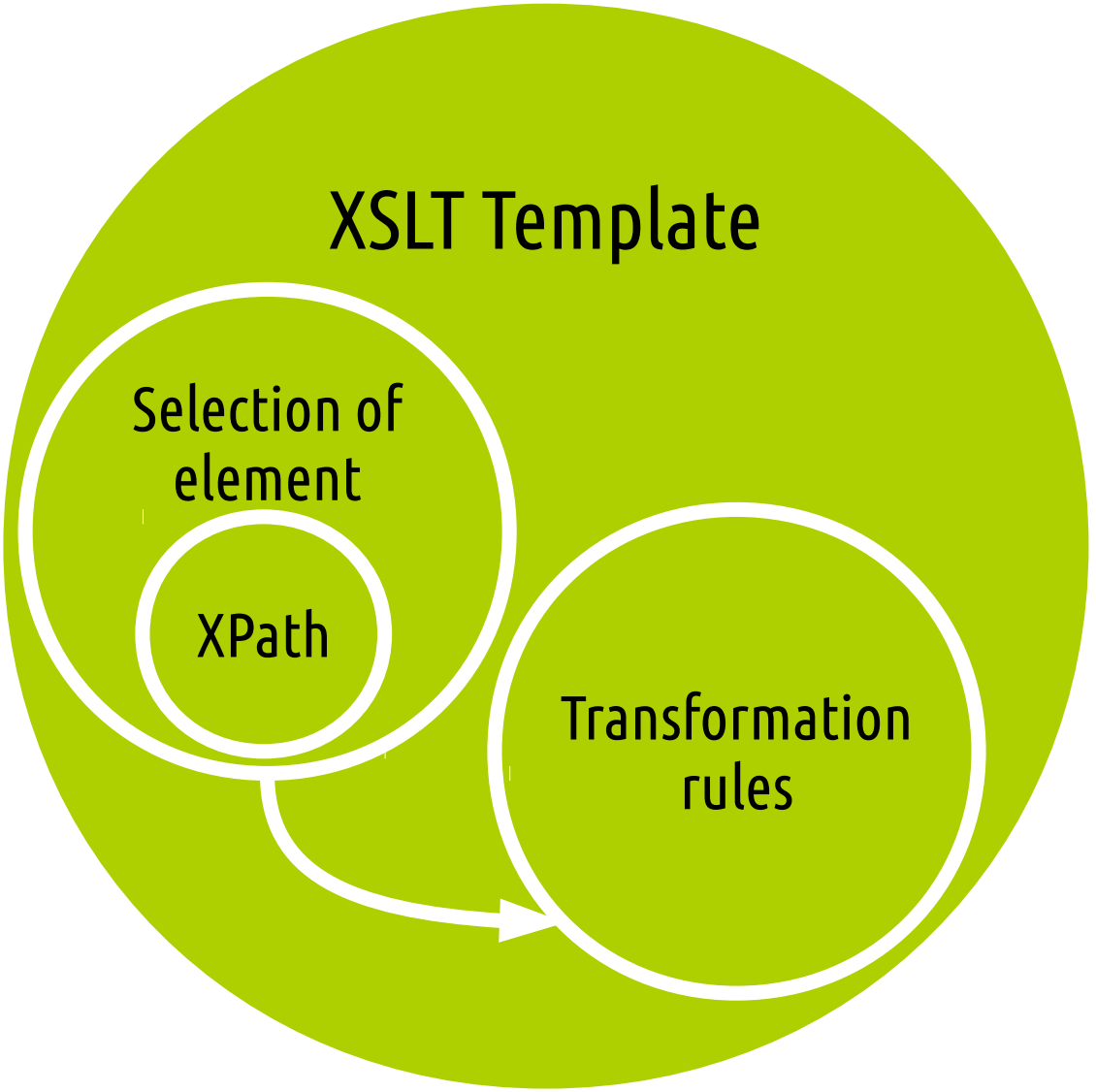
XSLT

- Transformation language (FOSI, DSSSL or CSS)
- Guaranteed by W3C
- Version 2.0 (2007 → stability); 3.0 Draft
- Sibling of XSL-FO
- XLink, XPath, XML Namespaces…

XSLT Principle



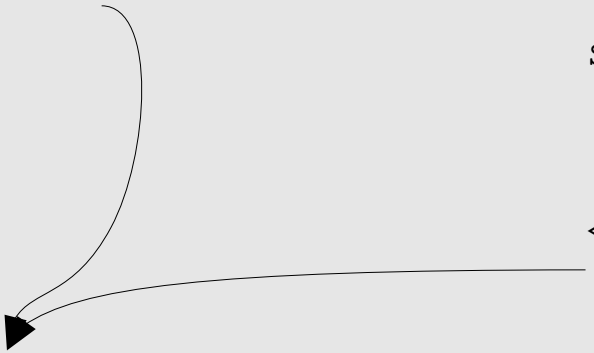
XSLT Structure



XSLT Template

Source data

```
<W789>
<x>France</x>
<x>Spain</x>
</W789>
```



Target data

```
<Europe>
<Country>France</Country>
<Country>Spain</Country>
</Europe>
```

Template

```
<xsl:template match=”/”>
   <Europe>
   <xsl:apply-template
select=”x”/>
   </Europe>
</xsl:template match>
```

```
<xsl:template match=”x”>
   <Country>
   <xsl:value-of select=”.”/>
   </Country>
</xsl:template match>
```

XSLT Components

- XML Infoset – Tree structure of input data
- XPath functions – strings, boolean…; document, generate-id
- xsl:output – xml, html, xhtml, text
- xsl:apply-templates (procedures vs. sequences)
- Conditions (xsl:if), cycles (xsl:for-each)
- Parameters, sorting, keys, regular expressions…
- xsl:value-of

XSLT Components

- XML Infoset – Tree structure of input data
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Great specification, documentation and tutorials

Why XSLT for geo-operations?

Power

Flexibility

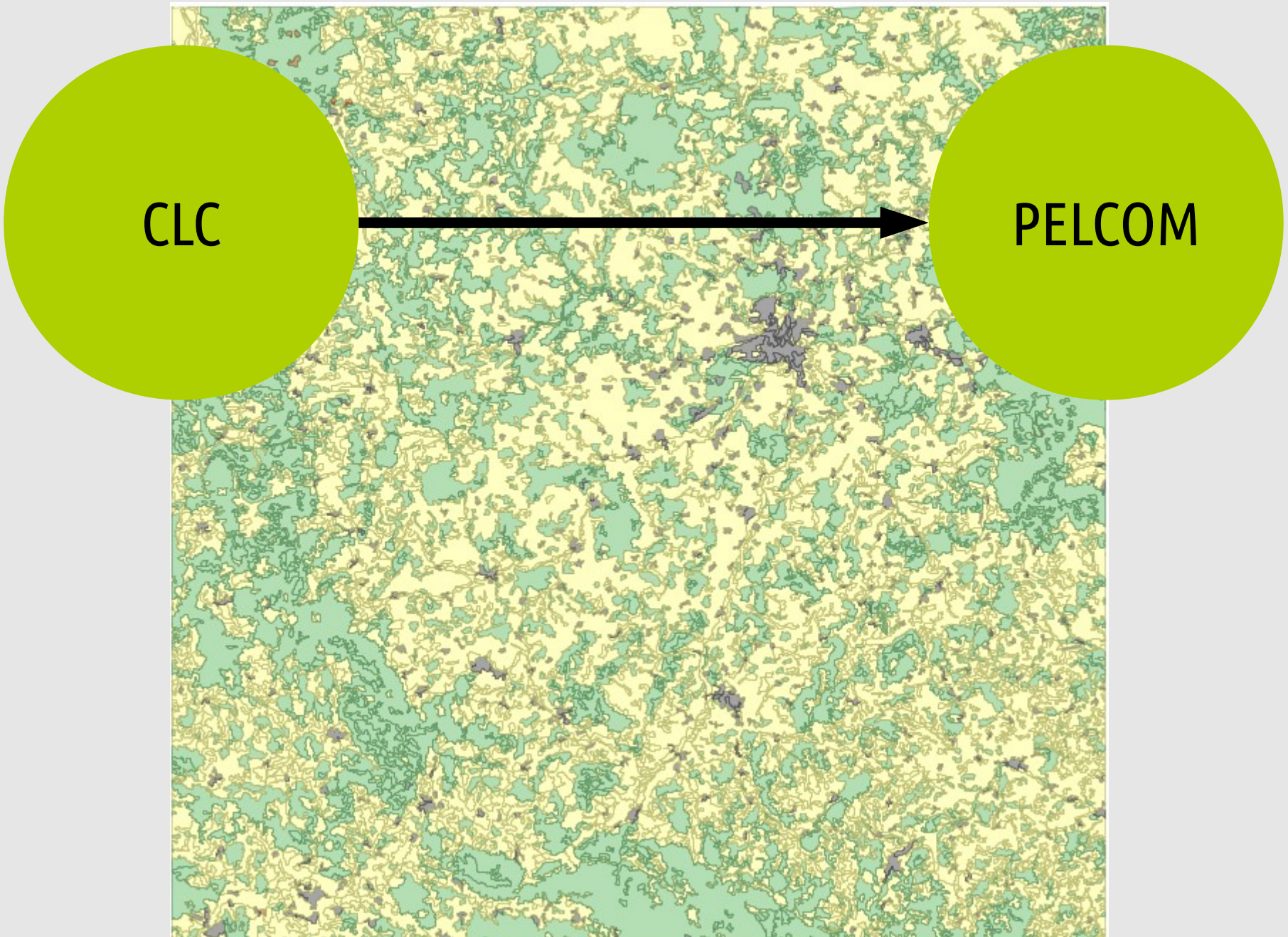
Links

Laziness

XSLT Geo/Carto-Applications

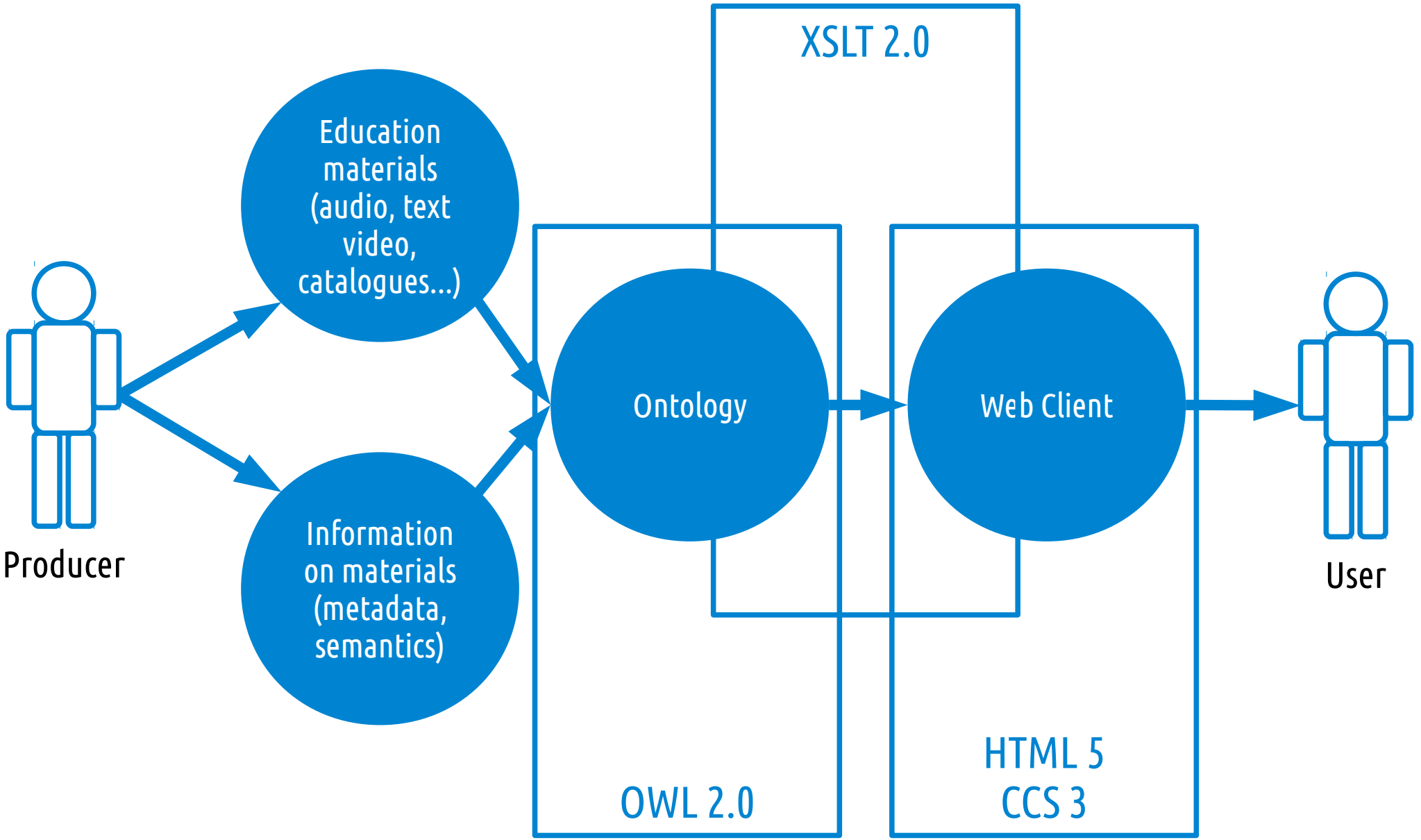
- Filters
- Data harvesting
- Data integration, harmonization and processing
- Data visualization

Habitats

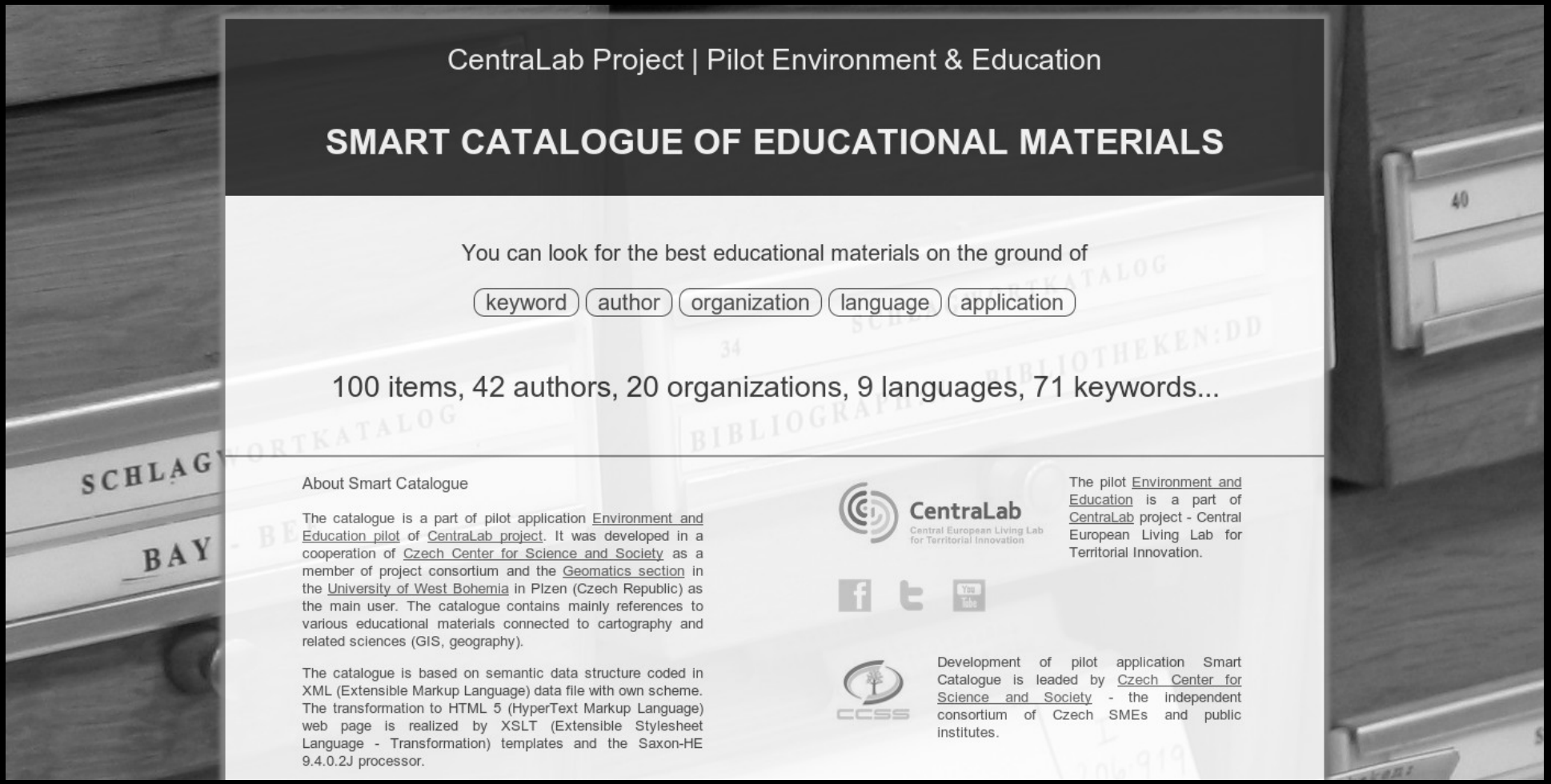


CentraLab
Central European Living Lab
for Territorial Innovation

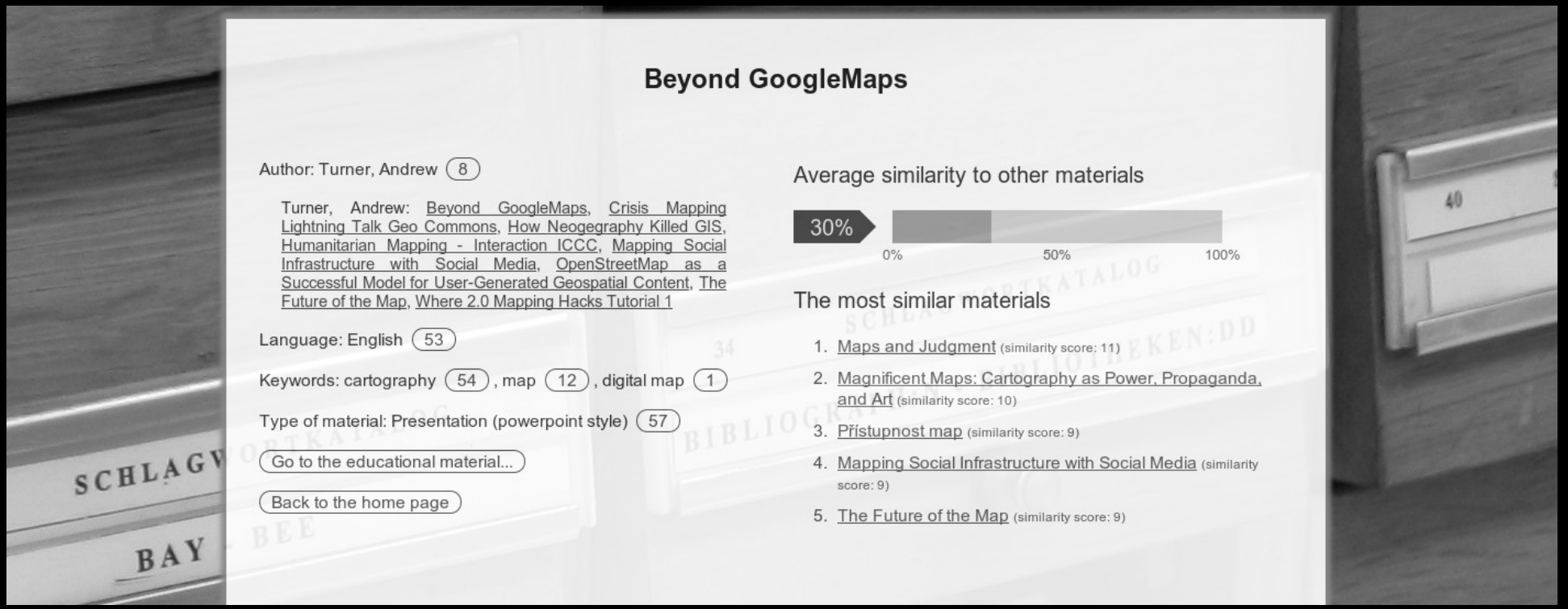
CentraLab



CentraLab


CentraLab Project | Pilot Environment & Education
SMART CATALOGUE OF EDUCATIONAL MATERIALS
You can look for the best educational materials on the ground of
keyword
author
organization
language
application
100 items, 42 authors, 20 organizations, 9 languages, 71 keywords...
About Smart Catalogue
The catalogue is a part of pilot application Environment and Education pilot of CentraLab project. It was developed in a cooperation of Czech Center for Science and Society as a member of project consortium and the Geomatics section in the University of West Bohemia in Plzen (Czech Republic) as the main user. The catalogue contains mainly references to various educational materials connected to cartography and related sciences (GIS, geography).
The catalogue is based on semantic data structure coded in XML (Extensible Markup Language) data file with own scheme. The transformation to HTML 5 (HyperText Markup Language) web page is realized by XSLT (Extensible Stylesheet Language - Transformation) templates and the Saxon-HE 9.4.0.2J processor.
CentraLab
Central European Living Lab for Territorial Innovation
The pilot Environment and Education is a part of CentraLab project - Central European Living Lab for Territorial Innovation.
CCSS
Development of pilot application Smart Catalogue is leaded by Czech Center for Science and Society - the independent consortium of Czech SMEs and public institutes.

CentraLab


Beyond GoogleMaps
Author: Turner, Andrew 8
Turner, Andrew: Beyond GoogleMaps, Crisis Mapping Lightning Talk Geo Commons, How Neogegraphy Killed GIS, Humanitarian Mapping - Interaction ICCC, Mapping Social Infrastructure with Social Media, OpenStreetMap as a Successful Model for User-Generated Geospatial Content, The Future of the Map, Where 2.0 Mapping Hacks Tutorial 1
Language: English 53
Keywords: cartography 54 , map 12 , digital map 1
Type of material: Presentation (powerpoint style) 57
Go to the educational material...
Back to the home page
Average similarity to other materials
30%
0%
50%
100%
The most similar materials
1. Maps and Judgment (similarity score: 11)
2. Magnificent Maps: Cartography as Power, Propaganda, and Art (similarity score: 10)
3. Přístupnost map (similarity score: 9)
4. Mapping Social Infrastructure with Social Media (similarity score: 9)
5. The Future of the Map (similarity score: 9)

Election Data

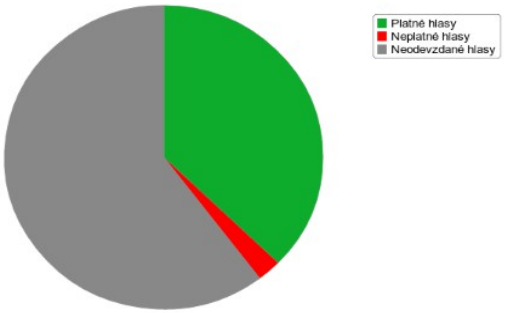
OPEN DATA

ČSÚ CZECH STATISTICAL OFFICE

Klatovy

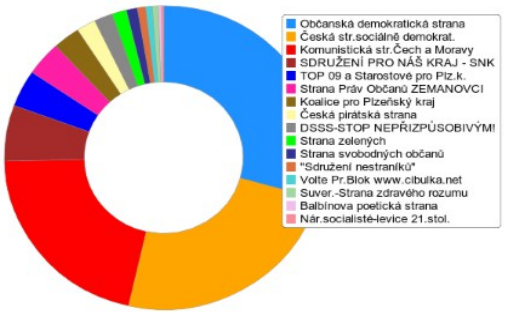
Zpět na hlavní stránku

Počet voličů	Počet vydaných obálek	Volební účast	Počet platných hlasů	Podíl platných hlasů
18380	7297	39.70%	6846	93.82%



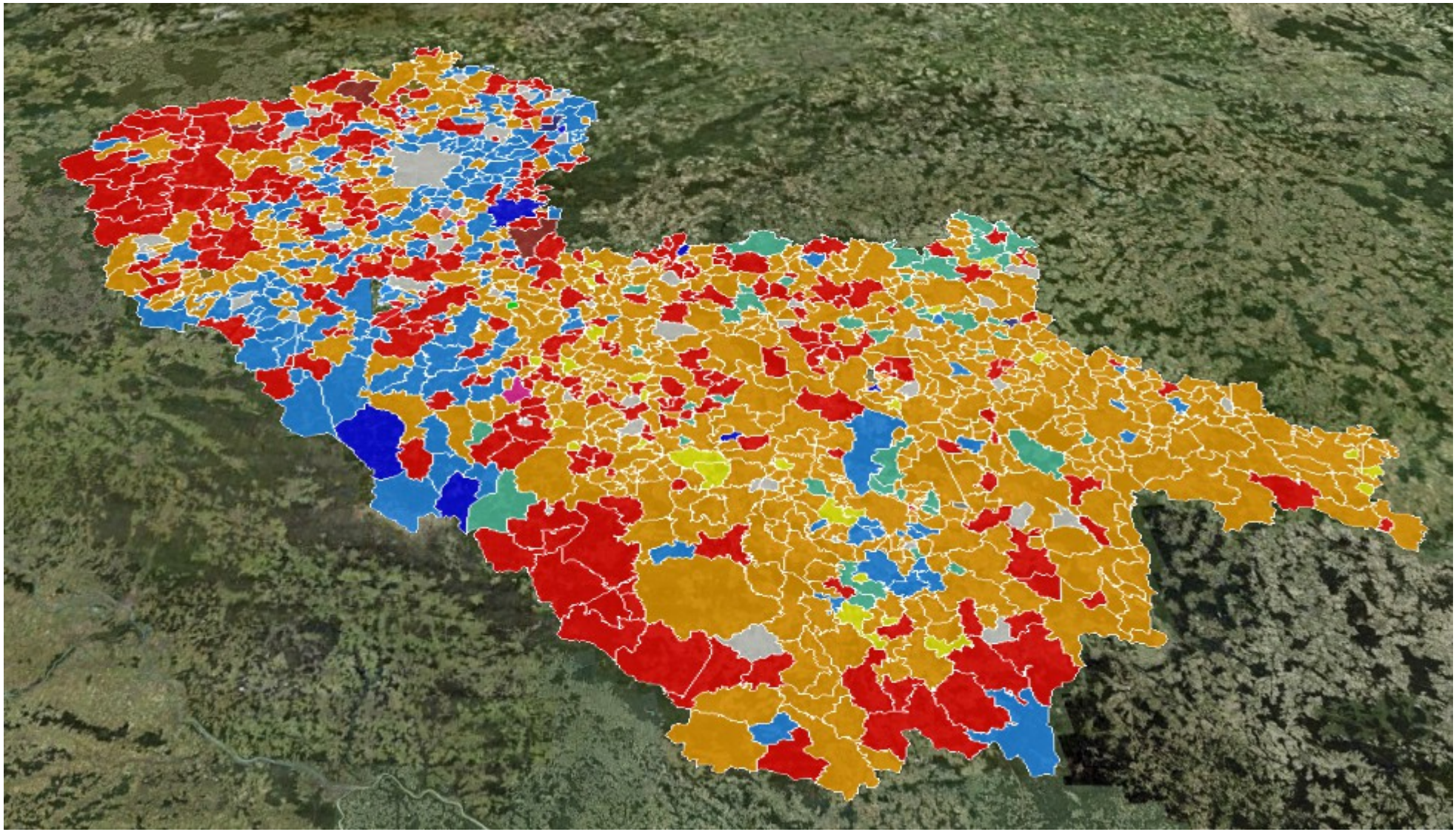
Pro tvorbu grafů byla použita knihovna RGraph.

Politická strana	Počet hlasů	% z celkových výsledků
Občanská demokratická strana	2009	29.34
Česká str.sociálně demokrat.	1657	24.20
Komunistická str.Čech a Moravy	1443	21.07
SDRUŽENÍ PRO NÁŠ KRAJ - SNK	407	5.94
TOP 09 a Starostové pro Plz.k.	267	3.90
Strana Práv Občanů ZEMANOVCI	250	3.65
Koalice pro Plzeňský kraj	190	2.77
Česká pirátská strana	134	1.95
DSSS-STOP NEPŘIZPŮSOBIVÝM!	129	1.88
Strana zelených	102	1.48
Strana svobodných občanů	77	1.12
"Sdružení nestraníků"	57	0.83
Volte Pr.Blok www.cibulka.net	46	0.67
Suver.-Strana zdravého rozumu	42	0.61
Balbínova poetická strana	22	0.32
Nár.socialisté-levice 21.stol.	14	0.20

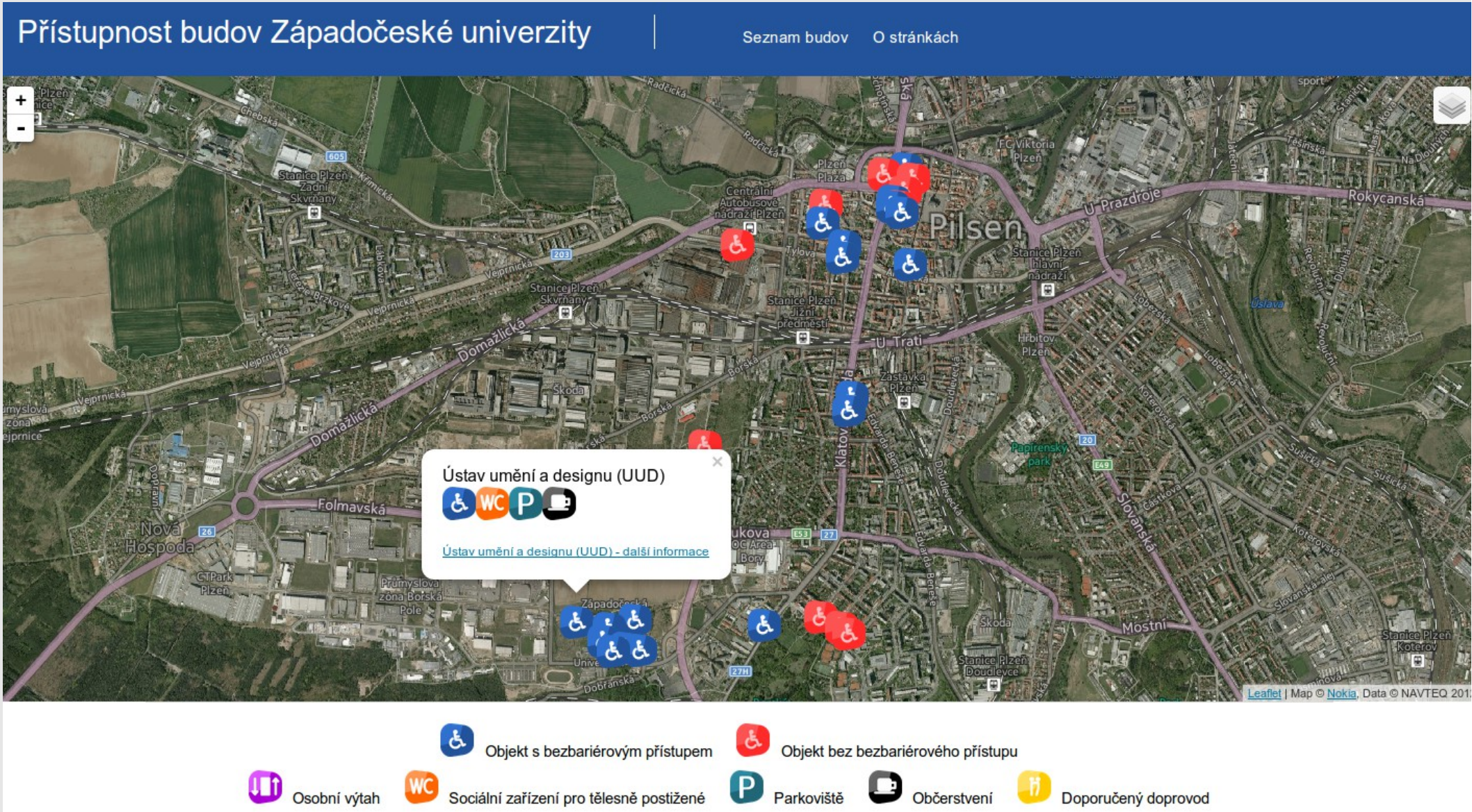


Pro tvorbu grafů byla použita knihovna RGraph.

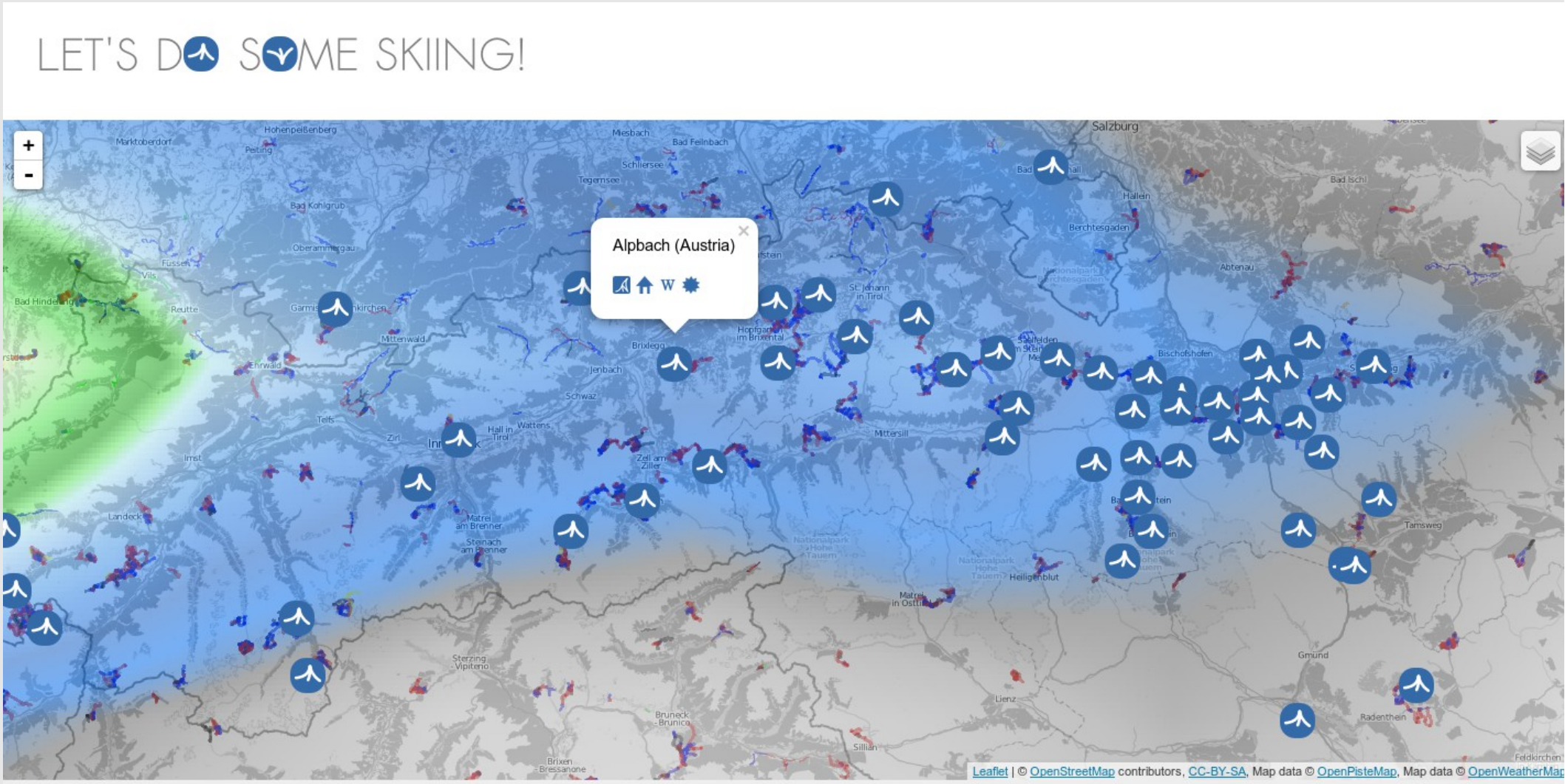
Election Data

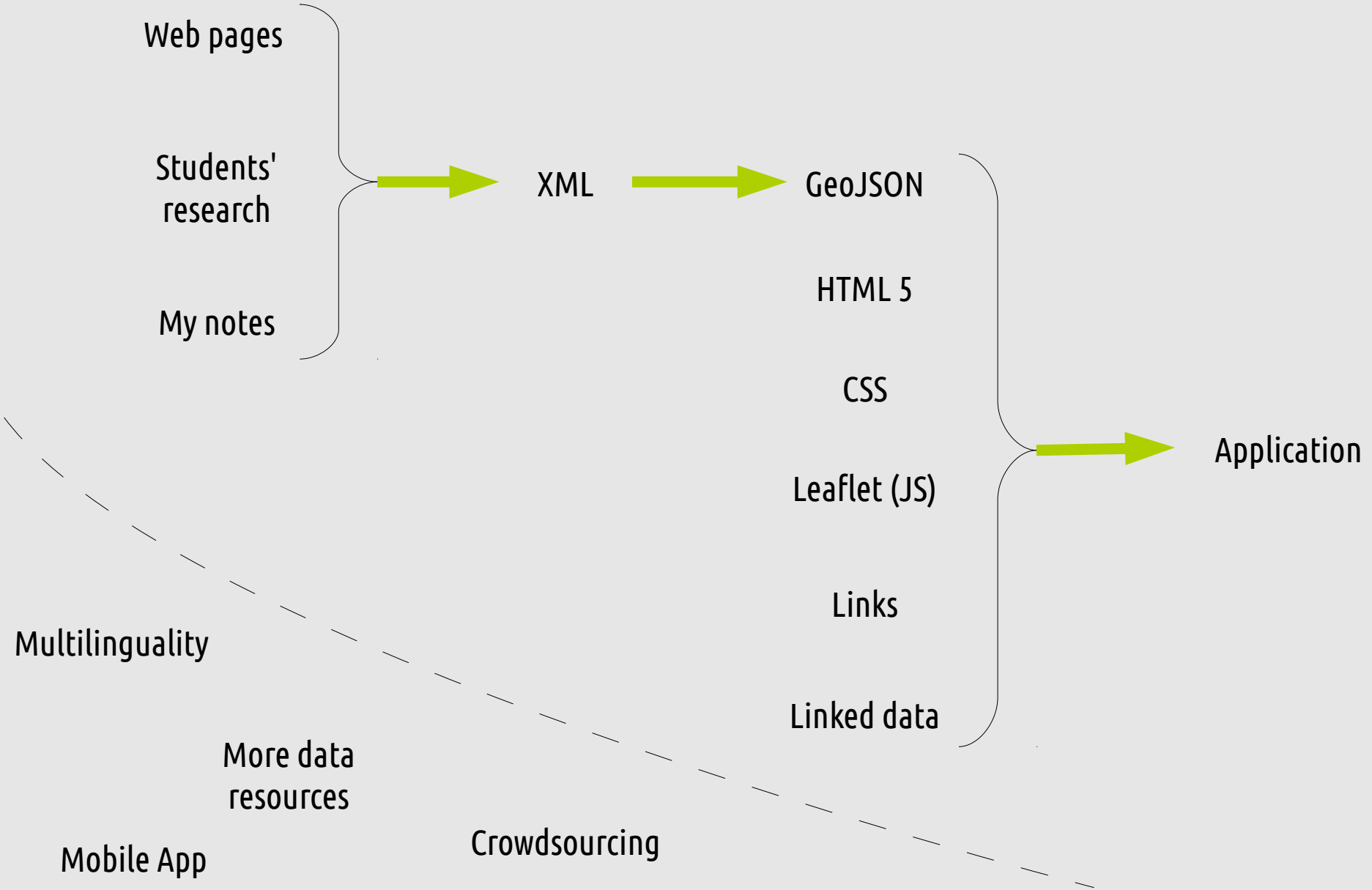


Buildings of UWB

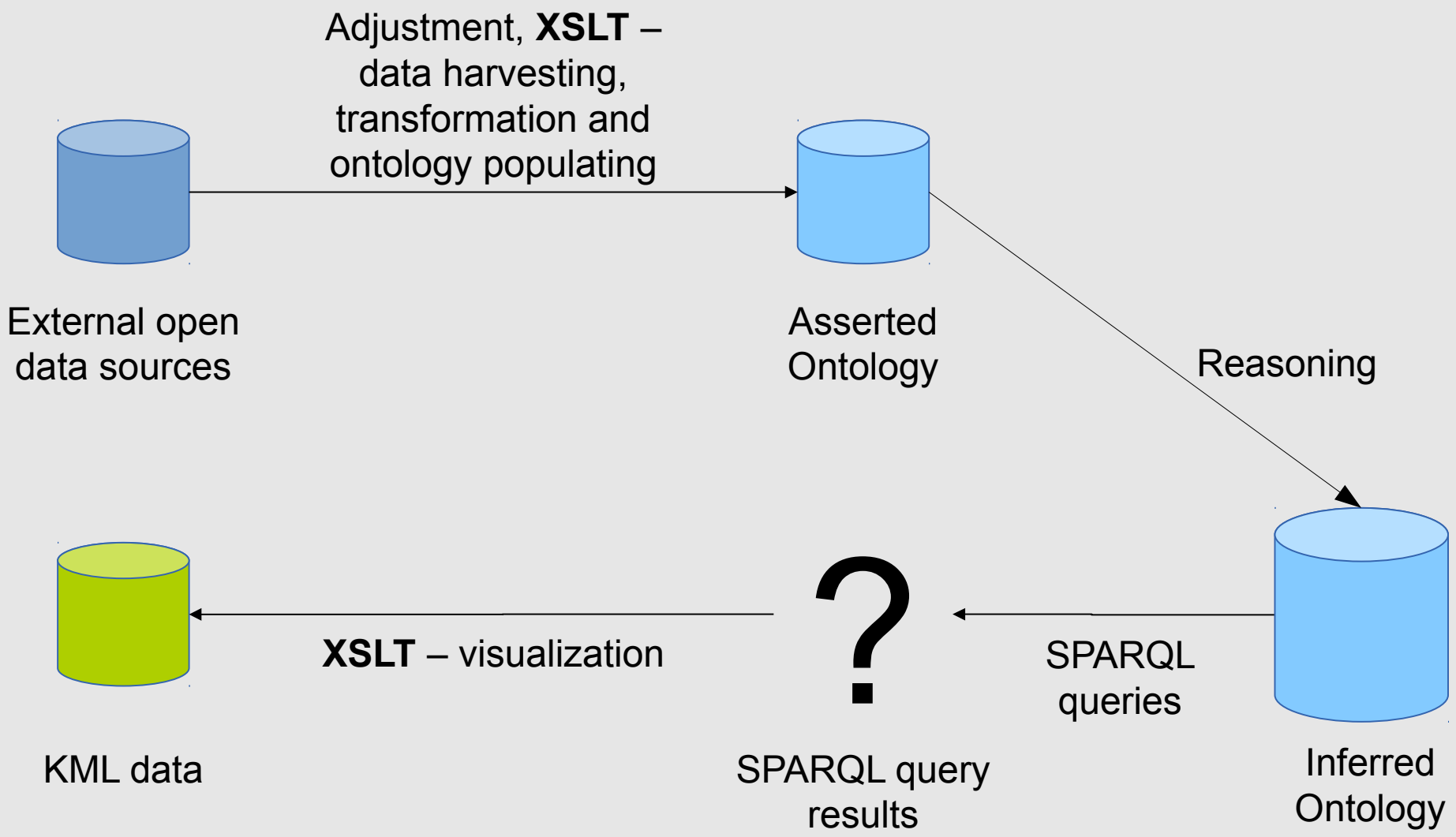


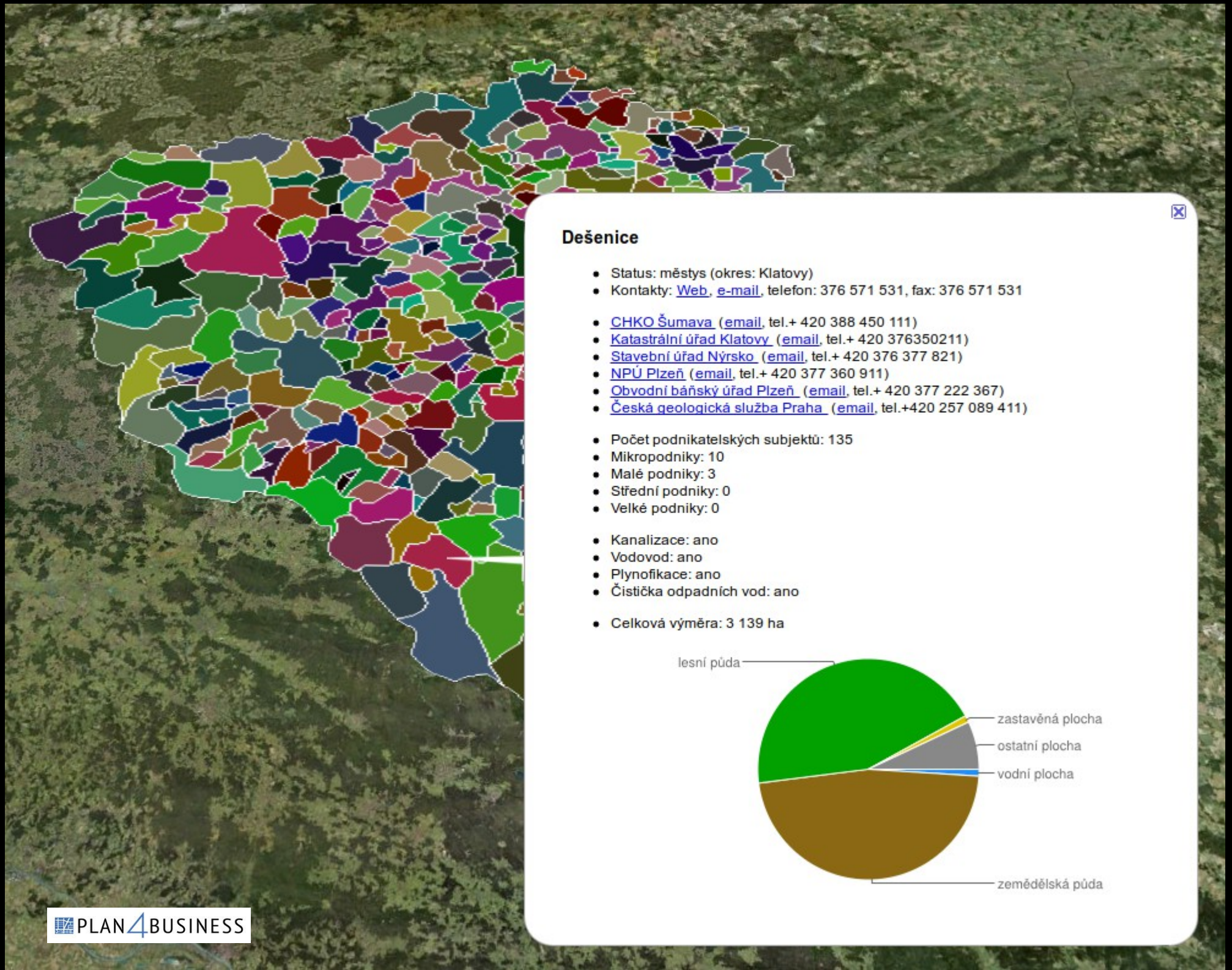
Ski Map


LET'S DO SOME SKIING!
Alpbach (Austria)
W
Leaflet | © OpenStreetMap contributors, CC-BY-SA, Map data © OpenPisteMap, Map data © OpenWeatherMap


Web pages
Students' research
My notes
XML
GeoJSON
HTML 5
CSS
Leaflet (JS)
Links
Linked data
Application
Multilinguality
More data resources
Mobile App
Crowdsourcing

p4b Ontology





Dešenice

- Status: městys (okres: Klatovy)
- Kontakty: Web , e-mail , telefon: 376 571 531, fax: 376 571 531

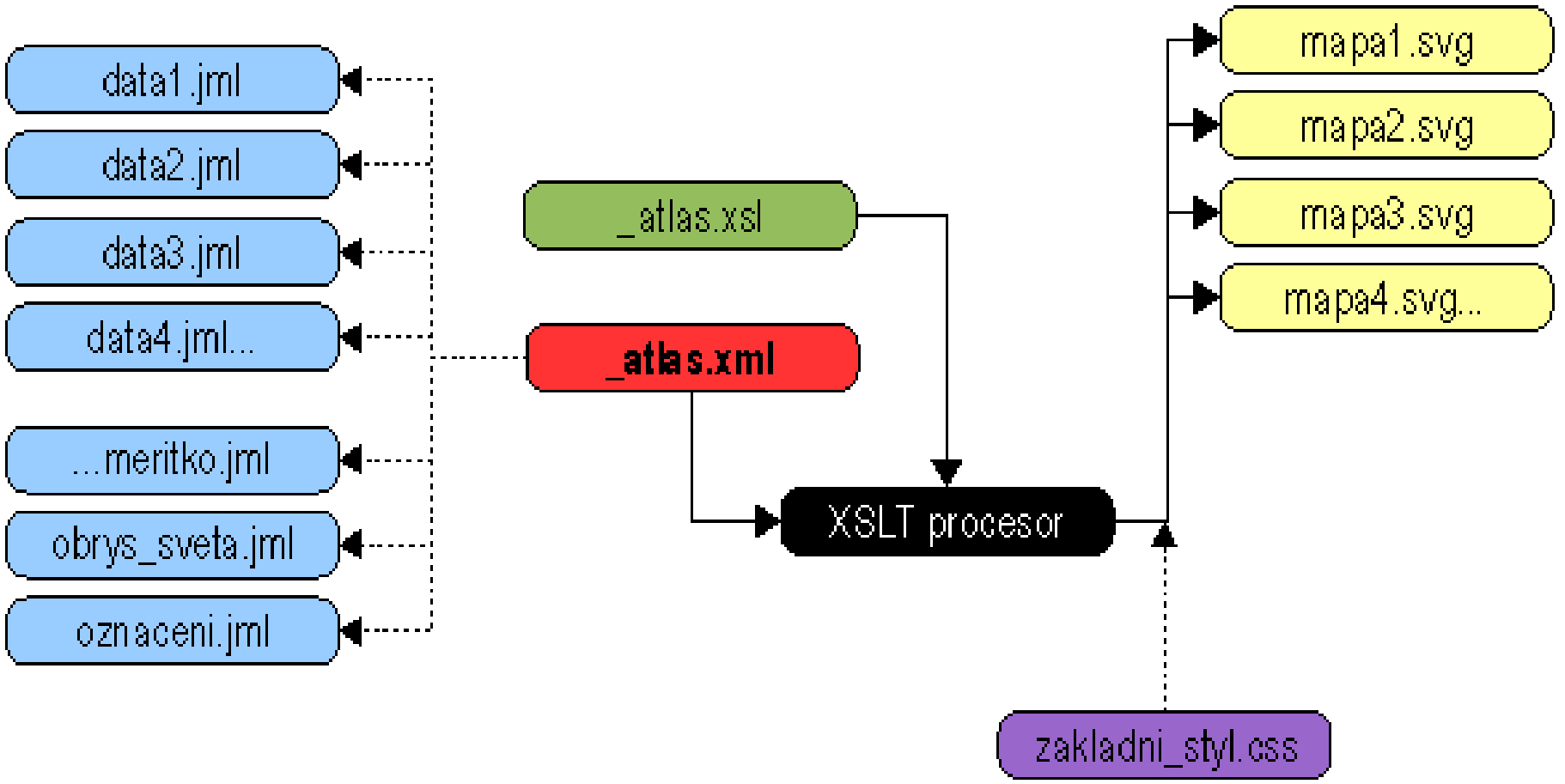
- CHKO Šumava (email, tel.+ 420 388 450 111)
- Katastrální úřad Klatovy (email, tel.+ 420 376350211)
- Stavební úřad Nýrsko (email, tel.+ 420 376 377 821)
- NPÚ Plzeň (email, tel.+ 420 377 360 911)
- Obvodní báňský úřad Plzeň (email, tel.+ 420 377 222 367)
- Česká geologická služba Praha (email, tel.+420 257 089 411)

- Počet podnikatelských subjektů: 135
- Mikropodniky: 10
- Malé podniky: 3
- Střední podniky: 0
- Velké podniky: 0

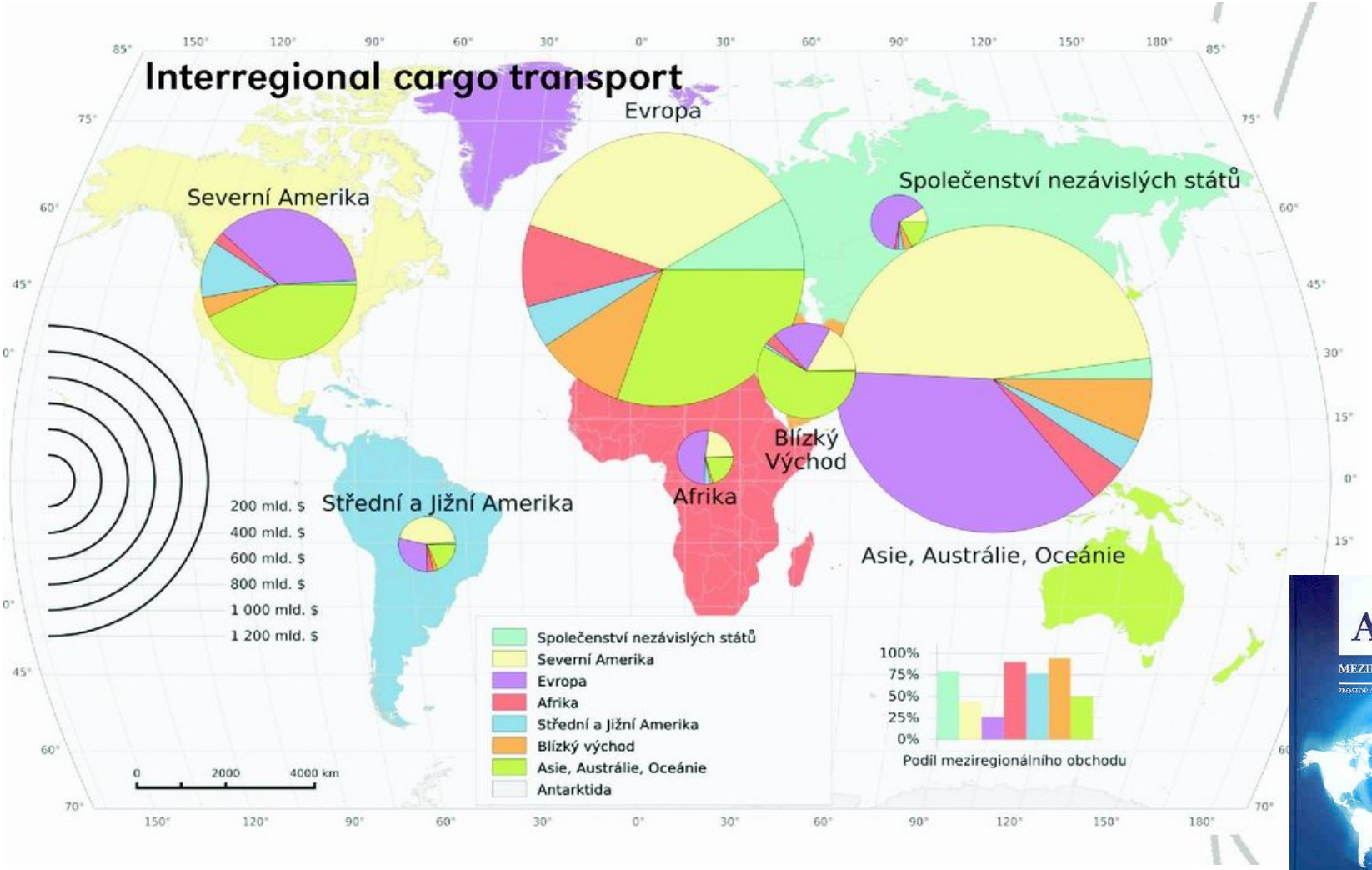
- Kanalizace: ano
- Vodovod: ano
- Plynofikace: ano
- Čistička odpadních vod: ano

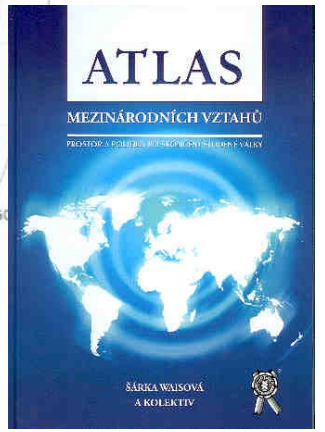
- Celková výměra: 3 139 ha

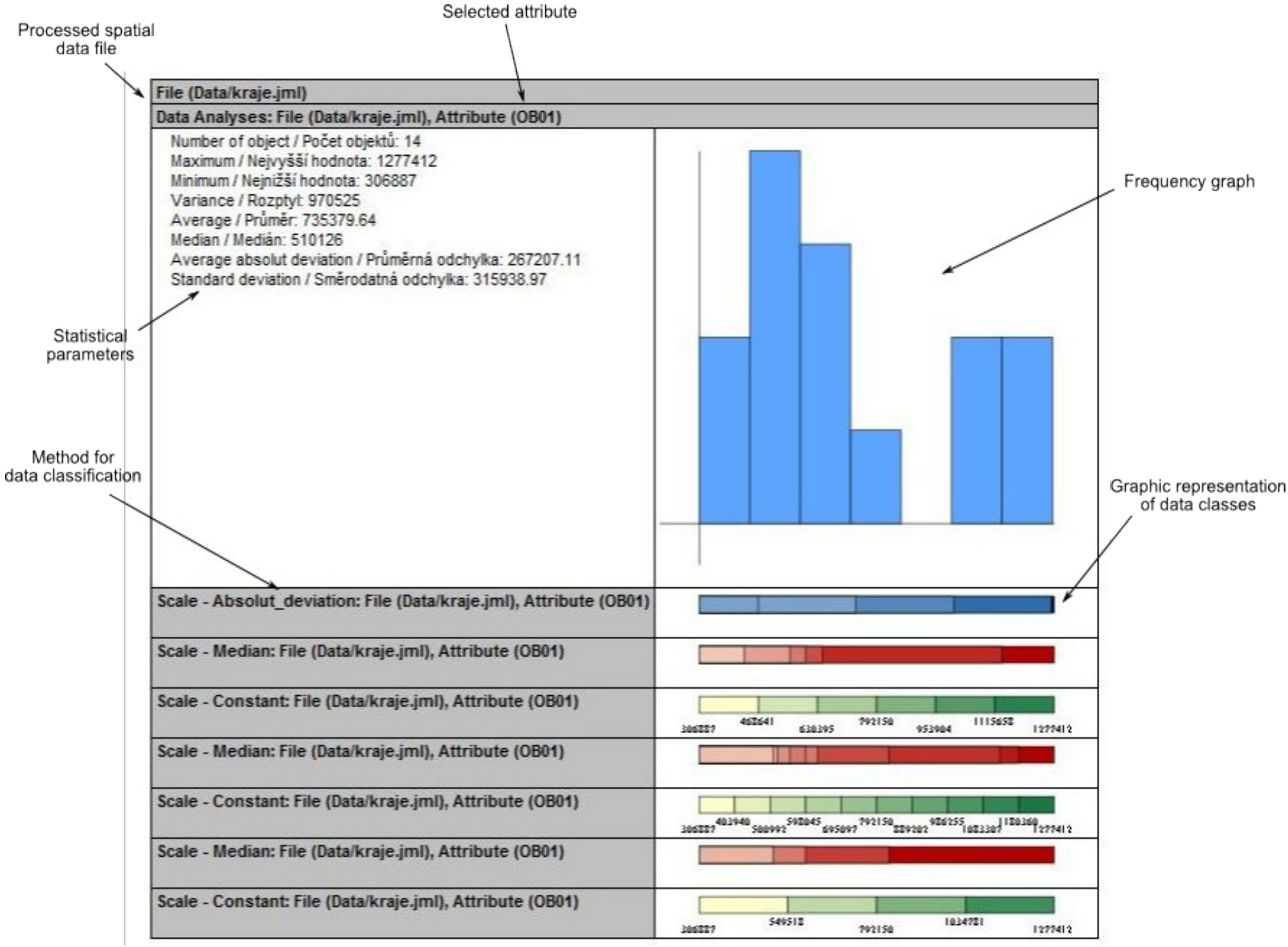
Atlas of International Relationships



Atlas of International Relationships






Processed spatial data file
Selected attribute
File (Data/kraje.jml)
Data Analyses: File (Data/kraje.jml), Attribute (OB01)
Number of object / Počet objektů: 14
Maximum / Nejvyšší hodnota: 1277412
Minimum / Nejnižší hodnota: 306887
Variance / Rozptyl: 970525
Average / Průměr: 735379.64
Median / Medián: 510126
Average absolut deviation / Průměrná odchylka: 267207.11
Standard deviation / Směrodatná odchylka: 315938.97
Frequency graph
Statistical parameters
Method for data classification
Graphic representation of data classes
Scale - Absolut_deviation: File (Data/kraje.jml), Attribute (OB01)
Scale - Median: File (Data/kraje.jml), Attribute (OB01)
Scale - Constant: File (Data/kraje.jml), Attribute (OB01)
Scale - Median: File (Data/kraje.jml), Attribute (OB01)
Scale - Constant: File (Data/kraje.jml), Attribute (OB01)
Scale - Median: File (Data/kraje.jml), Attribute (OB01)
Scale - Constant: File (Data/kraje.jml), Attribute (OB01)

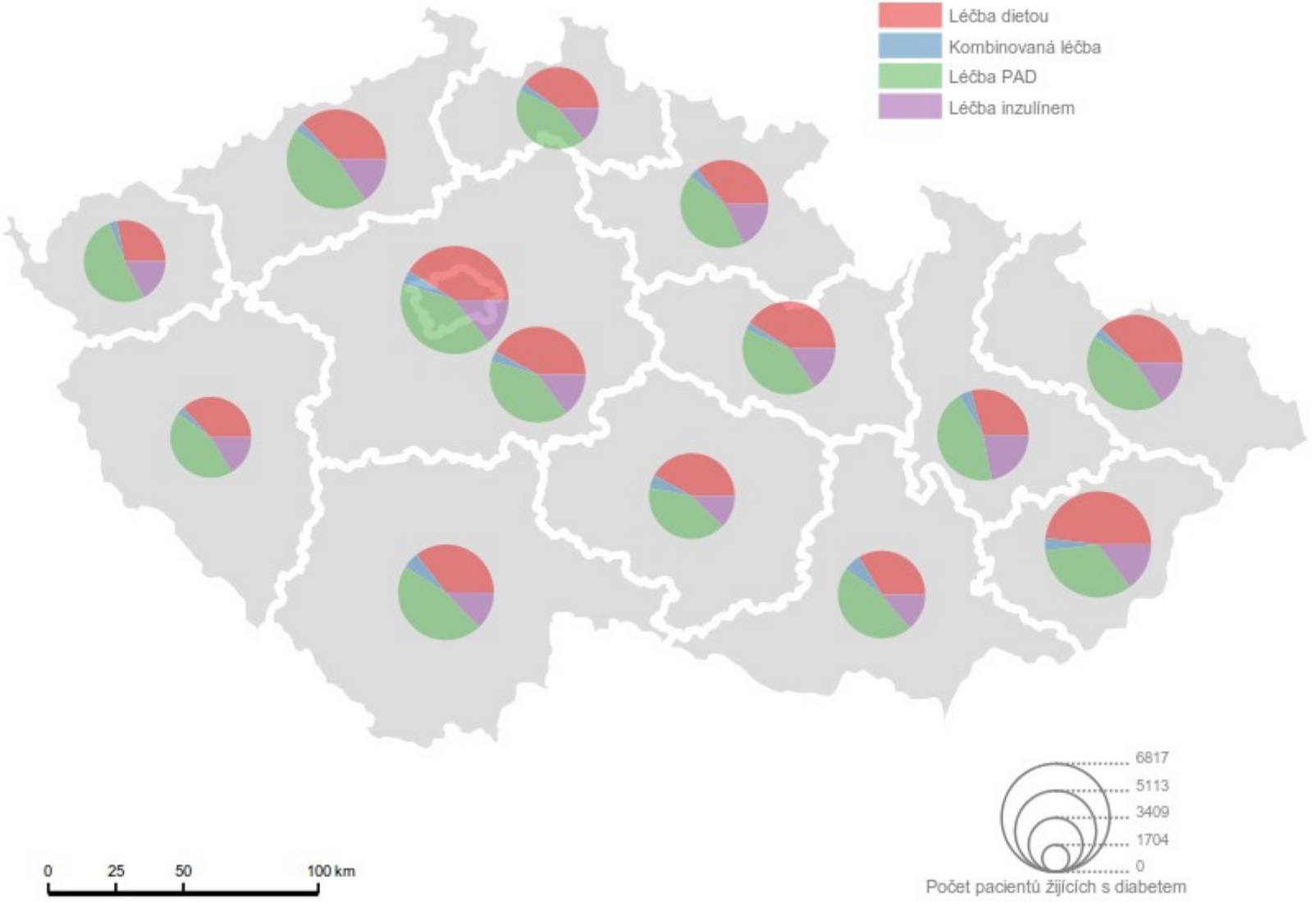
VisualHealth

Visual Health

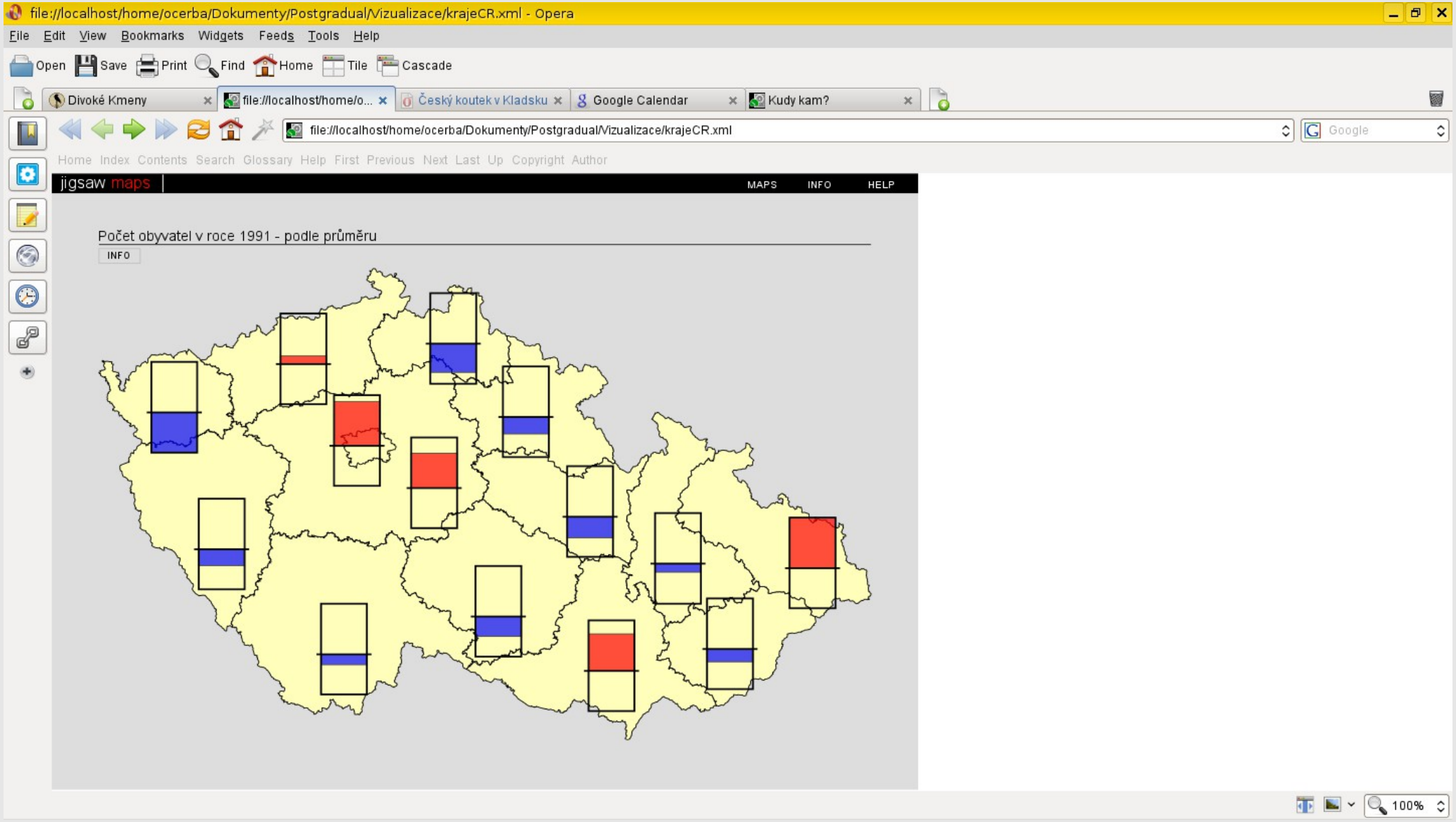
Diabetés: Náklady na léčbu (2000)

Diabetés
Náklady na léčení
Úvodní stránka

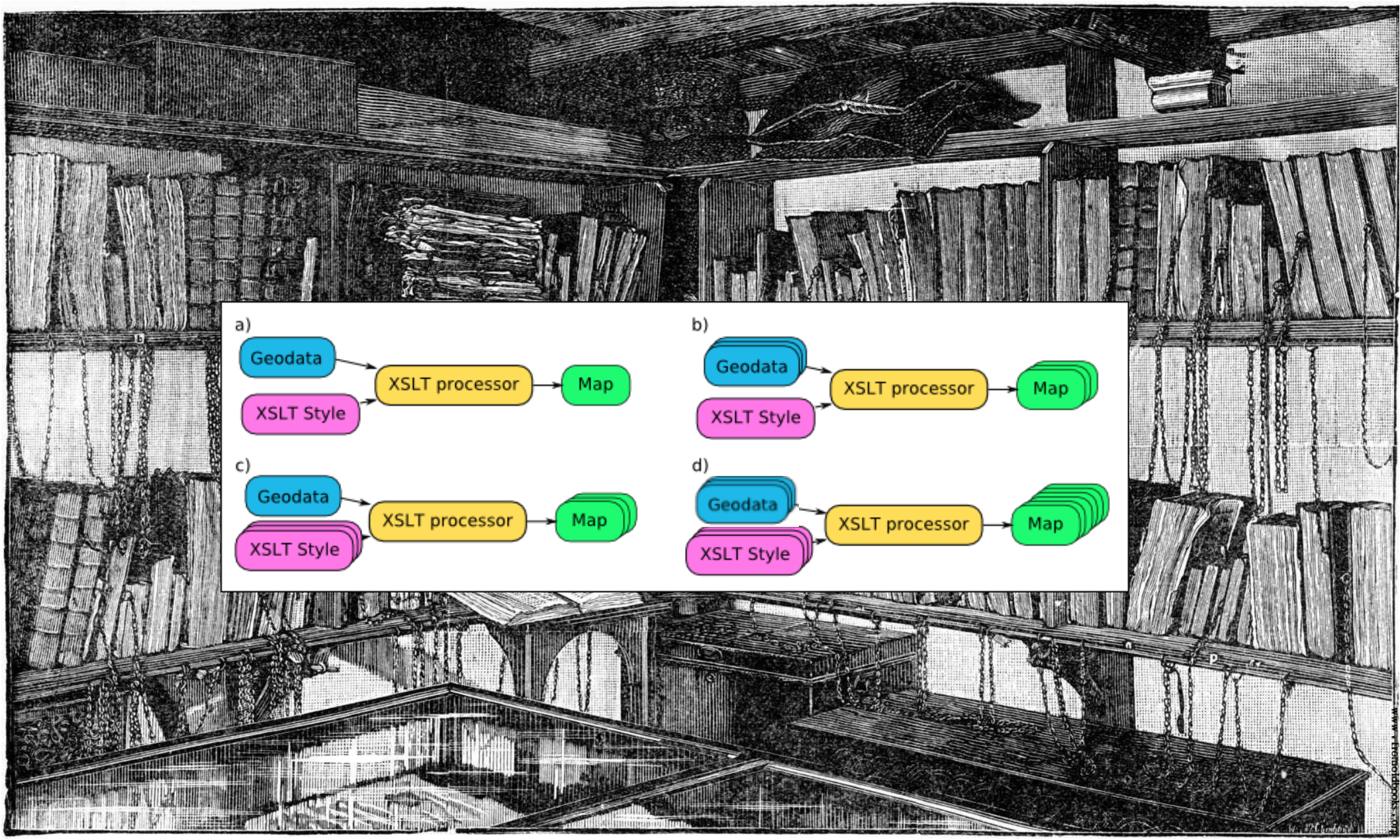
2000
2001
2002
2003
2004
2005
2006



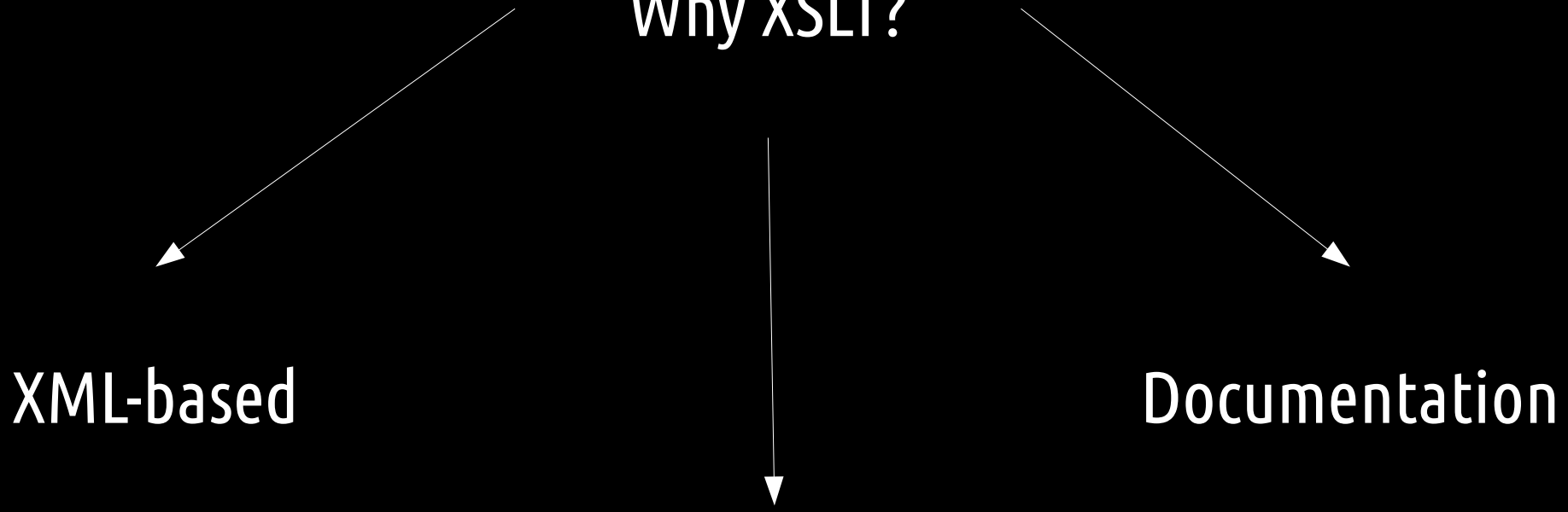
VisualHealth
(experiment – data in browser)



Future Steps

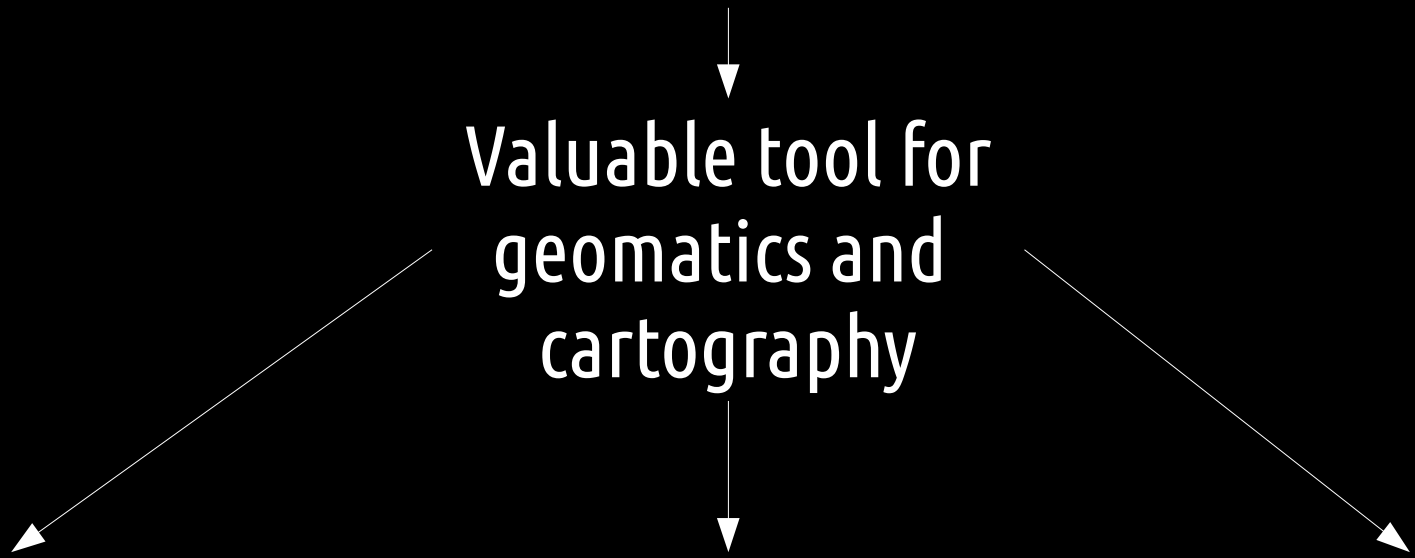


Conclusion


Why XSLT?
XML-based
Documentation
Standardization, open-source tools, platforms,
plain text, modularity...

Conclusion

Extensible Stylesheet Language – Transformation (XSLT 2.0)



Thank you for your attention

http://cz.linkedin.com/in/otakarcerba/

INVESTICE DO ROZVOJE VZDĚLÁVÁNÍ

Projekt CZ.1.07/2.4.00/31.0010 01.05.2012 - 30.04.2014