MODERN WEB CARTOGRAPHY AT
ITC-UNIVERSITY OF TWENTE

(ENSCHERDE, THE NETHERLANDS)

Gateway to international knowledge exchange focusing on
capacity building and institutional development
In 2010 ITC became a faculty of the University of Twente (UT)

- Distinctive character and mission is preserved
- More firmly embedded in Dutch academic education system
- It will lead to innovative research and education in different areas
UNIVERSITY OF TWENTE

- An entrepreneurial campus university established in 1961
- More than 10,000 students
- 3,300 staff members
Enschede
- A distinctive modern and lively university town
- At the Eastern border of the Netherlands
- Surrounded by remarkable spots of natural beauty and tranquility
ITC ESTABLISHED IN 1950
BY MINISTER WILLEM SCHERMERHORN

1950
International Training Centre for Aerial Survey, ITC

1968
International Institute for Aerial Survey and Earth Sciences, ITC

1985
International Institute for Aerospace Survey and Earth Sciences, ITC

2002
International Institute for Geo-Information Science and Earth Observation, ITC

2010
Faculty of Geo-Information Science and Earth Observation, ITC

University of Twente
WHAT’S ITC ALL ABOUT?
GEO-INFORMATION MANAGEMENT, WORLDWIDE AND INNOVATIVE

- One of the world’s foremost education and research establishments in geo-information science and earth observation
- A wide range of disciplines and activities in this field
- Contribute to capacity building in developing countries and emerging economies
- Solving real world problems
- Multicultural environment with staff and students from over 175 countries
KEY FIGURES 2013

- 939 newly registered students
- 348 degrees/diplomas/certificates awarded
- 161 registrants for the graduate programme (31 December)
- 44 external projects
- More than 20,000 alumni from 175 countries
SIX SCIENTIFIC DEPARTMENTS
OPERATING AS CENTRES OF EXCELLENCE

- Covering the different fields of disciplinary interest that encompass ITC's core mission:
  - Earth Observation Science
  - Earth Systems Analysis
  - Geo-information Processing
  - Natural Resources
  - Urban and Regional Planning and Geo-information Management
  - Water Resources
Combination of tools and methods for the
  ▪ collection
  ▪ storage and
  ▪ processing
of geo-spatial data and for the dissemination and use of these
data and of services based on these data
Focus on tools and methods and on application of these in:
- food security
- water management
- urban planning
- land administration
- disaster management
- strengthening civil society
- earth sciences
- environmental management and biodiversity
ITC’S CORE ACTIVITIES

- Education
- Research
- Capacity development

UNIVERSITY OF TWENTE
EDUCATION
A MULTICULTURAL ENVIRONMENT

UNIVERSITY OF TWENTE.
TARGET GROUP

- Young and mid-career professionals and scientists
- From developing and emerging countries
- Increasingly professionals from industrialized countries

Photo: Gerard Kuster
COURSES
IN THE DEGREE AND DIPLOMA PROGRAMMES

Geo-information science and earth observation for
- Applied Earth Sciences
- Geoinformatics
- Land Administration
- Natural Resources Management
- Urban Planning and Management
- Water Resources and Environmental Management
- Environmental Modelling and Management
- Geographical Information Management and Applications
RESEARCH
SPACE FOR GLOBAL DEVELOPMENT
CAPACITY DEVELOPMENT
IN THE FRAMEWORK OF INTERNATIONAL DEVELOPMENT COOPERATION

UNIVERSITY OF TWENTE
PROJECT SERVICES
TAILORED TO THE NEEDS OF OUR CLIENTS

- Institutional development
- Advisory services
- Contract training
- Contract research and development
An interactive Carto Dashboard for Distributed Statistical Data in an SDI

• what is it?
• where did it come from?
• how does it work?
• how does it ACTUALLY work?
An interactive Carto Dashboard for Distributed Statistical Data in an SDI?
An interactive Carto Dashboard for Distributed Statistical Data in an SDI

A system that can consume a combination of statistical data from the SDI, and cartographically integrate them, so that visual comparison of data from different providers or different data from a single provider is optimized. The Carto Dashboard can be considered as a “smart data viewer”
A new role for the cartographer

providing
(cartographic knowledge for)
tools that implement cartographic intent:

“code that thinks like a cartographer”
Cartography from Code...?

or

“how I learned to stop worrying and love coding in cartography”

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A change in my world

My tools once were these:
A change in my world

...but now look like this:
A change in my world

Computers gave me this at first:

SYMAP line printer output (1965, by Howard Fisher)
A change in my world

...but have been improving since:
A change in my world

...and now allow me to do really nice interactivity:


Students situate Eastern-European cities too far and Southern-European to close.

Click the buttons to see the differences between factual locations (and order) and how they were perceived by Geography students...

Works in modern browsers supporting HTML5 (not IE explorer 8 and lower)


A change in my world
Both were constructed using software

this one was
digitally drawn

this one was
coded (programmed)
A new role for the cartographer providing tools that implement cartographic intent
A new role for the cartographer

providing
(cartographic knowledge for)
tools that implement cartographic intent
The new role of the cartographer

providing
(cartographic knowledge for)
tools that implement cartographic intent:

“code that thinks like an atlas”
Statistics Dashboard

Building further on the NATIONAL ATLAS IN SDI prototype
The Dutch National Atlas within SDI

details in Dresden paper:
Cartographic Journal, 50 : 3, pp. 225—231
Brief history of the Dutch National Atlas
Brief history of the Dutch National Atlas

Brief history of the Dutch National Atlas

Brief history of the Dutch National Atlas

after 1998 government involvement and funding ended

=> limited and fragmented academic projects to keep atlas alive

2000:

digital facsimile of 2nd edition
Atlas as part of a Spatial Data Infrastructure
Atlas as part of a Spatial Data Infrastructure presents a synthesis optimised for visualisation
Atlas as part of a Spatial Data Infrastructure

visualisation of separate data, not optimised for combinations (synergy)
Atlas as part of a Spatial Data Infrastructure

a combination of two different worlds
Mapping in a webservices environment
Mapping in a webservices environment as part of
Mapping in a webservices environment as part of
conceptual change needed

sub-optimal combination of arbitrary map layers
conceptual change needed

sub-optimal combination of arbitrary map layers

integrated mapping of data layers
Statistics Dashboard

Building further on the Atlas prototype

Specifically for Statistical Data
From Statistics Netherlands (CBS)
- Open Data, API using ODATA standard -
  To be combined with other SDI data
Population dynamics; birth, death and migration per region

June 16 2014 | more info

Minimap
Options
Key (number)
- 158 627
Selection
Subjects
- Population on 1 January
Sex
- Males and females
Periods
- 2013

Enschede 158 627 (number)
Statistics Dashboard UI setup

choose map

MAP

simple render

MAP

subject

...etc...

direction

population

no. of inhabitants

...etc...

direction

per municipality

per province

2010

2013

direction

population density

nature
DEMO TIME!
Statistics Dashboard

Building further on the Atlas prototype

Specifically for Statistical Data

Concentrating on comparison tools:

in theme: same place and time, different variables

in time: same variable, different times

in space: same variable, different places/aggregation
Statistics Dashboard

comparison tools

in theme: same place and time, different variables
Statistics Dashboard

*comparison tools*

*in time: same variable, different times*
Statistics Dashboard

comparison tools

in space: same variable, different places/aggregation
How does it ACTUALLY work?

THE TECHNOLOGY
How does it ACTUALLY work?

THE TECHNOLOGY
also is building further on the
NATIONAL ATLAS IN SDI
prototype
Architecture overview
- use data services (WFS) requests
- GeoJSON output where possible
- use data services (WFS or REST) requests
- GeoJSON or CSV data output
ATLAS utility services & basedata
"name": [  "Bevolkings-dichtheid",  "Population Density"
],  "data_unit": [  "inwoners per km²",  "inhabitants per km²"
],  "mapunits": [  {  "name": [  "gemeente",  "municipality"
  ],  "mapdates": [  {  "date": "2011",  "geo_data": 0,  "attrib_data": 0,  "FK": "GM_CODE",  "attrib": "BEV_DICHTH",  "label": "GM_NAAM"
    },\n    {\n      "date": "2013",\n      "geo_data": 2,\n      "attrib_data": 2,\n      "FK": "GM_CODE",\n      "attrib": "BEV_DICHTH",\n      "label": "GM_NAAM"
    }
  ]
}]
],  "maptype": "area_value",
"classification": {
  "type": "manual",
  "colours": "Greens",
  "numclasses": "5",
  "classes": [0,400,800,1600,3200,6400]
},  "geo_sources": [  {
    "unitname": [  "gemeente",  "municipality"
    ],  "description": [  "Gegeneraliseerde gemeentegrenzen afkomstig uit de Basisdiensten Kadaster",  "Municipalities of the Netherlands, generalised from the Kadaster"
    ],  "date": "2011",  "FK_atrib": "GM_CODE",  "source": [  "Kadaster",  "Kadaster"
    ],  "serviceType": "localfile",  "serviceURL": "/data/gemeenten/geo.topojson",  "serviceTypeName": "",  "serviceOutputFormat": "topojson"
}]}
Atlas Viewer:
- based on the Open Web Platform:
  HTML5 + SVG + CSS + JavaScript
- uses D3 library
FUTURE WORK

Practical:
• make “compare to…” chooser context aware
• add more comparison methods
• add more Open Data connectors
• etc., etc…
FUTURE WORK

Practical:
• make “compare to…” chooser context aware
• add more comparison methods
• add more Open Data connectors
• etc., etc…

Theoretical:
• formalising map specifications for further automating thematic map creation
Thank you!

http://www.nationaleatlas.nl

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