

## The Norwegian O-Map Register

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Sciences

## Purpose

- Marketing of orienteering maps
  - Information
  - Availability
  - Sales (?)
- Administration
  - Map plans for districts and clubs
  - Municipalities' "Sports facilities plan"
  - Documentation - applications for funds

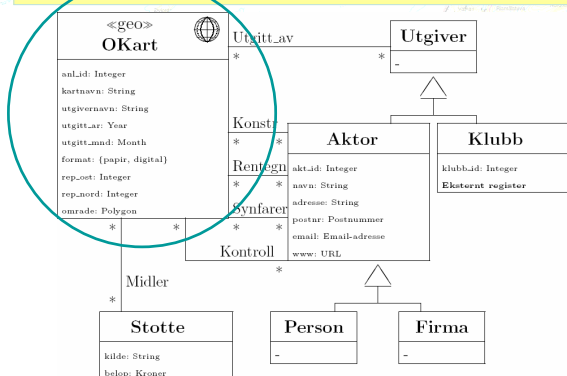
## Current contents

- Own data (~4100 maps)
  - Polygons (map delineations)
  - Map data (map name, publisher, year, scale, contour interval, area, misc.)
  - Two districts out of 18 are nearly complete (Nordland and Hedmark)
- KRISS (~3300 maps - last update 2002)
  - representative points
  - general sports facilities data

## Statistics - registration

	16 Jan. 2007	% of maps in use	all maps	% all maps
FI	89	100%	150	60%
TR	155	95%	450	35%
NO	268	100%	350	75%
NT	153	70%	400	40%
ST	159	70%	700	25%
MR	96	70%	250	40%
SF	242	100%	250	95%
HO	313	80%	700	45%
RO	250	100%	400	60%
VA	80	60%	250	30%
AA	87	95%	150	60%
TE	137	60%	450	30%
BU	90	30%	900	10%
OP	122	60%	550	25%
AO	469	70%	1200	40%
HE	794	100%	1000	80%
VE	150	80%	250	60%
OF	100	30%	600	15%
<b>Total</b>	<b>3754</b>	<b>Ca. 60%</b>	<b>9000</b>	<b>Ca. 42%</b>

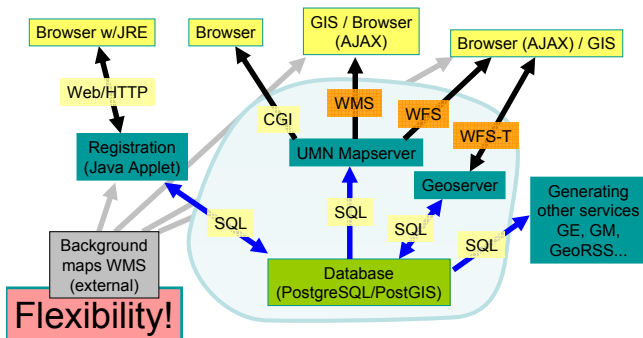
## Data model (rudimentary)



## Database contents

- New and old orienteering maps (all editions)
  - Polygons (map outlines)
  - Map data (metadata)
    - Map name
    - Publisher
    - Year (date)
    - Map specification
    - Map scale
    - Contour interval
    - Area
    - Availability
    - District map ID (municipality + number)
    - Map register ID

## Components and Interfaces



## Software & Hardware

### Prototype

- Software
  - PostgreSQL + PostGIS
    - RDBMS with SQL/MM Spatial geographical data type support
  - UMN Mapserver
    - Internet map server
    - Lots of support libraries (data input formats, output formatting and formats, projections, programming interfaces)
  - Own Applications
    - Java, PHP, Perl, Javascript
- Hardware (at the University)
  - Sun Enterprise 450 (from 1998!)
    - 2 x 300 MHz UltraSparc CPU
    - 1 GB RAM
    - Solaris 2.7
    - 10/100 Mb/s Ethernet card

## Database management

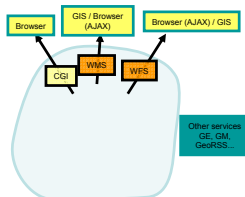
- **PostgreSQL** relational database management system w/ **PostGIS**
  - Reliable, powerful, flexible
  - Standards compliant geographical datatypes and operators
- Geometries:
  - Polygon (OGC Simple Feature)
  - Reference system WGS84, UTM33N
    - Transformations available in PostGIS (PROJ.4)

## DBMS Access Restrictions

- Open (read-only) services
  - WMS, WFS, GeoRSS
- Registration: Write-only
  - Data can not be changed directly by users through the registration / update interfaces
  - Change = create new version
  - Change approval through a PHP interface

## Open Interfaces

- Available through the Web
  - Browsing clients
    - Interactive web page
    - Google Earth
    - Google Maps
  - WMS service
  - WFS service
  - GeoRSS service



## WMS - Web Map Service

- Purpose
  - Simple standardised access to parts of the register
  - Graphics (several formats supported)
- Target
  - Information providers and consumers with an interest in orienteering maps
- Access
  - GIS
  - Web applications
  - Own applications
  - Lots of geographical ref.sys. (PROJ.4) supported
- Tools
  - PostgreSQL/PostGIS + UMN Mapserver

WMS - [getCapabilities](#), [getMap](#), [getLegendGraphics](#), [Arealisklient](#)



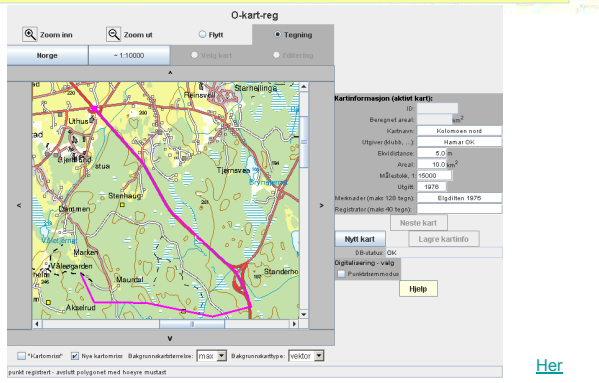


## Own Applications

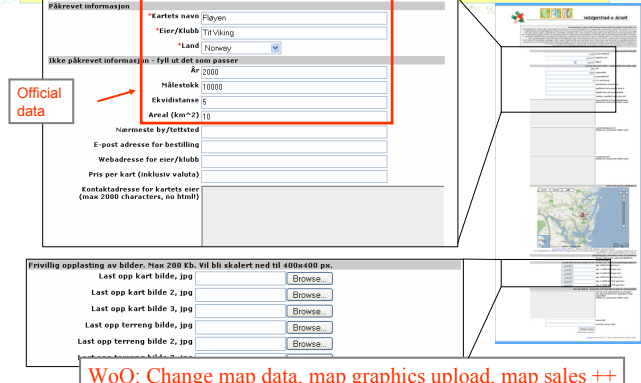
Data capture  
Update approval  
Map registers

...

## Data capture client (Java Applet)



## Updates++ (World of O)



## Administration utilities

- Update approval
  - Changes to the map data are listed
  - Options: Refuse (delete) or accept
- ...

## Map register

- Which maps?
  - IDs
  - User specified names for the IDs
- What map scale?
- Result:
  - Map (HTML table of map tile images)
    - Background map (through external WMS)
    - Map delineations + IDs
  - Table with map data for all the maps

Anleggsplan - Orienteringskart

ID	Kartnavn	Utgiver	År	Målestokk	Areal
36	Arangstråstve	JTEI	1970	1:10000	3.5 km <sup>2</sup>
33	Såberg	År.E.	1980	1:5000	1.0 km <sup>2</sup>
28	Brennå	År.E.	1982	1:10000	1.0 km <sup>2</sup>
4460	...	...	...	...	...

Målestokk ca 1:10000. E-coordinatssystem: WGS84 - UTM31N @yep4@utmapg26339



## Other

- Ordering maps
- Use for competitions (where is the race?)
- Adding O-map graphics



## Challenges

- Data model
  - What kind of information to include in the core
  - Suitable accuracy of map boundaries
- Registration (data capture)
  - Affordable background maps
    - Accuracy, level of detail
    - WMS services - flexibility, simplicity
  - Encouraging the districts to register maps
- Clients
  - Character encodings (UTF8 in PostgreSQL)



## O-map register - organisation

- Maintenance - map data:
  - Registration & corrections: district, club, others (inoff.)
  - Quality assurance: district, club
  - Approval: district, club
- Technology, infrastructure
  - Operation & Maintenance: NOF
  - Development: NOF
- Services
  - NOF (responsible for basic services)
  - Other players



## Who?

- NOF Map Group - Håvard Tveite
  - Database solutions – PostgreSQL w/PostGIS
  - Registration client – Java Applet
  - WMS service
  - WFS service
  - GeoRSS service
- Jan Kocbach
  - Google Maps - browse, updates, (registration)
  - Google Earth - browse
  - Facilitating sales (inclusion of club addresses)
- Districts
  - Registration of maps



## Status

- Some data has been collected
- Very little done on the use of the data