

In the Open

***building cheap and agile information
system with open source***

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Who are we?

Umhverfisstofnun, The Environment Agency of Iceland, established in 2003 with the merger of five institutions:

- Animal Welfare
- Health and Safety
- Nature Protection
- Hunting Authority
- Reindeer Authority

In 2008 the Food Safety and Animal Welfare departments were spun off into a new agency, Matvælastofnun, the Food and Veterinary Authority.

What do we need?

We need to be able to

- disseminate the data and information we have in various formats
 - to the public
 - to experts
 - to organizations, such as the EEA
- make it work without incurring great costs
 - in personnel and time
 - in license fees
- make it pain free to deliver it in various geospatial formats

What did we do?

We put our trust into open software, mostly old open software.

Most of them with 20 years of development behind them, tried and tested and constantly being updated.

In the software world 20 years is a long time. But these are no dinosaurs, about to become extinct.

We swim with the sharks

Old technologies that have stuck around are sharks, not dinosaurs.

They solve problems so well that they have survived the rapid changes that occur constantly in the technology world.

Don't bet against these technologies, and replace them only if you have a very good reason.

--Justin Etheridge

The Sharks

- **PHP** – serverside scripting, created 1994, latest release in 2021
 - Free license
- **PostgreSQL** – database, created 1996, latest release in 2021
 - Free and open-source
 - PostGIS extension for spatial data, created 2001, latest release in 2021
 - **Dbeaver** or PgAdmin for database maintenance
- **GeoServer** – geospatial server, created 2001, latest release in 2021
- **QGIS** – spatial client, created 2002, latest release in 2021
- **OpenLayers** – map viewer in browsers, created 2005, latest release 2020

Technology stack is the easy part

- **The biggest problem is always the data**
 - Getting it from the sources
 - Harmonize it
 - Keep it updated – someone should own it
- **Hard data vs metadata**
 - The user needs to be able to read what the data is about and where it comes from, web viewers need to provide a way to read more about the data
- **One source many outputs**
 - We need to cater for different services with different vocabularies

Gagnagátt – expert view

- Gagnagátt is a PHP-based frontend on the PostgreSQL database
- Experts can maintain the data and add new areas
- The same data is then used to create views for CDDA, INSPIRE and other specifications
- A XML-export module creates the CDDA delivery files

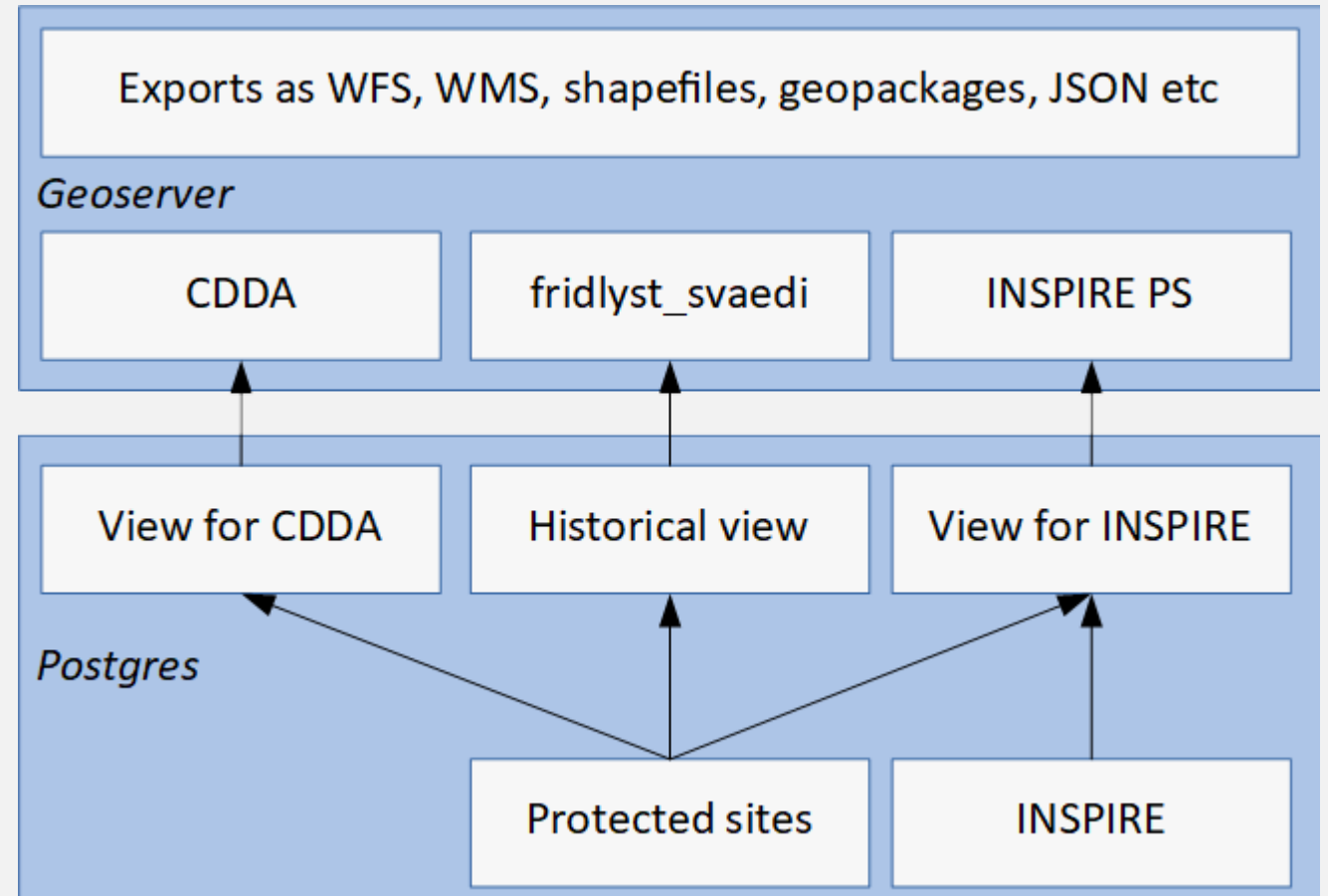
Áfangastaðir 6	Gönguleiðir 0	Innviðir 0	Skilti 0
Áfangastaðir sem tilheyra svæðinu	Allar gönguleiðir sem eru á svæðinu	Allir innviðir sem eru á svæðinu	Öll skilti sem eru á svæðinu

Bakgrunnsupplýsingar svæðis

Nafn	Snæfellsjökull	Friðlýst þann:	<input type="text" value="06/28/2001"/>
Local ID (Inspire)	346545		
Gildandi lög við stofnun	44/1999	Auglýsing stofnunar	568/2001
Núgildandi lög	<input type="text" value="60/2013"/>	Nýjasta auglýsing	<input type="text" value="816/2021"/>
Veldu friðlýsingarflokk	<input type="text" value="Enginn flokkur valinn"/>	Fláki á geojson formi	<input type="button" value="Choose File"/> No file chosen
Veldu IUCN flokk	<input type="text" value="II Þjóðgarðar"/>	Hefur svæðið verið aflagt?	<input type="radio"/> Já <input checked="" type="radio"/> Nei
Veldu landshluta	<input type="text" value="Vesturland"/>	Athugasemd	<input style="width: 100%;" type="text"/>
Svæðaflokkun	<input type="text" value="A-hluti"/>	Ítarefni	<input type="text" value="https://ust.is/nattura/natturuverndar"/>
Má birta almenningi?	<input checked="" type="radio"/> Já <input type="radio"/> Nei		
Kortaslóð	<input type="text" value="https://ust.is/nattura/natturuverndar"/>		
3D Kortaslóð	<input type="text" value="https://kortasja.ust.is/3dkort/snaefel"/>		

One source – many outputs

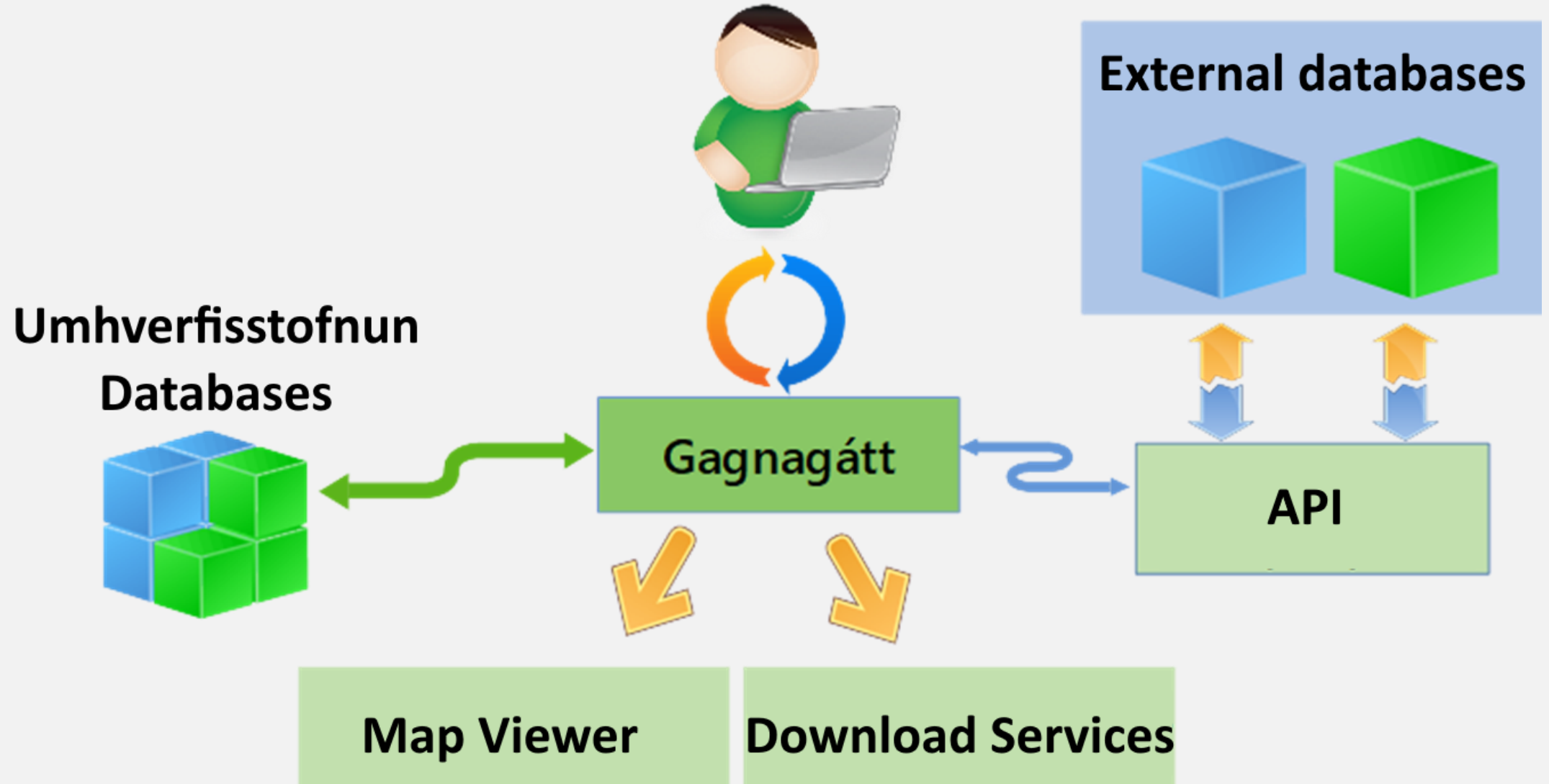
- The same basic data on our protected sites can be delivered in tailored views
- Each of the layers is different, with different categories, names of fields, all according to particular specifications
- The basic data behind it is the same, data rot is not a threat

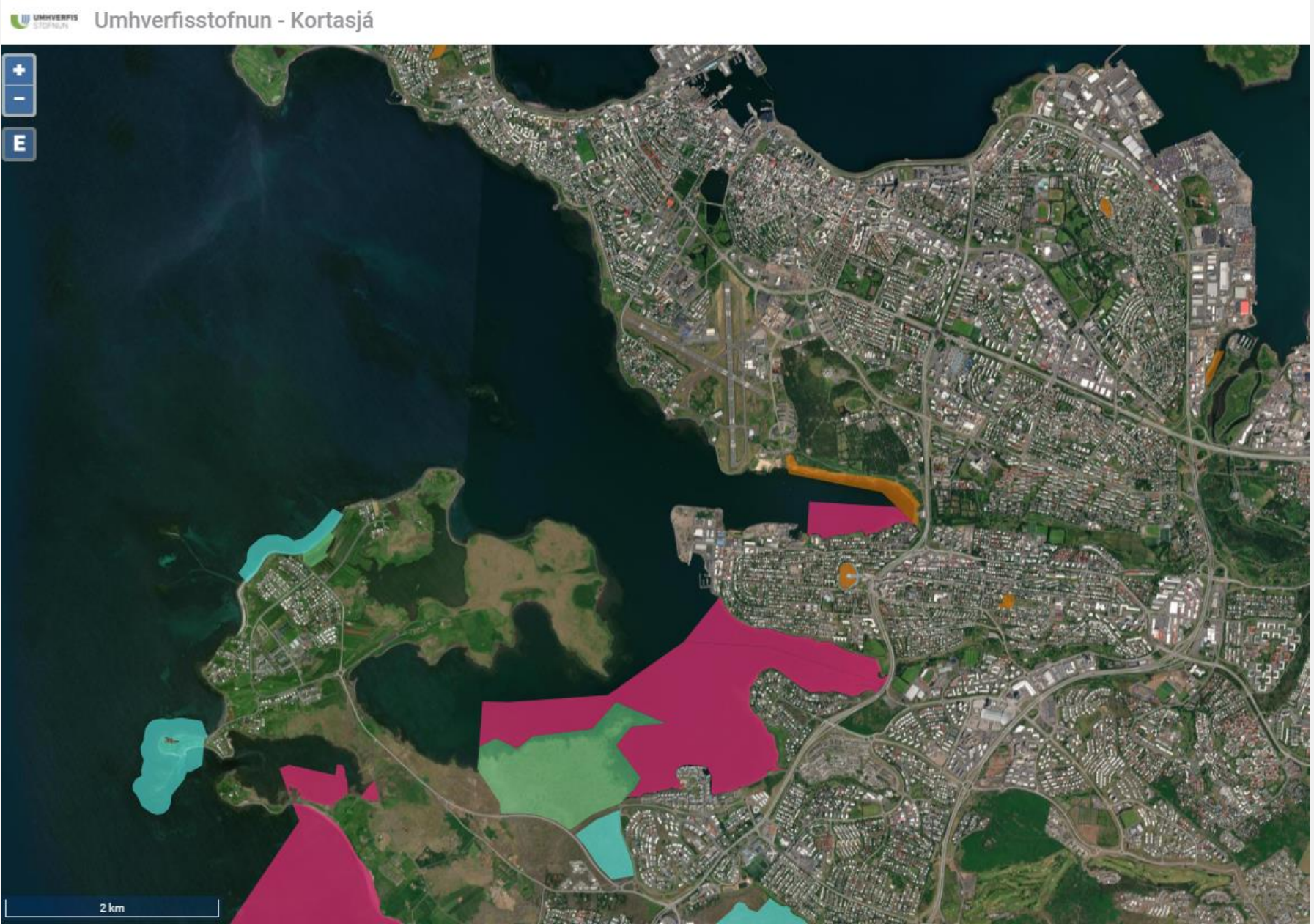


Example - CDDA

- In Gagnagátt (PHP powered frontend for our database) the experts can update information on protected sites
- A view transforms the data into the CDDA specifications
- Using PHP we generate the XML-files that are delivered in Reportnet 2 envelopes (manual upload by reporter)
- For Reportnet 3, with API support, we intend to let Gagnagátt and Reportnet do the data exchange by themselves, options are:
 - Gagnagátt pushes to Reportnet 3 API
 - Reportnet 3 pulls data from API and GeoServer

Automatic Data Flow





Umhverfisstofnun - Kortasjá

Baughnit: N 64° 6' 3" W 21° 56' 28"
ISN2016 hnit: 2556647,203081

Friðlýst svæði vegna náttúruverndar

CDDA kóði	394685
Heiti	Skerjafjörður innan Gardabæjar
Friðlýst	2009
Verndarflokkun	IS06
Enska	Habitat protection
Verndarflokkur	Búsvæði
IUCN	V
Uppfært	2009-11-05Z
Tengill	https://ust.is/nattura/natturuverndarsvaedi/friðlyst-svaedi/sudvesturland/skerjafjordur-gardabae/

2 km

API



API.ust.is/aq

getLatest

Mæligildi síðustu 24 tíma, uppfærð um 17 mínútur yfir.
Hourly values from past 24 hours, updated hourly around 17 minutes past.

Svæðið verification segir til um hvort gögn hafi verið yfirfarin (1) eða séu óyfirfarin (3)
Verification details if the data has been verified (1) or not (3).

getDate

Mæligildi fyrir valda dagsetningu.
Hourly values for selected date.

Svæðið verification segir til um hvort gögn hafi verið yfirfarin (1) eða séu óyfirfarin (3)
Verification details if the data has been verified (1) or not (3).

getStations

Upplýsingar um loftgæðastöðvar í JSON
Information on air quality stations in JSON

getStation

Upplýsingar um loftgæðastöð í JSON
Information on air quality station in JSON

Inntak: local_id
Input: local_id

CSV

Mæligildi eins árs í CSV
Hourly values for entire year

- [2015](#) (62 MB)
- [2016](#) (71 MB)
- [2017](#) (100 MB)
- [2018](#) (108 MB)
- [2019](#) (90 MB)

Why are we doing what we are doing?

- Chosen software is the leader or amongst the leaders, nothing niche
- Thriving ecosystems, free and paid for solutions
- Millions of developers with the knowledge
- Easy to learn the technology
- License costs are mostly eliminated
- Open standards widely used, no need to panic and do a rewrite because a vendor made a big move – taking you with them
- Modular approach allows reuse of code, a simple registration module can be done in a workday – but complexity is always key factor – big things take a lot of time

Would you like to know more?

- My e-mail is johannes.jensson@ust.is
- Websites mentioned:
 - UST.is – Our website
 - Gogn.ust.is – Gagnagáttin (Icelandic login required)
 - API.ust.is – the API, Air Quality and Consultation
 - Kortasja.ust.is – the map viewer (with some nice 3d maps too)
 - GIS.ust.is – GeoServer with spatial data