

Capacity Building For National Surveying and Geographic Information Institute

Introduction to Open Source GIS



CONTENTS



Overview of Open Source SW



Open Source GIS



Open Source GIS Projects



OSGeo – Open Source Geospatial Foundation

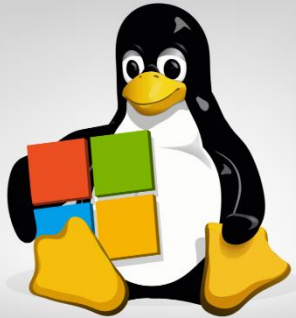


Wrap-Up



Microsoft joins the Linux Foundation

Posted Nov 16, 2016 by Frederic Lardinois (@frederic)



How is this for a surprise: Microsoft today announced that it is joining the Linux Foundation as a high-paying Platinum member.


Microsoft  Linux



Bash coming to Windows

Windows 10 To Open Up Further to Linux

Expect the changes to hit this fall.

By Kurt Mackie  08/01/2017

I. Overview of Open Source SW

01 | What is OSS?

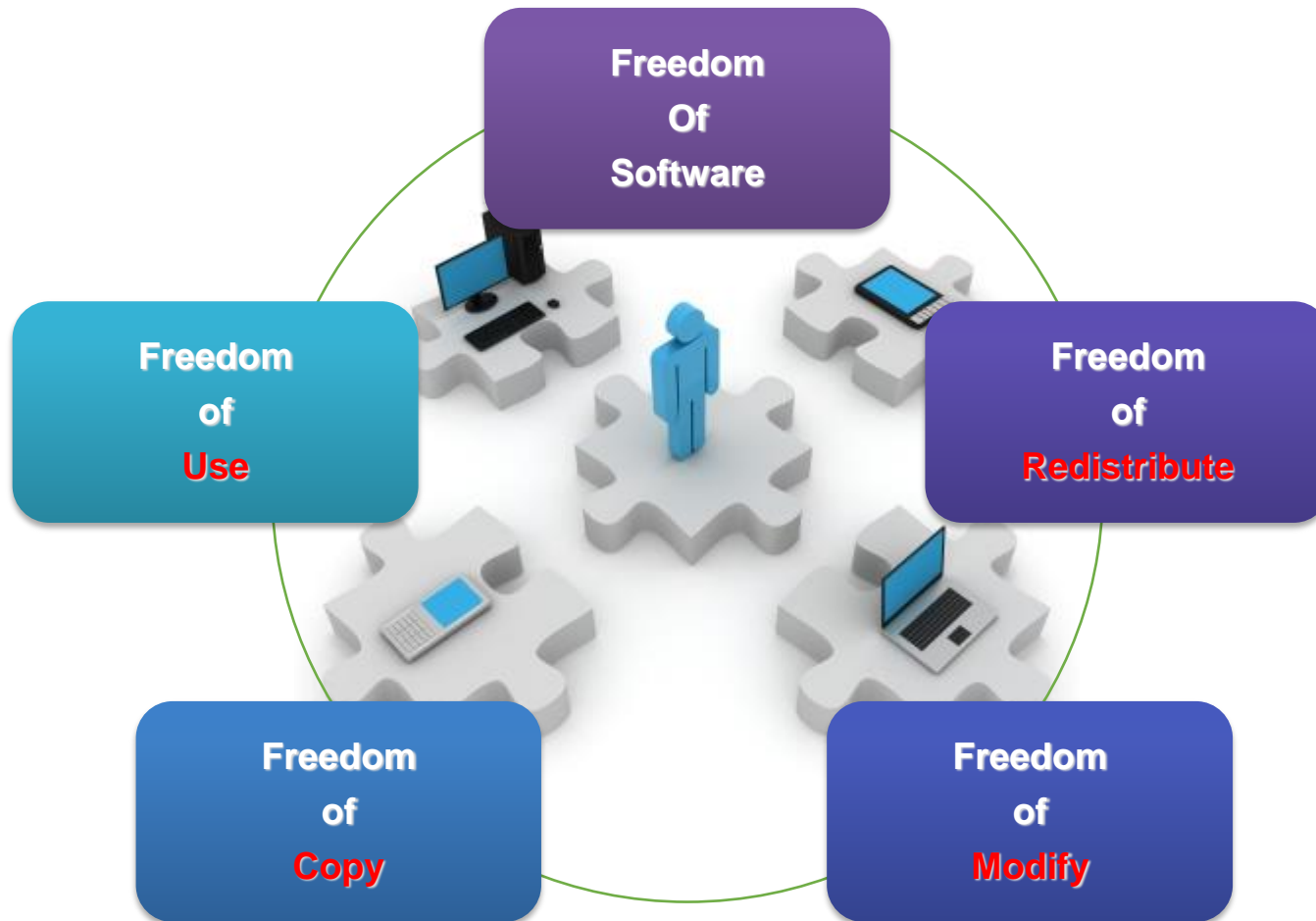
02 | SW Models

03 | Benefits of OSS

04 | Why Select OSS?

1. What is Open Source SW?

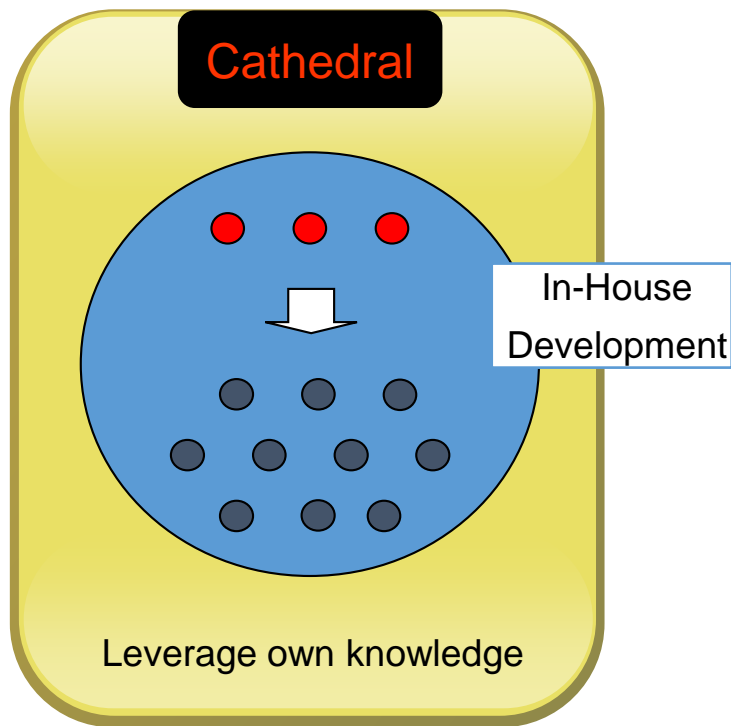
- ❑ Open source SW(OSS) is the computer SW that is available in **source code** form under certain licenses.
- ❑ Users of OSS are permitted to **use, copy, study, change, improve** and even **redistribute** those OSS freely.
- ❑ 'Free' does not mean 'Free of Charge' but '**Freedom**' or '**Liberty**'



2. SW Models – Cathedral vs. Bazaar

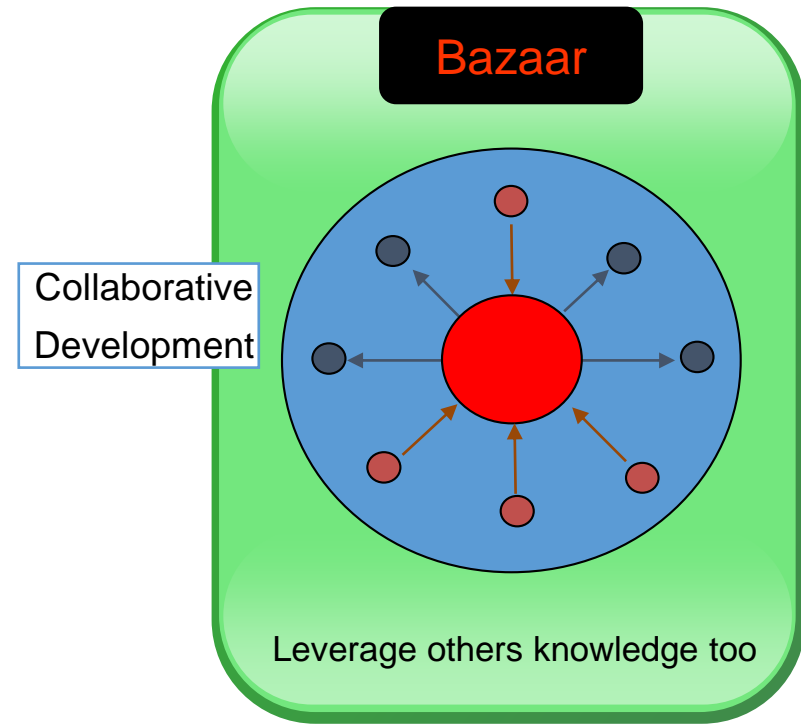
❑ Open Source Software Development Model

<Closed Development>



- Designed and developed by inside R&D lab
- Inside knowledge, intellectual property, experiences
- Idling knowledge, limited leveraging outside knowledge

<Open Development>



- Designed and developed with other outside partners
- Inside knowledge + outside knowledge
- 'We are smarter than Me!!'

➔ Leveraging inside & outside knowledge

3. Benefits of Open Source SW

□ Benefits of Open Source Software

- Empower people, save money, save resources, increase stability, access to source code, access to skilled community of developers

1. Technological Aspects

Rapid development of high-class SW

Increased stability by skilled community review

Reduce technological gap to leading proprietary SW company

Internalize outside SW developer resources

2. Economical Aspects

Very low adoption cost

Reduce SW development cost

Easy to customize

Reuse successful story

3. Business Aspects

Extend company's products portfolio

Open up new market by providing diversified services & products

Improve brand image of company

4. Other Aspects

Reduce energy

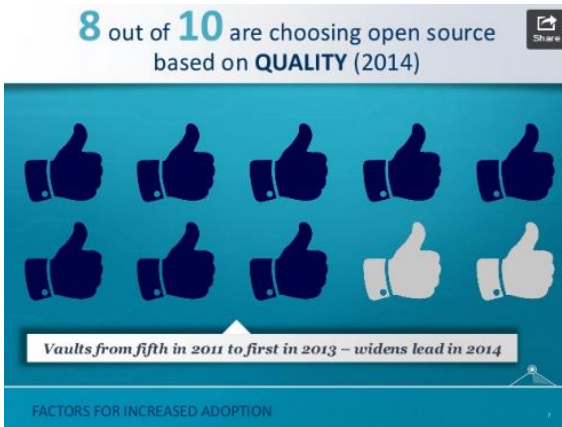
Self-Satisfaction

Help society

Develop the society by sharing technology & outcomes!!

4. Reasons Why Select Open Source

Open Source as Better Quality Software(2014)



1 Quality



Ease of Deployment 3



2 Security

Source Code Access 4



Source: BlackDuck Software, <http://www.slideshare.net/blackducksoftware/2014-future-of-open-source-survey-results>

II. Open Source GIS

- 01 | What is Open Source GIS?
- 02 | Why Open Source GIS?
- 03 | Characteristics of GIS
- 04 | GIS: Vertical Set of Many SW
- 05 | Another Lego Block
- 06 | Rising of Open Source GIS

1. What is Open Source GIS?

❑ Open Source GIS

- FOSS4G : Free Open Source Software for Geo-Spatial
- GeoFOSS : Geospatial Free Open Source Software



2. Why Open Source GIS?

❑ Current State & Needs of Open Source GIS

Current State

- ✓ Boom-up of Open Source & Open Source GIS
 - Around 300 ~ 400 Open Source GIS projects are available (Freegis.org, 2011)
- ✓ Advance of Open Source GIS
 - OSGeo Foundation : Commercial proprietary GIS SW can be replaced with Open Source GIS
 - **Google used Open Source based GDAL in its Google Earth program**
 - **AutoDesk open the source code of MapGuide, FDO & MetaCRS and then donated those to OSGeo**
 - **ESRI actively used GDAL and also changed its ArcGIS GeoPortal Server to Open Source based one**
- ✓ Active adoption of Open Source GIS in UN, EU, USA , Canada and other countries

Necessity

- ✓ Want to meet lots of needs of GIS from public sectors
- ✓ Want More with Less!!
- ✓ Want to replicate other people & institution's experience
- ✓ Want to manage & modify the system by ourselves!!

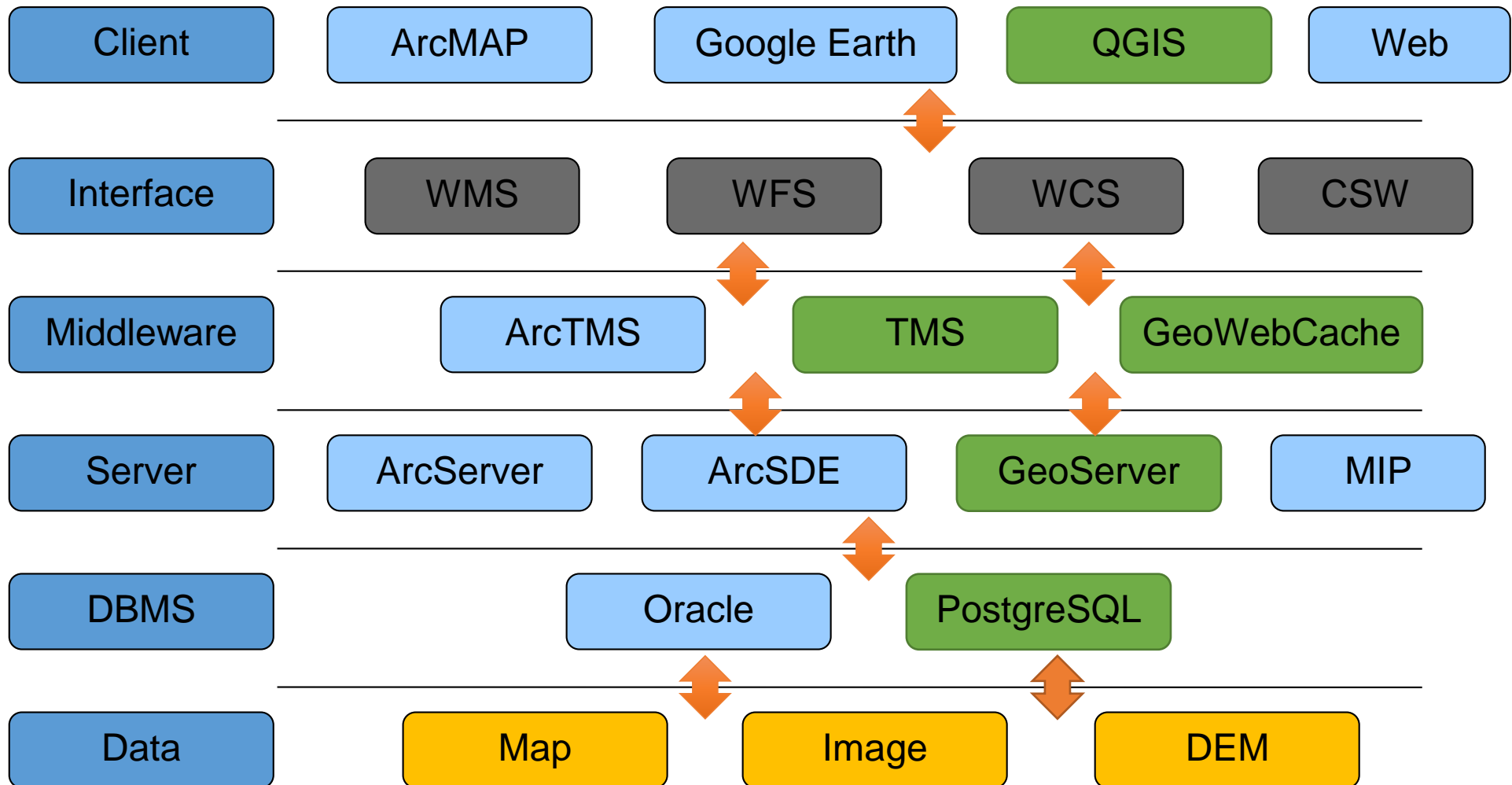
3. Characteristics of GIS

❑ Characteristics of GIS

- GIS = **Vertical Set of Many Software**
 - Interoperability is very crucial among components
 - Linux, Apache, PHP are Horizontal based Software
 - GIS is Vertical Architecture based one from DB to web client
- GIS as **Public Infrastructure** = Spatial Data Infrastructure
 - **Vendor neutral, standard based architecture** is very important
 - Active standardization by ISO, OGC
- Open Source GIS as another Lego Block
 - Active implementation of "Standard Compatibility" by Open Source GIS
 - Open Source GIS could replace commercial proprietary SW/Components

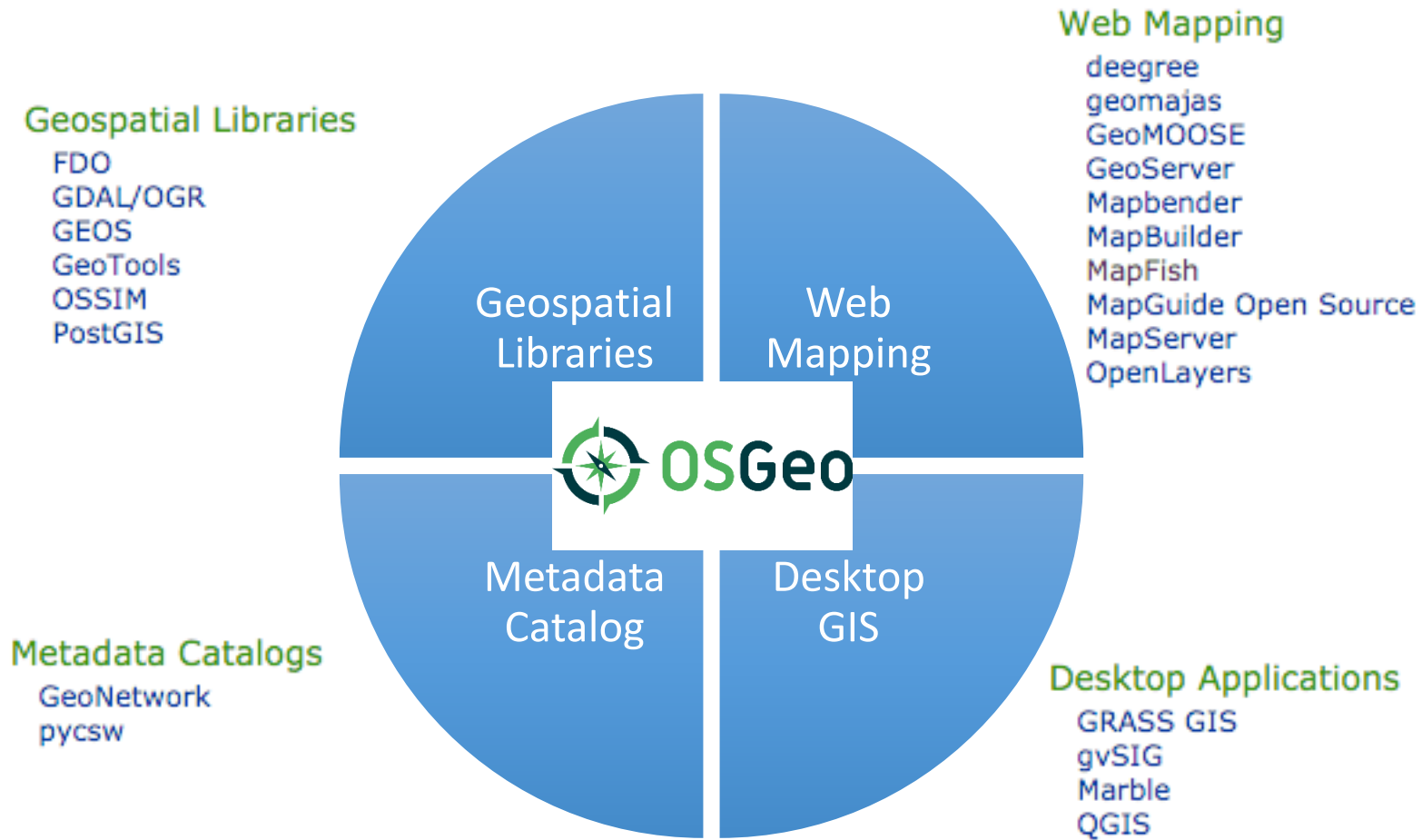
4. GIS: Vertical Set of Many Software

□ Characteristics of GIS : **Vertical Set of Many Software**



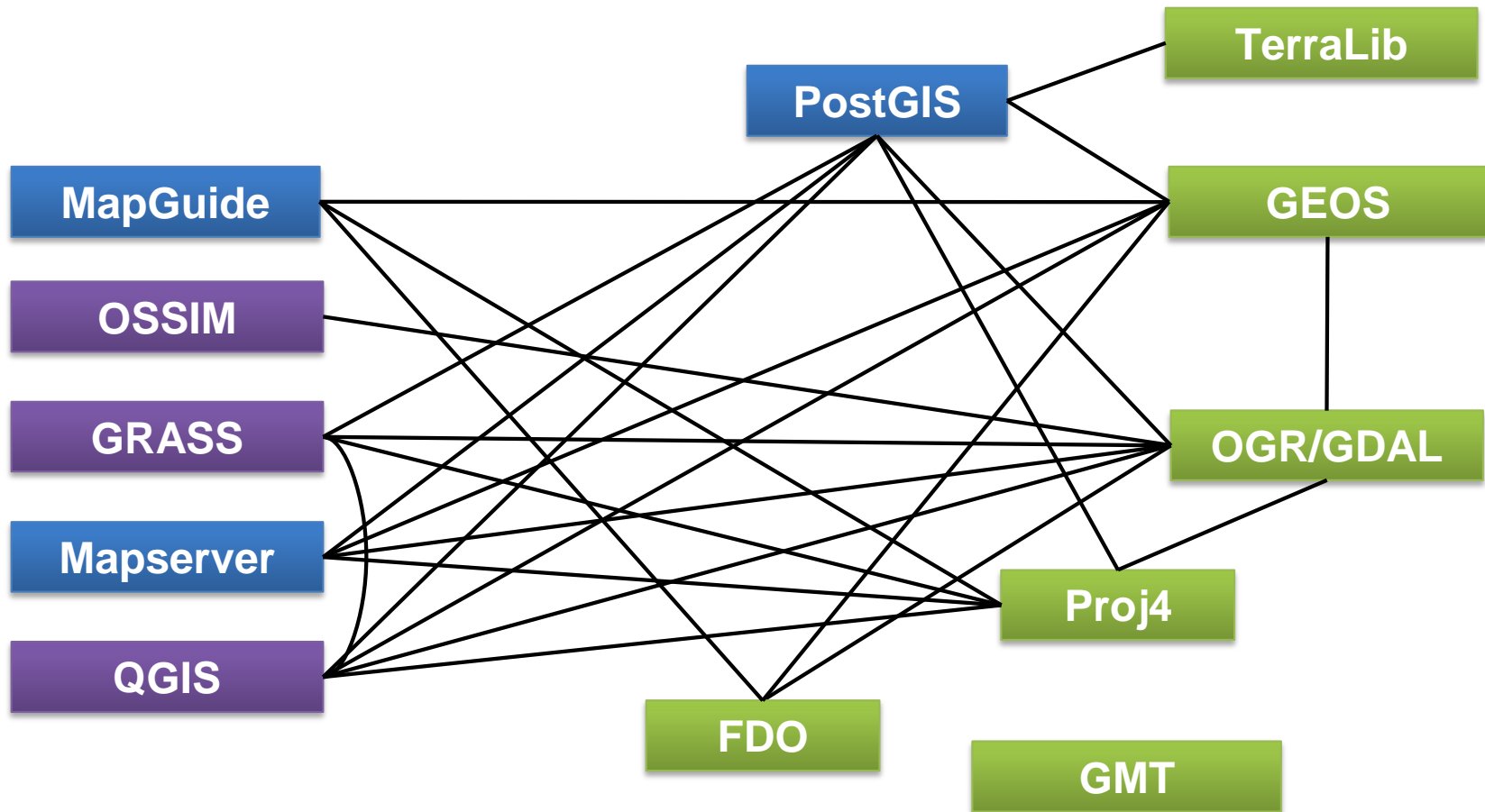
5. Another Lego Block

❑ FOSS4G Projects under OSGeo Umbrella



5. Another Lego Block

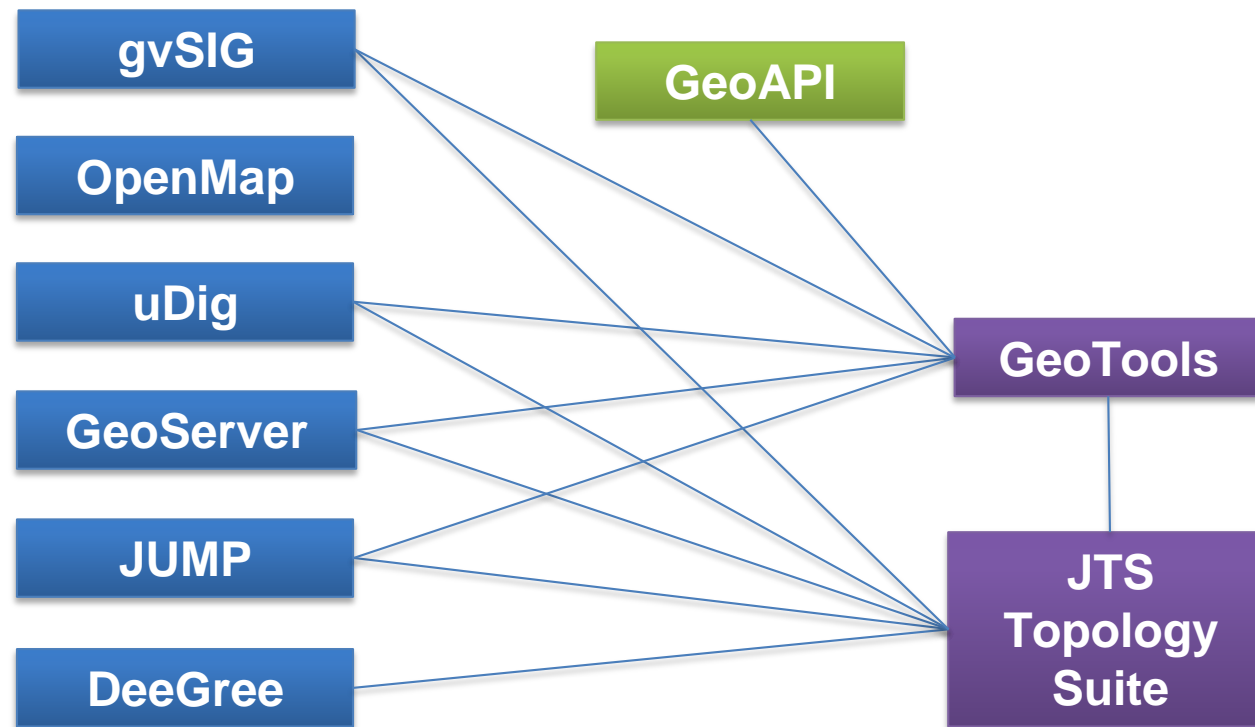
□ C Tribe



• Source : Tyler Mitchell

5. Another Lego Block

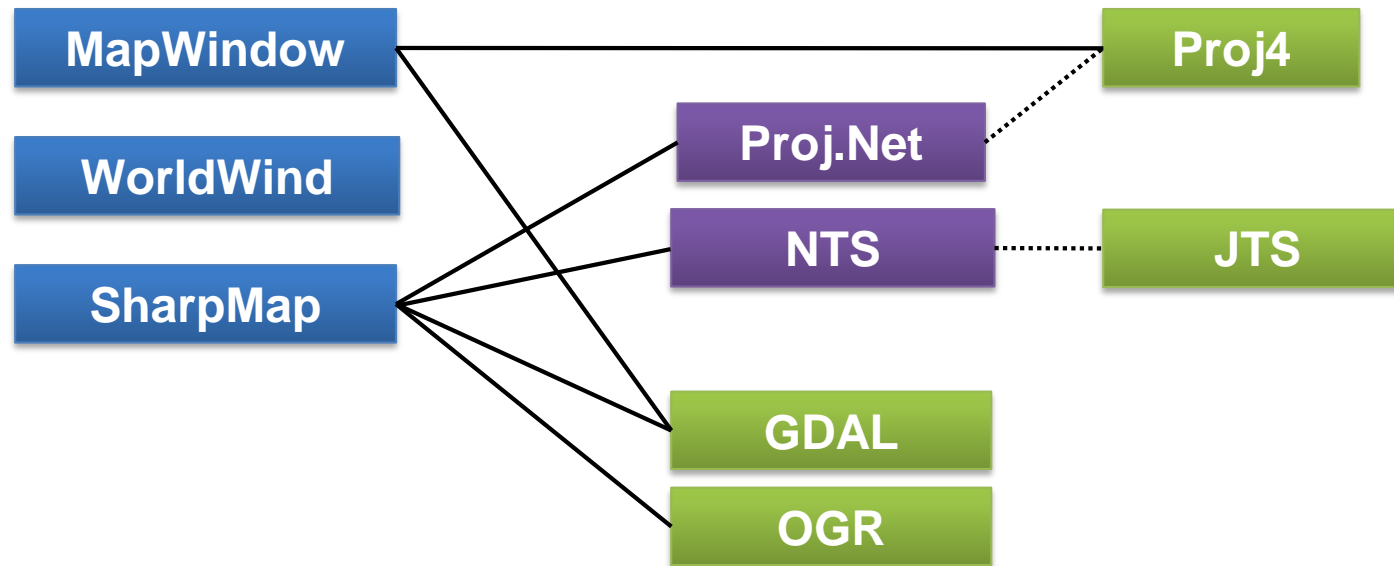
☐ Java Tribe



• Source : Tyler Mitchell

5. Another Lego Block

☐ .Net Tribe

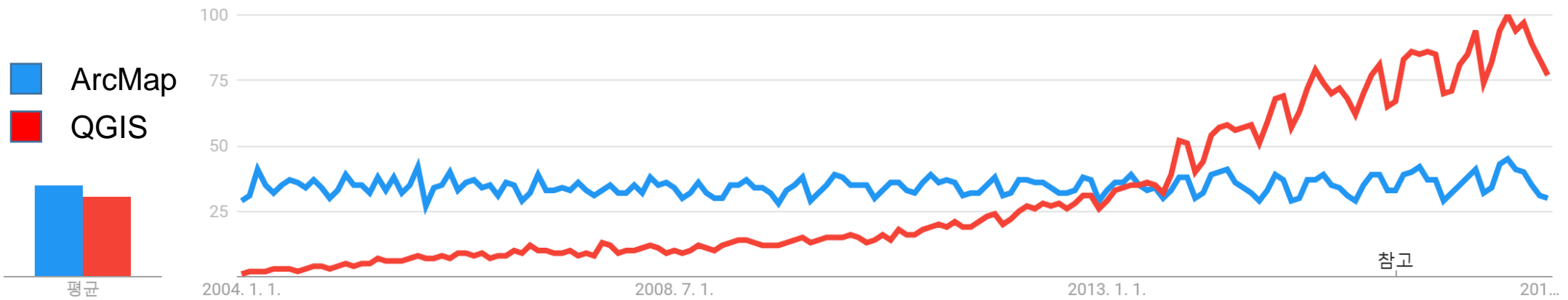


• Source : Tyler Mitchell

6. Rising of Open Source GIS

☐ Google Trends Analysis

시간 흐름에 따른 관심도 변화 ?



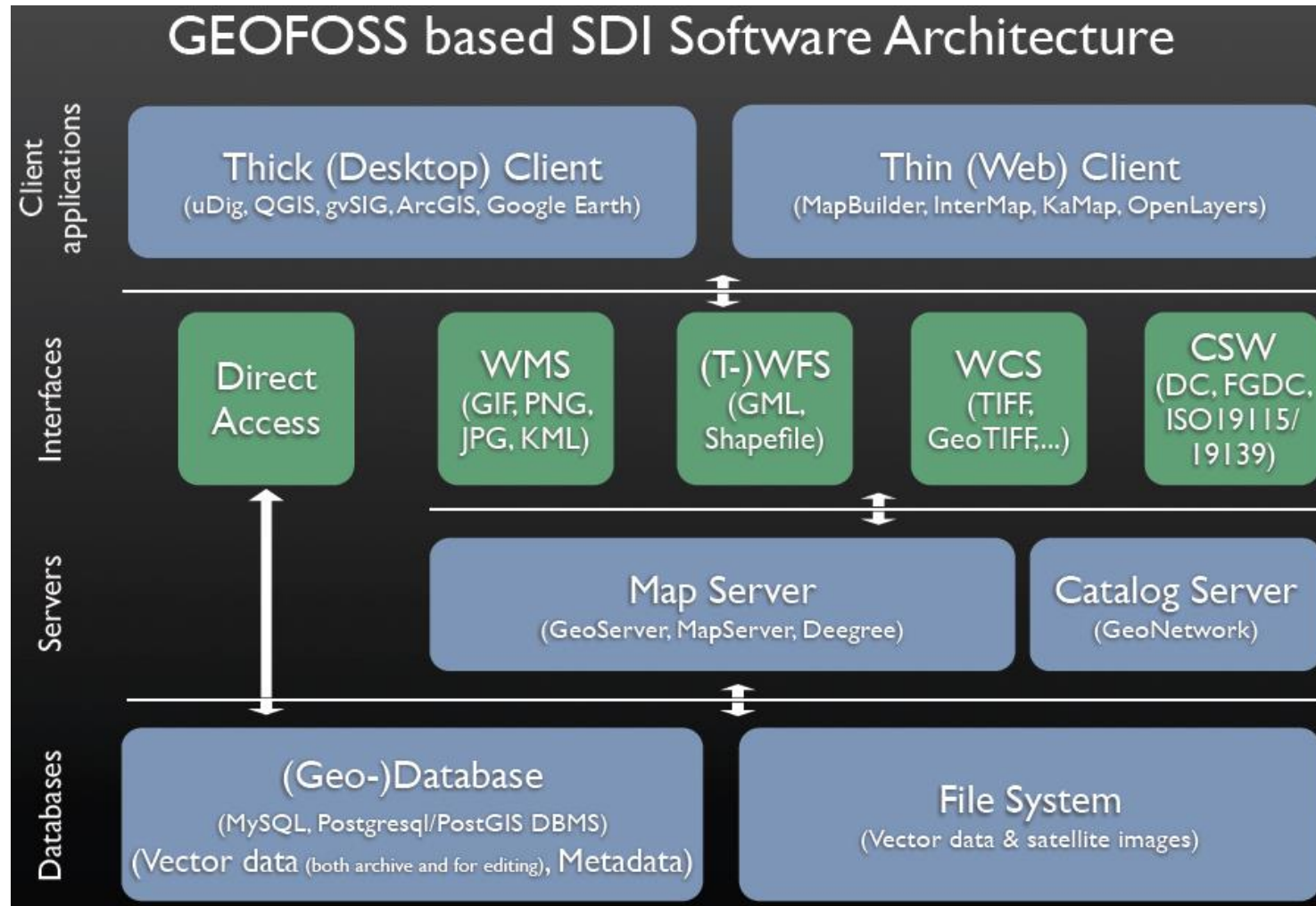
* Source: <http://www.google.com/trends/>

III. Open Source GIS Projects

- 01 | FOSS4G Based NSDI
- 02 | Real Cases
- 03 | Korean Cases
- 04 | Open GeoData

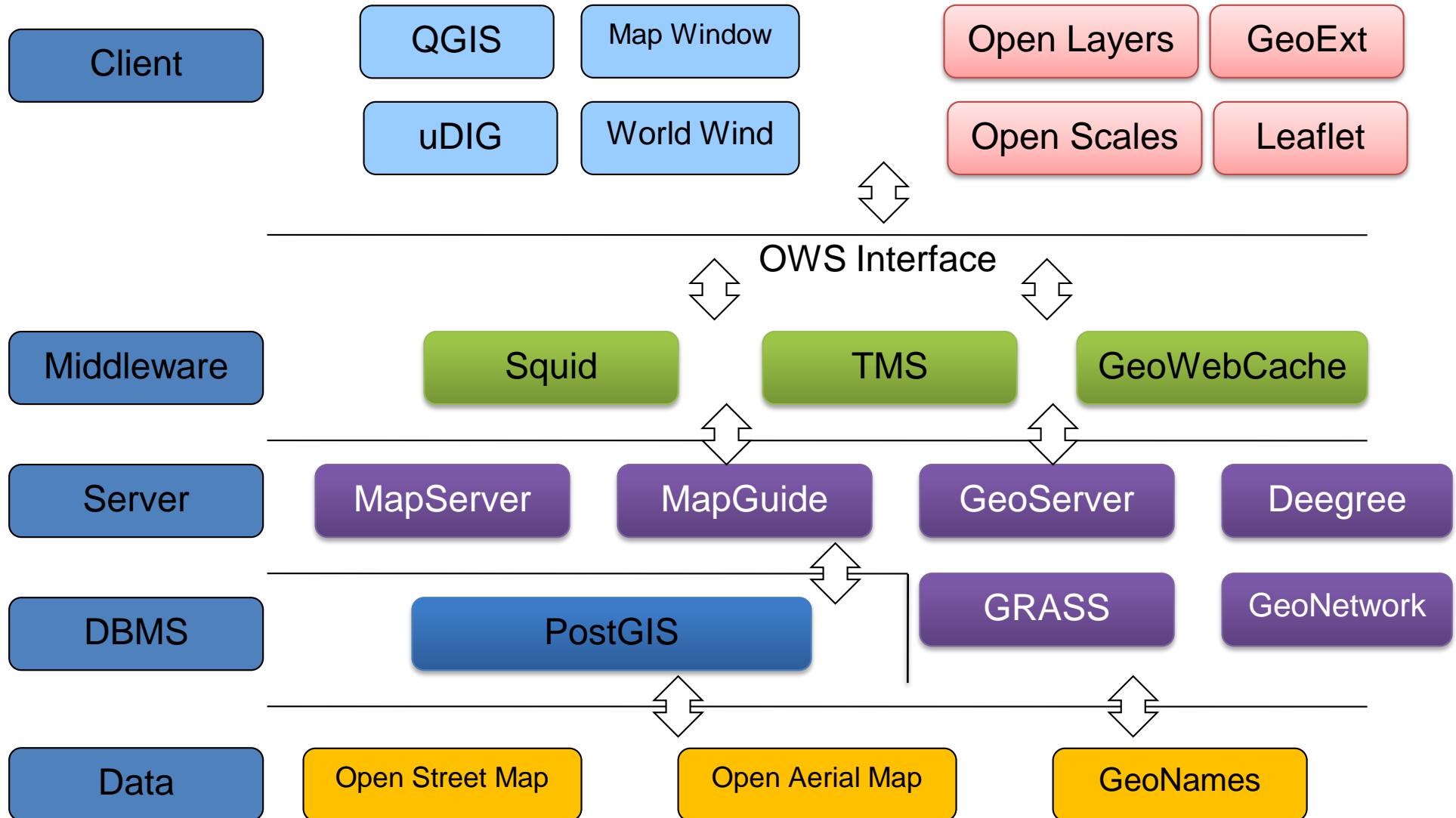
1. FOSS4G Based NSDI

❑ FOSS4B Based NSDI Architecture



1. FOSS4G Based NSDI

FOSS4B Based System Architecture



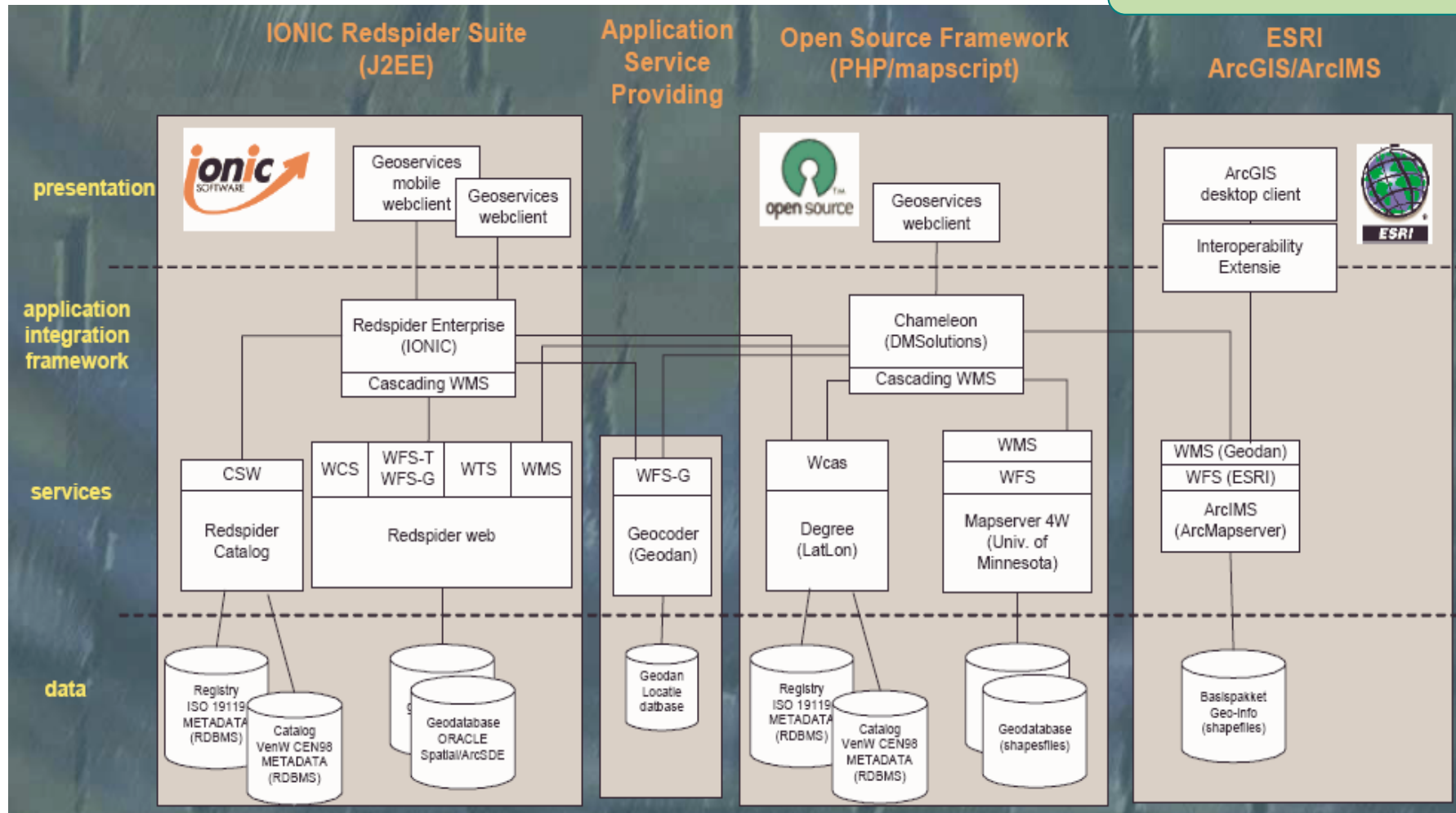
1. FOSS4G Based NSDI

❑ EU : INSPIRE

- Hybrid model mixing proprietary and foss4g



EU : INSPIRE



2. Real Cases

❑ Geo Bolivia

- Pursuing Open Source GIS based NSDI

GEO Bolivia
Infraestructura de Datos Espaciales
del Estado Plurinacional de Bolivia

Vicepresidencia del Estado
Presidencia de la Asamblea Legislativa Plurinacional
BOLIVIA

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra
Agencia Suiza para el Desarrollo
y la Cooperación COSUDE

Inicio Catalogo de datos Mapa Interactivo Archivos Shape Normativa

Demostración del portal de acceso a los datos geográficos compartidos entre entidades publicas de Bolivia

Buscar

Requerimiento de Personal Técnico

9 de febrero

El proyecto GeoBolivia, en el marco de la ejecución de sus tareas de la gestión 2012, requiere la contratación de cuatro informáticos y dos geógrafos. Las convocatorias se pueden encontrar en el SICOES (poner "vicepresidencia" en el campo "Entidad" de la búsqueda). Los cuatro cargos de informáticos son: consultoría individual de línea: responsable de sistemas y programación 1, CUCE 12-0006-00-294372-1-1, con perfil de programador senior consultoría individual de línea responsable de sistemas y (...)

Seguir leyendo de [Requerimiento de Personal Técnico](#)

Vínculos

- [FOSS4G 2011](#)
- [Catalogo de datos](#)
- [geOrchestra](#)
- [GeoServer](#)
- [Mapa interactivo](#)
- [OSGeo.org | Your Open Source Compass](#)
- [Vicepresidencia del Estado de Bolivia](#)
- [Welcome to the OGC Website | OGC®](#)

Boletín

[Suscribir al boletín de GeoBolivia](#)

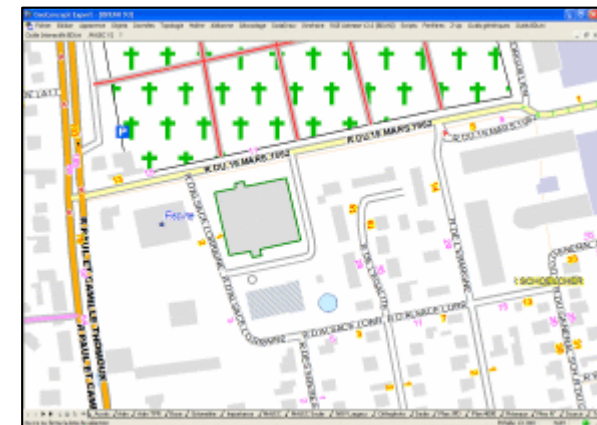
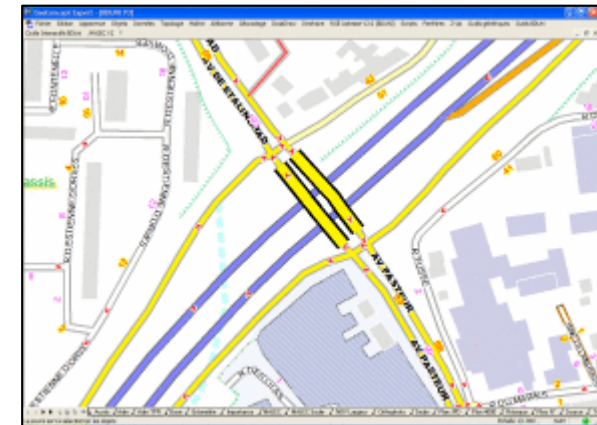
2. Real Cases

IGN, France



The screenshot shows the homepage of the Institut National de l'Information Géographique et Forestière (IGN). The header includes the IGN logo and the text "Institut national de l'information géographique et forestière". Below the header is a search bar with the text "Je recherche :" and an "OK" button. To the right of the search bar are three navigation links: "Espace presse", "Espace Education", and "Lettre d'information". Below the search bar is a section titled "Accès rapide :" with three dropdown menus: "Produits et Services ...", "Découvrir...", and "Les sites IGN ...". The main content area is divided into three columns: "Découvrir l'IGN" (Missions, activités, recrutements), "Espace professionnel" (INSPIRE, Données numériques, Services pour les pros, Téléchargements), and "Boutique loisirs" (Achat en ligne, Cartes, photos, GPS, Tourisme et randonnée). At the bottom, there is a section for "Inventaire forestier", "Recherche et formation", and "Les services IGN" (édugéo, le géoportail de l'Éducation). A news item features a photo of Pascal Bertheaud, ingénieur général des ponts, des eaux et des forêts, nommé directeur général de l'IGN.

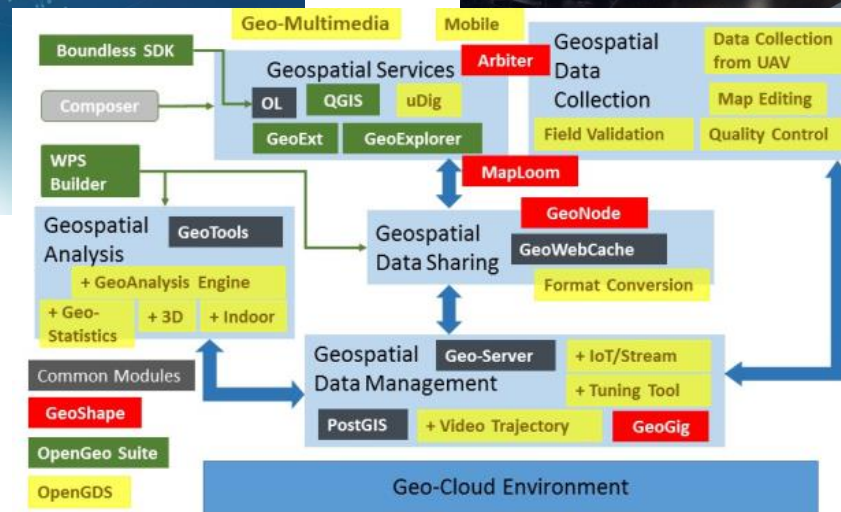
<http://www.ign.fr>



➔ Managing more than 100M spatial entities using PostGIS

2. Real Cases

United Nations Open GIS Initiative



March 8, 2016

UN OpenGIS Workshop

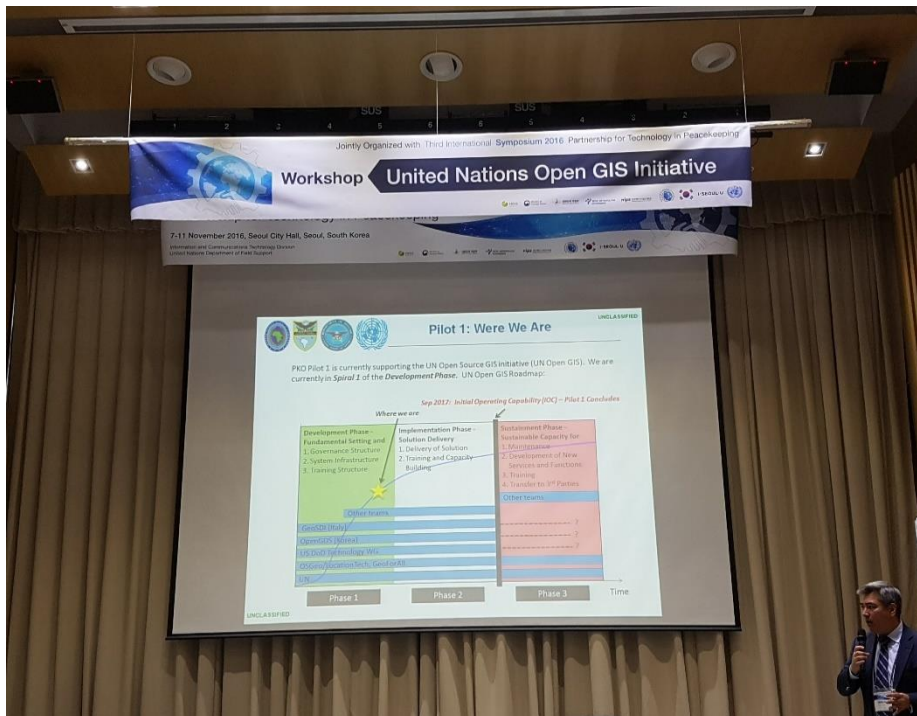
13

➔ From 'More with Less' to 'Better with Less'

2. Real Cases

❑ United Nations Open GIS Initiative

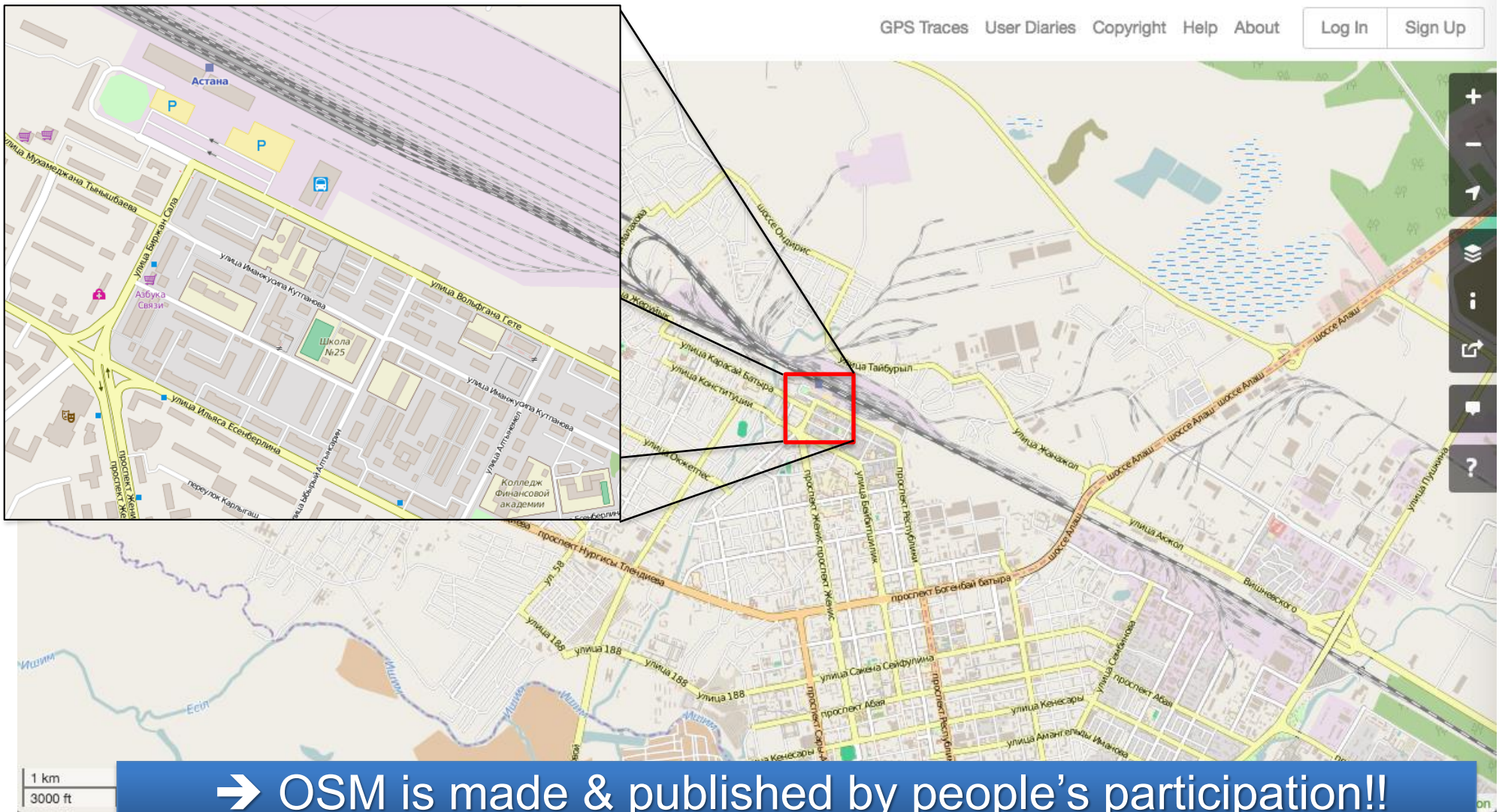
- 2 times meeting was held and 3rd meeting will be held on November



➔ TD of Spiral 1 on Sep, OD of Spiral 1 will be on November.

4. Open GeoData

❑ OpenStreetMap



→ OSM is made & published by people's participation!!

IV.OSGeo

01 | OSGeo

02 | Goal & Activities

03 | Incubation

04 | Conferences

1. OSGeo – Open Source Geospatial Foundation

OSGeo General

OSGeo Projects

Web Mapping

deegree
geomajas
GeoMOOSE
GeoServer
Mapbender
MapBuilder
MapFish
MapGuide Open Source
MapServer
OpenLayers

Desktop Applications

GRASS GIS
gvSIG
Marble
QGIS

Geospatial Libraries

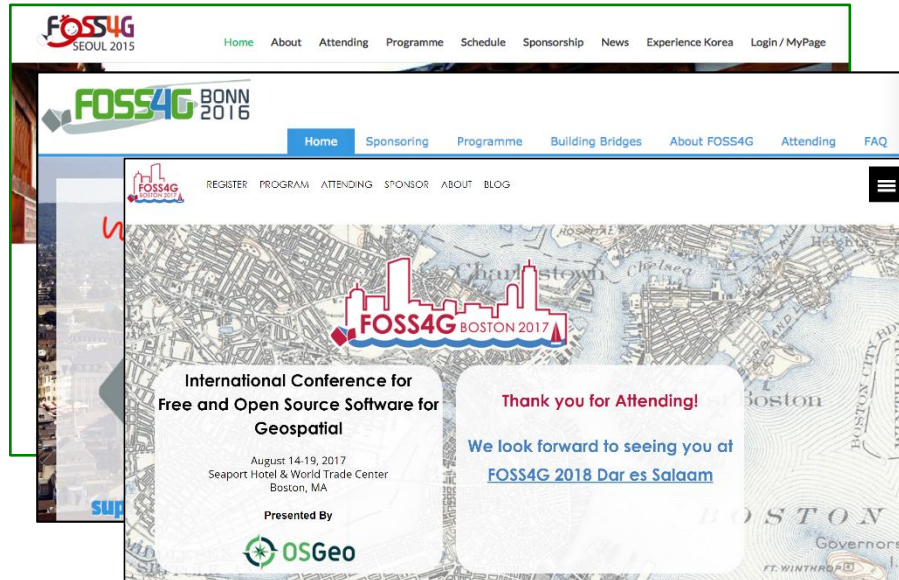
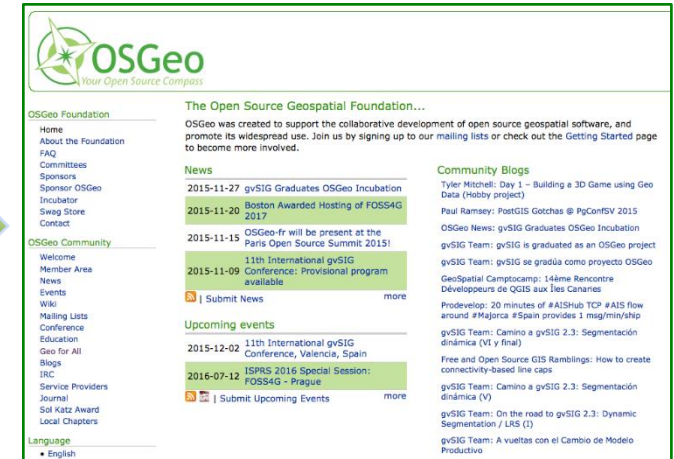
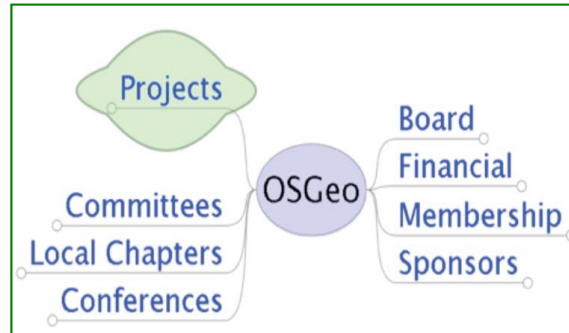
FDO
GDAL/OGR
GEOS
GeoTools
OSSIM
PostGIS

Metadata Catalogs

GeoNetwork
pycsw

Outreach Projects

Public Geospatial Data
Education and Curriculum
OSGeo Live



OSGeo

- Open Source Geospatial Foundation

- Established in Chicago, US on 4th February, 2006.
- Mission : To support the collaborative development of open source geospatial software, and promote its widespread use.
- OSGeo is a NPO that is functioning as community of communities.

2. Goal & Activities

□ Goal & Activities of OSGeo

Goal

- ✓ Provide resources for **FOSS4G** projects
 - Infrastructures
 - Legal
 - Financial
- ✓ Promote **free and open geospatial data**
- ✓ Create and maintain a **quality brand**
- ✓ Create and promote **free curriculum**
- ✓ Promote and contribute to **standards**

Activities

- ✓ Support **FOSS4G** on a global scale
- ✓ Support **local activities** and capacities
- ✓ Facilitate **inter-project** communication
- ✓ Build a **solid market** for business and users
- ✓ Interface with **industry** and **academia**
- ✓ Support the **education** of domain experts not <brand specialists>



<http://www.osgeo.org>

3. Incubation

❑ OSGeo Incubation

- Efforts for ensuring high quality open source GIS development
- A kind of project health inspection

1 Have a successfully operating open and collaborative development community

2 Have clear IP oversight of the code base of the project

3 Adopt the OSGeo principles and operating principles

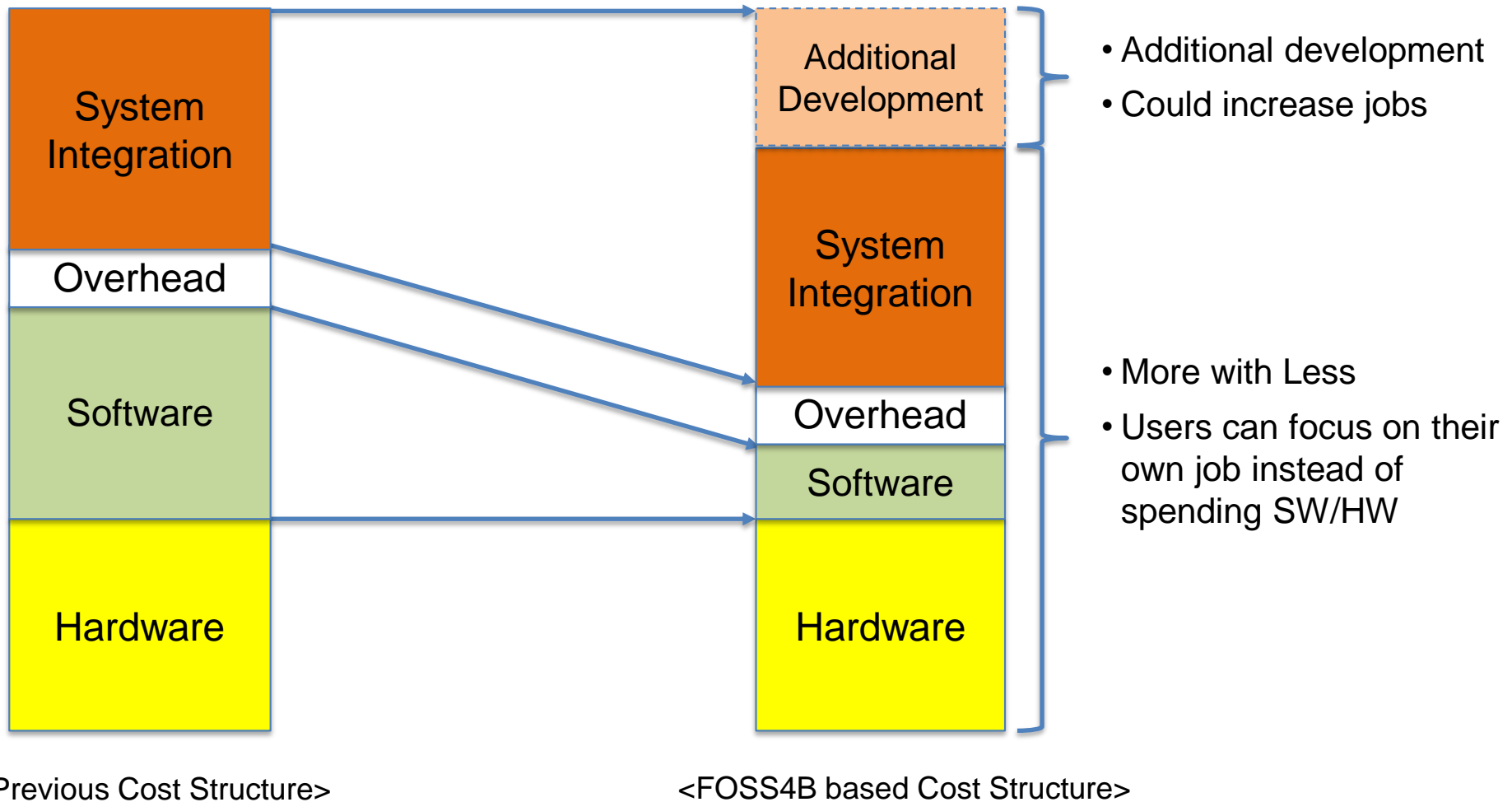
4 Are mentored through the incubation process

V. Wrap-Up

- 01 | Pros & Cons
- 02 | Commercial Open Source GIS
- 03 | Wrap-up

1. Pros & Cons

❑ Economic Advantages – More with Less!



1. Pros & Cons

❑ Social Advantages – Capacity Building

- Free access to open source GIS
- Source access to open source GIS

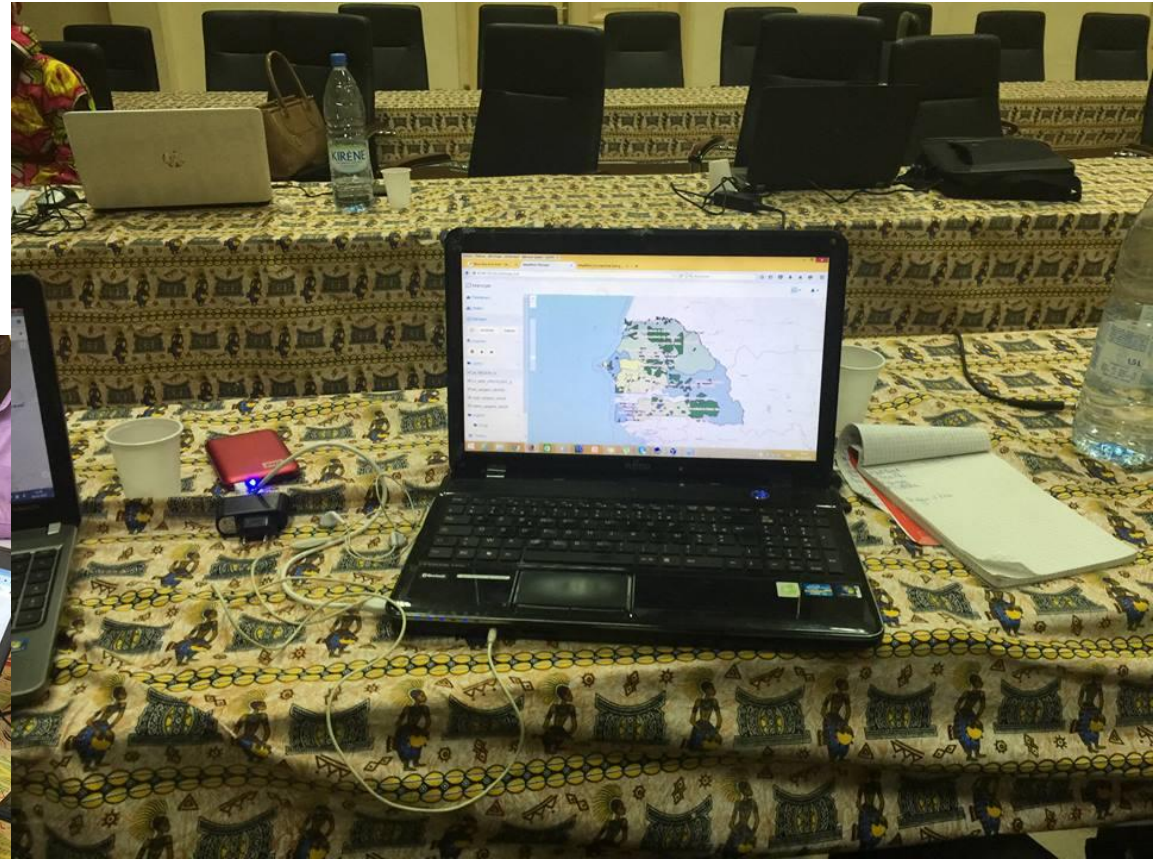
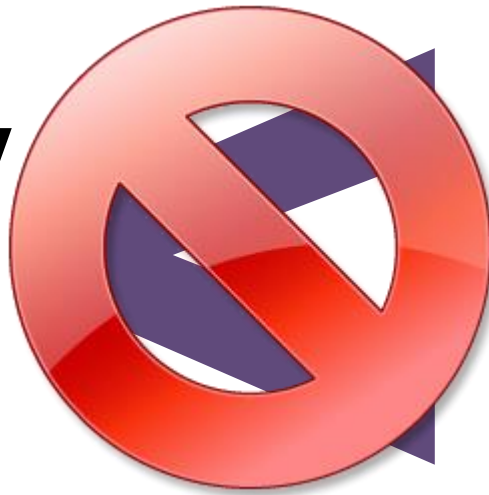


Image source: Gérald Fenoy, <https://www.facebook.com/gerald.fenoy>

1. Pros & Cons

❑ Downside of Open Source GIS

**Proprietary
Software**



**Open Source
Software**

- “Software of the developers, by the developers, for the developers”
- Highly depends on network effects
- Less economical incentive could reduce the sustainability of a project

1. Pros & Cons

❑ Downside of Commercial Proprietary Software

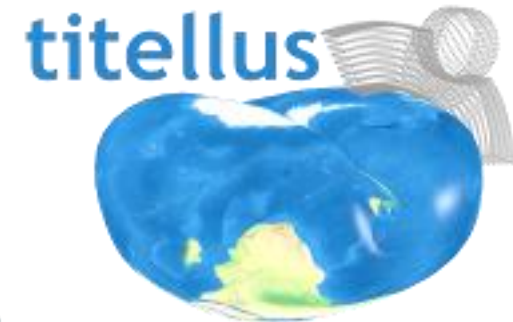
**Proprietary
Software**



**Open Source
Software**

- "High Price" is always headache to users
- Can be locked-in to non standard format or protocol
- Black box could hinder knowledge diffusion

2. Commercial Open Source GIS Companies



MAPZEN

3. Wrap-up

Advance of
Open Source
GIS

- Open Source GIS is now comparable with commercial proprietary GIS
- Open Source GIS is now actively adopted & used all around the world

Cost Reduction

- Open Source GIS is basically free.
- The price of commercial Open Source GIS is lower than proprietary one

Interoperability

- Almost all the Open Source GIS is compliant with OGC standards
- Open Source GIS can be used with existing proprietary GIS

Opened
Source Code

- Anybody can modify & upgrade the system from the source code level
- Can easily replicate or migrate success cases to their system

Collaboration
based SW

- Collaboration, sharing & community based SW development model
- Source code will be managed by community not by company
- Neutrality from specific technology or company
- Anybody can join and contribute to Open Source GIS with OSGeo