V3ct3D

Structuring project

École nationale des sciences géographiques

09 december 2016

Brainware

Method Scrum

- Daily sprints
- group of 14 people

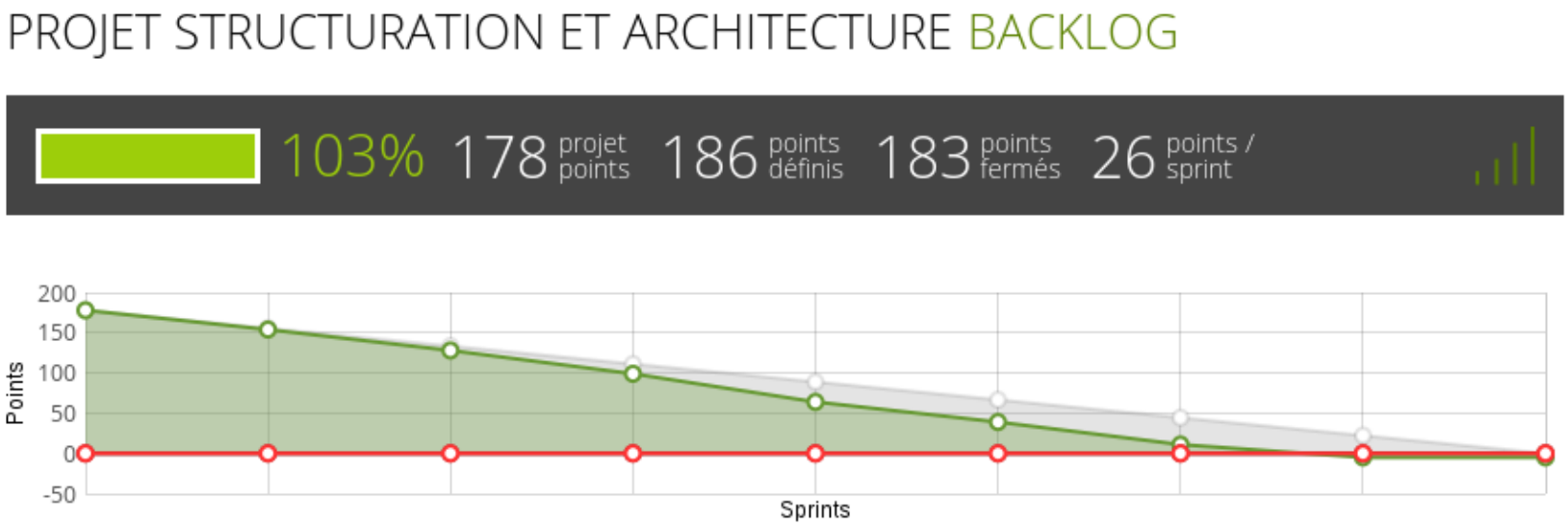


FIGURE: Product backlog

Personal Feedback - Elsa

- Scrum master and part of a big team
- Tools
- 3D world
- Advanced thinking

BD UNI & BD TOPO

BD uni

- Is a database of vector data for the whole of France containing all the themes that constitute the commercial products of the IGN.
- Its regroup 10 domains : The road network, The building, the vegetation etc. . .
- The vector component of the RGE

BD TOPO

- Is the topographic component of the RGE

iTowns

- IGN technology platform : viewing and exploiting 3D geographic data
- Writen in Javascript/WebGl
- Collective intelligence : Several companies are participating in the project :
  - IGN
  - Oslandia
  - AtolCD
- Github : https ://github.com/iTowns/itowns
- Supported data types :
  - Panoramic images
  - Point Clouds
  - 3D textured models
  - WFS Vector

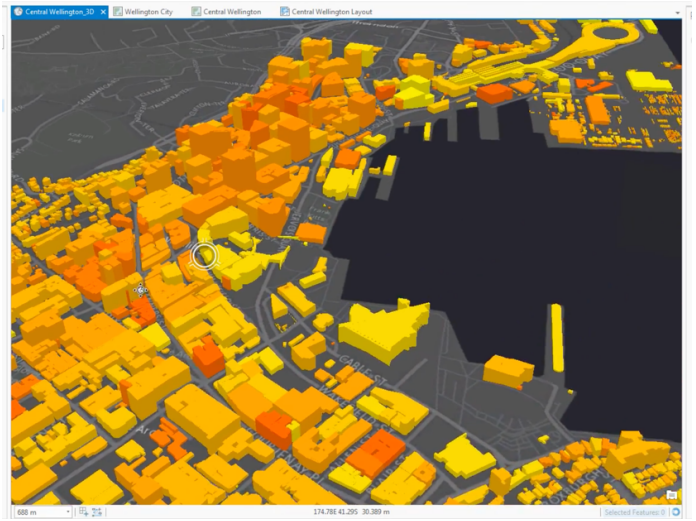
Personnal report

This project allowed me to :

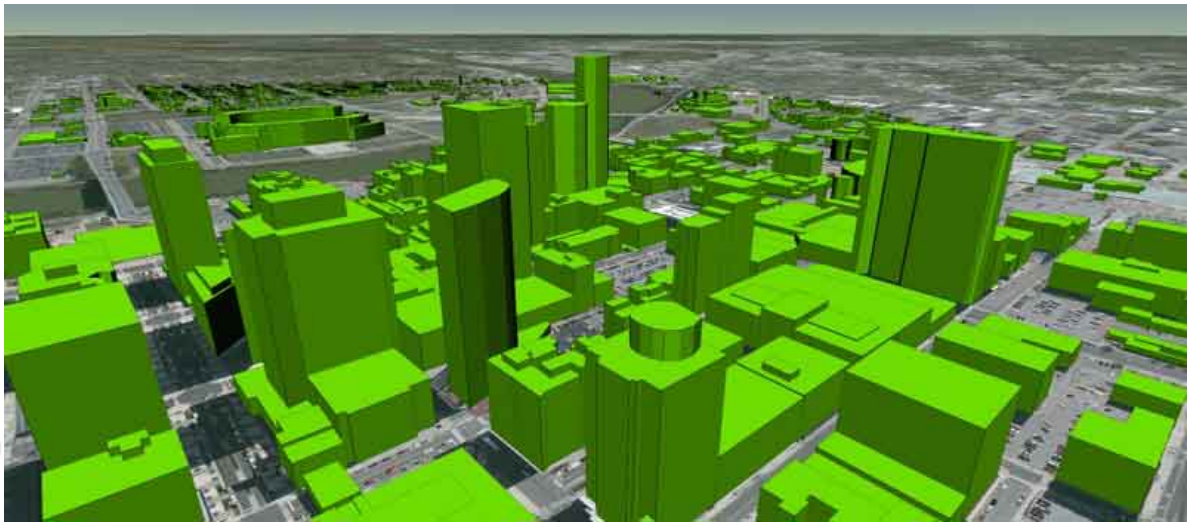
- Discover iTowns ;
- Discover cesium ;
- And be able to write in Markdown.

Different kind of data to do 3D

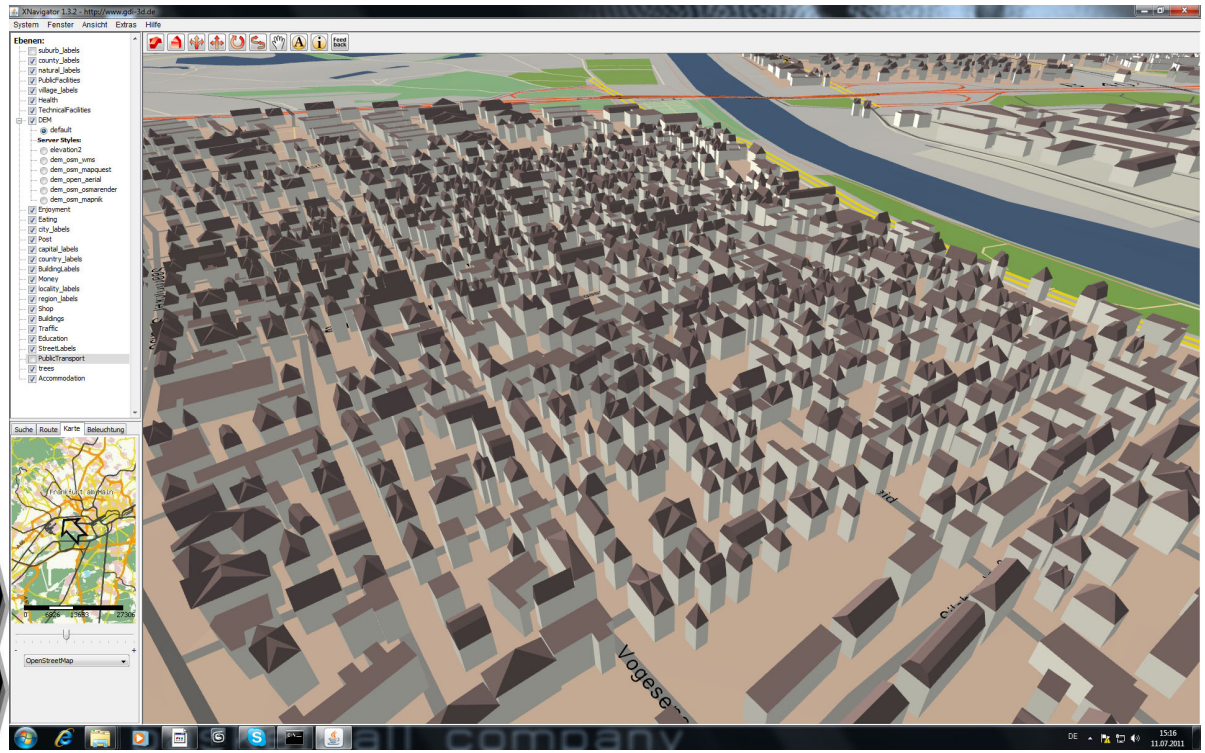
ESRI ArcGIS®



CityGML



Different kind of data to do 3D (2)



Personal report - Victor BRINON

Computer skills

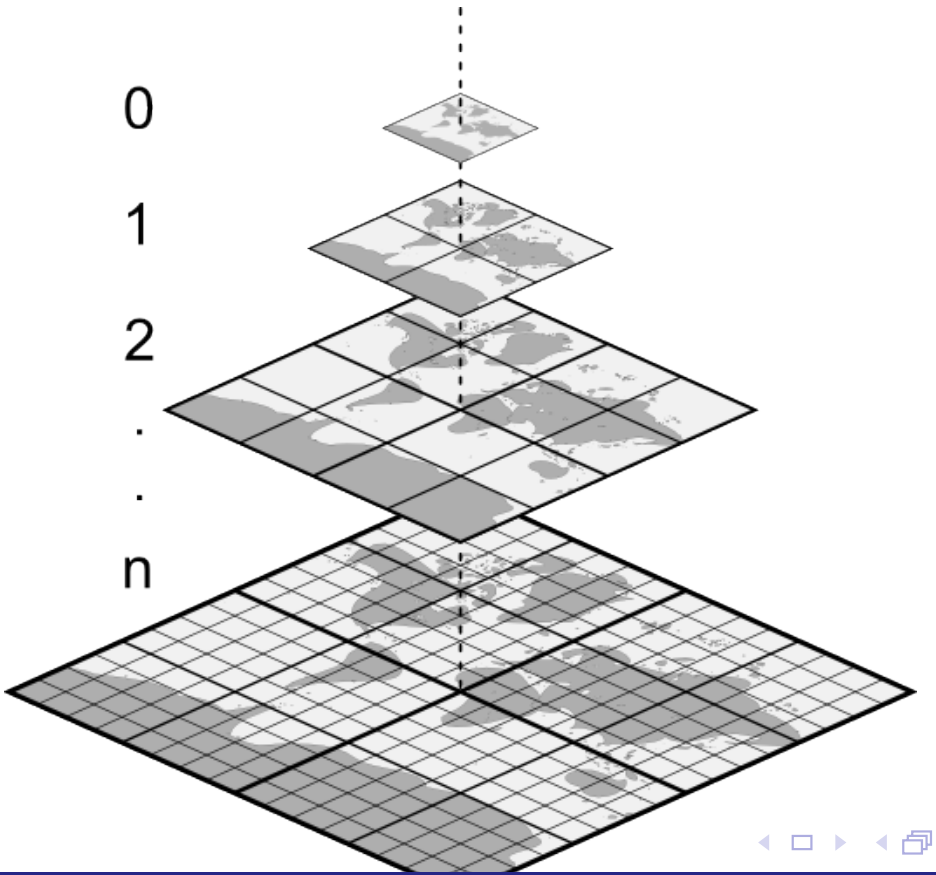
- Markdown
- Github
- Taiga
- Slack

Social skills

- Work in a big group
- Communication
- Relationships
- Daily meeting

Tiles

- Vector tiles are packets of geographic data, packaged into pre-defined roughly-square shaped “tiles” for transfer over the web.



The principle of tiles :

- The principle of tiling is to subdivide the entire surface of a map into small slabs ,
- Tiling allows two main advantages :

1. display on the screen only the tiles needed,
2. the level of generalization of the information. . .

Personal report - Hanane DERBOUZ

- Discovery of 3D libraries
- Discovery of 3D tiles and their principle
- Writing standard : Markdown

Libraries to display 3D

Cesium

FIGURE: Cesium

Personnal report - Er-razki Sibawaih

Computer skills :

- Markdown
- 3D Javascript librairies
- Github

Work method :

- Scrum
- Big team
- transverse view

Processing chain md => pdf

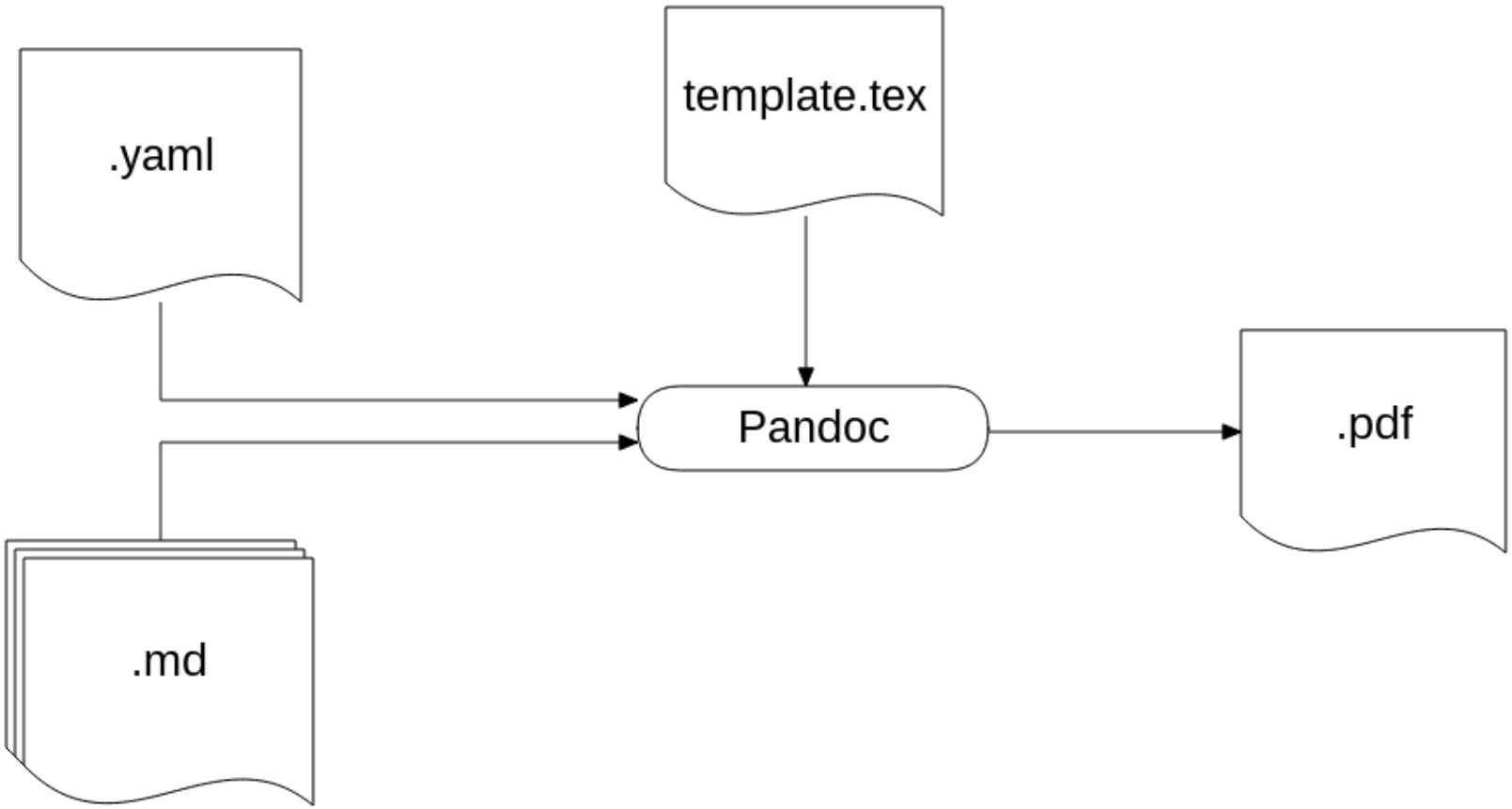


FIGURE: Processing chain

Use case diagramm

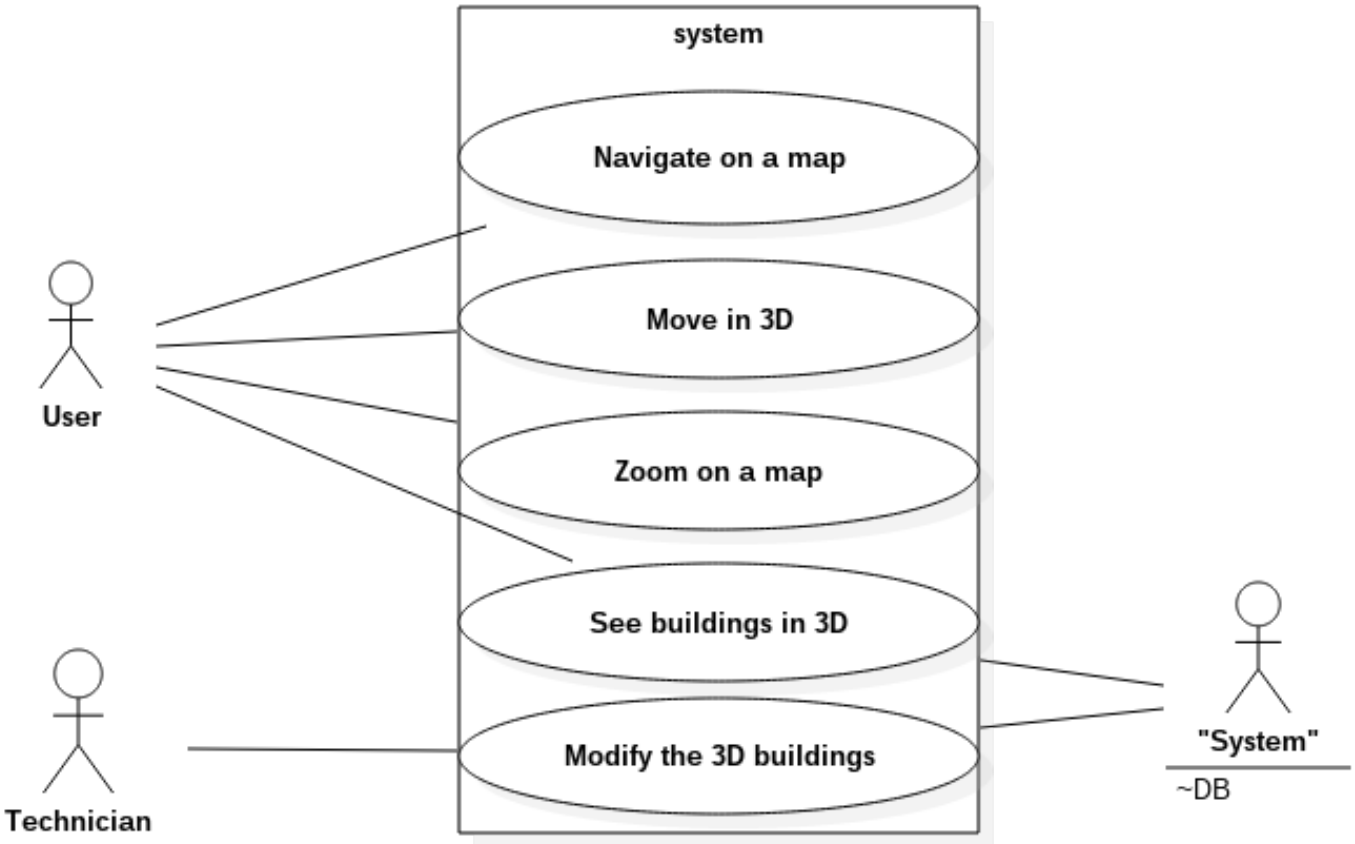


FIGURE: Use case diagram

Personal feedback - Hugo BALTZ

Computer skills

- Pandoc
- Markdown
- UML diagrams
- 3D-Viewer

Social skills

- Organization
- Relationships
- Communication
- Efficiency

Production chain : global

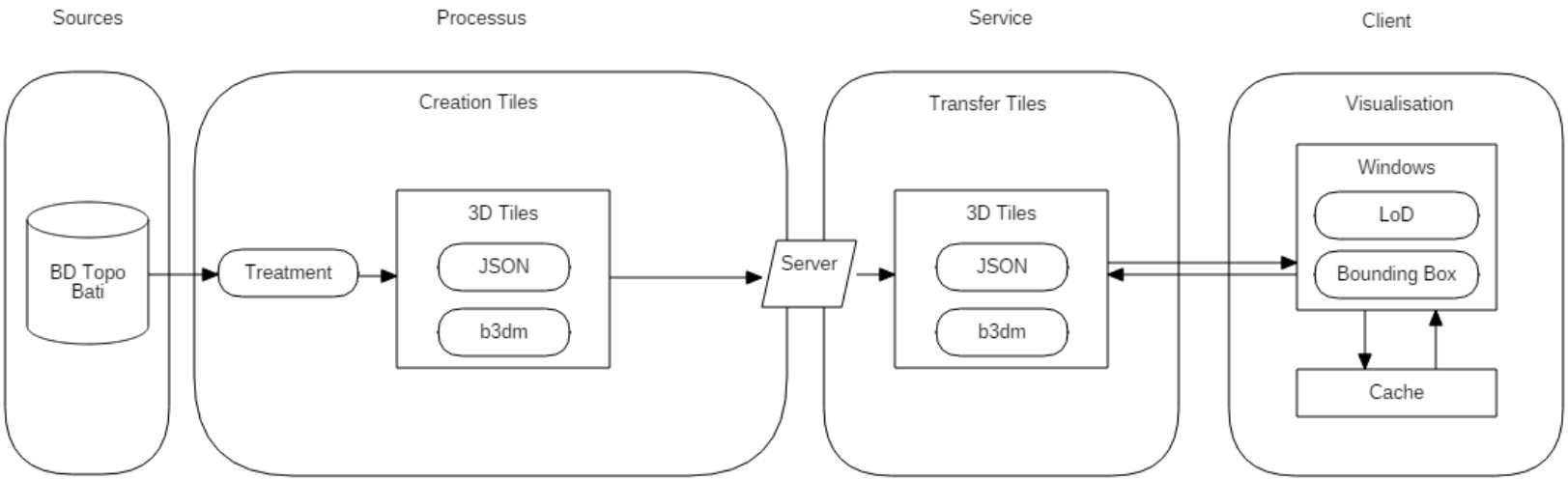


FIGURE: Production chain

Personal report - Julie MARCUZZI

- Learn Markdown methods
- UML diagrams
- Communication
- Discover Cesium, file format & library

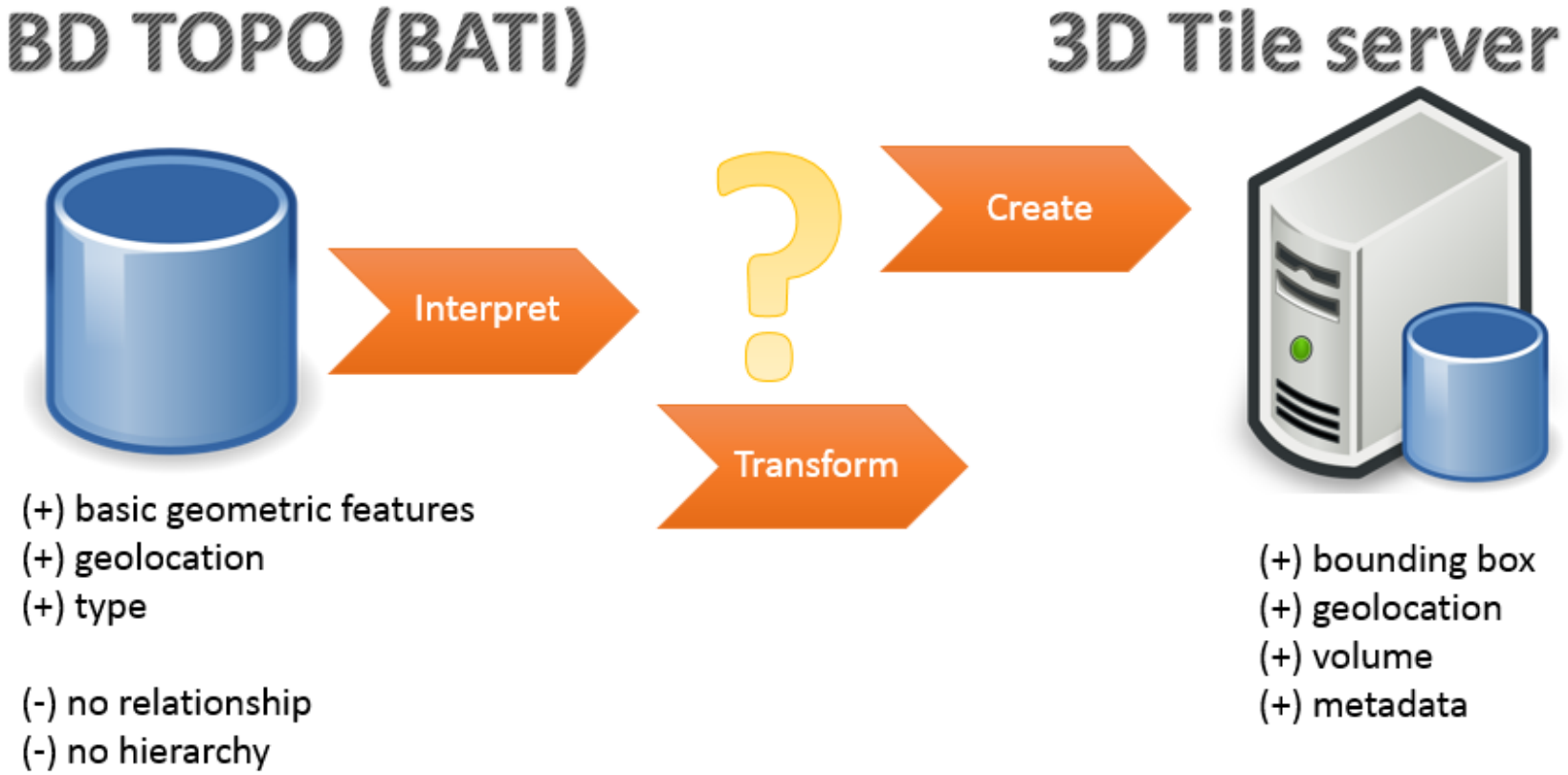


FIGURE: 3DTileGen

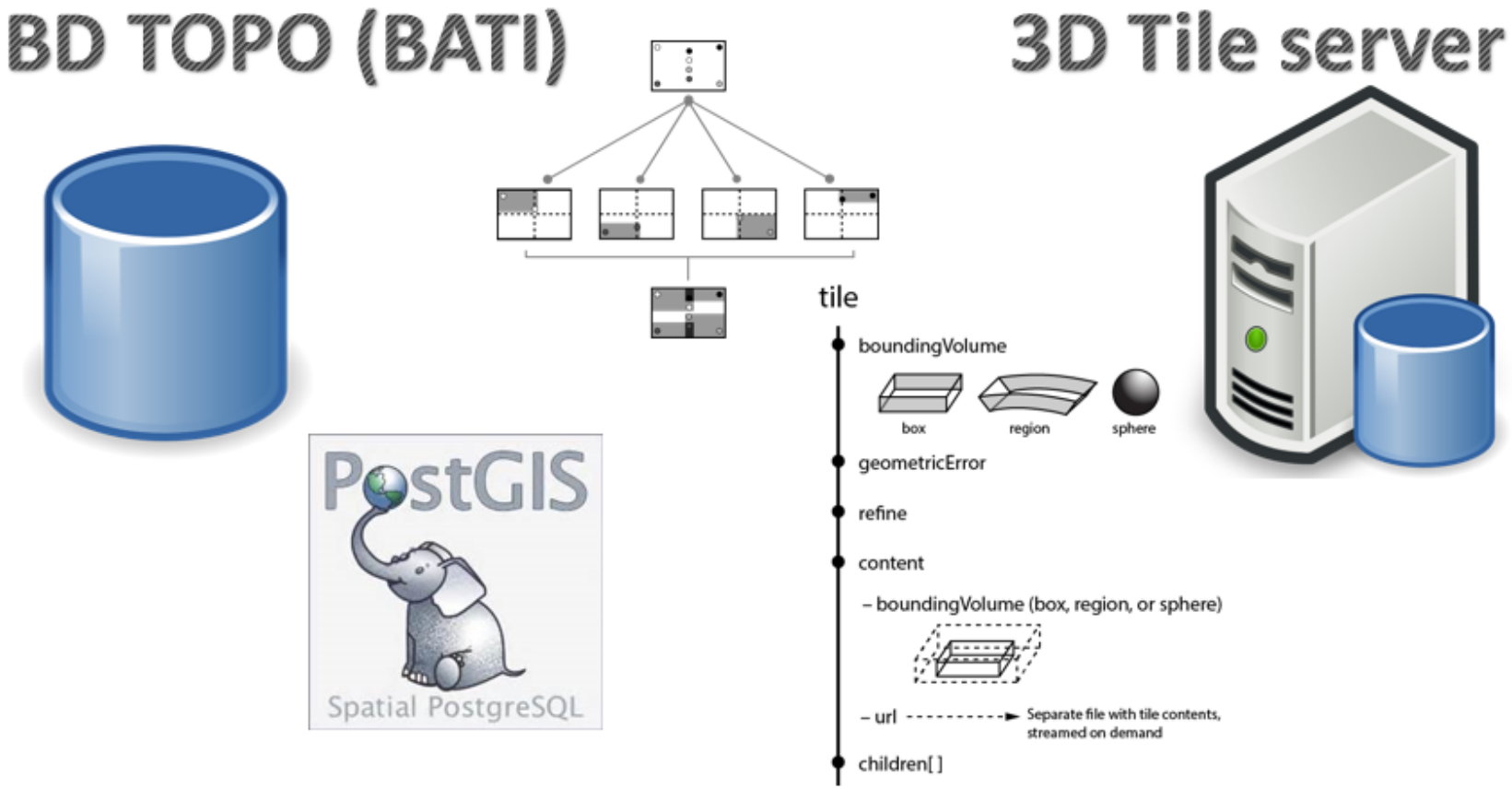


FIGURE: 3DTileGen

Personal report - Camille Parisel

Improved knowledge in Geomatic

- Vocabulary, geolocation units, data representation

Discovery of current standards and libraries

- Cesium, 3D Tiles, webGL, postGres, ...

Team work

- Large team, tiny sprints = hard work

The PostGIS Database

BDTopo

- Select the *bati* Shapefiles
- MultiPolygonZM

Import

- Using shp2psql
- Result

Data Processing

Bounding Box

- Creation

Object

- Geometry
- Relative positioning

Result

- Unique entity

Personal Report

The global processing

SQL

Organization

- Team
- Sprint

Data Hierarchization and display improvement

Bounding Volume Hierarchy (BVH) method

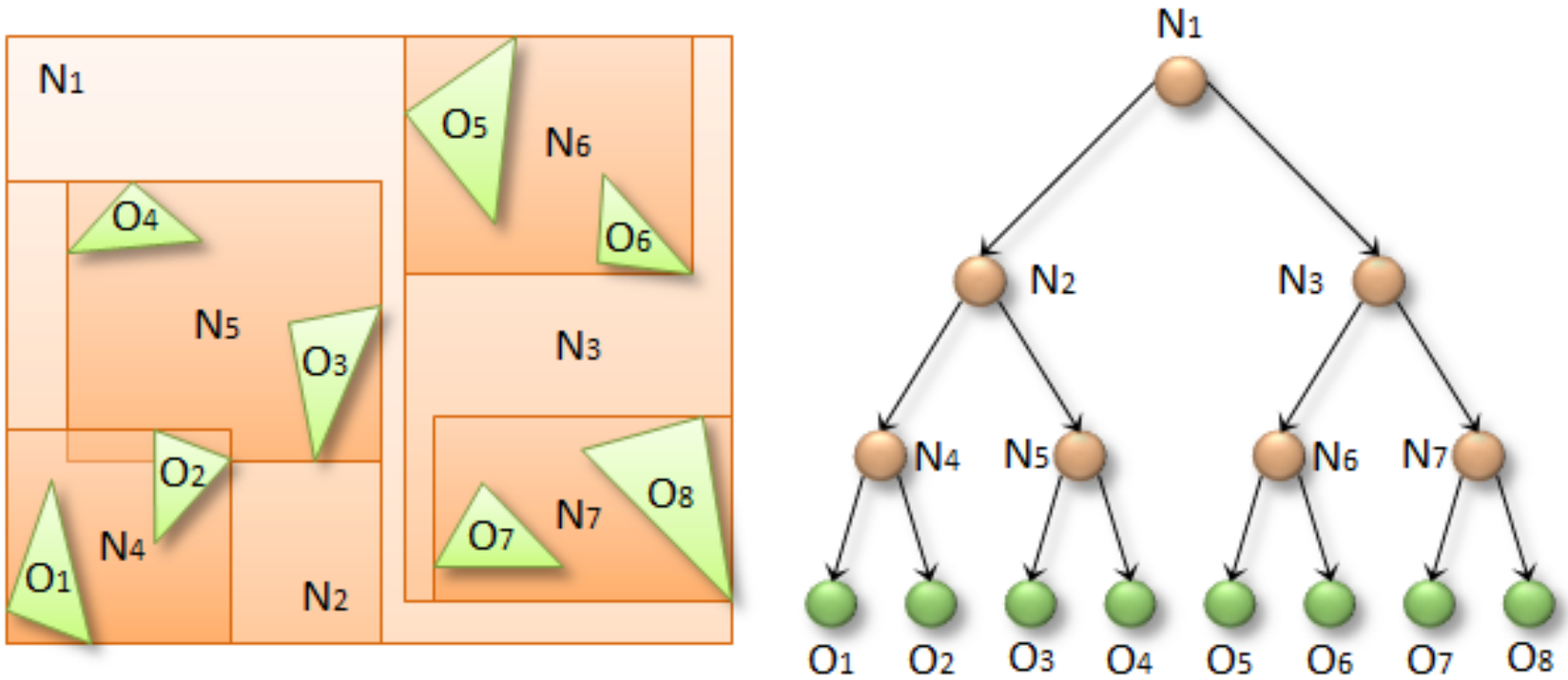


FIGURE: BVH

Chain of application

FIGURE: Chain of application

Personal report

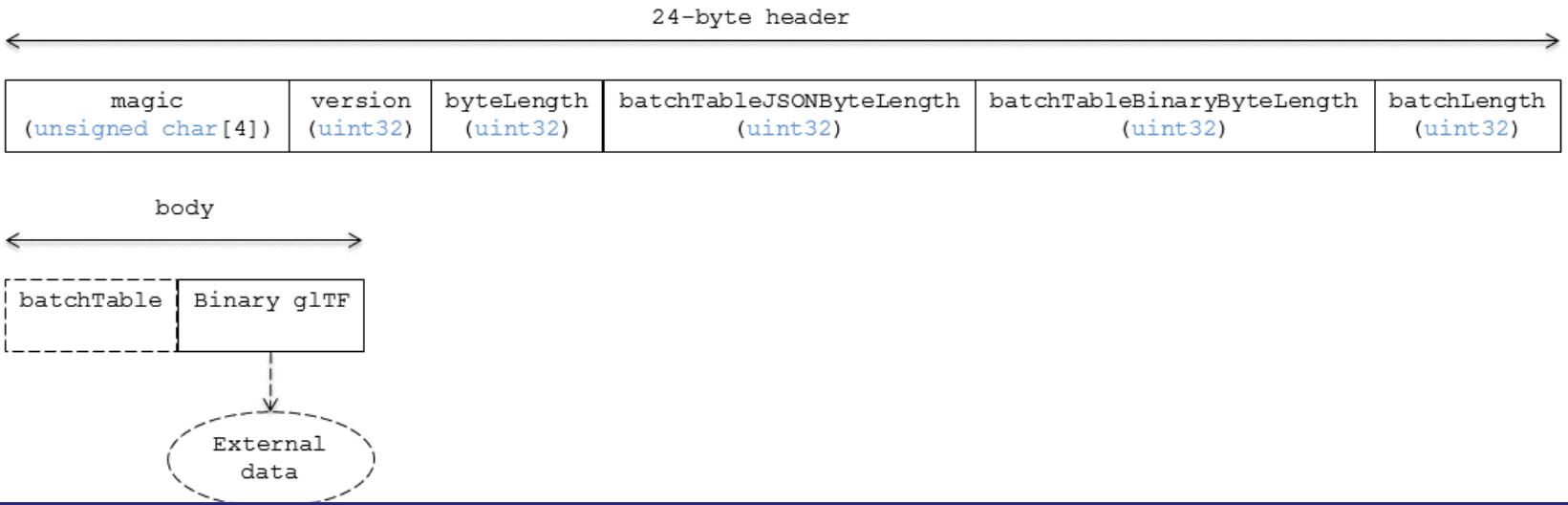
- Previously unknown formats and compatibility questions
- Conception at a high level of abstraction
- Knowledge gathering between all the individuals

b3dm *Batched 3D Model*

OGC is considering a proposed work item for 3D Tiles as a Community

The Batched 3D Models is an initial tile format proposed by **Open Geospatial Consortium (OGC®)** for **buildings**, terrain, massive models, etc. and the transfer of **3DTiles**.

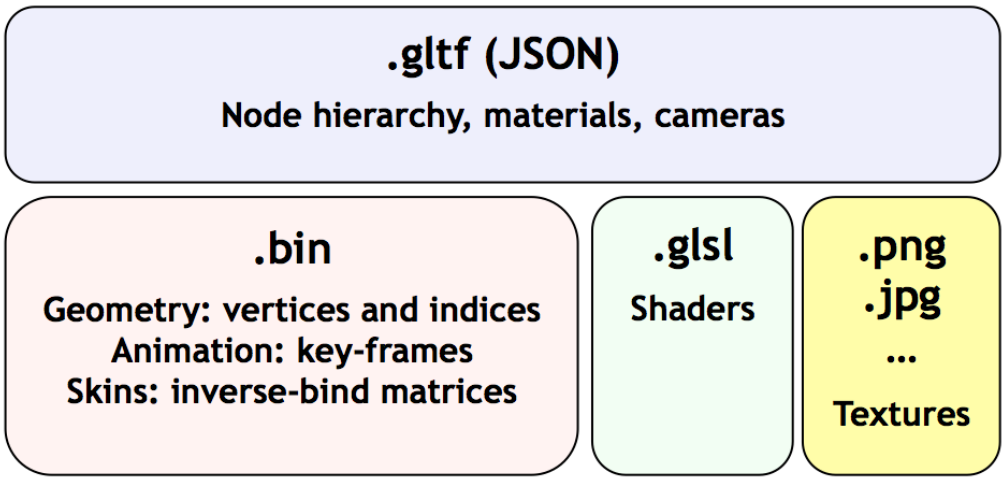
A tile is composed of two sections : a **header** immediately followed by a **body**, i.e. Binary glTF.



glTF *GL Transmission Format*

Used by 3DTiles

- Efficient, extensible, interoperable format (3D transmission and loading)
- Preserve full hierarchical scenes
- Making no assumptions about the target application or 3D engine.



Personal feedback

- Rediscovery of **Cesium** & Node js
- Discovery of streams (WMTS) and **file transfers** (gltf, b3dm . . .) + library js like OpenLayers
- Knowledge about **Markdown**
- Curious and Analytical mind

Bounding Box

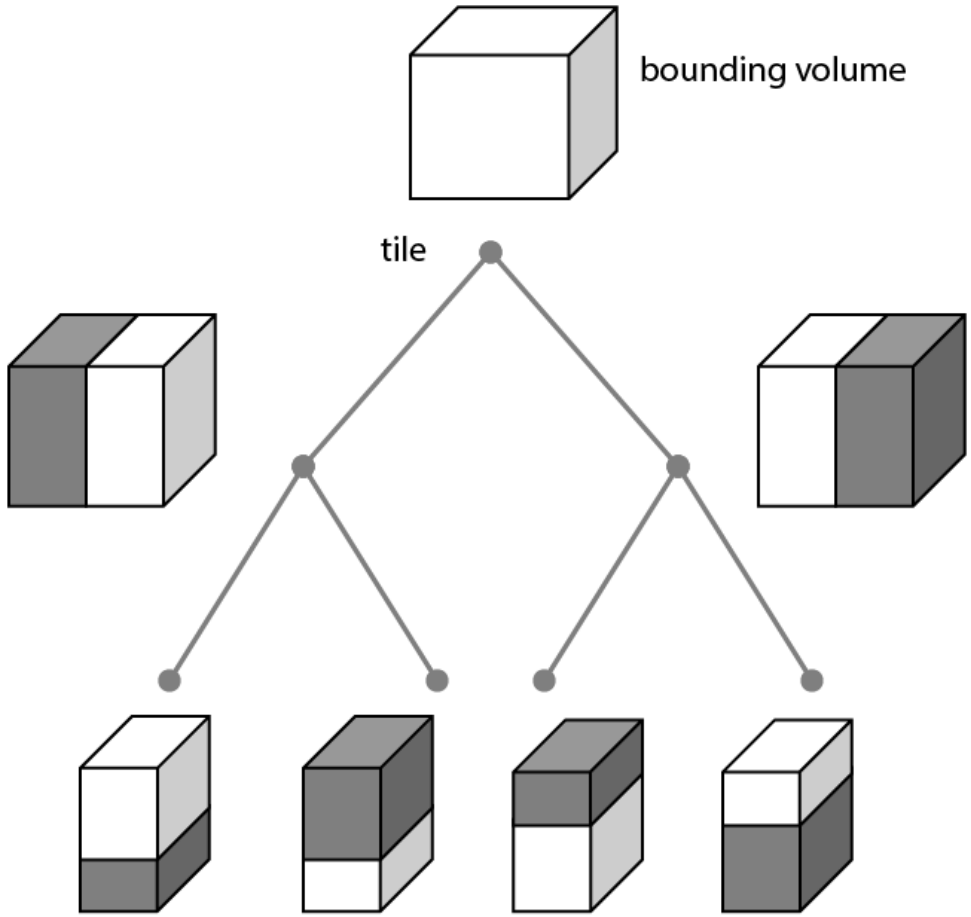


FIGURE: bounding_box

Level of Details

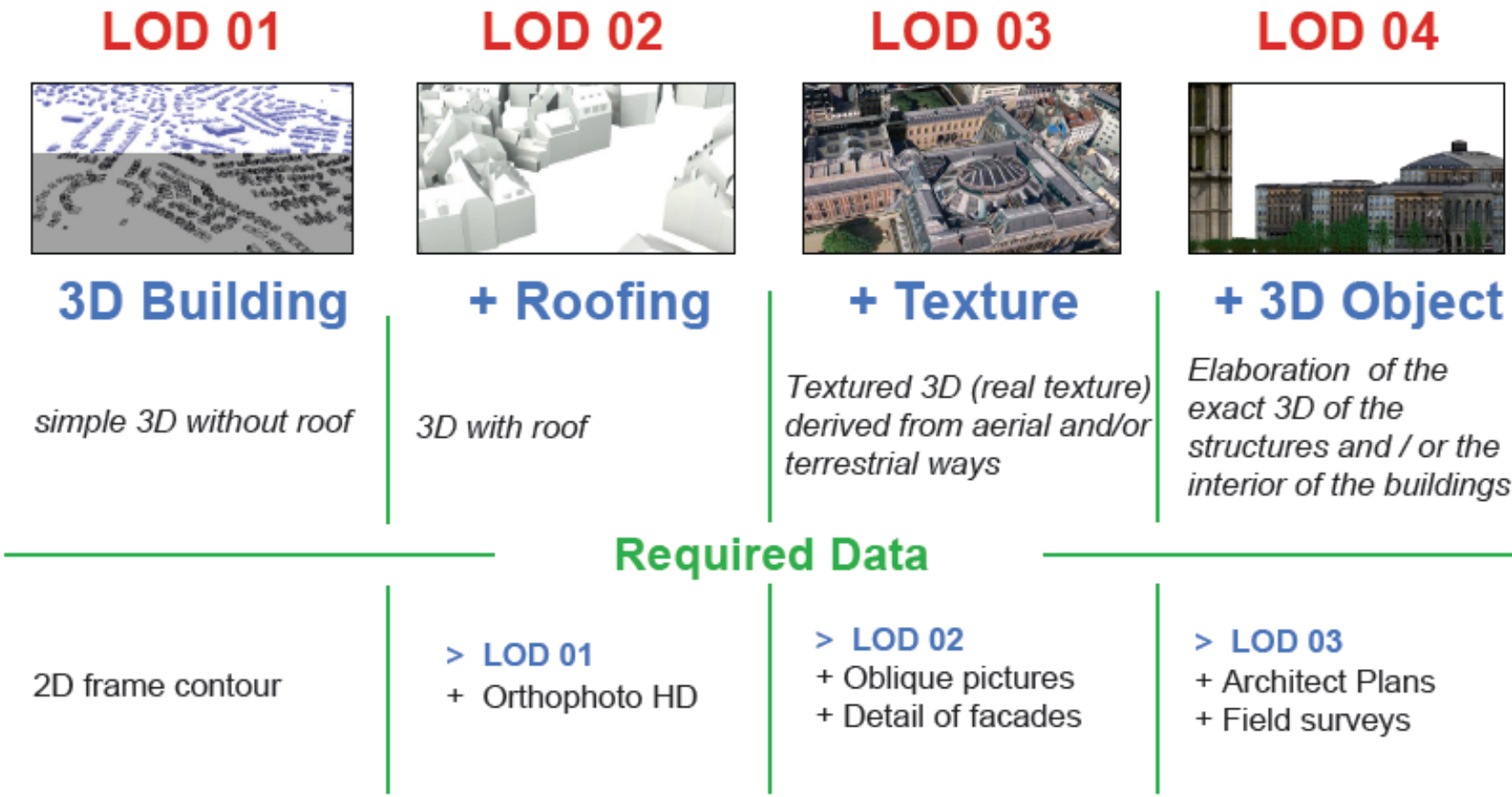


FIGURE: LoD

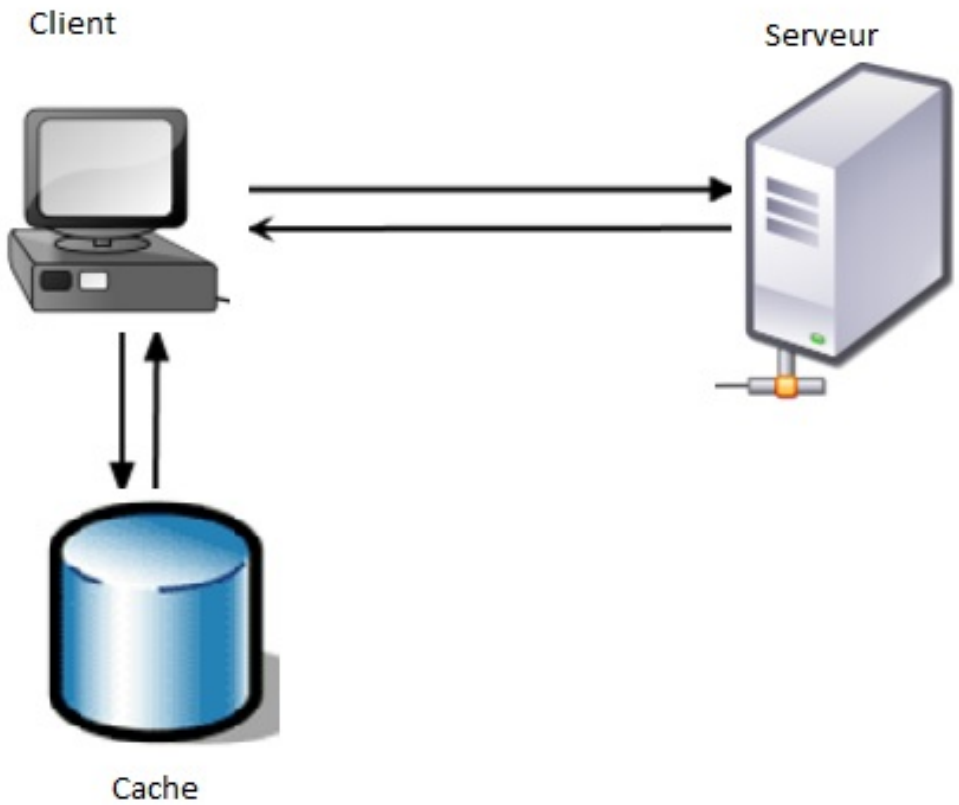
Feedback

Summary

- Production line of 3d vector tiles
- tools : iTowns, 3D Tiles, LoD, TileSet, glTF, Markdown
- Challenge, Communication
- Lack of synchronization

Visualisation : Process

- Initialisation : Global tileset
- Request : Bounding Box, LOD
- Cache



Visualisation :Response

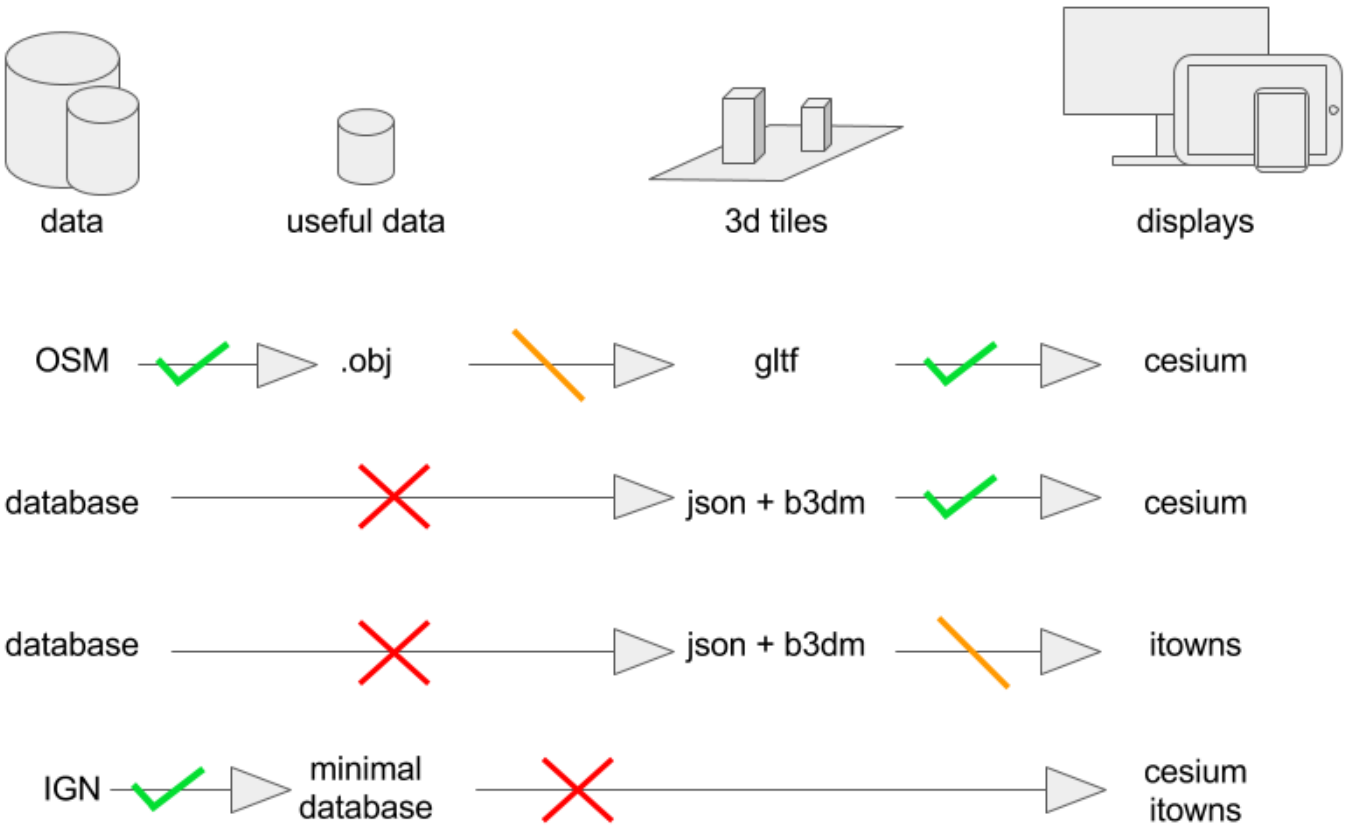
- 3d tiles format : gltf
- GLTFLoader : three.js

Personal report - Hind HAMYA

- Discovery of 3D libraries
- Discovery of an open standard XML schema : Collada
- Writing standard : Markdown

Demonstrator

Explainations



Demonstrator

Movie time

Personal report

Relationship

- Oslandia team
- IGN team

Technical skills

- 3d data mechanisms
- cesium exploration
- iTowns exploration

Team skills

- team splitting
- feedbacks

Conclusion

- Perspective
- Suggestion of a chain of production
- Creation of an interest