# Conceptualization and prototyping of an algorithm for providing geodata using the concept of vector tiling

The company INIT raised the topic for the thesis. For their customers, they want to achieve a fast solution for updating Geo-Information-System (GIS) data from Open Street Map (OSM) on their GIS-Server. The data should be pre-processed and made available throughout a web client, providing the possibility of spatial specific selection for the customer.

Enhanced GIS Data provision workflow. © INIT

At the beginning of the thesis, it seemed that the new field of vector tiles might contribute significant portions to the thesis, and even an integration seemed possible.

However, the research about vector tiles in general, available solutions, and scientific approaches showed no feasible integration of an existing format into the thesis, due to the lack of progress at the concept of feature-based vector tiles.

Three approaches were developed during the thesis for providing a possible solution. All three were developed inside the Feature Manipulation Engine (FME), which allowed a straightforward integration into the existing workflow at the company INIT. Two solutions were developed using the concept of tiling and concatenation. The third solution followed the concept of a "Central Feature" store, using PostGIS as a spatial database.
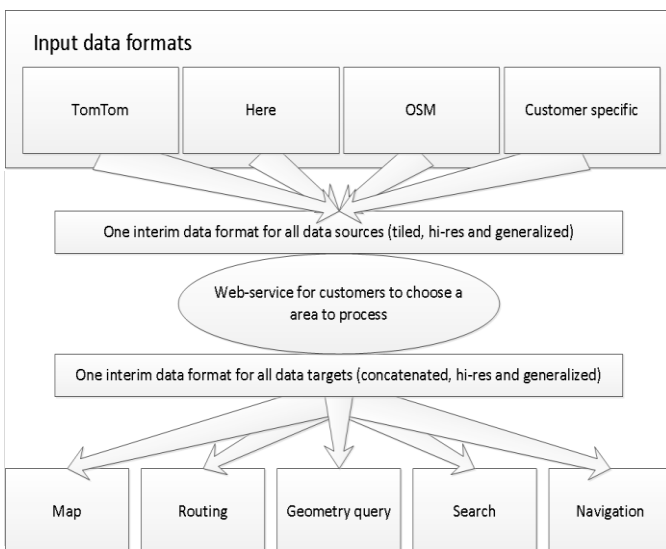
Depiction of the enhanced Init Workflow.

All solutions could be successfully implemented into the INIT Workflow and delivered satisfactory results when tested inside INITs GIS Tester. There were no significan errors detected in the map display or test routes.

This leads to the conclusion that all three solutions could be potentially implemented by INIT into their future solution of the GIS data provision.

● BW = Workflow bevor user selection | AW = Workflow after user selection

	Tiled Features	BW FME Dissolve	BW FME Edge	BW PostGIS	AW FME Dissolve	AW FME Edge	AW PostGIS	FME Dissolve Σ	FME Edge Σ	PostGIS Σ
Halle	3308	00:00:25	00:01:16	00:00:18	00:00:13	00:00:19	00:00:44	00:00:38	0:01:35	00:01:02
Luxemburg	27032	00:07:50	00:43:34	00:05:03	00:03:57	00:05:51	00:13:47	00:11:47	00:49:25	00:18:50
Syntis	65642	41:11:52	49:55:04	00:27:01	01:07:07	13:31:09	01:07:49	42:18:59	63:26:13	01:34:50

Timing Results for the three solutions developed.

University of Applied Sciences Karlsruhe
Faculty IMM · Geomatics Master
Lukas Nübel | 63889
Supervisor: Prof. Dr. Günther-Diringer
In cooperation with INIT represented by Mr. Feller