

# Redesign and optimization of the GIS triage process for construction permit evaluations

Degree programme : BSc in Computer Science | Specialisation : Digital Business Systems

Thesis advisor : Prof. Marcel Pfahrer

Expert : Dr. Joachim Wolfgang Kaltz (Camptocamp SA)

Industrial partner : Bau- und Umweltschuttdirektion BL, Liestal

The Bau- und Umweltschuttdirektion BL provides the convenience of electronic building application submissions. However, the software supporting this process has gradually become outdated and challenging to maintain. The main focus of this bachelor thesis is to redesign the GIS triage process within the software, aiming to tackle these issues and drive improvements.

## Introduction

The Bau- und Umweltschuttdirektion BL operates a system, called „eBaugesuche“, to handle construction permits electronically. An in-house development department maintains and extends this system. A key component of the system is the „GIS triage“ process. In order to identify the specific departments and institutions to be involved in the assessment of the construction permit, this process evaluates geographical information at the location of the construction project.

## Goals

The goal of the bachelor thesis is to redesign and optimize the GIS triage process and the corresponding system components. The current system's organic growth has led to significant drawbacks, including poor performance, high operating and maintenance costs, and limited extensibility. In order to address these issues, the redesign aims to integrate software components seamlessly into the existing „eBaugesuche“ system, ensuring flexibility while resolving the aforementioned problems.

## Implementation

The project followed the SCRUM methodology, incorporating some of its principles. It commenced with a concept phase aimed at assessing various options related to architecture, communication, and performance. Subsequently, the project progressed through five sprints, each dedicated to implement different aspects of the software.

The outcome of the project is a standalone .NET web service that offers seamless integration through HTTP requests. An HTTP post request with the construction application's location triggers GIS queries on the geodata warehouse. Crucial data, like proximity to monuments, is extracted and used in business rules evaluation. Based on this assessment, a specialized department may be selected to review the selection. Results are returned to the requester in JSON format.

Notably, the new service is much faster compared to its predecessor, primarily attributed to its extensive utilization of parallelization techniques. Furthermore, the enhanced service greatly facilitates maintenance and expansion efforts. Leveraging the open source “Microsoft Rules Engine”, the implementation of triage rules is now simpler, especially when compared to the previous reliance on a database trigger.

## Conclusion

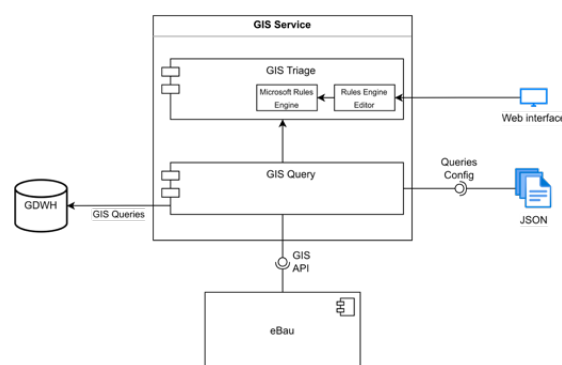
The project achieved its objective of delivering an improved GIS triage service.

The most significant challenge I encountered was effectively collaborating with my industry partner. To overcome this challenge, I implemented a strategy of weekly meetings with my partner. These meetings allowed us to discuss progress, address concerns, and work together towards the desired solution.

The next steps include integrating it into the eBaugesuche system and implementing a user-friendly web interface for rule management, empowering business users in maintaining the rules independently.



Timo David Schlatter  
timo.schlatter@hotmail.com



Service architecture