GIS Project

This page provides the context, the task, the scope of work, the deliverable requirements and the grading criteria of GIS Project. Students must review and understand them before getting started with the project.

Contents

Overview

The purpose of the GIS project is to provide students with a first hand experience on building a GIS-Enabled Urban Planning Support System by integrating open government data and other open source data sets. You will also learn how to collect, process and analyse spatially related issues using real world data. Students are encouraged to focus on research topics that are relevant to their field of study.

The project is to be done in a team. You are required to form a project team of **2-3 members** by the second week of the academic term. Each project team must start thinking about their project ideas after the first lesson. You are expected to discuss your project topic and scope of works with the instructor between week 2 to week 7 of the academic term. A project website must be prepared and will be linked to this page by the end of week 8.

Topic

In 2019, during his annual state of the union address at the parliament, President Joko Widodo announced a plan to relocate the capital to Kalimantan on the island of Borneo. As part of the plan, part of Kutai Kartanegara Regency (Kabupaten Kutai Kartanegara) and Penajam North Paser Regency (Kabupaten Penajam Utara) in East Kalimantan will be carved out to create a new province-level planned city, and the capital will be relocated to a more central location within Indonesia. The plan is part of a strategy to reduce developmental inequality between Java and other islands in the Indonesian archipelago and to reduce Jakarta's burden as Indonesia's primary hub.

Task 1: Report of Survey Indonesia New National Capital Development Plan

Assuming that you are a GIS Analyst of an international urban and regional planning consulting company and are task to build up a GIS for the proposed new capital area. The GIS will be used to prepare a report of survey to be submitted to the National Development Planning Agency (abbreviated Bappenas).

The GIS database and report of survey must include but not limited to the following themes:

- Population and Demographic
- Economic and Businesses
- Transport and Communication
- Infrastructure
- Environment and Hazard

Task 2: Site Selection

Use GIS analysis and multi-criteria evaluation method to identify site suitability for the proposed new capital city by using the criteria below:

- It should be between 4500-5500 hectares in size
- It should avoid steep slope. Steep slope developments are relative more costly because they involve cut-and-fill and is less environmental friendly.
- It should be away from potential natural disaster risk areas such as sea coasts, major rivers and volcanoes.
- It should be near to current urban settlement areas but not at the current major settlement areas.
- It should avoid natural forest as much as possible.

- It should avoid areas prone to forest fire.
- It should be highly accessible via road transport.
- It should be near to airport(s) and seaport(s).

The Study Area

The GIS should cover all sub-districts and district of Kota Balipapan, Kota Samarinda, and selected kecamatan (districts) and sub-districts of North Penajam Paser and Kutai Kartanegara Regencies.

- Kutai Kartanegara : Anggana, Loa Janan, Loa Kulu, Marang Kayu, Muara Jawa, Samboja, Sanga Sanga, Sebulu Tenaggarong, Tenggarong Seberang and **Muara Badak**.
- North Penajam Paser (Penajam Paser Utara) Regency: Babulu, Penajam, Sepaku and Waru.

The Data

For the purpose of this project, the following data sources are recommended but students are welcome to include other appropriate data.

- Batas Desa & Data Kependudukan Tahun 2019 Seluruh Indonesia. This data set provides comprehensive population data at the sub-district level. In Indonesia local language, they are known as **kota** (i.e. urban sub-district) and **desa** (i.e. rural sub-district). You are required to download data set for Provinsi Kalimantan Timur (i.e. East Kalimantan Province).
- Rupa Bumi Iindonesia (RBI) Provinsi Kalimantan Timur Perwilayah (Kabupaten/Kota). The term rupabumi means topographic. This data repository provides a coprehensive collection of topographical data layers of East Kalimantan. You are required to download data of Kota Balikpapan, Kota Samarinda, Penajam Paser Utara and Kutai Kartanegara.
- DEM SRTM 30m, digital elevation model at 30m resolution.
- Geological data layer.
- Forest fire hot spot data. This repository provides several years of forest hot spots data.
- Buildings and Settlements.

Scope of Work

The project will comprise of, but not limited to the followings steps:

- Selection of project area, this year the project area is provided.
- Data collection, extraction, integration, transformation and wrangling.
- Designing and building GIS model and database

- Preparing report of survey
- Performing site suitability analysis by integrating GIS and multi-criteria evaluation methods.
- Preparing site suitability analysis report including detail discussion of the analysing method used.
- Preparing poster and project webpage.

Project Milestone

- Formulation of project team: by week 2 before lesson
- Assemble GIS data: from week 7 onward
- Create project website : by week 8
- Update project webpage and interim project discussion with instructor: week 10
- Submission of project poster: by the end of Week 13.
- Submission of project artifacts and update project webpage: 15th November 2021 at 11.59pm (mid-night)

Grading

The GIS project will account for 30% of your final grade in the course. The distribution of marks for each stage of the project are as follows:

- Project website 15%
- Project poster 15%
- Project report 30%
- Project artifact 40%

The course instructor will consider strongly the novelty of the idea (If it has never been done before, you will get lots of credit!), how it addresses the problem at hand, the methodology you employ in doing the research, and your technical skill in implementing the idea.

In small group projects, each person will be graded individually. A good group project is a system consisting of a collection of well defined subsystems. Each subsystem should be the responsibility of one person and be clearly identified as their project. A good criteria for whether you should work in a group is whether the system as a whole is greater than the sum of its parts!

Townhall Poster Presentation

Due to COVID-19, there will be no Townhall presentation this term.

Deliverables

Project Website

PROJECT GITHUB

At the beginning of the project, project teams are required to create a project Github. The project Github should include all the materials used to develop the project and the written materials such as proposal, poster and project report. It must be used to maintain a complete project versioning including the application and project documents. The Github link must be included in the project webpage. By the end of the project, the project team must pack the final version of the Github repository and upload onto eLearn for final submission. The Github link also must be provided on eLearn.

PROJECT WEBSITE

Each project team are required to create the project website by using either blogdown or distill for RMarkdown. It will be disseminated by using web service such as Netfity.

- The title of your project,
- A short description of not more than 350 word summarising the motivation, objectives, main features of the application your team are going to build, and
- The project proposal.
  - Motivation of the project
  - Project objective
  - Data
  - Scope of work
  - Project schedule including a Gannt chart

Poster

The poster should provide an overview of your project. It should include, but not limited to the following information:

- Issues and problems - A clear statement of the issues or/and problems that your project addresses.

issues and problems - A clear statement of the issues and/or problems that your project addresses.

- Motivation - An explanation of why the issues and/or problems are interesting and what make them difficult to solve.
- Approach - A description of the GIS analysis and other urban analysis techniques you used to solve the problem.
- Results - Screenshots and a working demo of the system you built.
- Future Work - An explanation of how the work could be extended.

The dimensions for the poster must conform to the International Standards Organization (ISO) poster size format (A1).

- Size = ISO A1 (594 × 841mm or 23.39 × 33.11inci)
- Resolution = 300dpi or above
- File format = jpeg or pdf

Please ensure that the poster is in high resolution.

Project teams are required to use posterdown to design your poster.

The poster will be considered as a final deliverable. So don't forget to apply good visual design principles to both your poster and project report.

Note: The course instructor will be responsible for printing your poster. You are required to upload your posters to the project webpage of your project one week and your project Dropbox before the poster presentation.

Below are sample posters for your reference:

- Hut of North
- What's Best for Jurong West

Final Deliverable

The final deliverable will include:

- Fully updated project webpage
- Project Poster on project webpage
- Project Report on project webpage
- Project artifact, the complete GIS project folder including but not limited to raw data, process data, QGIS project file, and output maps.

PROJECT REPORT

The project report should focus on but not limited to the followings:

- A detail discussion of the GIS analysis process and functions used.
- A comprehensive discussion of the analysis results.
- A collection of analytical maps (can be statics or interactive web maps)

SUBMISSION INSTRUCTION

The project artefact is due (submitted to LMS Dropbox) by the end of the day on 15th November 2021 at 11.59pm (mid-night).

Sample Projects

Note that the following examples are for references purposes. You are urged to use your own creativity and innovation to design the application.

- AY2019-2020 Term 1 Project
  - G1-Group3 Innogol
  - G2-Group15 Nothing is 台南

Q&A

Q1: What is the national projection system of Indonesia?

> *Prof: The projected coordinate system of Indonesia should be DGN95 / Indonesia TM-3 zone 54.1*

Q2: Is my understanding of the geography of East Kalimantan below correct? Provinsi (East Kalimantan) > Samarinda and Balikpapan Regency/City (kota) > Kutai Kartanegara and North Penajam Paser District (kecamatan) > Sub-District (desa).

> *Prof: Please refer to this link*

Q3: Are we supposed to analyse the kecamatan and desa within the Samarinda and Balikpapan kota?

> *Prof: No, the analysis should be at Kelurahan level both the urban sub-dictrict (i.e kota) and rural villages (i.e. desa)*

Q4: Would you prefer if we translate the information in the CSV file to English or leave it in Bahasa?

> *Prof: Ideally, the field name and classes should be in English if possible.*

Hard Work

- Group 1
- Group 2
- Group 3
- Group 4
- Group 5
- Group 6
- Group 7
- Group 8
- Group 9
- Group 10
- Group 11
- Group 12
- Group 13
- Group 14