

CURTIN UNIVERSITY OF TECHNOLOGY
Department of Spatial Sciences

Project Application Form
(Spatial Sciences Project 430/530/630 or Honours Dissertation 400/450)

Please fill out this form by completing the following:

1. *Student Name:* Aiden Price
 2. *Student ID:* 17898661
 3. *Semester and year of enrolment:* Semester 2, 2015
 4. *Date submitted:* 14/8/2015
 5. *Title of proposed project:* Evaluating the Suitability of Spatial Data Infrastructures To Mobile Applications
 6. *Supervisor name (with his/her consent):* Dr David McMeekin
 7. *What Department facilities are required (if any)?* None.
 8. *Will this project require a monetary cost (if so, itemise and give estimate)?* No, \$0.00
 9. Please attach a proposal (maximum of two (2) pages) with the following outline:
 - a. Project title
 - b. Overview of project
 - c. Aims/objectives
 - d. Proposed tasks **and planned due/completion dates** (eg. include important due dates of deliverables)
 - e. References (at least 2 or 3)
 10. Please submit this project application online via the Spatial Sciences Project Blackboard web site by the due date: Tuesday 11th March 5pm (Perth time).
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AIDEN PRICE – 17898661

SPATIAL SCIENCES RESEARCH PROJECT PROPOSAL

EVALUATING THE SUITABILITY OF SPATIAL DATA INFRASTRUCTURES TO MOBILE APPLICATIONS

OVERVIEW OF PROJECT

This project intends to evaluate the suitability of Landgate's SLIP's Application Programming Interfaces (APIs) for mobile users. Variants of a generic mobile mapping application (app) will connect with a single API each. Differences in user experience and data quality between apps will form the basis of the assessment.

An Application Programming Interface is a protocol allowing an external application to make requests of a program. In our context SLIP offers several APIs which a third party app may query to return map data. The Open Geospatial Consortium interoperability standards, WMS, WMTS, WFS, are APIs for our purposes. SLIP's deprecated Google Maps Engine (GME) endpoints are also APIs.

In January 2015 Google deprecated Google Maps Engine and forewarned of its eventual closure by 26/1/2016 ("Overview - Google Maps Engine API (Deprecated)," 2015). Landgate built the SLIP Future spatial data portal around GME's API. They are thereby forced to choose a new provider. The July 2015 newsletter announced that they will substitute an ESRI RESTful service ("SLIP Stream," 2015). The new API should be implemented by the end of 2015 with GME running in parallel until Google finally closes it.

The researcher has experience in developing mobile applications for iOS devices and is familiar with the latest development approaches. Developing an app for an important organisation would add a significant highlight to the researcher's resume.

Dr David McMeekin has kindly assented to supervise this research project.

AIMS / OBJECTIVES

A period of rapid change is an excellent opportunity to tackle new challenges. This applied science project is squarely aimed at helping Landgate improve the SLIP service.

Many spatial data interoperability protocols have desktop GIS use in mind. Mobile users have different expectations when compared to desktop users. Mobile users set out to achieve different tasks, such as browsing or address search, and expect results in less time. The computing environment is also dissimilar, there being less processing power and variable internet speed.

The literature review will focus on best practice evaluation methods. The prime focus will be on those designed around web service evaluation or mobile experience assessment. Standard mobile application usability methods are only tangentially useful in this study. The first stages will search for a pre-existing assessment methodology concentrated on map data APIs. If none are available then a critical review of related assessment methods and their applications will permit the creation of a customised methodology for this task.

The next step involves designing a generic iOS mapping app. It does not need complex code or masterful design. The app and its code need not be obsessively optimised, so long as the display and interactivity does

not favour a given API over any others. The ideal version will feature a code structure that enables easy interchange of data sources. Indeed it is hoped that many component pieces of code will be available under open source licences. Using the generic apps as a basis, several variants will be contrived. Each variant will connect with a different API endpoint to retrieve data from SLIP.

An assessment of an API and the data storage and transmission infrastructure focusses on the data received at the point of use and factors concerning such. Using a set of standardised queries the apps may test for;

- Speed of data query, transmission and display over a range of extents
- Completeness and correctness of received data
- Connection stability and reliability
- Successful completion of common mobile mapping tasks such as browsing, geolocation and geocoding
- Human readable error messages

Mobile applications consume data in a variety of contexts and environments unlikely to be considerations for desktop applications. The following are common variables in mobile use;

- Mobile operating software; iOS and Android
- Mobile devices of differing size and usage; tablets and phones
- Mobile devices of varying computational power and age
- Variable internet connection speed and reliability

The evaluation will combine these factors. For example testing data quality and speed of interaction on a variety of devices in a variety of internet connectivity situations.

The assessment outcomes will point to recommendations for improvements. If Landgate can better accommodate mobile users now they will effectively future-proof their data portal. If action must be taken to improve mobile device access then now is an ideal time to implement that change. We can reduce the likelihood of or delay another critical transition in the future, thus minimising pain arising from organisational change.

PROPOSED TASKS

The researcher studies part time around work and family commitments. All tasks must be complete by June 2016. Meetings with the supervisor need only be held once per fortnight. Further, there will be an interruption in meetings over the festive season, to be resumed in January 2016.

The literature review will take around seven weeks of part time work. All papers will be discovered online through the Curtin Library and proxy server. A draft will be ready for review by the supervisor by 5/10/2015.

The assessment plan should take into account feedback on the literature review and, hopefully, the views of Landgate data users (to be identified in the literature review). A feasible and thorough methodology will take a week to design and should be delivered on 12/10/2015.

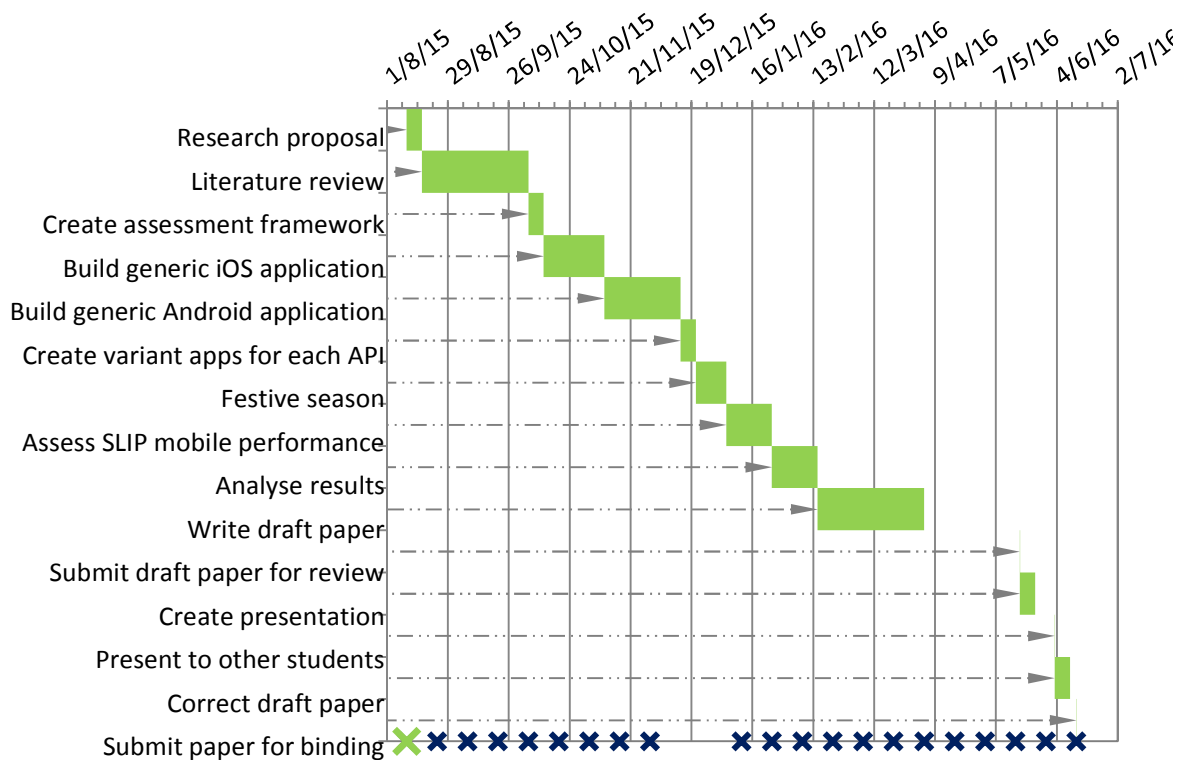


CHART 1 RESEARCH PROJECT GANTT CHART, BLUE CROSSES SHOW PLANNED SUPERVISOR MEETINGS, GREEN CROSSES COMPLETED MEETINGS.

The app development stage is duplicated for the creation of generic iOS and Android apps (note that the Android app will take much longer as it requires first learning how to develop Android apps). A shorter time is allowed for creating API specific app variants. The schedule allows for two and a half months to create and debug all apps. All should be delivered by 21/12/2015.

There will be a break for the festive season. Work should resume at the beginning of January.

The actual assessment will take three weeks with a further three weeks dedicated to analysing results. It is anticipated that this stage will be complete by 15/2/2016. It would be best if the assessment were complete before the GME shut down date as it will allow testing of yet more APIs. If the work is delayed and assessment cannot begin before then the methodology and results are still valid.

The final stages involve the preparation of a draft report, due before 18/5/2016, and presentation slides, due before 3/6/2016. After putting into effect the supervisor's thoughtful feedback the final version of the paper will be ready for binding by 13/6/2016.

REFERENCES

Overview - Google Maps Engine API (Deprecated). (2015, February 18). Overview - Google Maps Engine API (Deprecated). Retrieved April 15, 2015, from <https://developers.google.com/maps-engine/>

SLIP Stream. (2015, July). SLIP Stream. Retrieved August 12, 2015, from <http://slip.landgate.wa.gov.au/SiteAssets/Pages/SLIPStream/SLIPStream%20July%202015.pdf>