Development of a web-based interactive mobile map application for the Cranfield University campus
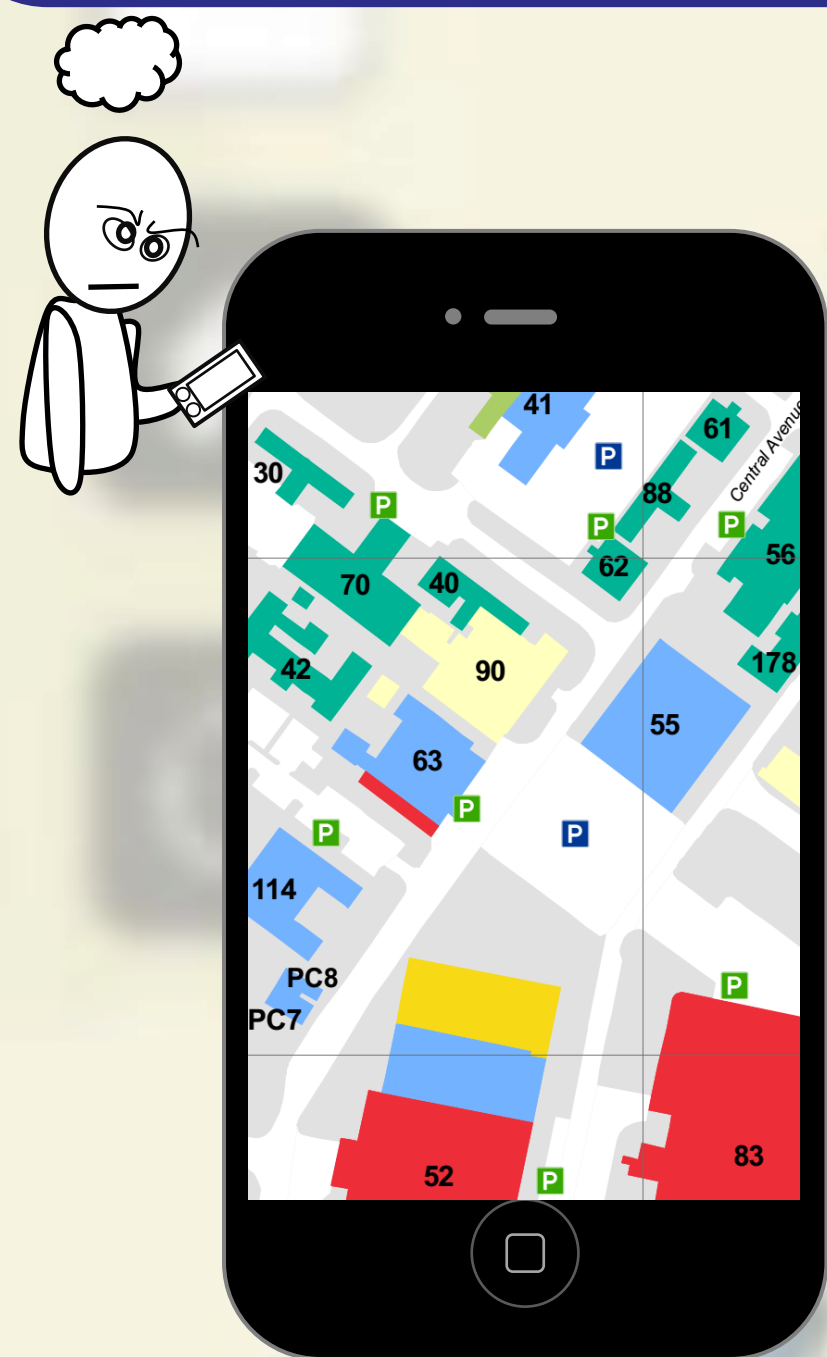
Cranfield UNIVERSITY

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Supervisor: Dr. Stephen Hallett
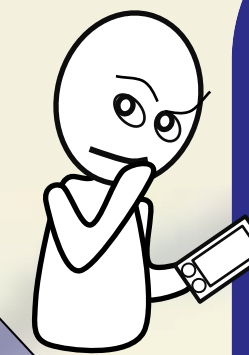Subject advisor: Jason Carvalho

Introduction

Cranfield University are developing an interactive application for mobile devices as part of their online services for visitors, students and members of staff. The application is based on web technologies so that it can be accessible by anyone through the means of a web browser which every modern mobile device is equipped with. This project is associated with the mapping module of this mobile application and its aim was to improve navigation through the University's campus by the means of a customised interactive map and geolocation service.
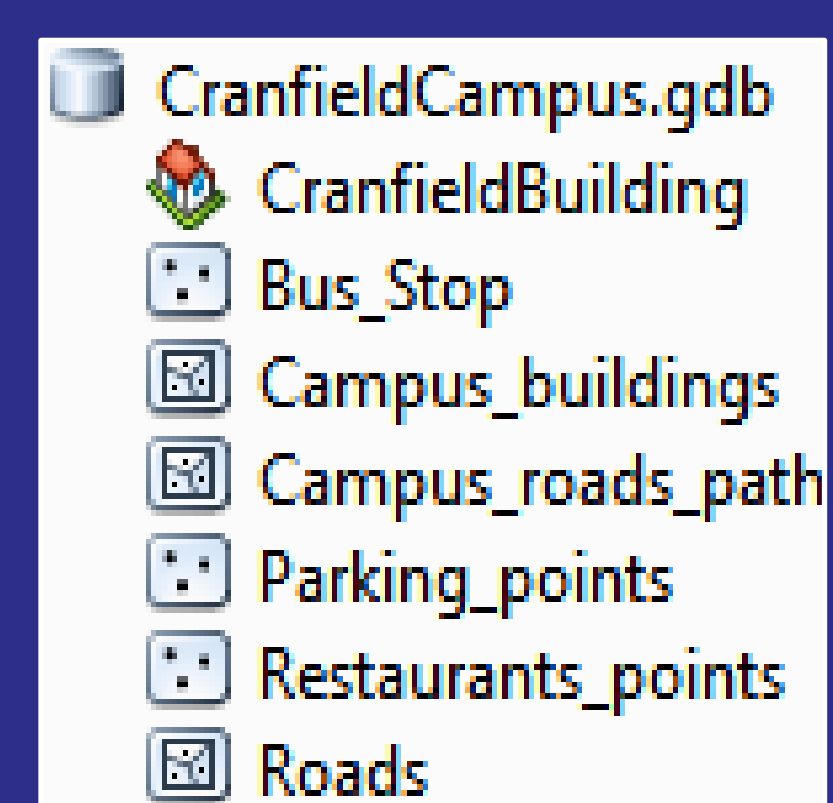
Objectives

The specific objectives of the project were to:

- Investigate the views and needs of the main stakeholders
- Explore all available ways of implementation
- Provide reliable map and geolocation services
- Ensure unhindered access to services
- Integrate the map application seamlessly in a mobile web services framework.

Methodology

CranfieldCampus.gdb
- CranfieldBuilding
- Bus_Stop
- Campus_buildings
- Campus_roads_path
- Parking_points
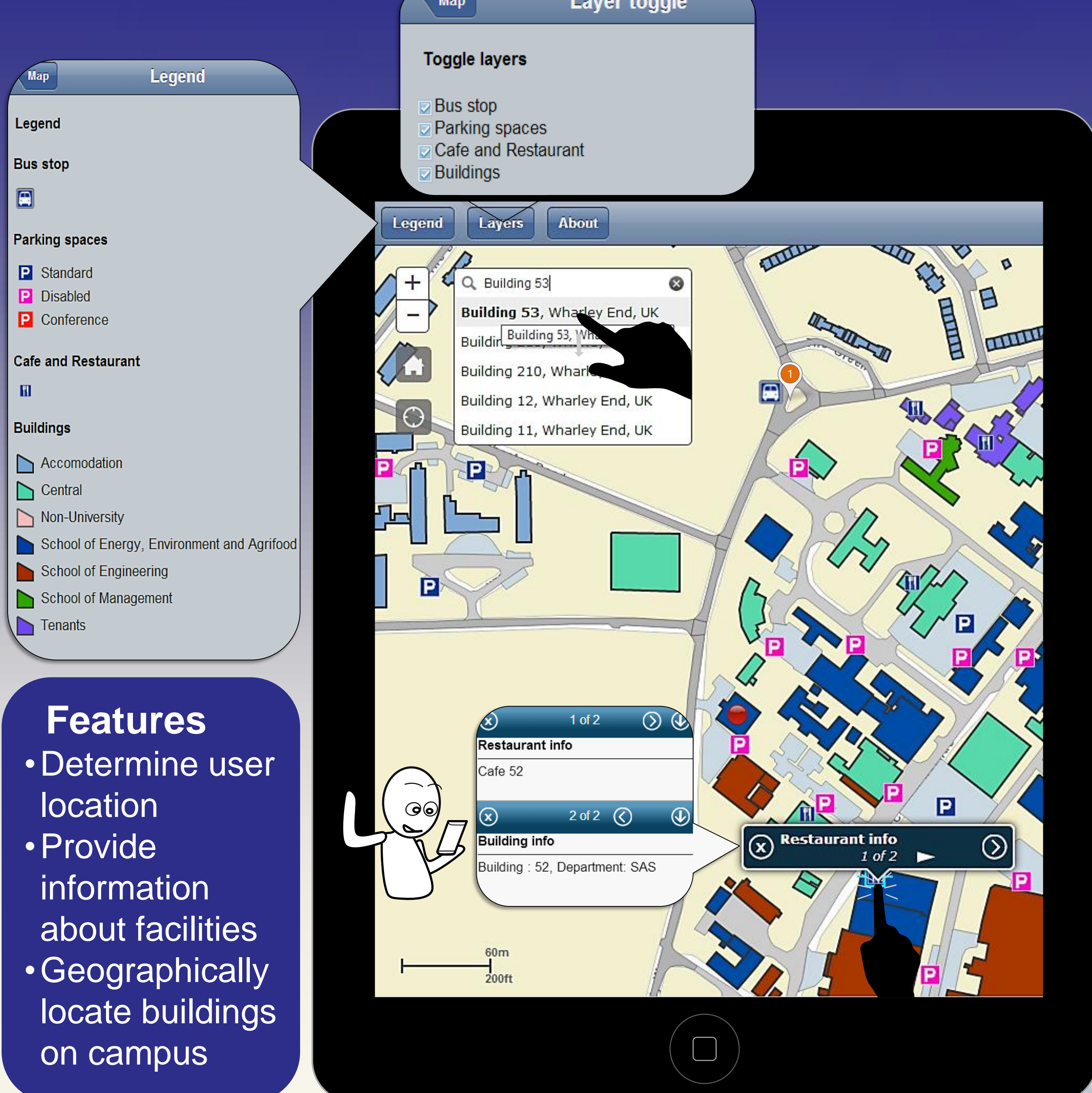- Restaurants_points
- Roads

Functionality

- Data procurement, collation and structuring into geodatabase
- Map compilation and styling using appropriate symbology
- Custom geocoder development to locate facility coordinates by place or building name

Integration

- Publishing of map and geocoding services on University's map server
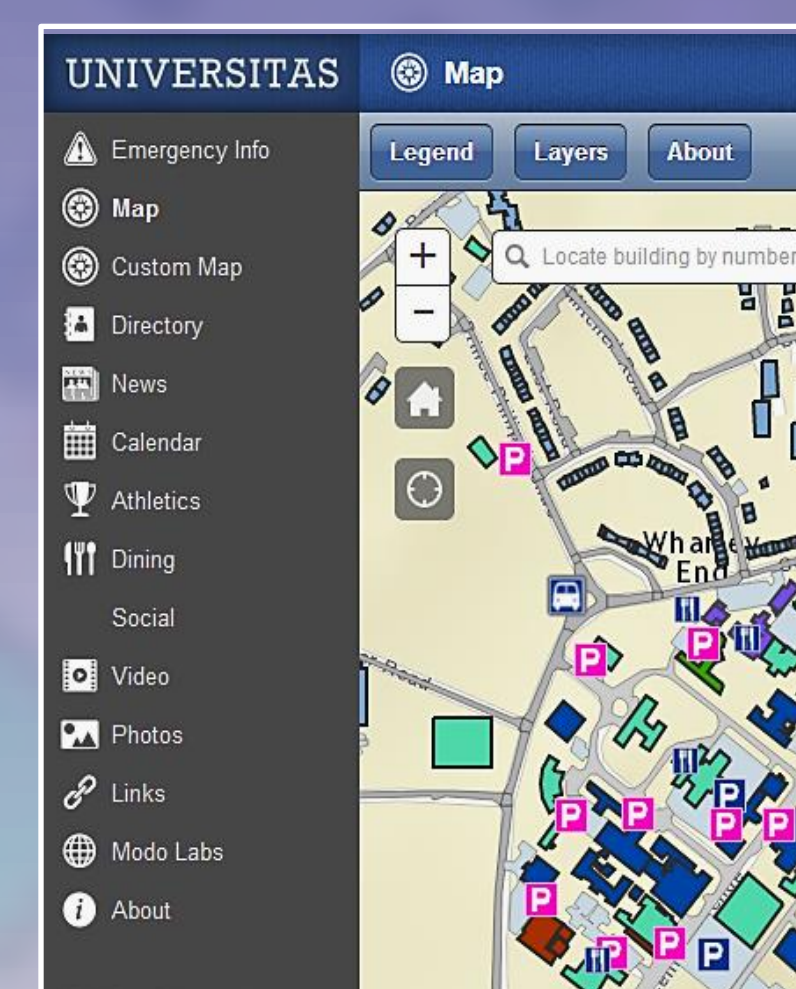- Development of web GIS application using ESRI's API for JavaScript and Kurogo

```
geocoder = new Geocoder({
  map: map,
  arcgisGeocoder: false, // this option disables
  geocoders: myGeocoders,
  autoComplete: true, // this property value enab
  autoNavigate: false, // this has been set to ''
  showResults: true, // this option makes matchir
  maxLocations: 20
},"search");
geocoder.startup();
// the following is a customised way to navigate
geocoder.on("select", function(results) {
if (results.result)
var pt = results.result.feature.geometry;
if (!graphic) {
  var symbol = new esri.symbol.PictureMarkerSymbo
  graphic = new esri.Graphic(pt, symbol);
  map.graphics.add(graphic);
}
else { //move the graphic if it already exists
  graphic.setGeometry(pt);
}
map.centerAndZoom(results.result.feature.geometry
});

var home = new HomeButton({
```

User experience
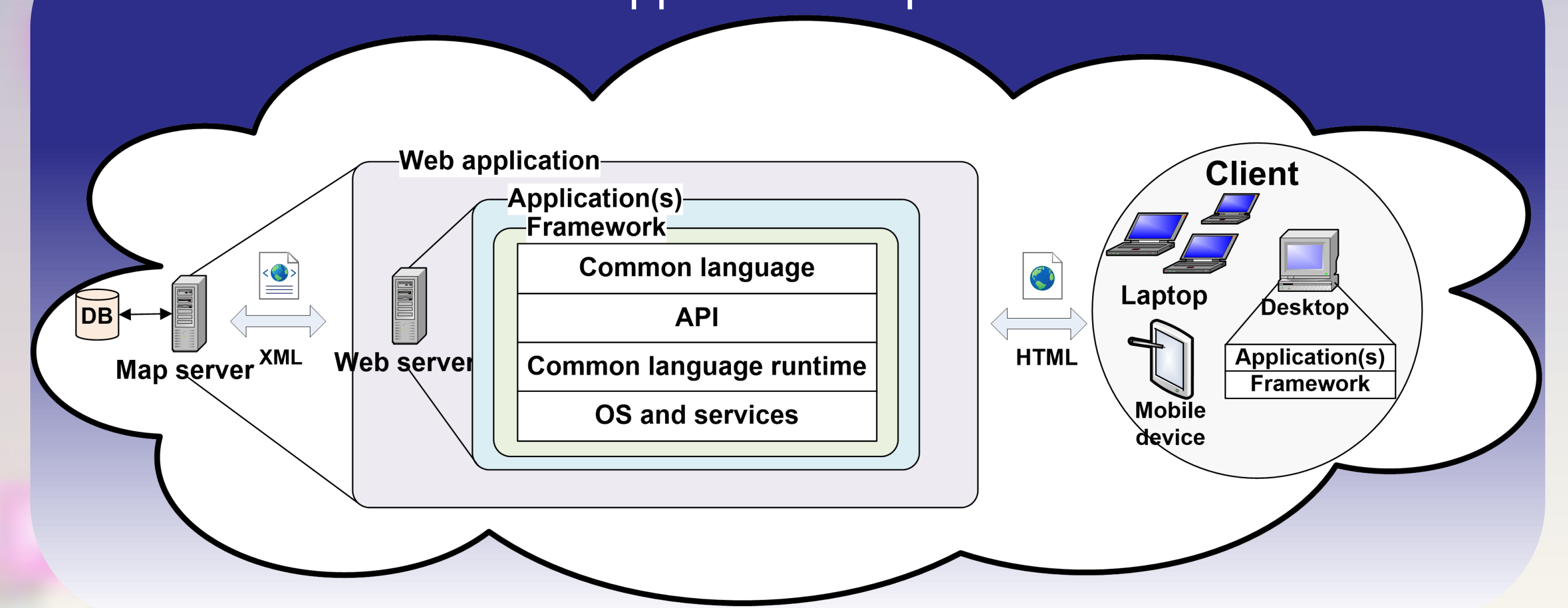
- Requirements survey of key representative stakeholder groups
- Development of the application's user interface using HTML and the Dojo API for JavaScript
- Seamless integration of the custom application module within the existing Kurogo framework

Web GIS application implementation

Results

Layer toggle

Toggle layers
- Bus stop
- Parking spaces
- Cafe and Restaurant
- Buildings

Legend

Legend

Bus stop

Parking spaces
- Standard
- Disabled
- Conference

Cafe and Restaurant

Buildings
- Accomodation
- Central
- Non-University
- School of Energy, Environment and Agrifood
- School of Engineering
- School of Management
- Tenants

Features

- Determine user location
- Provide information about facilities
- Geographically locate buildings on campus

Conclusions

This pilot application satisfies the need for navigational assistance and serves as a start for a novel, powerful tool of great utility for users of the Cranfield University campus. As a virtual representation of the campus, it offers a very promising and highly adaptive online service, being an extension of the university itself. The application is highly extensible and can incorporate future content and features, such as customised routing and asset management services. It can also serve as a complimentary tool to enhance existing services, such as providing the accommodation services with mapped three-dimensional building models with extended directions inside campus facilities, power distribution and room usage plans, or even hosting speculative projections of future building plans for campus expansion purposes.

http://www.cranfield.ac.uk/courses/masters/geographical-information-management.html

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