

New Zealand Property Mapping: Capital Asset evaluation on the Web

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SUMMARY

Working closely with a large, New Zealand based capital asset evaluation firm, we have developed a one stop solution for utilizing complex property information. This application uses numerous cutting edge web development tools to revolutionize the way they manage their data. In addition, several complex resources within the Esri development framework allow for powerful GIS analysis. By combining several aspects of the ArcGIS API for JavaScript with modern web design components, we are bringing the power of GIS to the user's browser. We also utilize a variety of geoprocessing tasks and hosted feature services to allow access to SDE datasets customized for property asset management.

In short this application is a focal point for the power of data access. Navigating through the interactive map, the user can quickly display complex property information with the click of a mouse. A variety of related tables and unique form designs provide very detailed records in a clean and efficient manner. Users can see specific rates for land value categories, break down detailed aspects of infrastructure, or record assets associated with equipment found on the property. Precise details of asset values can be added and removed as needed, allowing true representation of a property's overall value.

After designing the GIS infrastructure, we took this application one step further by demonstrating the power of ArcGIS on the web. Careful consideration went into the design and interface of the site, systematically displaying a large variety of supporting GIS utilities. Data access and layer transitions are combined with all kinds of useful tools, including query forms, custom widgets, photo attachments, and printing functionality. All in all it was an exciting product to create, combining robust GIS analysis with a smooth modern web interface.

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1. INTRODUCTION

The project aim was to provide Crighton Anderson Property & Infrastructure Ltd (CAPI) with a property mapping website that would revolutionise their daily workflow. The focus was on the data CAPI used and how to incorporate spatial components into their data structure.

The abundance of real estate websites that now utilize interactive mapping demonstrates the relevancy of location based information within the industry. In this case, we made the map the focal point of their core business structure. Detailed property assets, sales, evaluations, and value calculations all start with a map of New Zealand. In essence this brought power and structure to all the work being conducted by the team. For the first time, all property evaluations, sales, and reporting conducted by each valuer could now be shared through an interactive map.

The web application was built using the latest power tools within the Esri framework. On the back end we developed an ArcSDE database and feature services using ArcGIS Server to organise and access spatially enabled data. The front end was designed using the ArcGIS JavaScript API and modern web styling components. These solutions resulted in a robust and reliable application with a focus on intuitive user interaction.

2. THE BENEFITS

2.1 Making data available

CAPI's goal is to provide evaluation and advisory services. This application allows members of the organization to share their data with one another. With a few clicks any member of the team can isolate other properties based on location, purchase dates, total hectares, property types, and more. If an associate is evaluating assets for a nearby dairy, he can now search for all other dairies within the last six months that are in the same territorial authority and worth roughly the same price. Without the complex query tools and spatial relationships created in this application, these types of analysis would not have been possible.

2.2 Points of interest

The application offers true flexibility of data collection, where minor field notes are stored side by side with detailed reports on specific property sales and analysis. Much of this flexibility was achieved using a tool called info points. While in the field or at the office, users can add points to

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the map and quickly include specific comments and supporting data. Since all the information is shared live via the web application, notes can be instantly passed between the team. Whether it's observations from the field, evaluation information that is not tied to the cadastral framework, or anything else that might be useful, the CAPI web application has a way to store it.

2.3 File storage integration

Shared file applications such as Dropbox and OwnCloud are common tools in many modern organizations. By storing documents on the cloud, teams can now have a secure and reliable source for electronic files that can be shared amongst the team. This application has taken the organization's existing cloud storage infrastructure and integrated it into the map. As users select properties from the map, they have instant access to all files that are associated with that location. They can also add new files straight from the application as needed. This feature was key to allow the application to become the core of their data management. All file types such as pictures from the field, historical documents, emails, and more can be instantly tied in with the interactive map.

2.4 Spatial Analysis

When new properties or events associated with those properties are added to the application, the interface will transition to specific input forms where all necessary details can be included. Unlike the spreadsheets that were filled out in the past, this application does a lot of the work automatically. All areas are calculated by analyzing the collection of cadastral features that make up a property. Location details such as locality and territorial authority are pulled straight from the cadastral framework and added to each report.

2.5 Dynamic controls

After many collaborative meetings with CAPI, we learned that valuating property requires large amounts of fine tuning to get all the data to match up. This resulted in input mechanisms that took a lot of thought. The forms were organized into categories where the user could breakdown exactly what a property's value might be. Every possible value was accounted for: field equipment, all types of structures, breakdown of land classes, irrigation information, chattels, and more. Each category has its own table and each cell within the table can be updated at any time. With each change, the whole process is re-analyzed. In the end you have layers of supporting calculations regarding the average value per hectare of each asset and land class – all of which is dynamically updated with any slight change from the user.

3. CONCLUSION

This website is unique. That becomes clear after just a few minutes. It is a blend between a true GIS and the power of modern web design. As with many web technologies, it attempts to make life easier for the attended audience- recognizing key areas where the computer can do the work for

you. It removes a complex combination of spreadsheets, emails, and web resources from the equation, and allows the company to focus their attention back to one resource.

This is a site designed by a local New Zealand company for a local client, where collaborative discussions and real world testing resulted in a well-designed product. It utilizes highly complex tools associated with the Esri enterprise framework, but allowed CAPI to keep their focus on their core business needs.

REFERENCES

ArcGIS API for JavaScript [ONLINE] Available at: <https://developers.arcgis.com/javascript/>.

BIOGRAPHICAL NOTES

Geoff is a senior consultant at Christchurch-based Interpret Geospatial Solutions. He studied at Willamette University in Salem, Oregon where he graduated with a Bachelors in Environmental Science. He has been a GIS professional for over seven years working in New Zealand and the United States. He currently focuses on GIS development for desktop and web applications.

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