

Fulton Hogan Mobile Application: Mobilising a Remote Workforce

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SUMMARY

There is a growing demand by industries who use spatial data, to have mapping applications available for portable devices. This pressure has resulted in Esri developing different ready to use applications (apps) such as Collector for ArcGIS or Web AppBuilder for ArcGIS, which can be used outside the office. These apps are very powerful and allow light customization by editing a small amount of code and thus customizing the app to the client's needs.

However, when the client has more complicated needs, these predefined apps cannot always fulfill the client's requirements. This was the case for Fulton Hogan, a New Zealand company specializing in building and maintaining transport and civil infrastructure.

Fulton Hogan regularly work in remote areas, which results in offline environment. Therefore their main requirement is the ability to use mapping functions including editing features, viewing location and using basemaps on their touch screen devices in disconnected environment. Previously Fulton Hogan used a complicated workflow which included using multiple applications to achieve the required result (marking the faults in the utilities network). This workflow included using ArcReader for the mapping component which is not designed for use with touch screens.

In October 2014, ArcGIS Runtime SDK for .Net was released which allowed development of an application that can be used in an offline environment, has all required mapping capabilities and is touch screen friendly. This development tool was created by using #C programming language in the .Net framework. Fulton Hogan were now able to access all the functionality they required regardless of connection by using just one app with touch screens gestures for the entire workflow. Just by tapping the button in the app the end users are able to add and edit new features, find their current location or export the map to pdf. Once the end users are back in the office they have the ability to share changes (edits) with their clients through an ArcGIS Feature Service.

This new application is incomparably faster, has a user-friendly interface and provides a simple workflow for the end user. Implementing this new approach has also made the processing of field data more efficient.

Through the ArcGIS Runtime mapping application, Fulton Hogan has a powerful mapping tool that can be adjusted to keep pace with their evolving needs.

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1. INTRODUCTION

The project aim was to provide Fulton Hogan with a smart mapping solution to assist with maintaining water utilities which allows them to move from an inefficient process to a smart workflow and share data back to their council clients easily.

The complex process which Fulton Hogan had been following involved three different software packages which took time and lead to inaccuracies and frustrations. The existing GIS tool was not user friendly and difficult to use in the field. To resolve the situation we recommended building a lightweight, stand-alone app specifically designed for touch screen mobile devices which would allow Fulton Hogan to do all the required tasks in the field..

The application was developed on the ArcGIS Runtime for .NET SDK for desktop. Using this SDK allowed us to develop a solution that was capable to work in disconnected environment. Using an enterprise geodatabase and feature services in this new workflow has enabled data sharing between Fulton Hogan and district councils without the need to use other software

2. THE BENEFITS

2.1 Cost savings resulting from greater efficiency

The reduction in time has been the biggest efficiency gained from introducing the new workflow. The use of the feature service for data sharing between Fulton Hogan and district councils has saved time on both sides with the live database updates now faster and more efficient. When using the mobile app in the field, the touch screen friendly application significantly reduces time spent on a job. The location of faults recorded on site is more accurate and there's also a lower chance of errors caused by typing coordinates manually. The app also has the added functionality to generate images for reports with a single touch.

2.2 Better decision making

The mobile app allows the workforce in the field to access easily the most up to date data whilst in the field including high resolution imagery. The functionality of the application allows the teams to search for exact location by either using geocoding or by accessing the device's GPS. The identify function allows them to easily view the assets attributes. These two functions help the staff to make better and faster decision in terms of maintaining and fixing the reported faults (e.g. they can correctly decide which valve they need to turn off).

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2.3 Improved communication

The outcome of the previous workflow was jpg files with the screenshot of the location and red marking drawn in the Microsoft paint. These images were then sent by email to the district councils and also were used to create the reports. This caused frustration on both ends.

Communication between the Fulton Hogan and the district councils is based on a live database simply synchronised with a single button. This approach reduces the possible mistakes and also the end users are excited about using less complicated workflow.

2.4 Better geographic information record keeping

In the new workflow the recorded faults are saved as new features to local runtime geodatabase. This local database comes from enterprise geodatabase published to the feature service with the sync enabled. The same feature services are also used for the web viewer which was set to allow easy downloading the field data. Thanks to maintaining the data inside the multi users' database, everyone has access to the most up to date data.

2.5 Managing geographically

An ArcGIS Server was installed at Fulton Hogan to make this project as beneficial and efficient as possible. Fulton Hogan is a company dealing with lots of spatial data and through the development of this solution the management team has a better understanding of the potential to use smart GIS to maintain the data and also to create different mobile applications and are considering options to host their own web services.

3. CONCLUSION

This new application is incomparably faster, has a user-friendly interface and provides a simple workflow for the end user. Implementing this new approach has also made the processing of field data more efficient.

Through the ArcGIS Runtime mapping application, Fulton Hogan has a powerful mapping tool that can be adjusted to keep pace with their evolving needs.

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BIOGRAPHICAL NOTES

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Jana is a consultant at Christchurch-based Interpret Geospatial Solutions. She studied at the University of Ostrava in the Czech Republic, where she graduated with a Master of Science in Physical Geography. Her main focus is developing ArcGIS Runtime for .Net applications.

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