Northumbrian Water: DMA Explorer

The Challenge

Northumbrian Water came to us with the aim of improving their prediction capabilities for forecasting potential pipe burst points. The original process involved engineers surveying large areas which was often very time-consuming, and in some cases inefficient. Their previous tool to find leaks in pipes could have left customers with a longer wait for water. The main aim in this project was to best-equip engineers by providing them with an 'Optimised DMA pack', containing the right information at the right time. Emphasis was put on creating a quick and easy automation process which collated live, up-to-date data on hydrant and valve locations, along with previous pipe burst points.

The Project

Our end goal was to create a user friendly Shiny app to map the information we had for each DMA, an assigned area. Shiny is an open source R package that provides a framework for building web applications. We created a clear user interface for parameter entry, allowing an engineer to visualise the features mentioned above, within a selected DMA. Shape files containing geolocation data were used to map the outline of pipes (along with locations of valves and hydrants) onto a map of the UK. We acquired user studies and used agile methodology throughout the app development stage, to ensure we were meeting the engineers' needs. The database automatically updates every morning to ensure LT's have access to the most up-to-date data.

Our Results

The end product of this project was a Shiny dashboard used to visualise DMA data, region by region. The current app is being used to enhance the 'DMA pack' accessible to LT's going to survey a particular DMA. In addition to the mapping tool, we have processed information in regards to bursts, valve locations and soil types into interactive tabular data previews. We also assisted Northumbrian Water in deploying the application onto their internal server, to provide them with an easy to manage platform for maintaining and running the application. Northumbrian Water are using the app on a daily basis, which further emphasises the purpose of the automated database update feature.

Improved prediction capabilities

Spatial mapping with R

Automatic updates

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