



**first:utility**

Developing an energy usage portal application to help achieve a greener future.

# Developing an energy usage portal application to help achieve a greener future.

The environment and the negative effects of our energy consumption is a key focus of many energy providers at present.

First:Utility wanted to help reduce our carbon footprint by educating customers about their electricity usage, to provide them with greater control of their consumption and spend.

## BACKGROUND

To achieve this, First:Utility envisaged a customer portal where users could log in and view their energy consumption for any given time period, in real-time. This would help users to identify high usage periods and habits. The aim was to highlight such periods and help educate customers so that they would be able to make appropriate changes in order to make savings. In order to achieve the required data collection, First:Utility provided all its customers with smart meters, allowing real-time monitoring. This concept would require accessing and presenting large amounts of usage data in a way that was useful and understandable to the customer, something Dotfive had extensive experience in.

For the first time, First:Utility customers could actively track their energy usage using real-time data.

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### CHALLENGES

Multiple years of data had to be readily available to users, but with the ability to dive into the details of that data, down to an minute-by-minute view. This meant that large amounts of data had to be appropriately selected and retrieved speedily enough to give all users an acceptable experience, and presented seamlessly.

It also became apparent that browsers with lower capabilities were unacceptably slow in showing transition animations and processing large amounts of data.

Finally, for representing the graphs there were no currently-existing libraries or tools that would allow the behaviour First:Utility wanted to achieve.

### SOLUTION

We created a customer portal, capturing all the customer details, as well as providing energy usage data. The consumption data recorded by the smart meters installed into each customer's home was collected and stored on the company's servers.

We engineered the solution so that data for the period being viewed, plus the periods immediately before and after, would be retrieved and cached. This enabled the required animations to be created with a limited data set, with additional data being requested when the current period was changed. This meant that the user was able to navigate between closely-related items and be presented with results immediately.

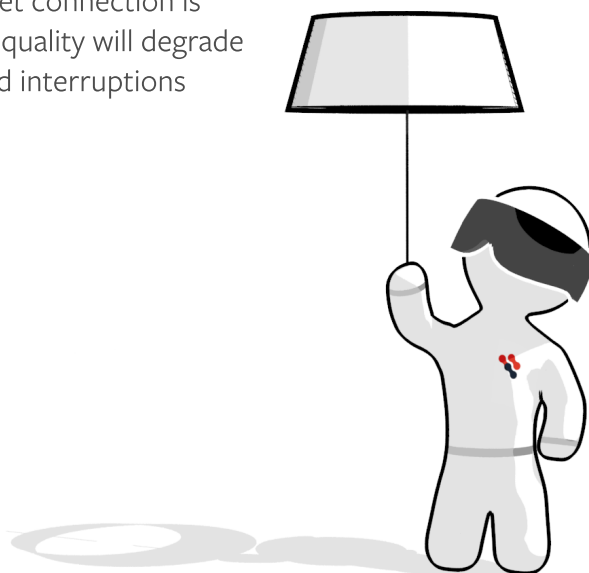
We decided upon using SVG (Scalable Vector Graphics) to present the graphs, as this is well-supported across multiple browsers and devices. We built a completely bespoke graphing library that allowed smooth and intuitive navigation between different levels of detail (e.g. between yearly and weekly views) by diving in and out of the data using animations, as well as travelling forward and back between data periods.

We overcame browser performance issues by ensuring that positive degradation of the user interface would automatically occur if a browser's capabilities were unable to cope. To determine this, the customer portal ran a small test to establish the available performance, and the features of the user interface were adjusted as appropriate. This smart solution was similar to those utilised today by film streaming services, which will stream a film to a device in High Definition provided the internet connection is strong enough. If it is not, the quality will degrade to Standard Definition to avoid interruptions in streaming.

## RESULTS

The success of the project meant that, for the first time, First:Utility customers could actively track their energy usage using real-time data, take positive action to reduce it, and see the results immediately. The flexibility of the components which were created to develop the graphs for the portal also meant that any future development plans would be quick and easy to implement.

This saved First:Utility future spend and ensured that updates to the portal could be released to customers in the shortest timeframes possible. All this helped to achieve a significantly reduction in the impact of the company's customers on the environment.



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## Technologies used:



PHP



MYSQL



RAPHAEL



NODEJS

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PHP | MVC | MySQL | JavaScript | Raphael | NodeJS | HTML | CSS | SVG | API | TDD | CI/CD



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