

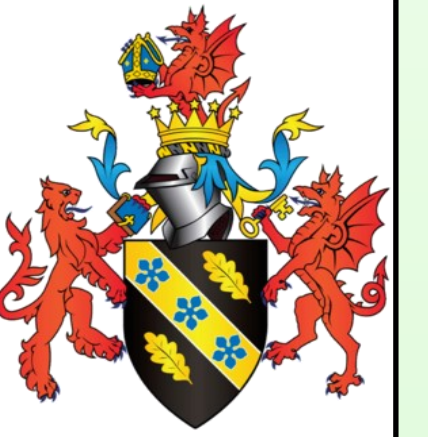
Utilising Modern Business Computing Systems to Illustrate the Impact Electrical Vehicle Technology will have on the Welsh Automotive Industry



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1. Project Aim and Introduction

Predominantly, this project aimed to investigate the number of electrical fast charging stations available in Wales and to ask Welsh motorists for their opinions on electrical vehicles and the surrounding infrastructure through the use of a survey. To coincide with the survey, the project also aimed to develop an application. The application was created using a geographical information system, after which it was exported into a HTML file and implemented into a WordPress website.

2. Project Objectives

1. Conduct secondary research discussing different future vehicular technologies. And analysing Geographical Information Systems (GIS)
2. Perform primary research through a quantitative survey, investigating public opinion on electric vehicle, the electrical industry and the surrounding infrastructure.
3. Develop an online Geographical Information System map illustrating fast-charging stations in Wales.

3. Literature Review - Key Findings

During 2015 the number of electric registered in the U.K. hit 2.6 million, a rise of 6.3% compared to 2014. In continuation, for the past four years, electrical vehicles have seen the largest market share growth.

There are now over 1700 'Fast Charge' stations across the U.K. on many busy travel routes. However, only a mere 14 of these are in Wales.

When comparing the market-leading GIS systems, it was decided that MapInfo would be most suited to our needs. MapInfo is one of the most highly advanced GIS packages and thanks to UWTSd it was free to use.

4. Survey and Developmental Methodologies

The survey methodology ensured that the survey was valid, generalisable and reliable. Additionally, it also outlined the target audience for the survey and displayed the changes made during and after the survey prototype stages.

In contrast, the developmental methodology determined that 'Rapid Application Development' would be used to create the map and explained the reasoning for choosing the software used to develop the application.

5. Implementation of the Application

Before implementation began, project requirements were set in place. The requirements ensured the application reached its full potential and achieved its objectives.

Secondly, both paper and then computerised prototypes were built to ensure the design ethos of the application was aligned with the initial vision set in place. The application was then developed and tested before being exported into a WordPress webpage.

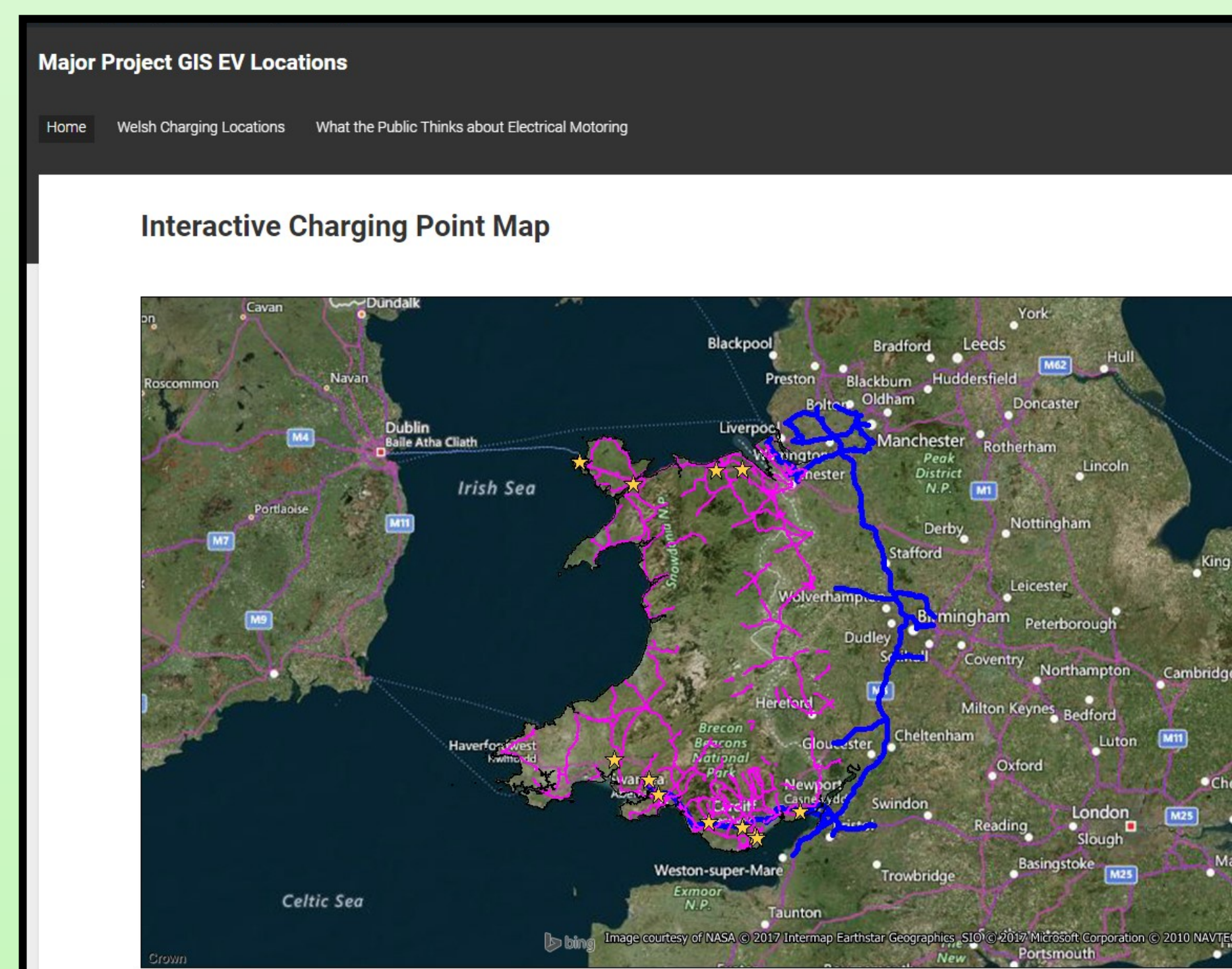


Figure 1 & 2: Displaying the home page of the application and an enlarged view of the interactive charging station plots.

6. Analysis of the Application

Once the application had been completed, analysis ensured that it hit the requirements and objectives set in the preceding sections of the project. Fortunately, it can be confirmed that the application achieved all of the goals originally set for it.

The map retained full interactivity within the WordPress environment, with each plot point having its own individual details page thanks to the integration of a flat-file database.

7. Analysis of Survey Findings

The survey discovered many interesting results. Firstly, the survey determined that nearly 90% of respondents would use a map based system to locate fast-charging stations near them. Completely justifying the feasibility of creating a map-based application for this project.

A second interesting finding was that over 88% of respondents believed that there were not enough fast charging stations in Wales. This is despite the fact that on average, respondents believed there to be over 40 fast-charging stations, compared to the actual number of just 14.

Surprisingly, it was found that 50% of respondents had no idea that there were any kind of government incentives in place for purchasers of electrical vehicles. Furthermore, of the 50% of respondents that knew about the incentives, 70% said they did not go far enough to influence their buying decisions.

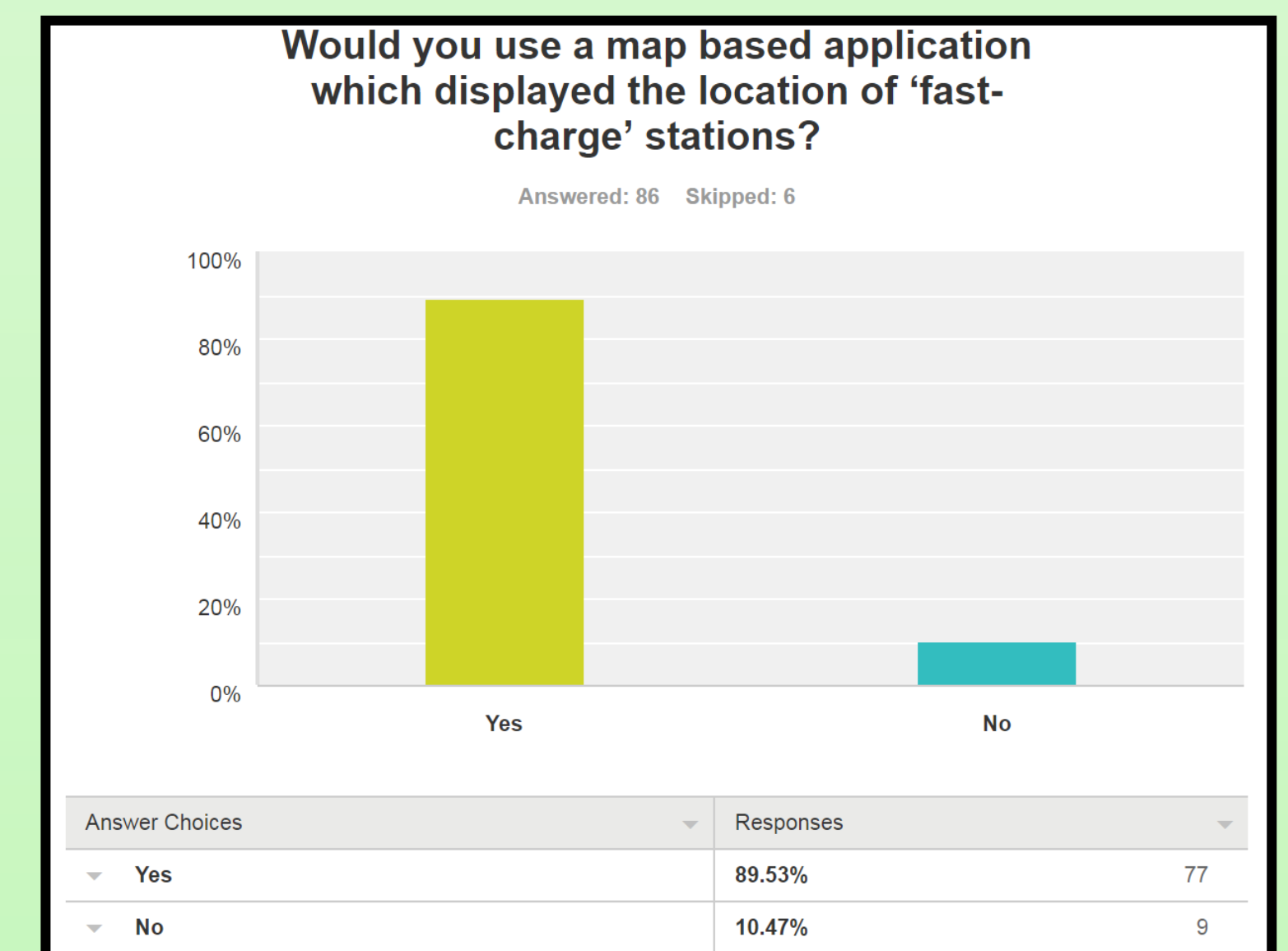


Figure 3: Displaying the results of question 16 from the survey.

8. Evaluation and Conclusions

Overall, it was extremely pleasing to see the project fulfil the original aim and all of its corresponding objectives.

Nevertheless, ensuring the application remained successfully interactive within WordPress was an extremely difficult task. This process would require simplification were the map to be developed further. Future developments could include showing slower charging stations and displaying other charge points throughout the U.K.

In conclusion, infographics created from survey results shows that many respondents believe that both electrical technology and the surrounding Welsh infrastructure needs development before widespread adoption takes place.

Moreover, the application supports this by displaying the severe lack of charging stations in Wales; particularly in the sparsely populated areas.