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Literature Review

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PlugMap UK

Professional

Data Accuracy and Management

PlugMaps data quality is critical since user experience and safety are directly impacted by the dependability of information. The Google Maps API, which is well-known for its accuracy, dependability, and worldwide credibility, provides the programme with its navigational data (Google, 2024). PlugMap concurrently uses OpenChargeMaps API (openchargemap.org, n.d.), which is also well-known for having a reliable data architect to obtain charging station data. This API has earned the trust of numerous businesses by guaranteeing the sufficient and correctness of the data being inputted. OCM API allows people worldwide to add new charging stations and charger types, meaning there is more data being inputted to the database. The proliferation of Web2.0 technology and the resulting increase in crowdsourced data, including spatially referenced data or volunteered geographic information (VGI), underline the importance of assessing data quality—a challenge that OCM addresses through rigorous verification processes (See et al., 2013). While there is a chance that errors could be introduced, OCM's rigorous

verification produces clean & reliable data. Once data is fetched, PlugMap stores it in private arrays which are then fed through an algorithm to find the best route.

Technology and Innovation

PlugMap aims to show how technology is essential to improving electric vehicle ecosystems. With a focus on creating a comprehensive application, its goal is to make it easier for drivers to find and access EV charging stations. The Program uses software-driven solutions instead of traditional infrastructure upgrades, utilizing real-time data to guarantee station availability and location accuracy and efficiency. This strategy not only facilitates the shift to environmentally friendly transportation but also advances the more general objectives for lowering carbon emissions and encouraging the use of renewable energy sources. Studies have shown that the use of EVs can significantly reduce C02 emissions proving that there are advantages for the switch from an internal combustion engine. EVs are a viable way to cut greenhouse gas emissions and rely less on fossil fuels, which is in line with larger initiatives to encourage sustainability and lessen the effects of climate change (Buekers et al., 2014).

Legal

Data Privacy & User Consent

Regarding Data Privacy and user consent, the PlugMap application does not directly collect or store any data. However, because our algorithms depend on Google's API and OpenChargeMaps API for functionality, any request made to these APIs—for example, starting a trip or locating a charger—gives these outside organizations access to the data within that request. It is crucial to clearly notify users about these 'integrated services' data collecting and sharing policies before the application starts up. This approach is in line with the UK GDPR principles of lawfulness, fairness, and transparency, among others, ensuring user consent is informed and compliant with data collection practices (Information Commissioner's Office, n.d.). Additionally, the GDPR's global impact on technology development emphasizes the necessity for organizations to adhere to these principles to avoid substantial fines and maintain a competitive advantage, reflecting the broader implications of compliance beyond just legal requirements (Li, H., Yu, L., & He, W., 2019).

Intellectual Property & Licensing

As PlugMap uses API technology like OpenChargeMaps (openchargemap.org, n.d.) and Google (Google, 2024), it is essential to ensure compliance with the intellectual properties of these companies. PlugMap adheres to the integration guidelines and legal requirements for using these APIs. While OpenChargeMap's API, being open-source, allows for free data usage under specific conditions, Google's APIs Terms of Service require that entities using their services for financial gain must register and may incur charges, aligning with the need for transparency and adherence to licensing agreements (Google APIs Terms of Service, 2021). Documentation by the UK met office provides an introduction to open source software, emphasizing its licensing, freedoms, and the implications for government IT, which supports the importance of understanding and

complying with open source licenses in the use of OpenChargeMap's data (Burr & Barrows, 2012) PlugMap follows all the the regulations set out by the met office.

Ethical

User Trust & Transparency

Establishing user trust is pivotal for any programme that handles personal information, especially location-sensitive data. PlugMap informs customers about the way their data is used by third-party APIs such as Google (Google, 2024) and OpenChargeMap (openchargemap.org, n.d.) before the application has started. To further strengthen users' confidence, PlugMap does not store or collect any user data and requests location permissions only when the trip is started, ensuring location data is sent to third parties only as necessary. This commitment extends to providing users with extensive details on procedures for data collection, processing, and sharing, aligning with guidelines on location data usage and consent under regulations such as PECR, which stipulates conditions under which location data can be processed and emphasizes the importance of obtaining informed consent from users (ico.org.uk, 2023).

Accessibility & Inclusivity

In order to ensure that a wide range of users, regardless of their physical ability or technical skills, can access and benefit from PlugMap, it is essential to prioritize accessibility and inclusivity in the app's development. By adhering to the Web Content Accessibility Guidelines (WCAG) 2.1, as recommended by the W3C on 21 September 2023, PlugMap aims to incorporate user-friendly design elements such as color contrast and voice navigation to accommodate users with visual or auditory impairments. Additionally, considering the needs of users from diverse ethnic backgrounds by offering bilingual support will enhance the application's usefulness and expand its reach. Implementing these guidelines ensures that content is more accessible to people with a wide range of disabilities (W3C, 2023). Moreover, the incorporation of design elements that specifically cater to the needs of older users, as emphasized by the insights of Pattison and Stedmon, underscores the vital importance of embracing an inclusive design philosophy. This approach enhances the overall usability of the application, making it more accessible to a broader spectrum of users, with a particular focus on individuals who may be encountering age-related changes in vision, hearing, motor skills, and cognitive functions (Pattison & Stedmon).

Social Issues

Promoting Sustainable Transportation

PlugMap aids in reducing range anxiety and promotes environmentally friendly transportation by providing easy access to information on EV charging stations. Beyond reducing carbon emissions, it educates the public on the benefits of sustainable transport. Integrating insights from Rauh, Franke, and Krems (2014) on how EV familiarity reduces range anxiety, PlugMap

underscores technology's role in decreasing fossil fuel reliance. Adding to this, the European Environment Agency highlights electric vehicles' importance in mitigating road transport's negative impacts, emphasizing the necessity of integrating EVs within a broader mobility system for a sustainable future (www.eea.europa.eu, 2023). This comprehensive approach reflects PlugMap's commitment to fostering a greener future through informed technology use.

Impact on Local Communities

PlugMap has the potential to have both positive and negative effects on nearby communities. Smaller towns may, on one hand, see an increase in traffic, which could put stress on infrastructure that isn't built for big numbers. On the other hand, PlugMap has the potential to greatly increase local companies profitability by directing EV vehicles to small neighborhood businesses charging stations. Furthermore, the availability of EV charging stations might draw in a more ecologically aware clientele and promote a sustainable culture, But it might also result in traffic jams in well-traveled charging locations, which would need careful planning and control to avoid.

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