Project: Green Energy Mobile App
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Introduction

There are two resources of energy: one is renewable energy and the other one is conventional energy. There are times when a large amount of renewable energy (e.g. sun, wave, wind) is produced. So how can we make more use of this energy? Every consumer has some influence on his energy consumption. For example, we can decide when to use our washing machines or dishwashers. So what we intend to do in this project is to advise consumers when it is the best time to turn their energy consumers on, in order to save conventional energy. This recommendation depends on whether there is more green energy or less. In the use case diagram on the next page, we will see in more details how the project will be done.

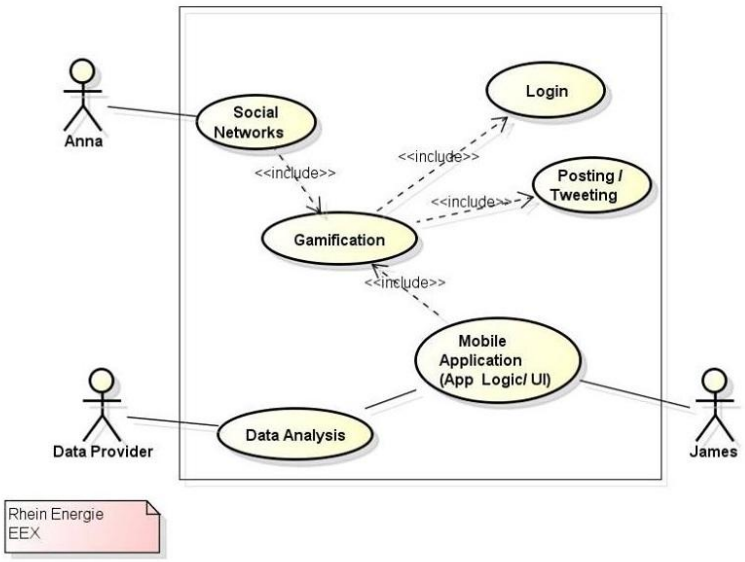
Who benefits?

Each individual would benefit from this system. It is a fact that the prices of conventional fuels continue to rise as energy reserves continue to be depleted. In contrast, we can enjoy pricing stability of renewable energy for the next 20 years or more. The environmental benefits of using green energy outweighs any financial drawbacks.

System Overview

First, we need data providers to get data from, as can be seen in the use case diagram on the next page. We need to know about current renewable energy production and also energy demand at several times of a day. We use this information in our application to advise the users and also show them how many kilowatt-hours are shifted to green energy production times. Our application consists of three main parts: data which was already mentioned before, the UI in which the data is visualized, and application logic which enables the visualization of data.

There are two scenarios here. Our application can be used by either one consumer or more. Imagine James wants to use the app. He would login and see the best times to turn his energy consumer on. The other scenario is that James logs in using a social network, like Facebook or Twitter. In that case he can share with others how many scores he got by saving conventional energy. This would result in encouraging others to also make use of this app. In our example Anna sees John's post and becomes interested to use the app as well.



Requirements

Functional Requirements

1. ***Data Processing:***

1.1 Data Acquisition/Access: system gets data (renewable energy production times and energy consumption times) from MySQL database

- Source/Initiator: Developers
- Priority: High

1.2 Analyzing data: process the mentioned data to achieve the statistics (compute recommendation)

- Source/Initiator: Developers
- Priority: High

2. ***Data Visualization:***

2.1 Visualizing data: show the computed recommendation to user

- Source/Initiator: Developers and Users
- Priority: High

2.2 Posting data to social networks: system sends the data to interfaces of social networks, to attract more users to the system and encourage the user to continue to use the system more often

- Source/Initiator: Developers and Users
- Priority: High

3. User Interface:

3.1 Main window, which shows the current and also predicted percentage of green energy, it also shows energy consumption in different time slots

3.2 Widget, which gives a quick overview of the current energy amount

3.3 One page for the process of publishing the scores on Twitter

Non-functional Requirements

1. **Usability:** The visualized information should be in such way that users can easily understand, and not in too much details
   - *Source/Initiator: Developers and Users*
   - *Priority: Medium*

2. **Performance (Availability):** In case that there is no internet connection, the system is not up to date.
   - *Source/Initiator: Developers and Users*
   - *Priority: high*

3. **Reliability:** It is guaranteed that the system processes and visualizes the data properly. But since the data depends on other resources, it may not be working, in case that the format of the data from providers has changed or if they do not deliver data anymore.
   - *Source/Initiator: Developers*
   - *Priority: Medium*

4. **Implementation requirement:** The system will be developed only for the Android platform.
   We did some research about cross-platform development and we realized it would take too much time to set up the environment, installation, read guides, and running on different devices. You can find more about this in the attached document (*Research on PhoneGap.pdf*).
   - *Source/Initiator: Developers*
   - *Priority: High*

5. **Interface Requirement:** The system should have
   5.1 Interface to a social network
   5.2 Interface to a data provider (see document *Research on Data Providers.pdf*).
   The interface includes:
   - *Source/Initiator: Developers*
   - *Priority: High (interface to data provider), Medium (interface to social networks)*

6. **Legal Requirement:** For the system we may need an agreement with data providers and we might have to agree to the license agreements of social networks. Further research on this will be done in the future.

- *Source/Initiator: Developers*
- *Priority: High*

7. **Scalability:** The application is supposed to be equipped with the feature to show the amount of kilowatt-hours shifted to green energy production times to the users. When the number of users grows this feature becomes more and more useful.
   - *Source/Initiator: Developers*
   - *Priority: Low*

Related Documents: "Research on Data Providers.pdf", "Research on PhoneGap.pdf"