Project Report

Group Members:
- Omer Abid (14922)
- Syed Huzaifa Ejaz (14905)

Business Knowledge:
Our primary aim for collecting the business knowledge was to collect as much information as possible regarding:
- How a smart home system works
- What type of smart devices are used by a smart home
- What data is collected by IoT devices
- How that data is stored and what analysis is carried out on them

Our primary sources of that information were Wikipedia, Youtube and various other websites.

The information that we collected was not complete but the bits and pieces that we collected allowed us to understand and perceive the big picture of what a smart home is and how it works. That said, it should be pointed out that the smart home industry is rapidly innovating and with lack of standards and protocols, it is still hard to precisely define what a smart home really is.

Database Diagram:
We assumed that there are two primary type of devices: sensors to send input to our system and the smart devices like light bulbs and thermostats etc which take command from our system

We assumed that there is a central control application that takes input from the sensors and then decide based on that input to turn on, or turn off or change the configuration of a smart device. These instructions are sent as commands to various devices with certain parameters. The central control application can also be manually commanded by the user.

Whenever a device changes its configuration (like a thermostats working on a lower temperature), it records that change at the timestamp at which that change occurred.

Also, every device (both sensors and smart devices) is capable of measuring and recording the power it consumed during the time period that it was working.

Dimensional Modeling

We decided to take energy_consumed by a device in a minute to minute manner. This is to make sure that devices which run for a longer and shorter time period can both be represented in our Energy_Fact table in a standard manner. Although, each device would now have multiple rows in fact table for a single run of more than 1 min.

Similarly, alert_level by itself was not making much sense from the user's perspective so we defined alert_type which will be strings to tell the user about security issues. Each alert type will have multiple alert_levels that tell the seriousness of a security issue. For example an "electrical fault" may have alert 3 or even 5 depending on the seriousness of the electrical fault detected by the smart home management system.