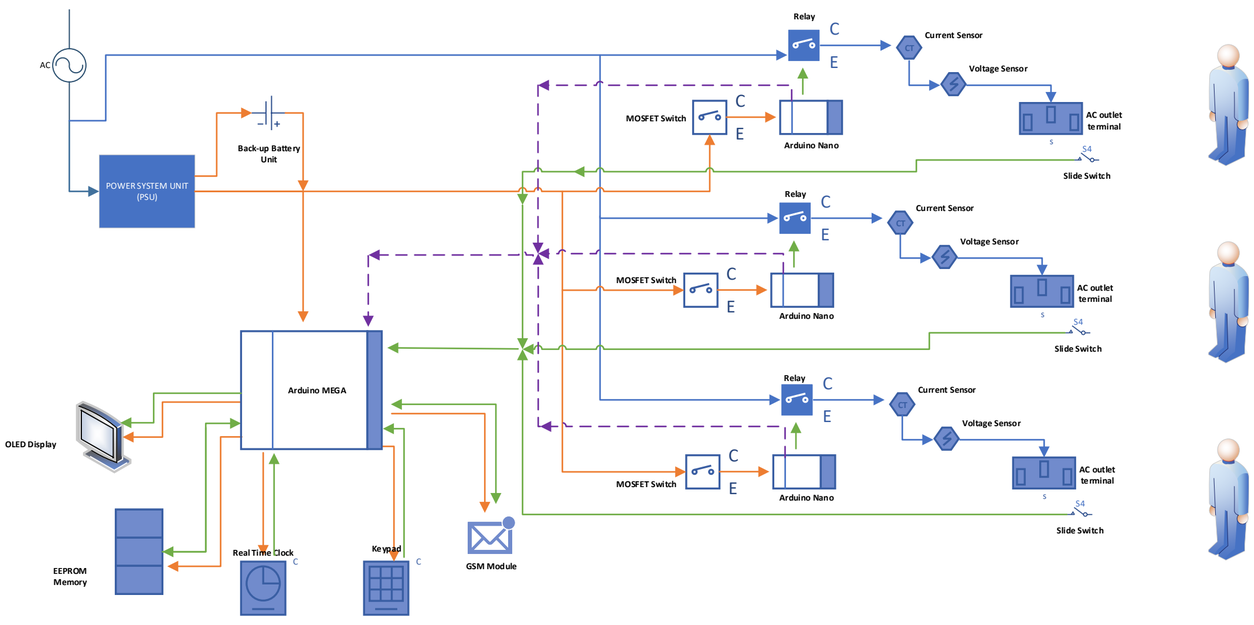
Concept Design 1: Centralized Approach

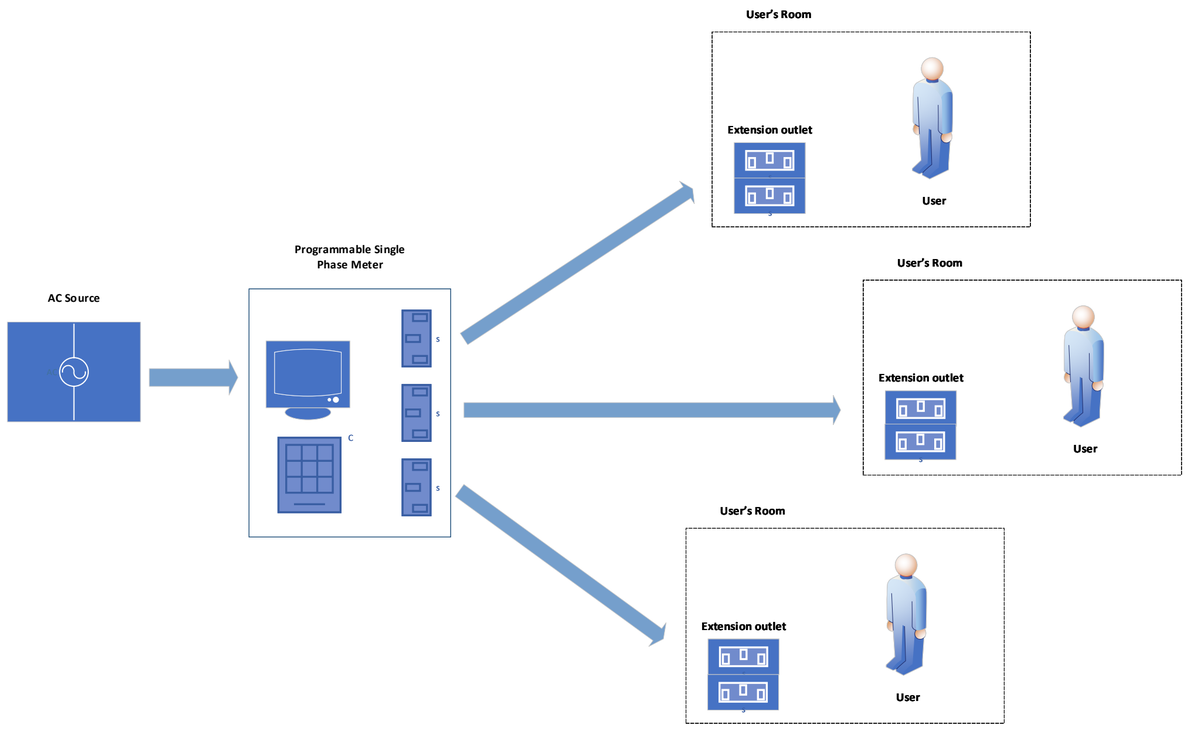
LEGEND:

- DC Power
- AC Power
- Data and Command
- Communication Data

This Approach focuses all processes unto a single prototype, meaning all calculation and processes are integrated into one device. The systems allows only extension chords unto the room of different users. But this system shows the difficulty and lack of ease of use as the users have to go to the meter of request for validation and access to electricity.



Concept of Usage

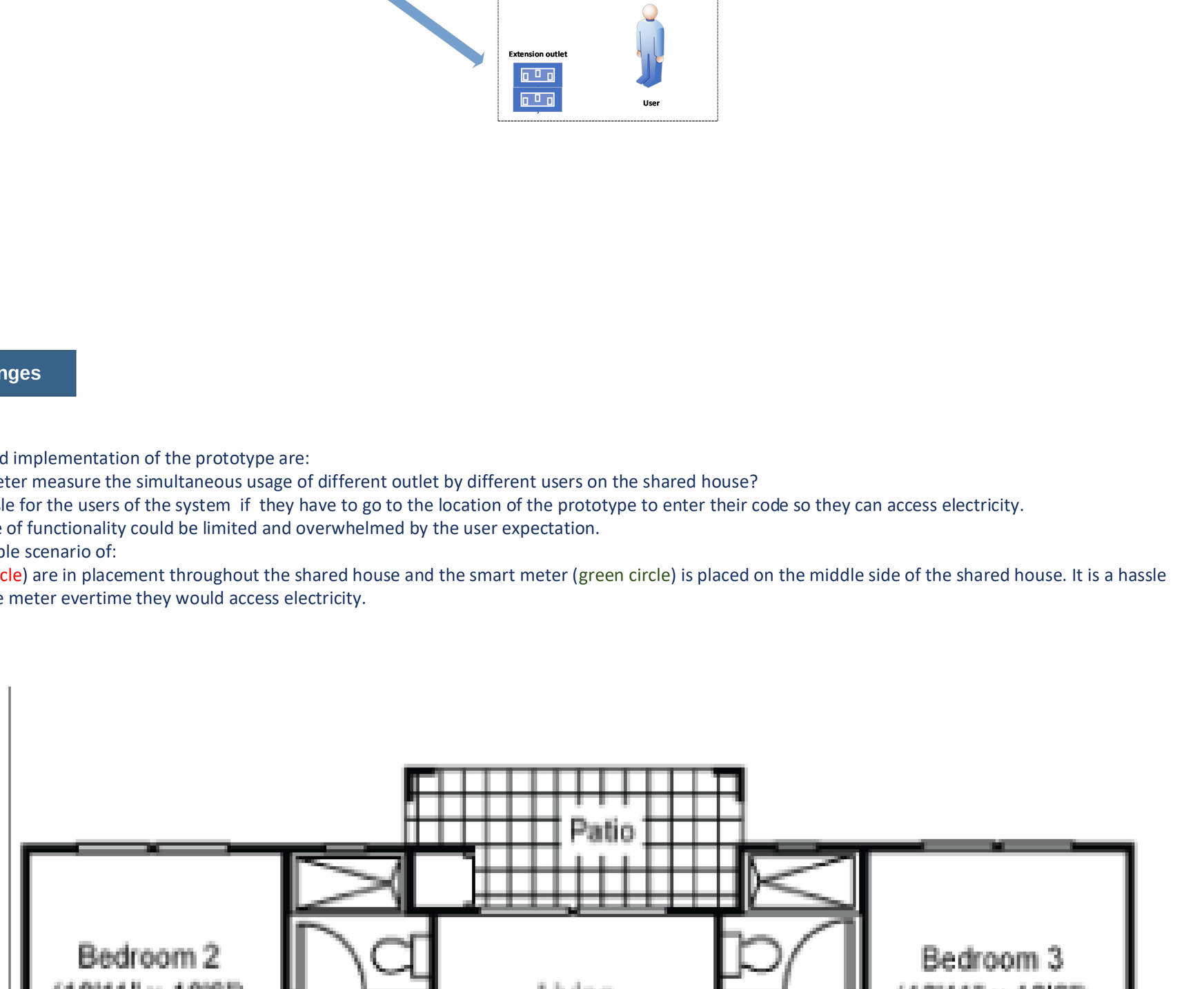


Problems and Challenges

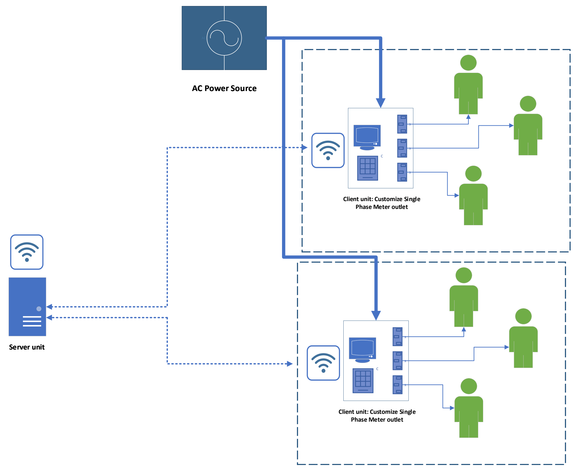
Problems on the design and implementation of the prototype are:

1. How would the meter measure the simultaneous usage of different outlet by different users on the shared house?
2. It would be a hassle for the users of the system if they have to go to the location of the prototype to enter their code so they can access electricity.
3. The design's scope of functionality could be limited and overwhelmed by the user expectation.
4. Take for am example scenario of:

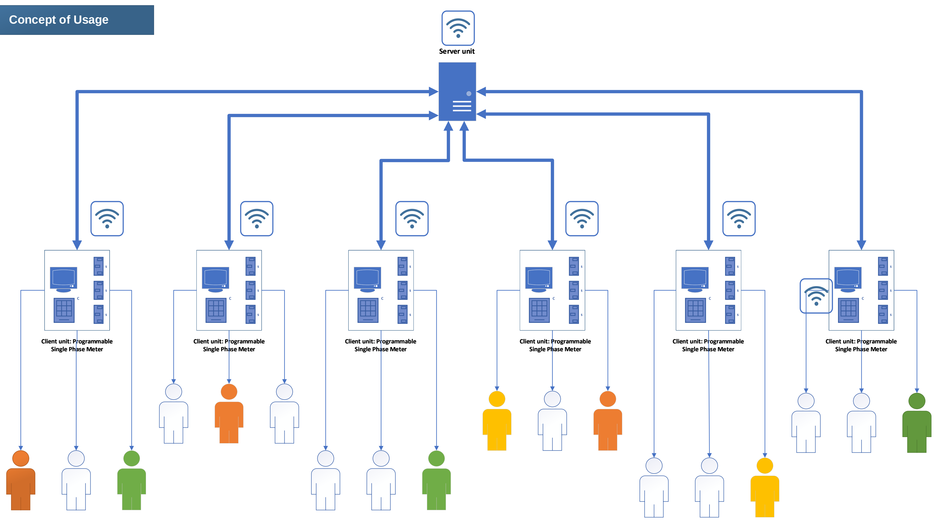
Outlets (red circle) are in placement throughout the shared house and the smart meter (green circle) is placed on the middle side of the shared house. It is a hassle for the tenants to go to the meter evertime they would access electricity.



Concept Design 2: Wireless Client and Server Approach



Concept of Usage



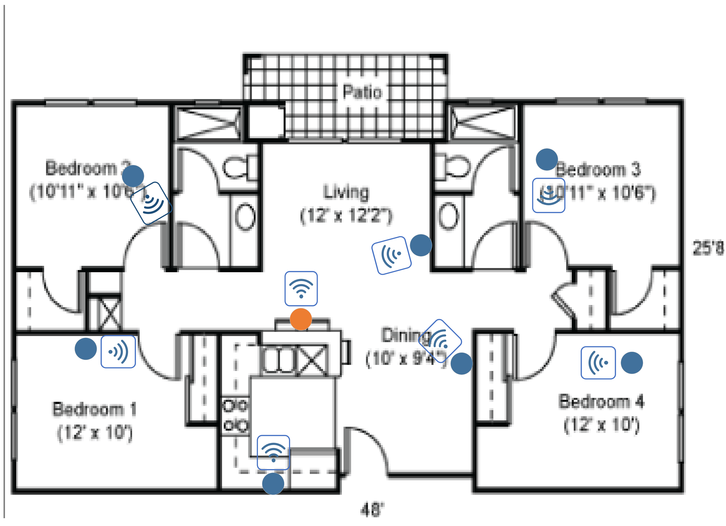
Problems and Challenges

Advantages:

1. Wireless and Reduces risk of malfunction due to physical connectivity problems
2. If designed successfully: could eliminated the problem of simultaneous usage monitoring problem and efficiently measure power consumption of individuals

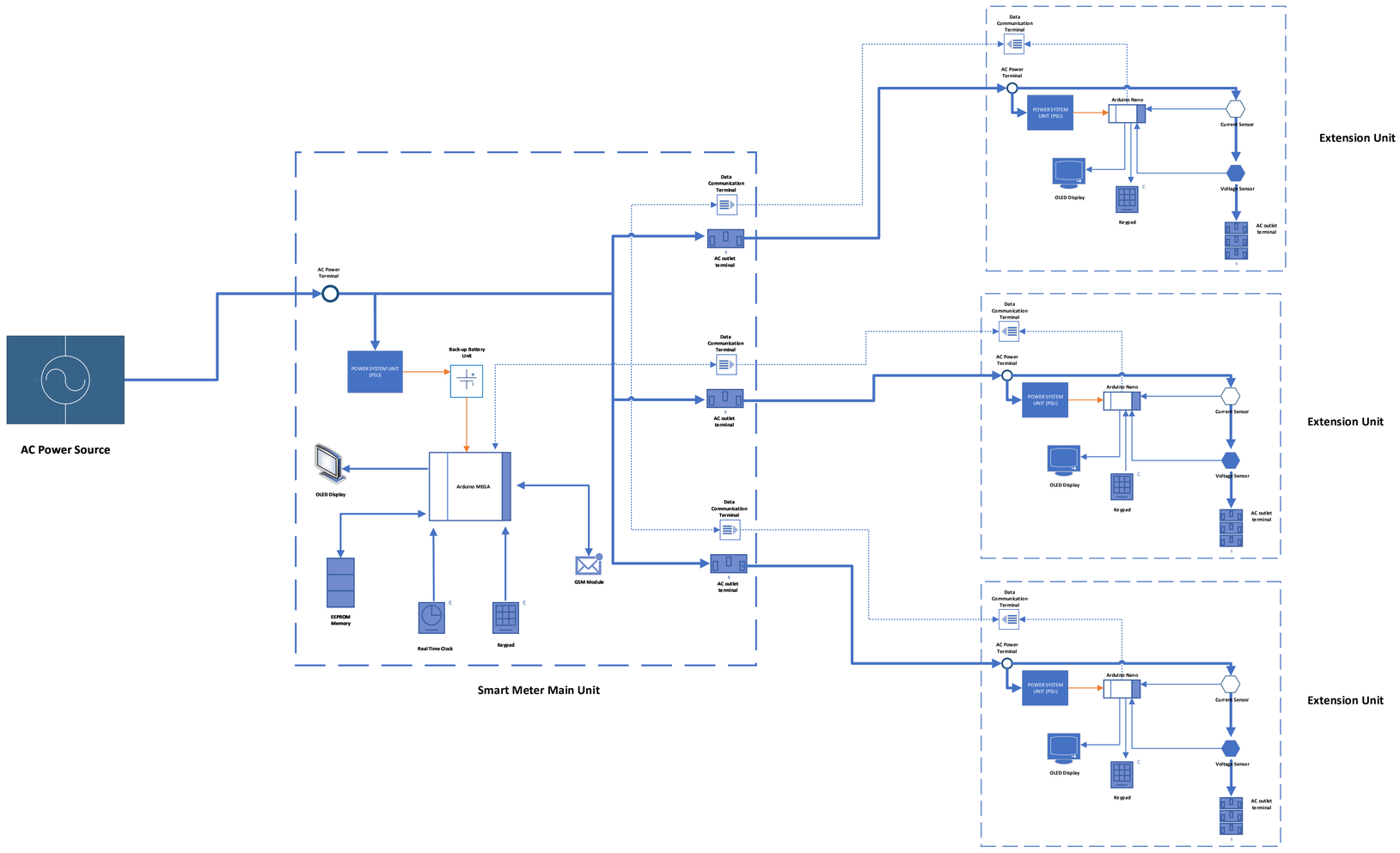
Disadvantages:

1. Increases the Systems complexity
2. Database management will be needed and Wifi or Bluetooth communications protocol will be implemented which would leave the environment full radio frequency signals.
3. Many errors are expected to arise due to data communication traffic between several devices.

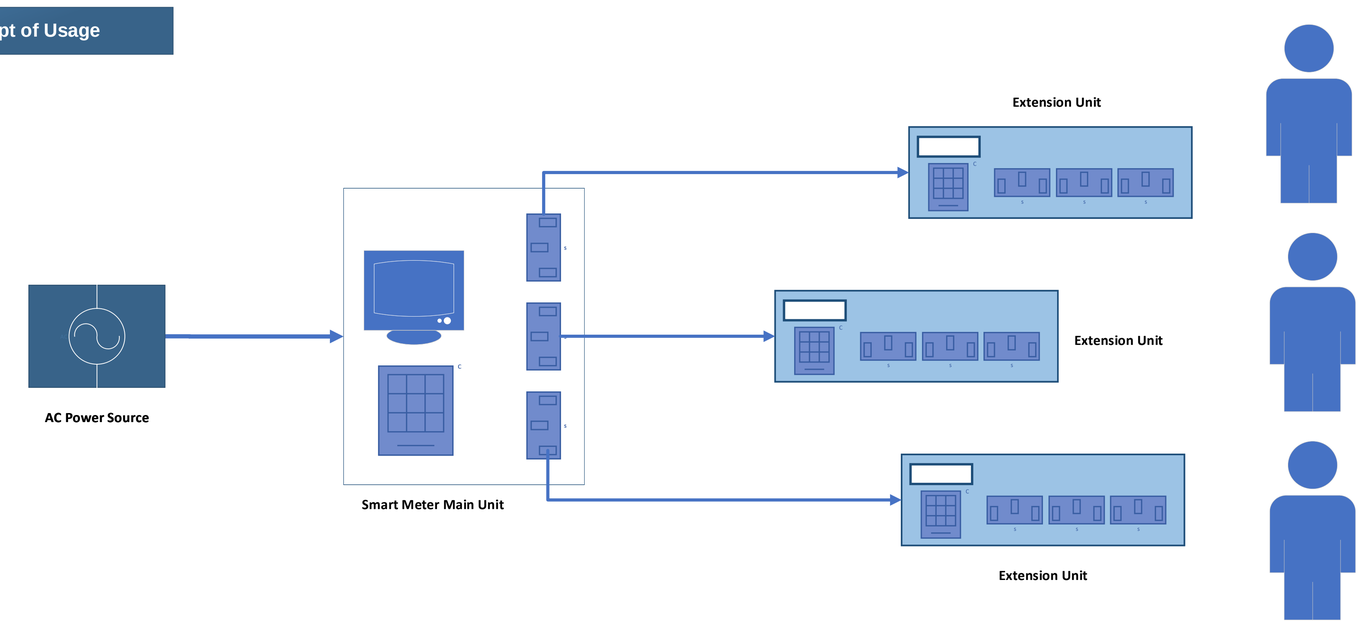


Concept Design 3: Extended Centralized Approach

This Approach portrays a similar wired connection set up with electric measuring unit but in the case, specialized outlets are made that can be used by any user under the condition that only one user is allowed to solely use the extension outlet. There are 3 more terminals on the customized outlet for the user to use for another device and the energy consumption would still be recorded under his name.



Concept of Usage



Problems and Challenges

The advantages of this approach is that individual users can have or use the outlet exclusively therefore ensuring accurate measurement of their individual power consumption. Rules and Policy are need to be stablished when implementing the system so that no other user is going to connect to an outlet when its access is not validated under their name. Otherwise it could be considered breach in fairness and would to in accurate power monitoring. It much simple than the wireless method of putting up wireless devices throughout the whole building/house.