Recreate Energy

Purpose: Build a web-based platform to be able to not only regulate Recreate Energy's bio-reactors but also be specifically tailored to other energy regulation systems (i.e Battery, Solar, Energy Meter)
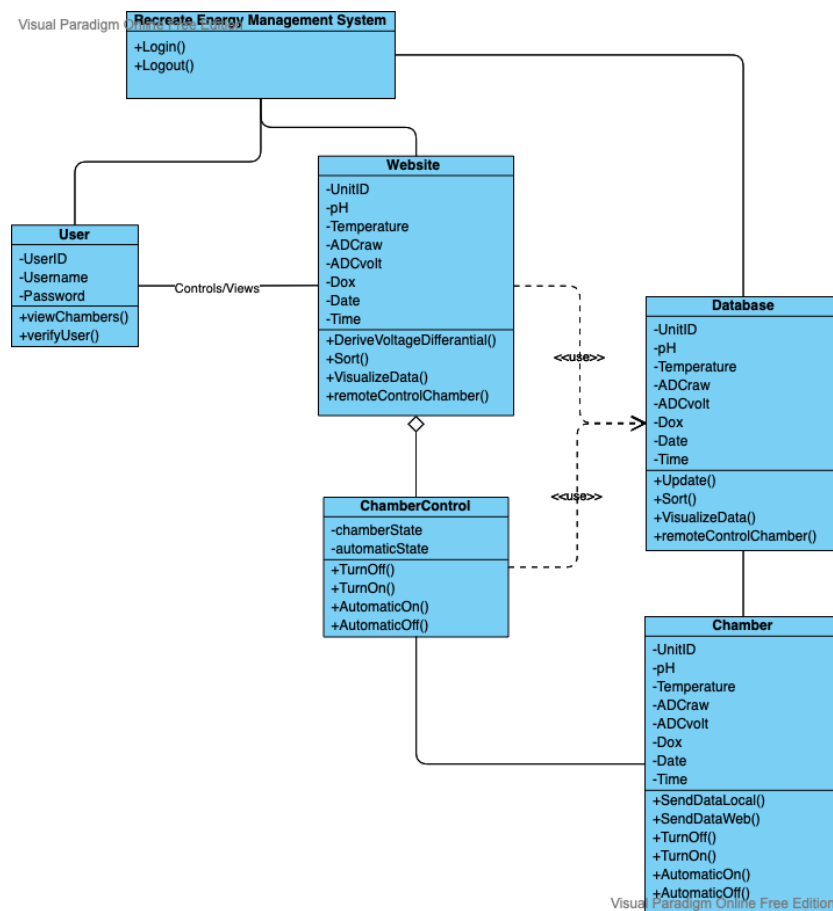
Global Architecture:

Fig.1

Figure 1 lays out the global architecture of the web-based system. A user will log into the Control Panel with their appropriate credentials which will pull the appropriate chambers from the database. The user will then be able to see the vitals of each individual chamber and will be able to change them on the fly if need be.
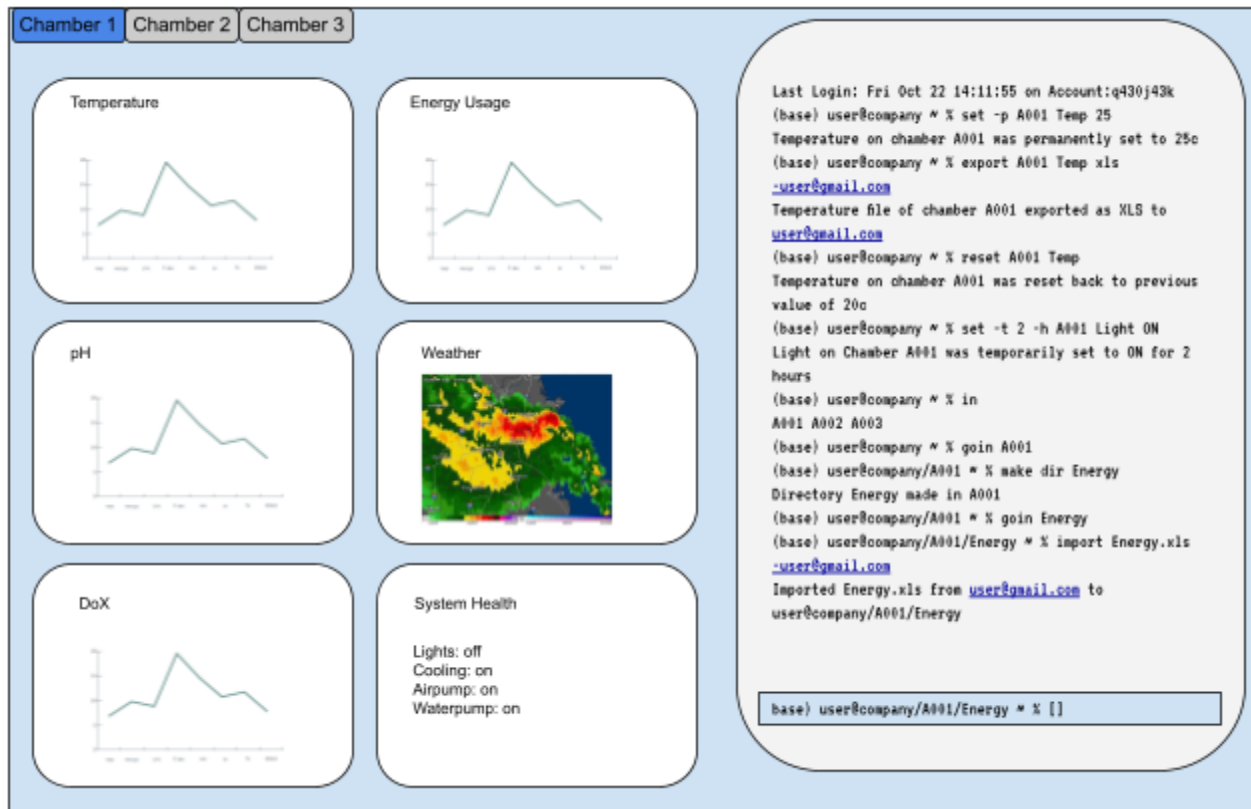

Figure 2

Figure 2 lays out a simple UI/UX where the user can track current system vitals and change them on the fly with an integrated terminal system.
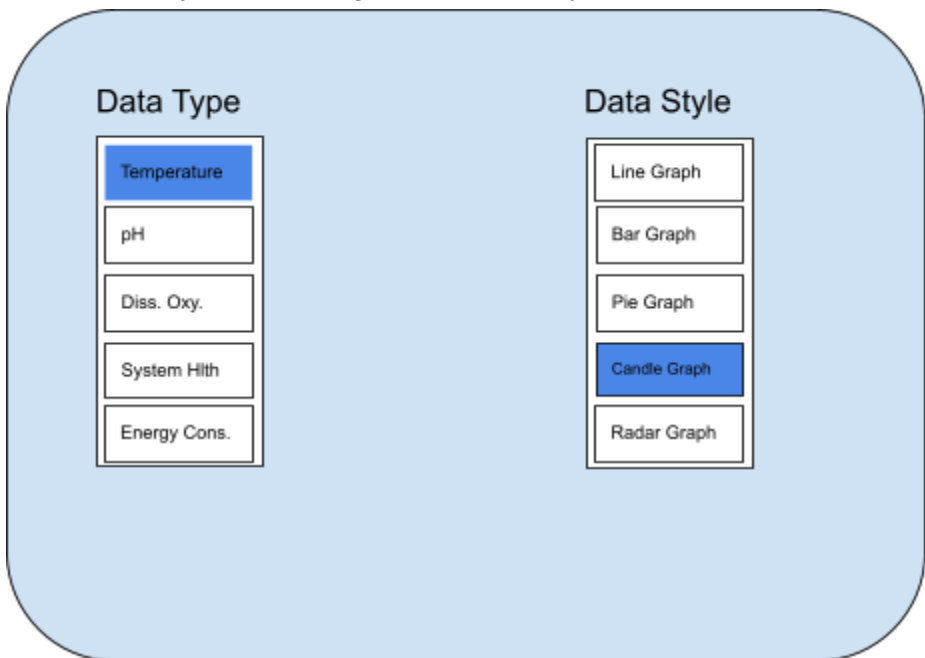
Figure 3

Figure 3 outlines how the user can choose what to display in each of the 6 panels. The user first chooses data type from a drop down menu and then data style appropriate to the data type.

Terminal

The terminal is a quick way for a user to manipulate the chambers with easy commands.

Commands:

Set

Set - The 'set' command will toggle a certain aspect of the chamber to a specific value for a determined period of time.

anatomy : set {time} {device} {attribute} {value}

- {time}: depending on the user's preference, a user could toggle an attribute for a specific time or permanently. If a user wants the change to remain permanent they would write '-p' in {time}. If a user wants the change to be temporary for a set time they would write '-t {value} {value type}'. Here the value would be an integer greater than 0 and value type will determine the time span. Allowed value types are 's' for seconds, 'h' for hours, 'd' for days, 'm' for month
- {device}: The user would input the device ID they wish to manipulate
- {attribute}: The user would choose the attribute they would like to change. Some examples include {temperature}, {fanspeed}, {ping},{lights},{fan}. {Temperature} pertains to the temperature that the environment controls will try to maintain. {fanspeed} pertains to the radiator fan speeds. {ping} pertains to the amount of time between each ping from the raspberry pi to the database.
- {value}: The user would choose a numeric value depending on the {attribute} chosen.

Ex. 'set -t 5 -h A001 temperature 25'
This would set the target temperature of chamber A001 to 25 degrees celsius for 5 hours then revert to previous set value.

Reset

Reset - The 'reset' command will revert the chosen {attribute} to the previous set value.
Anatomy: reset {device} {attribute}

- Refer to **Set** for {device} & {attribute}

    Ex. 'reset A001 light'
        This would reset the value of the light system in chamber A001 to the previous set value.

Ask

    Ask - The ask command will ping the raspberry pi for the current value on an {attribute} even if the next {ping} event has not occurred.

    anatomy : ask {device} {attribute}

- Refer to **Set** for {device} {attribute}

    Ex. 'ask A001 ph'
        This would ping the raspberry pi and get the current ph value for chamber A001

In

    In - The 'in' command will show the user to currently available databases or tables.

    anatomy : in

    The 'in' command may show different things depending on which database/table is currently being accessed. For example, if a user were within A001 they would be able to use 'in' to see the other tables associated with A001 like temperature, ph,etc.

Goin

    Goin - The 'goin' command will enter a desired database/table and have access to associated databases/table

    Anatomy: goin {place}

- {place}: This refers to either a database, table, or file that a user would want to enter and have access to.

    Ex. 'goin A001'
        This would enter the table associated with chamber A001 and give the user access and visibility to associated database/tables

Make

Make - The 'make' command will make a specified {object} with a {title}.

anatomy : make {object} {title}

{object} - The user can choose to make a directory {dir}, table {tbl}, database {dtb}, etc
{title} - The user can choose what to call this object

Notice - This command can only be used within a specific {device} and the {object} created will become tied to the {device} and can only be accessed through that {device}'s hierarchy.

Ex. user@company/A001 ~ % **'**make dir Energy'
        This will make a directory called "Energy" tied to device A001

Remove

Remove - The 'remove' command will delete a certain {object} within a {device}'s hierarchy.

anatomy : remove {title}

-   Refer to **make** for {title}

Notice - This command can be used anywhere but will delete the {object} where the user currently finds themselves. If the user finds themselves at home, they can use this command to remove a {device}'s entire hierarchy or if they find themselves within a {device}'s hierarchy they can remove an {object} with the same {title}.

Export

Export - The export command will export an {object} from a {device}'s hierarchy to a specified location with a specified format

anatomy : export {device} {title} {format} -{location}

Refer to **Set** and **Make** for {device} and {title},
        {format} - The user will choose a format to export the desired {object}, such as excel 'xsl'
        {location} - The user will specify an email address they would like the file to be exported to.

Ex. 'export A001 Temperature xls -drvega@uci.edu'

This would export the table called "Temperature" in the A001 hierarchy as an excel file and send it to drvega@uci.edu