Team 27 AQUASOL

Sponsor: Abdelrahman Elmaradny

October 21, 2024

Team Formation

1.1 Introduction

AQUASOL is a project focused on revitalizing the future of clean drinkable water on our planet. Our team of engineers will design and produce a system that will transform beach water into clean drinkable water using thermodynamic and fluid dynamic principles. Generating most of the power from the sun we can provide our product in almost any part of the world that is near an ocean. For the foreseeable future we hope to be able to provide clean and drinkable water for communities in need of clean water.

1.2 Team Name

Our team name is **AQUASOL** meaning **A**dvanced **Q**uality **U**ltrapure **A**bstraction (via) **SOL**ar energy, which we chose in order to emphasize the relationship between solar-powered energy and water purification. We wanted to use an acronym to stand for something that relates to our project and the acronym does that. Even the team name itself, AQUASOL, explains that this project is water and sun related. Some of the other acronyms our team thought of were SOLARIS which stands for Solar-Optimized Liquid Abstractor for Resourceful Irrigation and Sustainability, but we thought it could be misleading as we do not specify anything about use for irrigation in our design specifications.

1.3 Team Goal

During our sponsor meeting, we planned out different milestones that we needed to complete during the two quarter project. Our milestones include:

a. The first milestone is all of the designs: the solar panel energy design and the desalination unit design by the end of the quarter.
b. The second milestone by the end of the quarter is all the parts selected and the electrical components/wiring design, and piping diagram finished.
c. The last milestone is the physical demo due at the end of the winter quarter.

1.4 Organizational (Org) Chart
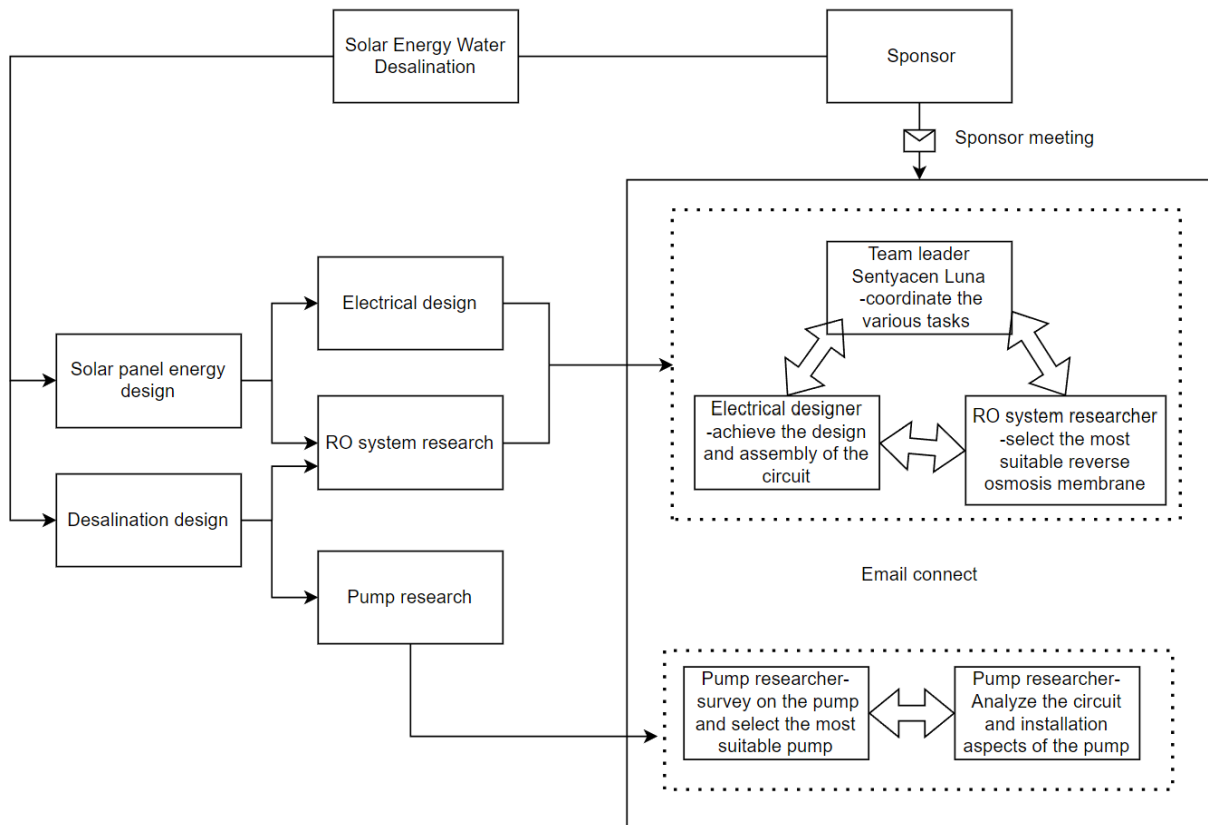
Provide clear descriptions of the roles for each entity in the Org chart :

Our goal is to create a solar water purification system, which requires us to do two things. One is to design a water purification system, and the other is to design a solar energy supply device. The water purification system consists of RO system and pump, therefore, we need to design the RO system and pump, as well as their corresponding circuits powered by solar energy.

There are five people in the group, one is the leader of the group, two are responsible for the design of the pump, one is responsible for the design of the circuit, and one is responsible for the investigation of the RO system.

The leader of the group is responsible for coordinating the various tasks of the group and building the overall framework for the tasks. And participate in the construction of circuits and RO systems.

The circuit designer will communicate with the person in the solar energy system, water purification system and pump system to achieve the design and assembly of the circuit.

The investigator of RO systems should consult information on RO reverse osmosis and select the most suitable reverse osmosis membrane

The investigator of pumps should conduct an investigation and select the most suitable pump.

The other pump designer should conduct an analysis of the pump's circuit and installation, and communicate with the circuit designer.

Real time collaboration and communication within the group are conducted through email and communication software, while the group communicates with sponsors through weekly sponsor meetings

1.5 Identify Support Structure and Available Resources

Resource Type	Specific Resource
Monetary Resources	$500 from team members, additional funding?
Equipment	Laser cutter, 3D printing machines, soldering irons, bandsaw, drill press, assorted tools (screwdrivers, measuring tapes, pliers, etc)
Facilities	Fabworks, Engineering Tower lab space,
Technical Support	Our sponsor, Abdelrahman Elmaradny; Professor Copp, Professor Walter
Material & Fabrication Support	Fabworks staff, Makerspace staff

1.6 Team Communication Plan

Internally, our team will mainly communicate using a team discord. We will have separate categories to maintain clear communication about the various topics that will come up during the progression of the project. The separate channels are general, textbook research, links, pumps, systems, water desalination, and an additional off-topic channel. The general channel will be used for ongoing discussion about project assignment deadlines and current 'next steps' and the other channels will be used for more specific information gathering about the subsystems of the project design. This discord has also been shared with our sponsor.

For external communication with our sponsor, our professors, and any additional staff that we may need to discuss our project with, we will use email, where one person from the team will be in charge of the email communication with everyone else from our team cc-ed, along with anyone else that the email thread is relevant to.

1.7 Team Rules

Governing Interactions:

- We will communicate often with Discord to keep one another informed about decisions. We will allocate time to meet up in person together whenever necessary through when2meet schedules and accommodate those who cannot come through Discord updates. We will treat one another with courtesy and respect all throughout the process, avoiding conflict through open communication and civil discourse.

Honesty:

- We will always be truthful in our faults and troubles. We will communicate if we made an error, are struggling with an issue, or cannot meet a deadline. We will keep one another informed of such possible troubles.

Appropriate Personal Behavior:

- We will be professional and friendly with one another to keep team morale up throughout the project. We will be respectful of any differences of opinions.

Appropriate Technical and Professional Behavior:

- We will always follow lab safety protocol and follow guidelines when working with technical equipment. Professional behavior will include adequate language and a good work ethic.

Budget:

- We will constraint our budget to fit the $500 limit, but if we find it necessary to spend more of our personal money we will split it evenly if we all find it to be necessary.

Decision Making:

- We will democratically vote on decisions and make sure everyone's voice is equally considered.

Team Coordination:

- We will each work on our sections independently and time when needed. We will update one another often online and meet up all together in person when necessary.

Stages of Group Development

Forming:

- We will get to know one another better and learn from each other. We will explain our strengths and weaknesses to see how we will split responsibilities for the project.

Storming

- We will communicate any disagreements and issues modestly and professionally to make sure everyone feels safe to communicate dissenting opinions. We will create a safe environment for all to express their opinions and not let any one person entirely dominate the project plans. Team leader will ensure everyone follows these ideas if anyone falls out of line.

Norming

- We will help one another in any way we can even if it is not one's main role. We will organize structure in our project goals, meetings, and shared notes to keep progress consistent.

Performing

- As a team we will keep our progress going and have our momentum in our progress by continuous work. We will ensure we do our work and be comfortable with one another's skills to be as efficient as possible.

Adjourning

- We will celebrate our group's efforts whether or not we succeed or fail. We will recognize any outstanding members, but also respect the smaller deeds anyone put into the project.

Why this document is important:

- We will look back on this document in the case that anyone falls out of line. Most importantly however, we will be keeping these ideas in our mind all throughout the project to create a healthy working environment for all.

Consequences and Follow-up Procedure:

- If people are not able to get their work done we will help one another out where we can. Yet, if failures to meet work needs or a toxic environment is formed, we will have an intervention with that person as a team to express our issues. If that does not fix the issues, we will contact our sponsor, Abdelrahman Amr Abdelaziz Elmaradny , and if needed Professors Copp and Walter as well.

1.8 Roster and Signatures

Name	Phone	UCInetID	Lab Section	Signature
Brian Mora	562-667-6893	morabm1	2	Brian Mora
Ethan Vu	714-743-8398	ethancv	2	Ethan Vu
Devyn Mallon	949-566-1689	dmallon	2	Devyn Mallon
Sentyacen Luna	656-262-0104	sentyacl	2	Sentyacen Luna
Jiankai Wang	949-795-2993	jiankaiw	2	Jiankai Wang

Sponsor/Advisor Approval:_____   _____

                                        Signature   Date