Logbook

Weekly Report

Week Report - 15.03-22.03

During this week, our team was searching for information connected with different approaches to solve the problem. We had team meetings and brainstorms about different solutions and ideas on how our fluid desinfection system should look like. Our team also prepared a preliminary Gantt Chart with general tasks and timeline of our work till the final presentation. During this week we also had a meeting with the client and we obtained all the answers for our doubts and questions. After that we got a clear view of how our project should look like.

Week Report - 22.03 -29.03

This week we had a meeting with António Ferreira da Silva to verify our hydraulic system and organized a meeting to develop the PC interface control system. We have been searching for equipment needed to build our project. We improved our marketing plan. We worked on the Interim Report. We organized four meetings to develop these tasks together.

Week Report - 29.03 -05.04

This week our team was building theoretically electrical system and searching for the necessary components for its construction. We had two meetings to resolve this issue.

Week Report - 05.04 -12.04

In this week our main goal was to find appropriate equipment (filter, pump, UV lamp) to build the system and determine the spesifications of these equipment. Also we started doing marketing plan for our system - segmentation, positioning, etc. In addition, we design the logo for our “company” and we created leaflet for interim presentation which includes main idea of our system: that`s it is UniVersal and modular.

Week Report - 12.04 - 19.04

During this week we prepared and assembled interim report which includes: abstract, introduction, marketing plan and sustainability development part. Additionally, we made mid-term presentations and were discussing how the presentation should look like. At the end we printed prepared earlier leaflets to advertise our product.

Week Report - 19.04 - 03.05

During those two weeks, we researched local market for buying appropriate materials to build our system. We made preliminary list of materials and then after discussion with our client we made corrections and created final list of materials from local shops.

Week Report - 03.05 -17.05

In those two weeks our group finally bought materials to construct the disinfection system. Also, the person responsible for water test carried out first preliminary test of contaminated water in chemical engineering departments with help of professor Maria Aurora Soares da Silva. We also arranged PLC system from electrical department and make an appointment with professor to make an electrical scheme of the system .

Week Report - 17.05 -24.05

In this week, each member of the group started to work with writing final report. Adam was improving marketing program, Sander was creating state of the art, Aleksandra prepared correct abstract and Joanna changed introduction. Additionally, we were thinking in group about different functionalities of our product and we discussed what other modules can be changed in the future.

Week Report - 24.05 -31.05

During this week we prepared scheme of electrical circuit and arrange power supply from electrical engineering department. We started also to assemble electrical part of the system what involves connecting all inputs (water lever sensors and buttons) and outputs (electrical valve, UV lamp, pump). What is more, all team members were still working with the parts of report: functionalities and tests elaboration.

Week Report - 31.05 -07.06

During this week, our group finished to assemble electrical part of the system and started to construct mechanical part. We also programmed our PLC to control all electrical equipments and made a simulation to make sure that the system will work properly. What`s more we prepared project development part for the final report. In the same time, we were recording our work and started to work on video and poster.

Week Report - 07.06 - 14.06

In the last week before final presentation, we eventually finished construction of the system and tried to disinfect the contaminated water. We checked speed of cleaning water and it fulfill client needs. To prove efficiency of working system we did final, bacteriological tests which results fully satisfied us. What is more, we finished writing final report, making presentation and video. At the end, we made final presentation and was preparing to present in the best way our final product.

Meetings

1st Meeting (2012-03-01)

Agenda:

1. Presentation
2. Modus operandi
3. Project proposal
4. Electronic Logbook

Minute:

Getting familiar with the proposed themes and selection of the project and its possible implementation.

2nd Meeting (2011-03-08)

Agenda:

1. Where this disinfection system should be used?
2. How big are the volumes of these fluids?
3. Cycle times?
4. How clean the fluid should be after disinfecting?
5. What information should the PC/web-based user interface give?
6. Whether it should be possible to change something through the user interface?
7. What equipments are available ?
8. Do we know water properties? What kind of bacterias contains the water?
9. Where the water come from?
10. Where container will be used?
11. What is the budget for this project?

Minute:

Date: **09.03.2012**

Present: All members of team 2, supervisors

The meeting was started from discussion and answering questions from agenda:

1. Where this disinfection system should be used? The system will be used in a greenhouse nearby the entrance of the students car parking. It may be tested in the Laboratório de Tecnologia (Building L, room L101).
2. How big are the volumes of these fluids? Think of 100 l/h. You should project the tank so shat

this flowrate can be treated “continuously”.
3. Cycle times? It may depend on the design. The system should be able of disinfecting/sterilizing 100 l/h. You can choose either a continuous system or a batch system.
4. What fluids are going to be disinfected? Water with nutrientes (nitrate, sulphate, phosphate, chloride of metals such as Na, Ca, Al, Fe, Mg, K, Mn, and many others). It is possible that there are larger amounts of Fe and Cl ions, depending on the method used to recover the microalgae from the culturing media.It is possible to use salty water (such as seawater) in some processes but most of the work will consider only fresh water.
5. How clean the fluid should be after disinfecting? It does not matter the complete cleanliness of the water, as long as there are no viable cells of pathogenic (in particular bacteria, viruses, seaweeds). If there are many particles, there must be some way of making the water clearer so that sun light can pass through the water and reach about 15 cm depth of water with microalgae.
6. What information should the PC/web-based user interface give? If possible, the amount of water treated, the time spent in the treatment (such as time of UV irradiation or the amount of chemical injected inline). Also it may be interesting to know the time of operation and/or flow rate of water fed to the system. Would it be possible to use turbidity or absorvance or any other type of measurements to infer the effectiveness of the treatment without using lengthy procedures involving culturing methodologies?
7. Whether it should be possible to change something through the user interface? The user may want to set the “flowrate” of the water through the system or choose between fresh water, brackish water or brine (seawater) in order to adjust the system.

Second part of the meeting was devoted to explain what kind of work our team is supposed to do for next project weekly meeting. We are supposed to prepare information of different approaches to solve given problem. It was suggested to propare table for each approach which will contain: way of dissinfection (UV, chemicals, biomaterials), according to UV solution (power aspect, type of UV lamp), cost of each solution, type of valve (manual, electrical or both and for which voltages it works), cost of each solution, material for container (making container from polymer/other material in laboratory or buy), size and shape of container.

3d Meeting (2012-03-15)

Agenda:

1. Discussion and presentation different methods of problem solving
2. Choosing the best method
3. Discussion about hydraulical and electrical equipment

4th Meeting (2012-03-29)

Agenda:

1. Discussion and presentation of our system
2. Automatical part of our system (discussion about using sensor to turn on/off the system)
3. Discussion about list of material which we need to buy to build our system:
4. Filter of 5 microns size: http://www.freshwatersystems.com/p-5771-10-space-saver-sediment-prefilter-kit-14.aspx

5. UV lamps: http://www.boyuaquarium.com/en_ArticleShow.asp?ArticleID=134

5th Meeting (2012-04-12)

Agenda:

1. presentation of alternative materials and providers,
2. discussion of possibilities to choose alternative proposals,
3. presentation of the implementation of the solution and final discussion of possible changes,
4. questions about the type of tests required and needed for this material.

Minute:

Present: All group and supervisors

Meeting was started from presentation of list of materials for building our fluid disinfection system. All equipements and parts of the system are from PreçoFilters shop in Porto. All of them were accepted but the task of group is to provide and get know electrical specification of each part (current and voltage). After that we are supposed to decide if there is needed any voltage transformer. We also discussed how should look like troley/platform where the final system should stand. We decided to build easy platform with wheels to have chance to move our system from place to place. At the end we made two appoitments with:

- professor Antonio Silva at 10 a.m on Wednesday (14.04) in order to prepare automation part of our system
- and our client in order to check what equipments in chamical laboratory are available for testing water.

8th Meeting (2012-05-08)

Agenda:

1. Questions to Nídia Sá Caetano about the shopping procedures,
2. Discussion with Nídia Sá Caetano about chemical bacteria water tests.

Minute:

During the meeting we got familiar with procedures of buying materials. After the meeting we went to chemical department and met with a person working with testing water. We saw laboratory and necessary equipment and make an appointment for the next day to carry out preliminary water test.

13th Meeting (2012-05-31)

Agenda:

- Final requirements
- Power supply (250 V → 24 V)

Activities

Start and End	Description of the task	Who
March	Search components and materials on the Internet	Joanna, Aleksandra and Sander
March	Gantt Chart	Sander
March	Project sketch	Sander
March, April, May	Search for providers and materials in stores	Aleksandra, Joanna, Sander, Adam
April	Leaflet	Sander
April	The final choice of materials in stores	Aleksandra, Joanna, Sander and Adam
April	“Competitors” and SWOT part of marketing plan	Joanna
April	Evaluating marketing objectives part of marketing plan	Sander
April	The rest of the marketing plan	Adam
April	Introduction	Joanna
April	State of the Art	Sander
April	Glossary	Aleksandra
April	Team members allocation	Joanna
April	Task allocation and work plan	Aleksandra
April	Eco-eficiency Measures for Sustainibility	Aleksandra
April	Cover	Adam
April	Interim report- structure and graphic	Joanna
April	Mid-term presentation	Joanna
May, June	PLC programming	Sander, Joanna, Aleksandra
April, May,	Shopping	Aleksandra,Joanna, Adam and Sander
May, June	Build the system	Sander and Aleksandra
May, June	Final tests	Joanna
April	Logo design	Adam
May, June	Video	Adam
May	Functionalities	Aleksandra
May, June	Paper	Joanna
May, June	Poster	Adam
May, June	Simulation	Joanna
May, June	Project development	Adam, Aleksandra, Joanna and Sander
June	Bibliography	Sander
May	Conclusions	Joanna
May	Abstract	Aleksandra
June	Final presentation	Joanna, Aleksandra, Adam, Sander