Web Application for Aqualab Sensor Monitoring and Analysis

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Faculty advisor from CSE: Dr. Slhoub - kslhoub@fit.edu
Client: Dr.Turingan - Ocean Engineering and Marine Sciences

Progress of Current Milestone

Task	Completion	Greg	Haley	Ruth	To do
Implement, test, and demo interface between frontend, backend, and database	90%	30%	70%	0%	User configuration and role options need to be added to the backend.
Implement, test, and demo water sensor implementation	90%	10%	90%	0%	Test further with possible new water sensors.
Implement, test, and demo UI tweaks/improvements	95%	0%	0%	100%	Demo UI further in testing to ensure client satisfaction.
Implement, test, and demo additions to Analysis Tool (filtering, calculated data relationships, csv exporting)	85%	0%	90%	10%	Test further with different data loads and csv file downloads.
Implement, test, and demo user notifications	40%	90%	10%	0%	SMTP Server needs to be set up and implement text notifications.

Discussion of each accomplished task (and obstacles) for the current Milestone:

- Implement, test, and demo interface between frontend, backend, and database
    - Frontend, backend, and database elements of the system are cohesive and work together as intended. All sensor data is stored in the database from the backend. The frontend system can query the database for readings to be sent to remote clients.

- Implement, test, and demo water sensor implementation
    - System is able to connect the water sensor, read the values, store them to the database, and display them accurately on the user interface.
- Implement, test, and demo UI tweaks/improvements
    - Tweaks and improvements have been made to the GUI to ensure it is completely functional, user-friendly, and intuitive.
- Implement, test, and demo additions to Analysis Tool (filtering, calculated data relationships, csv exporting)
    - Analysis tool is functional and works as intended. Users can access all data and filter via time and sensor/measurement. Calculated data relationships are displayed and filtered data can be downloaded to a client's computer in a csv file.
- Implement, test, and demo user notifications
    - The system checks if read values are within acceptable ranges. A notification is displayed on the control computer's screen, but no email is sent. Google disabled the API system we were going to use to send these emails in January 2025, which means we will be using a different SMTP mail system.

Discussion of contribution of each team member to the current Milestone:

- Gregory Thompson:
    - Designed the system to transfer data from sensors to the database. Formalized the execution flow to allow the web app frontend to operate simultaneously with the back end. Created the system for sensor readings to be checked against acceptable ranges and display out-of-bounds messages on the screen.
- Haley Hamilton:
    - Worked with the water sensor to connect, read measurements, and implement it into the main system to record measurements to the database and display to the user interface. Allowed the backend to read from the database to configure the main program using user imputed sensor data and allowed the sensor data to be stored in the database. Developed the analysis tool, ensuring the frontend can access and display all0 data from the database and users can filter this data and download it to their computer in a csv file.
- Ruth Garcia:
    - Made style and functional tweaks and improvements to the user interface to ensure client satisfaction and functional requirements.

Task matrix for Milestone 4

Task	Greg	Haley	Ruth
Implement, test, and demo *all sensor implementations*	0%	100%	0%
Implement, test, and demo *program recovery after shutdown*	50%	50%	0%
Implement, test, and demo *backing up data/disk space management*	80%	20%	0%
Implement, test, and demo user notifications	100%	0%	0%
Conduct evaluation and analyze results	33%	33%	33%
Create poster for Senior Design Showcase	0%	0%	100%

Discussion of each planned task for the next Milestone

- Implement, test, and demo all sensor implementations
    - Assuming we have access to all sensors, we will implement classes to enable the software to read values from each of the sensors and ensure all measurements can be stored to the database, displayed on the frontend, and filtered using the analysis tool. If we do not have access to the necessary sensors, we will simulate multiple different sensors and measurements using an arduino to demonstrate functionality.
- Implement, test, and demo program recovery after shutdown
    - In the event of a system shutdown, it must be able to relaunch without losing all prior data. This will be implemented during this milestone.
- Implement, test, and demo backing up data/disk space management
    - The functionality to export data to other devices is necessary to ensure the main drive does not run out of space. We will implement a display on the GUI to show

the user how much disk space is being taken up. This way they are aware of when it's getting full and can export the data when needed.

- Implement, test, and demo user notifications
    - Continue from the last milestone to set up a SMTP Server for email notifications and implement text notifications.
- Conduct evaluation and analyze results
    - This task includes looking at our documentation and doing a product evaluation to see what requirements we have or have not met and analyze the results to identify elements we need to improve.
- Create poster for Senior Design Showcase

Date(s) of meeting(s) with Client during the current milestone: Wednesday, February 5th 2025
Client feedback on the current milestone:

- We updated the client on where we are in the development process and what the upcoming milestones look like. We discussed when sensors would arrive and were informed of sensor updates that are still in progress. We confirmed that we have implemented the current water sensor they have and they are satisfied with this progress.

Date(s) of meeting(s) with Faculty Advisor during the current milestone: Communicated via email.
Faculty Advisor feedback on each task for the current Milestone:

- Implement, test, and demo interface between frontend, backend, and database (Satisfied)
- Implement, test, and demo water sensor implementation (Satisfied)
- Implement, test, and demo UI tweaks/improvements (Satisfied)
- Implement, test, and demo additions to Analysis Tool (Satisfied)
- Implement, test, and demo user notifications (Satisfied)

Faculty Advisor Signature: _____Khaled Slhoub_____ Date: ____2/20/2025_____

Evaluation by Faculty Advisor
Faculty Advisor: detach and return this page to Dr. Chan (HC 209) or email the scores to pkc@cs.fit.edu

Score (0-10) for each member: circle a score (or circle two adjacent scores for .25 or write down a real number between 0 and 10)

Gregory Thompson	0	1	2	3	4	5	5.5	6	6.5	7	7.5	8	8.5	9	9.5	10
Haley Hamilton	0	1	2	3	4	5	5.5	6	6.5	7	7.5	8	8.5	9	9.5	10
Ruth Garcia	0	1	2	3	4	5	5.5	6	6.5	7	7.5	8	8.5	9	9.5	10

Faculty Advisor Signature: _____ Date: _____