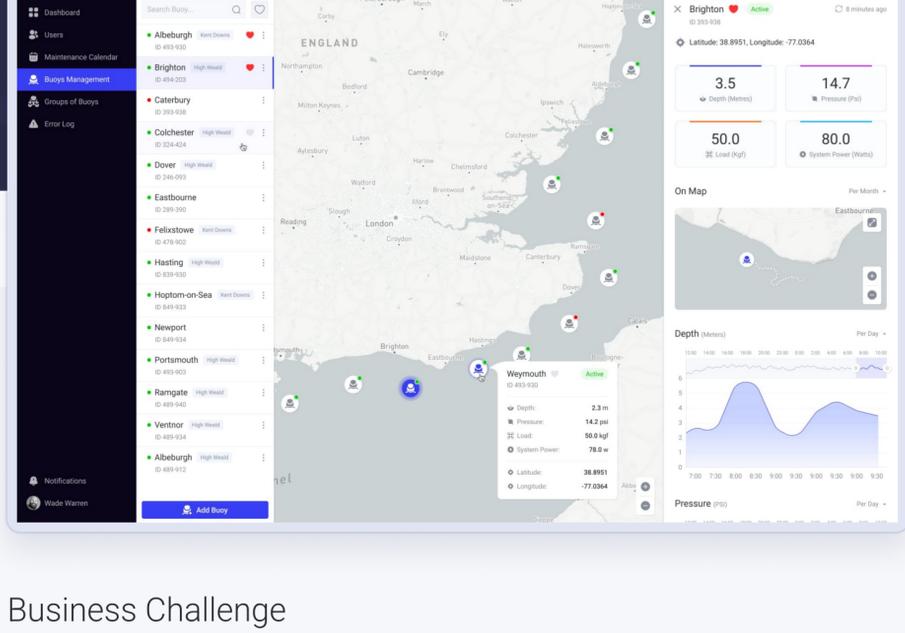


## Navigation Buoys GPS Tracking and Monitoring Solution

GPS tracking web application system for navigating, monitoring the location and data of marine buoys. The buoys have GPS trackers that are connected to the satellites to ensure real-time data monitoring.



### Business Challenge

Be it a fisherman, boater, scientists, or a group of people that has any other reason to be on the water, it is vital for everybody to be safe while afloat. One way to do so is by using buoys. With their help, it is possible to measure barometric pressure, wind direction and speed, etc. They are used for sea level and research and can aid in monitoring areas that are difficult to reach. In order to get and monitor all the data, one needs to use GPS trackers and software that will obtain and process the information.

Considering that navigation buoys are deployed in remote locations, it can be difficult and costly to maintain them manually. Our client faced the challenge of developing a solution that is cost-effective and easy to deploy. They needed to create a solution that can be easily installed and monitored remotely, reducing the need for frequent site visits.

### Solution

A customer asked us to create a convenient software tool that will help with tracking and monitoring the marine buoys, their location, and gathered data. GPS buoys should be connected to the satellites, and the navigation buoys GPS tracking and monitoring solution would receive the data.

To satisfy the client's requirements, our team developed a web application with an implemented [GPS tracking system](#). The application provides detailed information on real-time data on marine buoys, such as depth, pressure, load, system power, etc. All buoys have unique IDs to let the app users identify the particular device the obtained data belongs to.

All data is recorded including the situations when a buoy returns an error or doesn't send data and becomes disconnected from the system. In this case, an email notification is sent to all the users who are responsible. To make it more convenient, admin is able to manage the template of an error notification, by changing text or inserting links.

The application creates a list of all maintenance tasks and errors received from buoys in order to let users choose the further actions. They can schedule future events that need to be performed for a buoy and add notes. Also, new maintenance tasks can be added into the list and shared in the calendar. The users are able to specify the type of the event, its date and time, and add description. A user can choose to receive notifications about a maintenance event they've chosen.

The buoy software shows the map with markers each belonging to a specified buoy. Every marker contains the information about the buoy and the diagnosis box with the gathered data. One can see the mooring buoys statuses (active, inactive, error, etc.) and ID number, the nearby city it was located the last time, and the user that is responsible. Admin has access to all buoys in the system, while users have access to those that belong to the group assigned to them or their account. The application requests data on buoys automatically after a certain time, specified by the admin. The data can also be updated upon request manually if needed.

To have a better understanding of the responsibilities and received data, the GPS tracking and monitoring solution offers unique functionality for admin and users.

### Admin

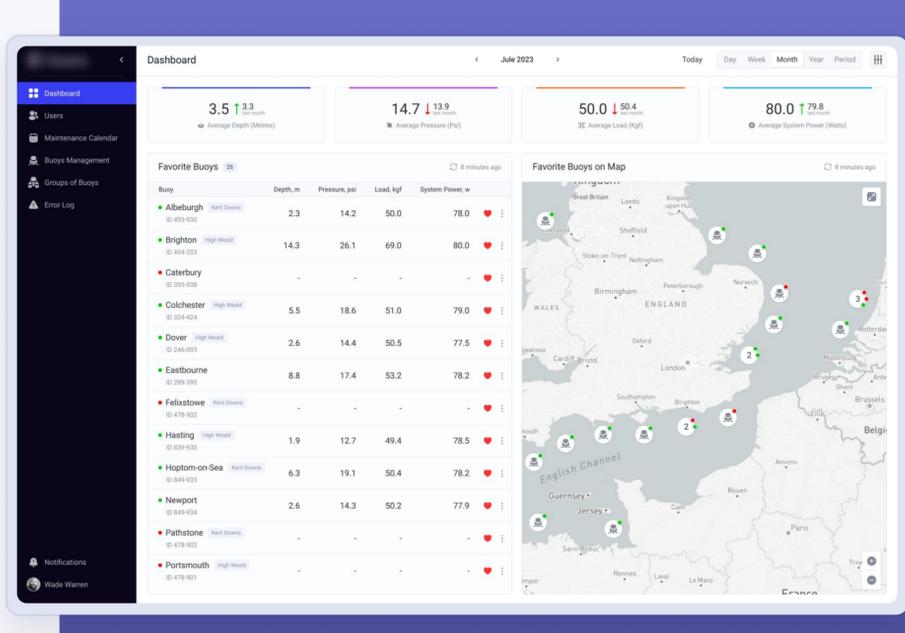
The admin can change the information on users including their email address or delete them from the application. They can also manage the rights of users and groups, such as viewing buoys, accessing data history, receiving errors, adding notes and logs. The admin can unite buoys into groups and assign them to certain users. Each buoy can belong to several groups at once.

If required, the admin can create new buoys in the buoyage system by specifying their IDs and additional information. They see the full list of buoys and are able to edit the information or delete buoys from the list.

### Users

Users can change their own information and can be united into groups, each with its own name and description. They are also able to switch between the map view and the table view to see all buoys accessible to them and their latest data, including the ones, whose location is unknown.

For each buoy, a user can access its data history with a map that shows the changes in buoy's location. Users are able to bookmark the buoys, which they find the most important, as well as add notes or specific timestamps of a buoy's data to the log.



### Project in Figures

9+

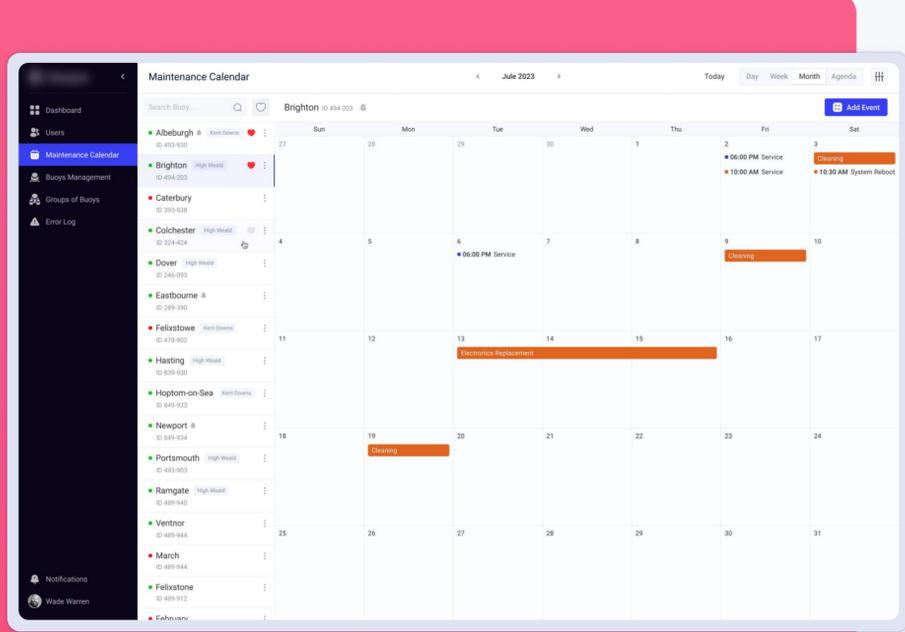
Month

Duration

4000+

Estimated

man-hours



### Applied Technologies



### Result

The navigation buoys GPS tracking and monitoring system allows access to the required information on buoys, their accurate position, etc. which helps users to make better navigation and research decisions.

**Your questions and requests are always welcome!**