General ideas on what the company does:

QuantumGPS tests sonobuoys which is an 8-hour testing process where data is updated once every 5 seconds.

Current System:

Each sonobuoy is equipped with GPS and is controlled from the control center. Raw data is collected and translated into a text file in GPRMC format. Information like the past locations of the sonobuoy and the current location is available.

The receivers pick up data from the sonobuoys and it is demodulated to be stored in the text files. A company-owned server stores all data. At a single time, a maximum of 16 sonobuoys can be dropped and about 8 sonobuoys share one receiver. Each buoy covers an area of several miles.

The current systems run on Windows 7 or 8. They might upgrade to Windows 10 in the future. Standalone system. No special hardware systems. (out of scope)

Stakeholders, who want to interact with the data and need data analysts to bring the data up.

The collected data is stored in disks for future reviews of the timelines.

The receiver boats do not have their own GPS coordinates and neither the coordinates of other boats.

Once the test is over, the scientists get the text files. Data analysts are always there.

QuantumGPS keep copies of data for further testing and review.

They work out the files and send a more readable version of the text file to the scientists.

Problem:

Due to the complexity of the data, only data analysts and use and interact with data right now. The data in the text file is extremely clustered and hard to filter by the stakeholders due to their lack of technical knowledge.

In case of data loss due to interference with the radio waves, the data is completely lost. Corrupted data. No recovery method.

Even though a range is set, sometimes the sonobuoys go out of range of the receivers and the data is lost.

Requirement:

The stakeholders want to improve visualization, filter data, measure relative distance from different coordinates, get GPS information of other ships in the range.
They want a centralized system to control and navigate through the data and sonobuoys.
Provide reconfigurability
Filter or measure and compare to existing data
Minimize interference, correct “stupid” data
Visualize correct data, smart options in case of interference: Keep the data in text files
Support zoom, pan, rotate options to get coordinates of sonobuoys, relative direction to the skippers(on retrieval boats) who are in the test are so they can navigate around the sonobuoy
Only show specific sonobuoys, mark them
Retrieval boats may or may not have GPS data
Click and see the GPS coordinates of a buoy.
No proprietary systems! Cannot be incorporated
Technical analysts should be able to do everything
No internet
ZULU time !!
Once
The program should work with the text file that stores data
Negotiable $30000