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Background



Employee health condition and fatigue are heavy factors when it comes to productivity and safety in the offshore oil industry. Furthermore, multiple incidents in the offshore oil and gas industry have been associated with poor safety culture. This study is part of a larger project (named EMPOWER) that aims to design a dashboard to display safety culture and worker fatigue data to be used in offshore drilling industry. Such dashboard can potentially present crew safety and fatigue information that can potentially help rig supervisors make critical decisions and improve safety.

Research Aims

This project aims to gather health and safety data from volunteers aboard an oil rig in order develop a user friendly dashboard that is updated in real time and is usable to predict potential risks as well as track and measure performance. To this end, we seek to come up with a well defined list of potential user requirements necessary in accordance with the 9 item list of safety characteristics and elements of robust safety culture designed by the committee of offshore oil and gas industry safety culture.

Methods

Survey & Market Search

By developing a survey for potential customers and users of this dashboard, we are seeking to quantify the preferences of multiple experts and workers in the industry. Through the search of existing dashboards and applicable publications, we intend to find best practices as well as potential sources of innovative design. The survey is designed for any user of a college level academic background to take. The purpose of this survey is to see which visual cues and design requirements satisfy them best while making a decision.

Prototype Development

Utilizing the figma software we are currently in the development of the User interface and dashboard design. By combining the market search and survey results, we look to develop an efficient system for the end user. The prototype will follow an executive summary that will further

Results

Market Search and Survey Question Examples

- Preliminary results of dashboards has not yielded any existing examples of our project aims. We have found methods in data visualization that will be implemented.
- Survey Question Examples:
 - . When you're trying to make quick precise decisions, rank the following options of which data indicator would draw your attention first.
 - . Graph Indicators
 - . Numerical Color indicators With Label
 - . Combination of Both
 - . Would you prefer to see multiple graphs on one interface, or have a slider that looks allows you to only view one graph at a time?

Prototyping with User interface design and Dashboard

- Developing computer interface design before mobile application
- Emphasis on making the design follow an executive Dashboard approach
- Implementing white space and coloration cues to help visually assist user
- Further stages in design will be dedicated to back end development or architecture.

Implications

In the oil and gas industry, we expect the integration of this dashboard and others like it to set a standard for future safety data visualization and performance dashboards.

With regards to dashboards in general, dashboards lack standards, so most dashboard interfaces only have have user requirements as the standard for design and development. This dashboard looks to put an emphasis on effectively merging safety data with an executive dashboard.

Future Work

Data Collection

Project EMPOWER is conducting a workshop to get more design requirements from industry workers. Our team will benefit in implementing results from this workshop in our prototyping stage.

Dashboard Design

Cater prototype to design requirements from workshop and survey. Integrate more advanced data sets into the prototype. Possibly get the opportunity to implement back end development in coming months.

Collaboration with Industry

In early trials, we look to bring in rig supervisors and employees to test the software and furthermore assist in the implementation of safety data within the rig operations.