Single Page Applications

Modular situational awareness tools for data visualization

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In cooperation with:
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Introduction KUES

- Core task
  - „Design a GUI that allows to monitor selected indicators of Offshore Wind Farms."

- For the presentation we will focus on data representation

- Different tasks were important
  - AIS Data
  - Turbine Data
  - Bayesian Network

source: Dudgeonoffshorewind.co.uk, Globaltechone.de
Methodology of the Framework

• Used Angular as a Framework
  ▪ Allows for Single Page Application (SPA) approach
  ▪ „A SPA is a web application that interacts with the user by dynamically rewriting the current web-page with new data from the web-server […].“
• Also used a small backend
  ▪ Answering calls from the SPA
  ▪ Responsible for pre-processing of data

Implementation KUES
Introduction Risk Register

• A Database to store Entities, Reports and Scenarios
  ▪ Risks are assigned by the user based on data
  ▪ User should compare current risk to stored risks and assess the situation
  ▪ Theory and Database model were created by Dr. Arto Niemi

• Main goal -> Create a user friendly GUI
  ▪ Search data and represent it for the user
  ▪ Add new data

• Again Angular was used with a Python (Flask) backed
# Implementation Risk Register

*Entity: Personnel member*

A person who is present in a professional context.

<table>
<thead>
<tr>
<th>Domain</th>
<th>Likelihood</th>
<th>Impact</th>
<th>Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personnel safety</td>
<td>Rarely occurs</td>
<td>Fatality, extensive or catastrophic damage</td>
<td>RGR: 255.000.000.000</td>
</tr>
</tbody>
</table>

**Report:** Quantification of Occupational Safety for Offshore Wind Farms  
**Author:** Jennifer Mielczak  
**School:** Jade University of Applied Sciences  
**Type:** Master Thesis  
**Year:** 2019

**Scenario:** A member of personnel is hit by ice falling from a wind turbine blade
Visualization of the Framework
Conclusion

- Web applications are very flexible
  - As an example the map could also be used for (air) traffic visualization
- Allows for more interaction with data
- „Low“ entry level
  - Requires a bit of knowledge in TypeScript and Python
  - After this a lot of existing libraries can be used
  - JavaScript for easy front-end visualization

Thank you for your attention!
Questions

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