Design of a locomotive UI for system testing

Graduate

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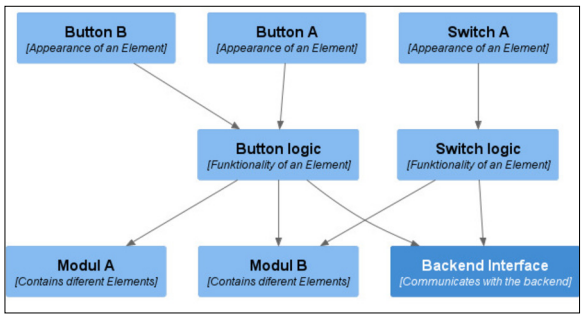
Objective: Testing new components on a real locomotive is expensive. That is why there exists simulations for locomotives. The aim of this project is to design and develop a prototype of a GUI for system testing, which can interact with a new simulation system that is still under construction. The new Application should have improved usability and structure, limited on a locomotive driver's cab for the time being. The design approach should be inspired by a real locomotive. Expandability, variability and modularization are particularly important. The new application should serve as a foundation for future expansion, accommodating additional views, variants, and functionalities.

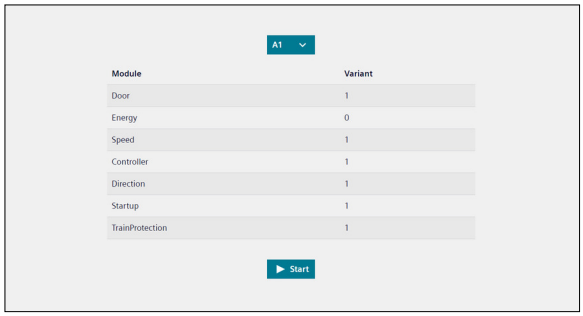
Approach: A component-based stateless user interface using web technologies is implemented that can be integrated into the new simulation system. This prototype aims to provide an intuitive user experience by aligning the structure with the real locomotive. This is achieved with usability test, official documentation and a test scenario for putting the locomotive into operation. The application should also be easily configurable to support different variants. Although the system is a prototype, it provides insight into how a new and improved user interface can be achieved and serves as a starting point for future developments. To simulate the prospective interface connection, a mock backend was created, as the actual backend implementation is pending.

Conclusion: A component-based UI prototype for a locomotive testing system, with focus on the cab was developed. The system is designed to be expandable so that other modules and overviews can be added in the future. A key feature is the customization capability through a configuration file in CSV format allowing flexible configuration of modules and variants. The prototype also includes a collection of components and modules available in Figma and React. This project provides a solid foundation for further development and demonstrates the possibilities of extending the application with additional views and functionality, serving as a valuable platform for ongoing work in this area.

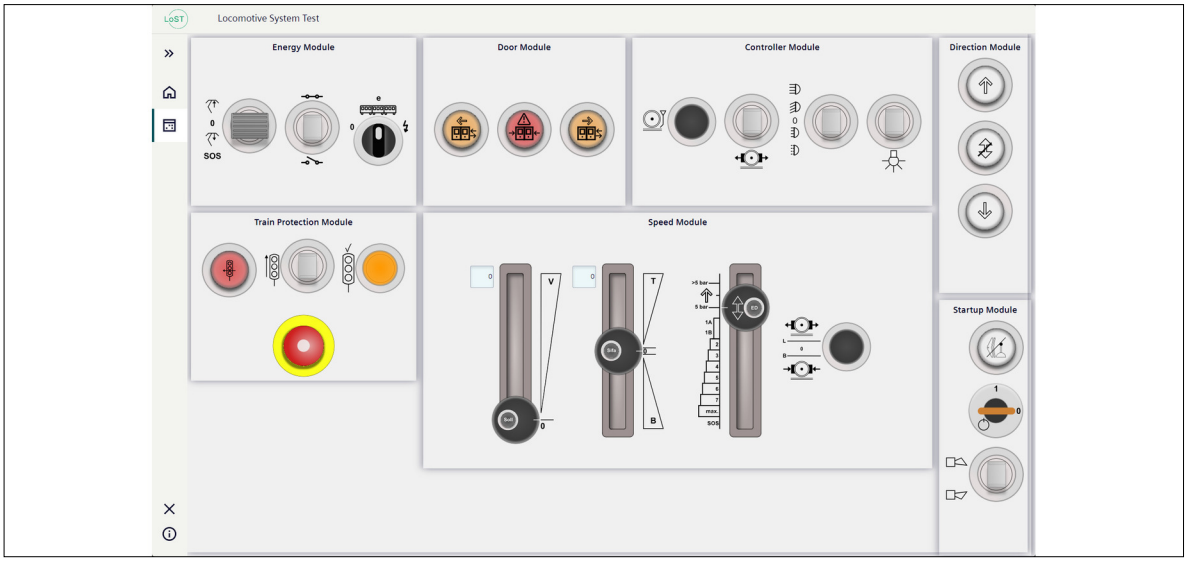
Component structure
Own presentment



Configuration screen
Own presentment



UI of driver's compartment
Own presentment



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Subject Area
Application Design, Software, Software Engineering - Core Systems