# Rail4Future

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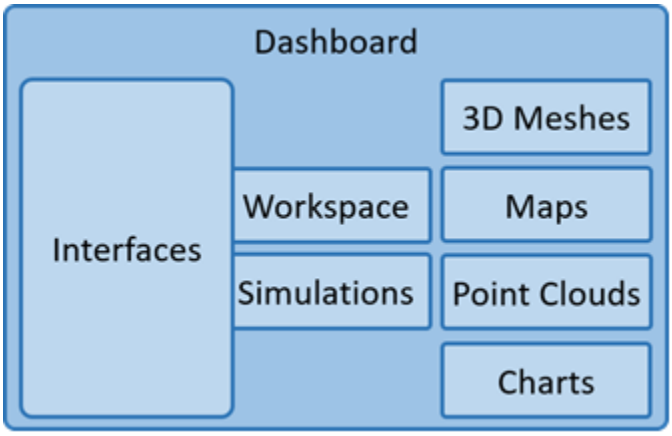
| Projekttitel: | **Resilient Digital Railway Systems to enhance performance** |
| Projektnummer: | **882504** |
| Deliverable: | **1.2.2 Specification of Visual Analysis Framework** |

The system architecture of the Rail4Future platform's visualization layer is presented in this deliverable. The visualization layer comprises modules for different visualization modalities, including point cloud visualization, 3D mesh visualization, maps, charts, and simulations. These modules are combined in the dashboard module, which also includes a workspace module for asset management. Interfaces connect the visualization layer to the rest of the Rail4Future platform.




The chosen architecture provides flexibility and scalability by allowing for the addition of new visualization modules in the future. The separation of basic functionality from higher-level visualization modules helps to avoid code duplication and inefficiencies.

The geospatial module handles geospatial data and includes functionality for coordinate transformations and working with GeoJSON files. The UI module provides user interface elements required by other modules, including basic and complex elements. The simulations module allows configuration, initiation, and exploration of simulation results. The maps module employs the Leaflet library for interactive map display and manipulation. The charts module utilizes the D3.js library to display and interact with different generic and domain specific charts. The point clouds module is dedicated to the display of and interaction with large point cloud datasets. The workspace module handles asset management, providing a graphical user interface elements for asset selection.

Finally, the dashboard module combines the workspace module and visualization modules, using the GoldenLayout library for flexible and interactive layouts. It allows for the configuration of layouts and the creation of specific use cases. The modular approach minimizes the effort required to create new use cases.

Overall, the system architecture of the Rail4Future platform's visualization layer provides a flexible and extensible solution for visualizing data in various modalities, supporting efficient interactive analysis.