Web Programming

Case Study - Openlab Drilling

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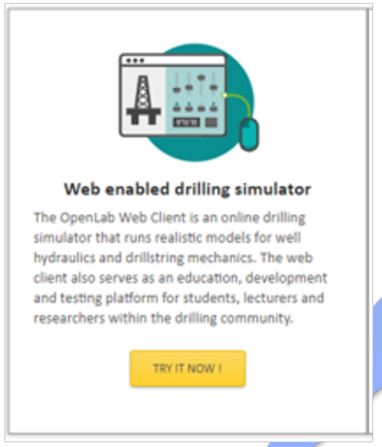
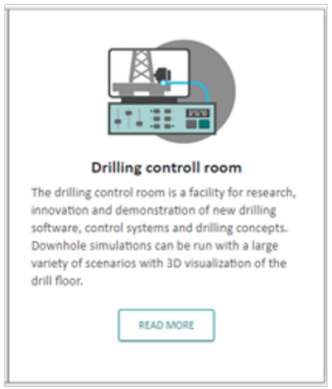
Openlab Drilling

- Digital infrastructure
- Financed by the research council
- Drilling simulation through the web

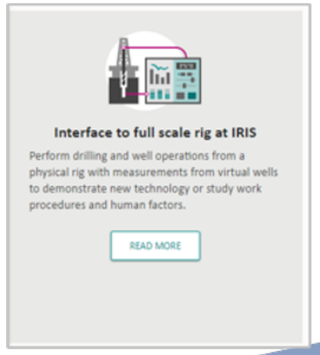
Purpose: Qualifiying automated drilling systems



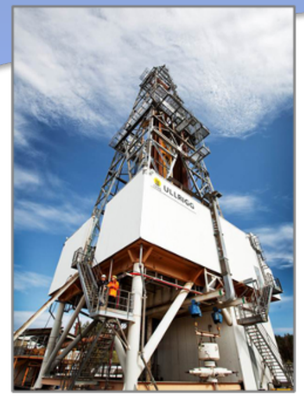
Verification against simulated or real drilling data



Testing in unique virtual rig environment



Full-scale testing at Ullrigg



Offshore deployment

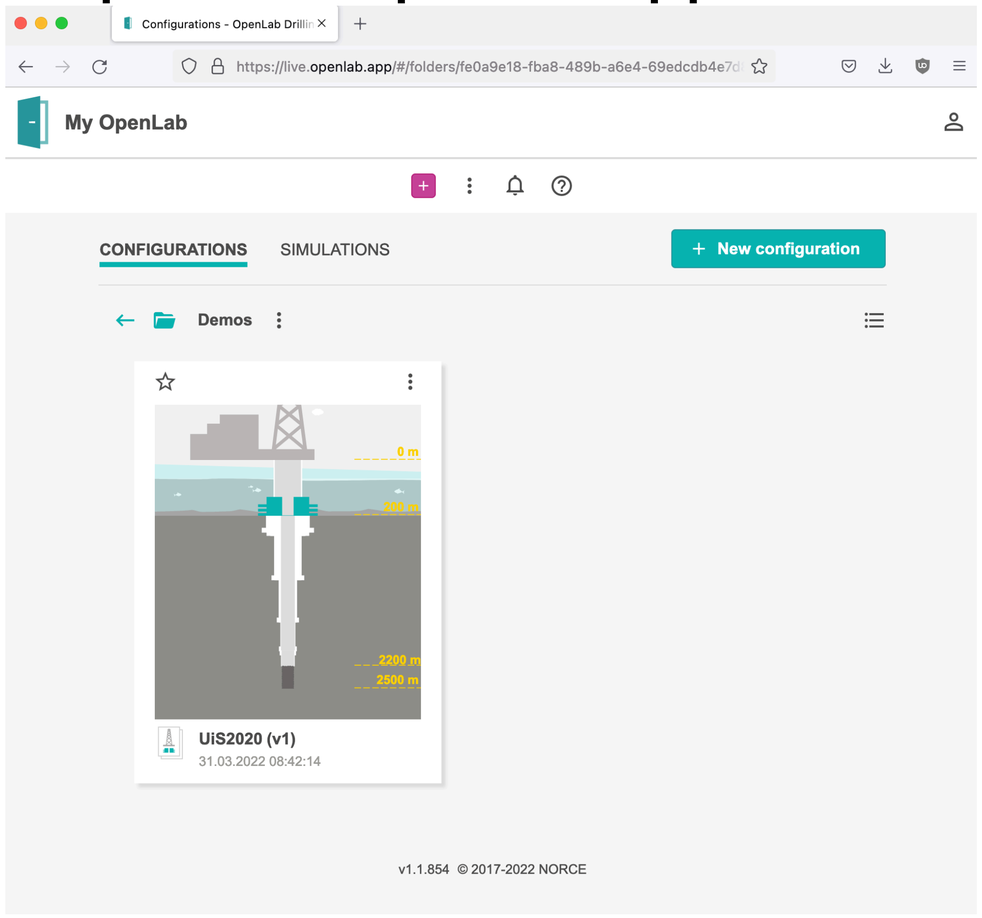
Drilling control room

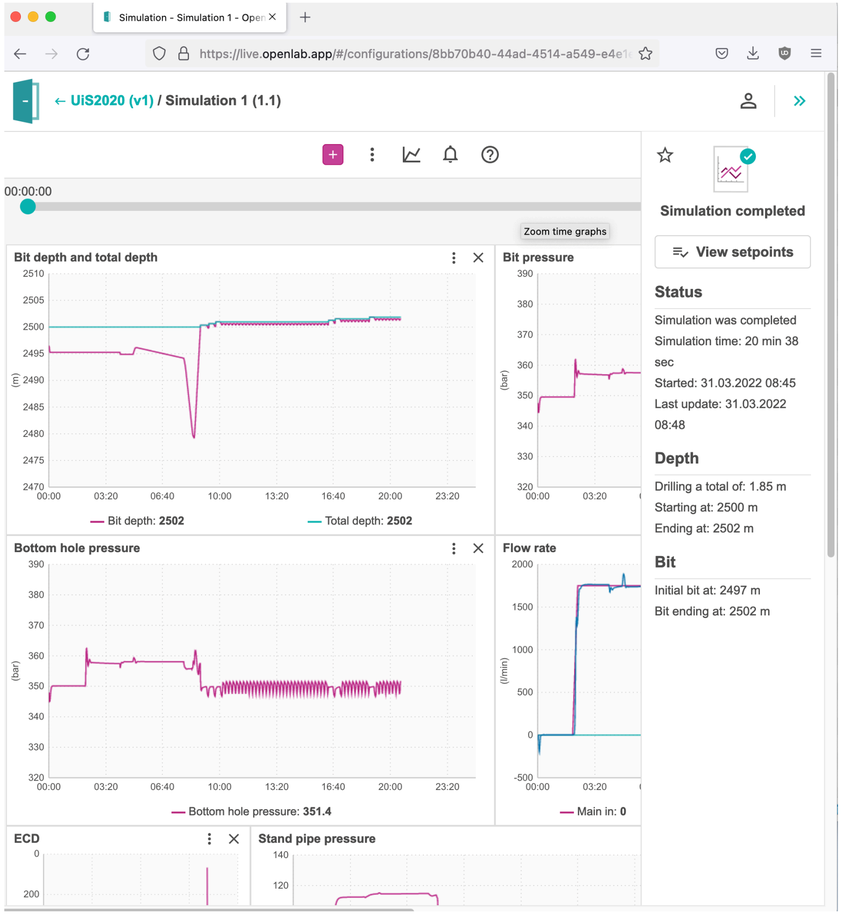
Outline

- Demo
- Requirements, constraints and context
- Development process
- Technology used
- Architecture
- Challenges

Demo

https://live.openlab.app





Requirements, constraints and context

- Allow web access to an existing simulator software
- Allow simulation 10x faster than realtime
- Create the necessary server infrastructure
- Allow simulations to be saved
- Allow other clients (Matlab, python)
- Don’t modify the simulation software
- Work with the competence available

Development process

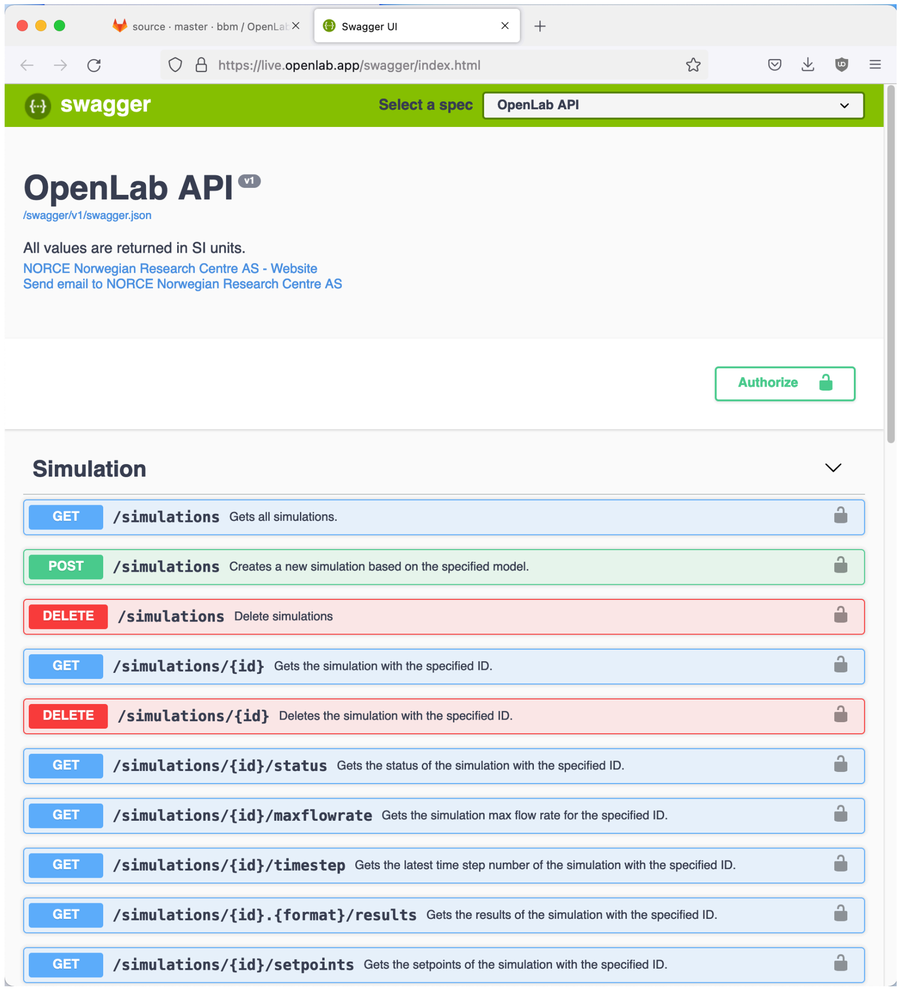
- Team: Project leader, Design and User Experience (UX), Developers with frontend experience, backend experience and simulation
- One page basic requirements
- Specification of user personas (Students, Educators, Researchers/Engineers)
- Continuous specification of the workflow and user interface
- User surveys feedback

Technology used

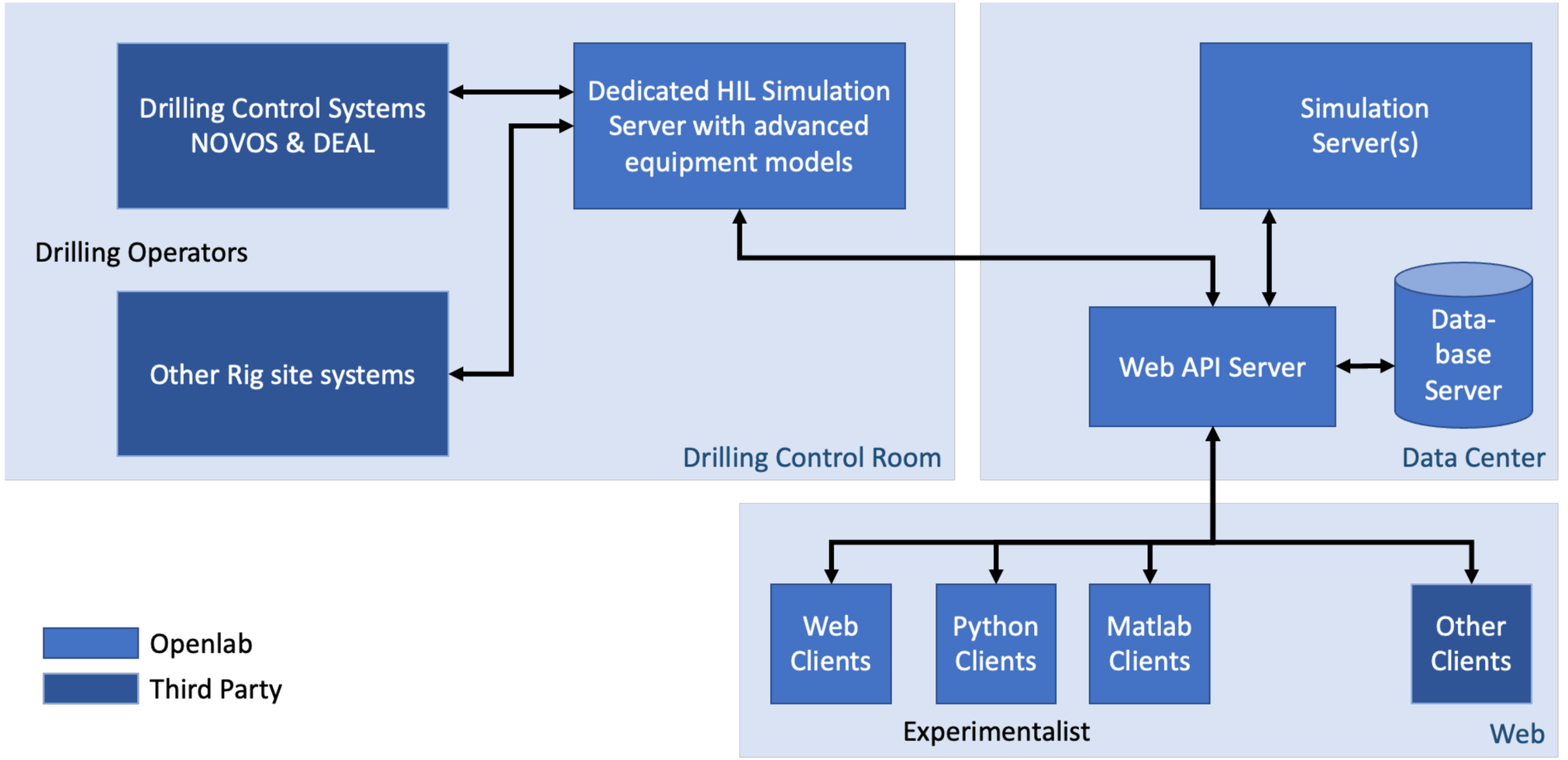
- Backend: C#, ASP.net, ClojureCLR
- Frontent: ClojureScript, Re-frame
- Database: Postgres

Architecture: Software

- WebAPI service
- Watchdog service
- Database service
- Simulation processes



Architecture: Deployment



Challenges

- Initial database schema not performant when deleting
- Multiple revisions of UX with big workflow changes
- Render much data quickly on web