

This Bachelor's final assignment describes the design process of a final design proposal of an operations room for Royal Netherlands Navy vessels that contains conceptual solutions to improve staff interaction. In this assignment commissioned by the Royal Netherlands Navy, TNO is tasked to research and design conceptual solutions that would improve staff interaction in a Royal Netherlands Navy Operations room. This Bachelor's final assignment is set up in six different phases. These phases are Introduction, Research & Analysis, Conceptualisation, Detailing, Evaluation and Conclusion.

The report starts with setting the main and sub research questions. The main research question is:

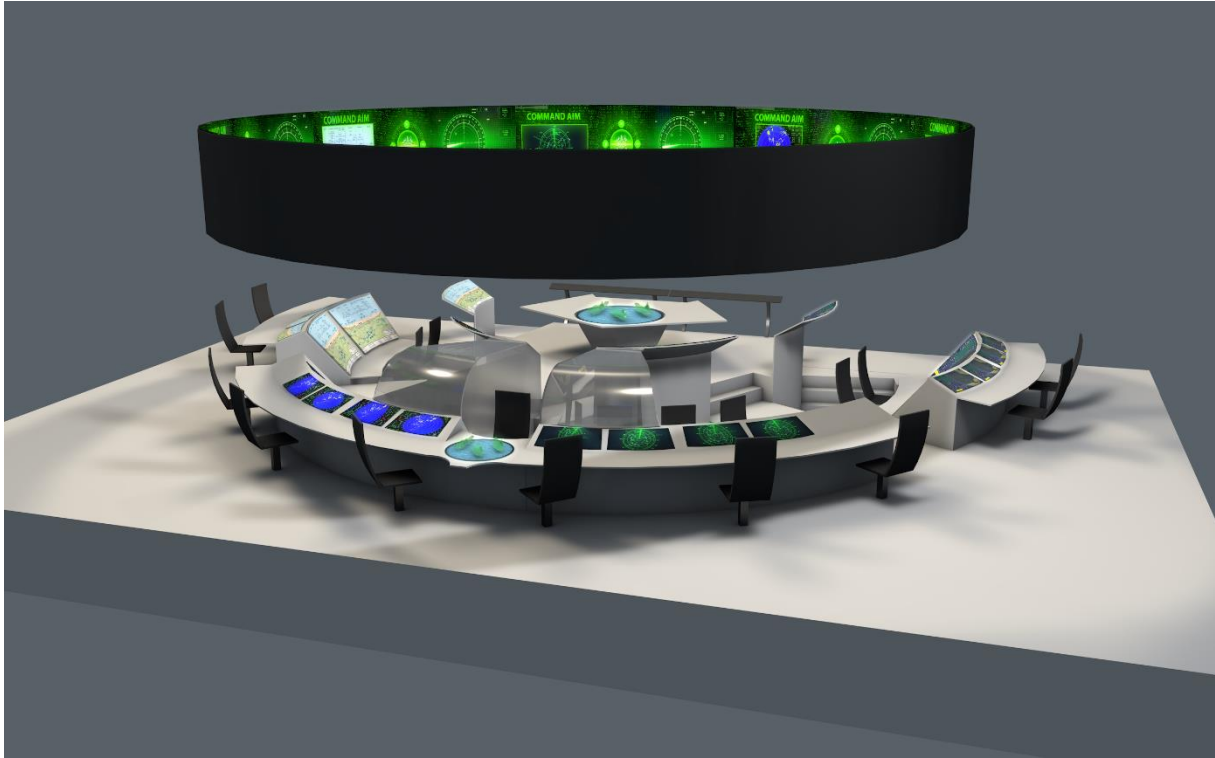
*“What conceptual solutions help improve staff interaction in operations rooms of Royal Netherlands Navy Vessels?”*

The research and analysis chapter summarizes the investigation that was done to find the answers to the research questions laid out in the introductory chapter. This starts off with a theoretical framework where relevant vessels and their operations rooms are analysed. This is followed up by a literature study on staff interaction as well as an interaction analysis for the relevant operations room personnel. This information is translated into archetypical personas. This is used as a framework for the conceptualisation phase and showcases the different tasks and needs from operations room personnel. Lastly ergonomics for operations rooms is researched to conclude the requirement specification. This requirement specification is used to serve as a guideline for the conceptualisation and detailing phase.

The conceptualisation phase starts with laying out the concept of a design funnel. This is the process that is used to develop concepts. This starts off with an inspiration phase that draws inspiration from a broad spectrum of sources and translates them in to concrete ideas. These ideas are further worked out to create four concepts. This phase is concluded with a concept validation that results in individual conceptual solutions from these four concepts that are further iterated upon.

The detailing phase takes the core conceptual solutions presented in the conceptualisation phase and combines them to create a follow-up concept. This follow-up concept is analysed and validated to create the final concept. The final concept is the last iteration that is made to the follow-up concept.

The final concept consists This final design has the shape of a crescent moon and is divided into four different compartments that meet in the middle at an elevated command podium. On this command podium a command desk with a hologram can be found where a situational overview can be presented. This design focuses on creating a dynamic working environment. Because of the open layout design, walking around and collaborating is better supported. This design also offers the possibility to choose between sitting at one of the consoles within a team and standing at the central command desk on the stage. This command desk is easily accessible due to the different walkways leading up to it. The design can be seen in the figure below.



To test the final concept on the project aim as well as the requirement specification, an evaluation was conducted. This evaluation was done with a specific target group of operations room personnel of the Royal Netherlands Navy. This evaluation consisted out of an interactive questionnaire as well as a supporting interactive application of the final model. In this evaluation, some overall domains like overview and cooperation were tested as well as specific design features of the final design.

The final design does offer some interesting conceptual solutions that have a potential future in operations rooms of the Royal Netherlands Navy. The final concept itself was deemed to unrealistic to be implemented as is. The recommendation towards TNO is therefore to further analyse the singular conceptual solutions that make up the final design, and see which would be beneficial to use in future operations rooms. This report along with the presented conceptual solutions could serve as concrete inspiration for this.