Over the last 30 years, the Sonar group at TNO has been developing and improving a computation kernel to estimate sonar performance. This application, commonly referred to as ALMOST, is used by many research projects and end-user applications, both inside and outside TNO. Projects that make use of it include an underwater testbed for tactical analysis, research-oriented sonar modeling and deployed sonar simulation applications. However, all of these applications leveraged ALMOST differently: some used project-specific library bindings, some used files to exchange information and others used proprietary network communication mechanisms.

This fragmented state of affairs could be attributed a myriad of factors, but chief amongst them was TNO's focus on self-contained projects. In particular, this approach led to every project tuning the core application and using its own mechanism to interface with ALMOST. Furthermore, these different project-specific interfaces can be traced back to the fact that Fortran was the main language used in ALMOST's implementation. This in turn created maintainability problems, obfuscated the algorithms at play and complicated attempts to exploit parallelism at the algorithm level.

Therefore, the aim of Jonathan's project was to bring ALMOST to the 21st century. Not necessarily by rewriting it, due to the domain knowledge required, but making sense of it and extending it. In particular, this project was a prime opportunity to explore a more holistic approach to the problem; an approach that could focus on all the projects in unison and not just cater to their needs individually.

The final solution focused on a service-oriented architecture, aimed at providing a simple interface over network and language barriers. This immediately reduces fragmentation by directing all communication through a single common interface. Other activities carried out in the course of the project included transferring the main program flow to C++ and designing the solution to exploit parallelism whenever possible. Jonathan's focus on bringing multiple existing tools and frameworks together allowed him to provide usage documentation, examples in different languages and a comprehensive regression test suite alongside the main service-oriented ALMOST.

In closing, the use of a service-oriented architecture model will allow TNO to leverage ALMOST across different platforms and explore new use cases. This in turn will ensure the future of the tool itself and its continued use aboard navy vessels.