

Open Architecture Framework for Improved Early Stage Submarine Design

by

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Abstract

Could transparency between current disparate methods improve efficiency in early stage submarine design? Does the lack of transparency between current design methods hinder the effectiveness of early stage submarine design? This thesis proposes that coordinating data and design methods from current disparate sources would improve the initial early stage submarine design process. Improvements achieved through knowledge capture include:

- the making available of options in determining key naval architecture values,
- the ability to compare and contrast said options, both by results and underlying principles/assumptions,
- and an overall process for developing key naval architecture values, to be used in later stages of design, that is easily expandable to incorporate further unleveraged design processes or newly developed data.

The designer is encouraged through this approach to critically evaluate the data, customer requirements, and design philosophy they are bringing to the design. Capturing the knowledge of multiple design traditions means the decisions and calculations made while stepping through a design are no longer locked into a single frame of reference. The appropriateness of each decision is better understood within the context of the greater knowledge of submarine design. This flexibility in approach allows decision making such that the assumptions made during design best reflect the design scenario. Use of an open architecture to map how key naval architecture values are handled in different current methods may also provide the designer with insights which would otherwise remain hidden.

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