Public
Summary

Problem definition

The scope of WP5, Platform-based product family design & production, despite being elaborately described in the NAVAIS Project plan, is still open for many interpretations. In deliverable 5.1 a vocabulary is developed and the requirement needs are investigated to provide a solid basis for the further development and refinement for the work to be carried out in WP5. Due to the complexity of the task at hand it was found that convergence on requirements is for now only possible at a high abstraction level since the NAVAIS principles and working methods need still to be developed in consecutive working packages. Therefore, an iterative approach for providing further detail to the requirements is adopted, where this deliverable is the starting point for developing the relevant principles and working methods for both the working environment and the product and production phases of a modular ship produced by applying modular production principles. Throughout the execution of WP5 the requirements in this deliverable are further refined and used as a basis for the feasibility assessment halfway the project.

Methods applied

Since Damen, with different entities, is one of the leading partners in the consortium that intends to implement the ship design procedures developed in NAVAIS, partner DSGo took the lead in the works for D5.1. This is done primarily by interviewing experts within Damen, Dassault Systemes and Bureau Veritas to investigate the current design procedures and methodologies and from there on detail out the possible directions for the developments in NAVAIS and identify specific areas where requirements are needed. This resulted in a list of high-level requirements that will need further detailing as soon as the works for NAVAIS are progressing and the methodologies and procedures are becoming clearer. This iterative approach is required because the NAVAIS results are yet unknown or under development, so drafting too detailed requirements will quickly result in defining solutions that are not necessarily in line with the high-level requirements. The adopted approach is in line with the systems engineering approach for the project execution as described in the earlier NAVAIS deliverables.

To enable a meaningful conversation a glossary of definitions is also developed. These are an addition to the definitions formulated in the previous deliverables

Deliverable results

The main results are categorised in the following groups:
- Requirements for functional decomposition
- Requirements for Modules and their attributes
- Requirements for Systems Engineering based design procedure
- Requirements for Modular production approach
- Requirements for NAVAIS Working Environment

Furthermore, a comprehensive list of definitions to be used throughout the execution of WP5 is developed of which the most important ones are repeated here:

RFLP framework : a systems engineering framework to manage complexity by identifying different product structures:

o Product Requirements structure (R) - What is expected from the product in terms of the customer? What the system should satisfy? (mission, safety, regulation...)

o Functional product structure (F) What is expected from the product in terms of the naval architect? What the system should do? What the system does? (functionalities)

o Logical product structure (L) How are the functions realized by the systems of the product? How the system will be constituted? What the system is? What technology will be used? (equipment, parts, interfaces...)

o Physical product structure (P)How are the systems combining into a product that is to be used as input for the manufacturing definitions.

Module : Each of a set of jointly standardized parts or independent units that can be used to construct a more complex structure. Modules can be defined on the level of Function (F), Logical (L), Physical (P) and manufacturing level.

Platform-based product family : the different product variants enabled by or built upon the shared and common features, subsystems, interfaces and/or manufacturing processes.

Conclusions and recommendation

Based on the analysis as reported in this deliverable a number of high-level requirements and requirement needs have been drafted. For the further successful implementation of the NAVAIS concept these requirements and needs need to be further detailed out together with further refining the methods. In this way it is possible to include some experimenting with the ideas as presented in this version of the deliverable in the final solution for the NAVAIS concept.

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