

Jury Member Report – Doctor of Philosophy thesis.

Name of Candidate: Nicola Garzaniti

PhD Program: Engineering Systems

Title of Thesis: A decision support system for agile development of complex hardware systems

Supervisor: Associate Professor Alessandro Golkar

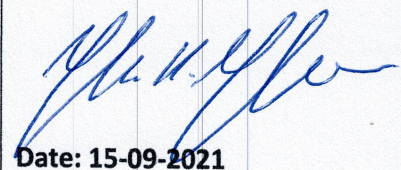
Co-supervisor: Professor Clement Fortin

Name of the Reviewer: Prof. Ighor K. Uzhinsky

I confirm the absence of any conflict of interest

Confirm

(Alternatively, Reviewer can formulate a possible conflict)



Date: 15-09-2021

The purpose of this report is to obtain an independent review from the members of PhD defense Jury before the thesis defense. The members of PhD defense Jury are asked to submit signed copy of the report at least 30 days prior the thesis defense. The Reviewers are asked to bring a copy of the completed report to the thesis defense and to discuss the contents of each report with each other before the thesis defense.

If the reviewers have any queries about the thesis which they wish to raise in advance, please contact the Chair of the Jury.

Reviewer's Report

The thesis presents analysis of the Agile framework's concept and approaches and the design of A DECISION SUPPORT SYSTEM FOR AGILE DEVELOPMENT OF COMPLEX HARDWARE SYSTEMS.

The first chapter of the thesis introduces the subject of the research, identifying its Scope, Goals and Research Questions. The whole introduction chapter is presented in a very professional manner, in compliance with the classical research methodology. The structure of the subsequent dissertation is introduced in a clear manner with the necessary outlines that helps a lot in following of the research's logic and content.

The second chapter is devoted to the analysis of the Agile concept, including discussions on the appropriate scopes of its applications and examples of case studies. The author presents a thorough analysis of benefits, concerns, opportunities, and limitations of the Agile framework, introducing the necessary definitions and terminology that is essential for the subsequent material. Overview of the Product Development Processes presented, analyzed, and Gaps in the Agile theory in applications to the product development process introduced. Implementation of the Scrum process for the Flat Sat delivery is presented in details with valuable conclusions based on the lessons learned.

A set of tools facilitating the introduced process including the developed software and interfaces, along with appropriate examples of their implementations presented in the third chapter. The author introduces the Hybrid-Agile framework that is essential for applications of the investigated concept for some of practical

cases particularly in combination with a traditional Gate process. A variety of tools, including modeling and simulation, DSM, processes for validation of the developed models and their applications presented and analyzed. The developed by the author CURSIVE tool-kit and its scope of applications is introduced.

The chapters four and five are devoted to implementation of the developed approaches and tools for the New Space Mission Payload and for A Consumer Product projects. The presented material provides a comprehensive illustration of the proposed approaches and tools, their scopes, opportunities, and benefits for use as a Decision Support System.

The Conclusion summarizes the whole work done in an inherent for the presented thesis consistent and thorough way, with no exaggerations and overstatements.

The whole work is done well and meets the requirements for an industrially oriented, engineering Ph.D. thesis. Its structure is pertinent to the topic researched and to the content covered.

The methods employed for the topic's analysis and for the delivery of scientific results are relevant to the subject researched and reflect both the state-of-the art and the research topic's significance for practical applications. The work's scientific significance is the author's contribution in the theory and practice of the Agile concept and its applications in real world processes. This area is the focus of publications and discussions internationally.

The provided publications are satisfactory and meet the established for Skoltech's Ph.D. dissertations.

The whole text is written in English very well, practically with no errors or misspellings. Both its language style and the content delivery manner can be a sample for a good Skoltech dissertation.

Reviewers report should contain the following items:

- Brief evaluation of the thesis quality and overall structure of the dissertation.
- The relevance of the topic of dissertation work to its actual content
- The relevance of the methods used in the dissertation
- The scientific significance of the results obtained and their compliance with the international level and current state of the art
- The relevance of the obtained results to applications (if applicable)
- The quality of publications

The summary of issues to be addressed before/during the thesis defense

Provisional Recommendation

☒ *I recommend that the candidate should defend the thesis by means of a formal thesis defense*

☐ *I recommend that the candidate should defend the thesis by means of a formal thesis defense only after appropriate changes would be introduced in candidate's thesis according to the recommendations of the present report*

☐ *The thesis is not acceptable and I recommend that the candidate be exempt from the formal thesis defense*