SEUS
Smart European Shipbuilding

Funded by the European Union

NTNU CADMATIC CONTACT Software ULSTEIN GONDAN SHIPBUILDERS SARC NHL STENDEN UNIVERSITY OF TURKU

RISK MANAGEMENT PLAN

This project has received funding from the Horizon Europe Framework Programme (HORIZON) EU programme under grant agreement No 101096224.

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Executive Summary

This Risk Management Plan shows how risk aspects are considered in a variety of processes and activities within the SEUS project. Note that this was an important part of the proposal and the key measures here commented are considered by the consortium since its inception.

Risk Management is here understood as the process of continuous monitoring identifying, reporting, assessing, and responding to risks. The Risk Management Plan sets out a framework to define how risks associated with SEUS activities will be identified, analysed, and managed. The management process will identify and monitor technical and management risks as well as any other issues that might affect the project progress towards its objectives.

Therefore, the goal is to carry out mitigation actions as early as possible. The Risk Management Plan is effective throughout the lifetime of the project and is open to revision if necessary. Responsibilities for risk planning, assurance, and control are shared between all partners, which allow various views on risk issues to reach the optimal outcome. A continuous reporting tool was developed, which includes follow-up measures for each described risk.

The present version of the Risk Management Plan represents the base for the future analysis about risks related to the project and their monitoring and responses. The plan is effective throughout the lifetime of the SEUS project and its core is planned to be incorporated into the Data Management Plan (D7.3), which will undergo three updates according to the schedule of deliverables (M18, M36, M48). Responsibilities for quality planning, assurance and control are shared between all partners, which allows multiple views on quality issues to reach the optimal outcome.

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1. Critical Risks

During the development of the proposal, 11 critical risks were investigated by the consortium. A description with proposed mitigation measures is presented in Table 1.

Table 1 - Critical Risks and Proposed Mitigation Measures

Risk number	Description	WP No	Proposed Mitigation Measures
1	One of the partners leaves the consortium (likelihood: low, impact: high)	ALL	Depending on the project stage, finish the project with the remaining partners or include a new partner from existing networks.
2	A limited gain in productivity / efficiency in shipyards after implementation due to unforeseen added complexities in the process (uncertainties) (likelihood: medium, impact: high)	WP1-WP6	Mitigation includes mapping of all inputs and implementation tests to minimize complexity and uncertainties and a systematic feedback loop with key stakeholders. Continuous monitoring during implementation while ensuring that productivity is improved.
3	Resistance from shipyards to implement new technologies: resistance to innovation, lack of skills and resistance to change can become obstacles to platform use (likelihood: medium, impact: medium)	WP1-WP5	Focus on human-centricity, and user experience design for computational tools, as the core of the project is to ensure the development of computational tools that provide tangible benefits for users and follow the best practices in shipbuilding.
4	Difficulties to adhere to open standards in commercial software development (likelihood: low, impact: medium)	WP2, WP3, WP6	Dedicated tasks to study practices for using open standards and embedding these practices in the software development process.
5	An economic crisis in the maritime sector (low number of new orders, high competition from Asian yards) (likelihood: low, impact: medium)	WP1, WP4, WP5	Downtimes in shipbuilding are a reoccurring reality and present good opportunities for improvements in internal processes and upgrading tools, this might result in the preference of SaaS business models to reflect the workload of shipyards.
6	High customization costs and the need for consultancy services to adapt the use of the platform for each shipyard installation (likelihood: medium, impact: medium)	WP1-WP5	Establish a coherent and robust taxonomy in a stepwise way for use and implementation. Focus on productization of the solution, embedded knowledge, and user experience design.
7	Limited gain in efficiency due to unforeseen added complexities in the process (likelihood: low, impact: medium)	WP2-WP5	Mitigation includes mapping of all inputs and implementation tests to minimize complexity and uncertainties and a systematic feedback loop with key stakeholders.

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8	Delay in the development of the platform due to higher than estimated development effort needed (likelihood: medium, impact: low)	WP2, WP3	Systematic project management and constant feedback, with an embedded mechanism to balance workloads on development (SAFe framework).
9	Delay in the implementation due to unseen external causes (market / strike / war / government policies) (likelihood: medium, impact: medium)	ALL	Developed contingency plan for each case and prepared resource management strategy (risk management plan).
10	Technical incompatibility of platforms or unforeseen failure of software components (likelihood: medium, impact: low)	WP2, WP3	Ensured preliminary technical evaluation protocol and high competence integration team. Prepared security measures for every development repository, with a double mirrored backup system and distributed storage, quality assurance for developed tools.
11	Damage or delay caused to the shipyard by non-performance of the platform (likelihood: low, impact: high)	WP4	Alpha and beta testing on development servers using local datasets and close guidance in the implementation process in cooperation with the shipyard's IT.

2. Risk Monitoring and Continuous Reporting Tool

WP coordinators are supposed to be aware of the risk for their tasks (Table 1), in a close contact with Task Leaders and project management (PM). If any risk occurs, the affected partners should contact the coordinator, and jointly Consortium will discuss and implement necessary contingency measures to contain negative effects on activities and, accordingly, outputs. If a risk cannot be mitigated in the way foreseen in the proposal, and that would result in either a substantial delay or a loss of output of the project, the coordinator will inform the PO at EU immediately and will present a possible solution for solving the problem.

In general terms, it is responsibility of all partners to manage and minimize the risks mentioned, including:

- Monitoring the assigned risks and informing the Project Coordinator of any threats or opportunities to the project.
- Jointly assessing the probability that a risk will occur and specifying the criteria used to assess the probability.
- Jointly assessing the impact of risks on project cost, time, scope, and quality of deliverables, and specifying the criteria used to assess the impact.
- Consulting on the risk response strategy.

Work Package Leaders are responsible for the following tasks within their work package(s):

- Identifying and describing any new risk.
- Helping to identify the risk owners and assisting in developing the risk response strategies.

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- Assisting the Project Coordinator in activities associated with risk monitoring and control.

The monitoring of the foreseen and potential new risks will be conducted also through the regular Consortium Meetings and through the internal project progress reporting process set in WP7.

A suggested risk management procedure is proposed, including the following steps: risk identification, analysis, response planning, and monitoring and control. This is explained as follows:

Risk identification

Risk identification will be done throughout the life cycle of the SEUS project, updating info from Table 1 if necessary, with an emphasis on identifying risks as early as possible in order to enable effective response planning and subsequent monitoring. A Risk Identification activity will be performed within the work packages.

WP leaders will report the risks and suggestions for the risk's priority to the Executive Board, which will agree on the final risk priority as well as on the respective response strategy. Identified risks will be included into the Risk Registry. This registry will be accessible to the consortium through the repository (SharePoint platform – www.seus-project.eu).

Risk Analysis

Risks which have been identified and documented are analysed by the probability that the risk may occur and, if it occurs, the size of the possible impact. The exposure to a given risk is estimated using a risk matrix which includes the two dimensions: likelihood and impact.

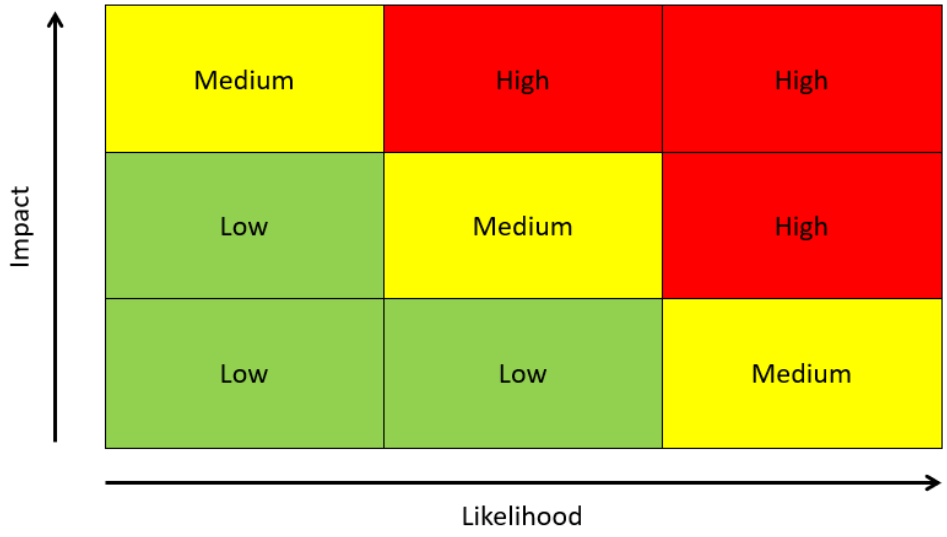

Figure 1 Risk Matrix

The risk levels can be defined as follows:

- Low: very unlikely to occur
- Medium: quite possible to occur
- High: more likely to happen

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Response planning

The response planning allows to develop strategies and plans to minimize the effects of risks in order to enable sufficient control and management. Higher priority risks receive more attention than lower priority risks to ensure that the risk will not occur. The following strategies will be taken (depending on the risk's category):

- Very high risks: Avoidance – Eliminate the threat by eliminating the cause.
- High and medium risks: Mitigation – Identify ways to reduce the probability or the impact of the risk.
- Low risks: Acceptance – Monitor the risks but no other action will be taken.

Every registered risk is followed by a mitigation plan including actions to prevent the risk (see Table 1). For each major risk, a course of action will be outlined in order to minimize its impact. Ways to prevent the risk from occurring, reduce its impact, or probability of occurring will be identified. This may include adding tasks to the project schedule or adding resources.

Risk Monitoring and Control

The level of risk on a project will be tracked, monitored, and reported throughout the project's lifetime. The continuous reporting tool commented in D7.1 Management and Quality Plan will be used to keep track of the risks (Figure 1). The tool is a live document managed by the PM, which requires inputs from all partners.

Risk number	Description	WP No	Proposed Mitigation Measures	Was mitigation measures applied?	Did risk materialise	Comments	State of Play 1st period	State of Play 2nd period	State of Play 3rd period
1	One of the partners leaves the consortium(likelihood: low, impact: high)	ALL	Depending on the project stage, finish the project with the remaining partners or include anew partner from existing networks	yes/no	yes/no		Submitted/not	Submitted/not	Submitted/not
2	A limited gain in productivity / efficiency inshipyards after implementation due to unforeseenadded complexities in the process (uncertainties)(likelihood: medium, impact: high)	WP1-WP6	Mitigation includes mapping of all inputs and implementation tests to minimize complexityand uncertainties and a systematic feedback loop with key stakeholders. Continuousmonitoring during implementation while ensuring that productivity is improved						
3	Resistance from shipyards to implement newtechnologies: resistance to innovation, lack of skillsand resistance to change can become obstacles tothe use of the platform (likelihood: medium, impact:medium)	WP1-WP5	Focus on human-centricity, and user experience design for computational tools, as the core ofthe project is to ensure the development of computational tools that provide tangible benefitsfor users and follow the best practices in shipbuilding.						
4	Difficulties to adhere to open standards incommercial software development (likelihood: low,impact: medium)	WP2, WP3, WP6	Dedicated tasks to study practices for using open standards and embedding these practicesin the software development process						
5	An economic crisis in the maritime sector (lownumber of new orders, high competition from Asianyards) (likelihood: low, impact: medium)	WP1, WP4, WP5	Downtimes in shipbuilding are a reoccurring reality and present good opportunities forimprovements in internal processes and upgrading tools, this might result in the preferenceof SaaS business models to reflect the workload of shipyards.			This sheet keeps track of Critical Risks. *TBD* fills inn whether measures was applied, whether risks materialised and adds any comments they may have. The Coordinator submits the status for each risk for every reporting period in the EU Portal.			
6	High customization costs and the need forconsultancy services to adapt the use of the platformfor each shipyard installation (likelihood: medium,impact: medium)	WP1-WP5	Establish a coherent and robust taxonomy in a stepwise way for use and implementation.Focus on productization of the solution, embedded knowledge, and user experience design						
7	Limited gain in efficiency due to unforeseen addedcomplexities in the process (likelihood: low, impact:medium)	WP2-WP5	Mitigation includes mapping of all inputs and implementation tests to minimize complexityand uncertainties and a systematic feedback loop with key stakeholders.						
8	Delay in the development of the platform due tohigher than estimated development effort needed(likelihood: medium, impact: low)	WP2, WP3	Systematic project management and constant feedback, with an embedded mechanism tobalance workloads on development (SAFe framework)						
9	Delay in the implementation due to unseen externalcauses (market / strike / war / government policies)(likelihood: medium, impact: medium)	ALL	Developed contingency plan for each case and prepared resource management strategy (riskmanagement plan).						
	Technical incompatibility of		Ensured preliminary technical evaluation protocol and high competence integration team.Prepared security measures for						

Figure 2 - Excerpt of Risk Management in the Continuous Reporting Tool

The continuous reporting tool will be maintained and will be used to record all possible risks to the project and any subsequent measures or actions required.

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Each Work Package Leader is responsible for the Risk Management within their Work Package. Each project partner is highly encouraged to communicate and discuss any (possible) risks and response planning with their Work Package Leader. It is the responsibility of all SEUS partners to communicate to the Project Coordinator about the status and effectiveness of each risk and mitigation measures in order to update the continuous reporting tool. Risk exposure will be continuously re-evaluated and modified accordingly and the results of monitoring and control will be documented.

3. Closing Remarks

This Risk Management Plan demonstrates that risk aspects are taken into account in a variety of processes and activities within the SEUS project. The Critical Risks (Table 1) introduced the risks and the related actions which will be taken to avoid an occurrence or to react immediately. This will be done through the continuous reporting tool and the risk management procedure. The plan is effective throughout the lifetime of the project but is open to revision if necessary. The responsibilities of risk avoidance and mitigation are shared between all partners, which allow for a shared qualitative monitoring and response strategy.

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