

Academics4Rail



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Quality Assurance and Risk Management Plan

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Abbreviations and acronyms

Abbreviation / Acronym	Description
CA	Consortium Agreement
EC	European Commission
EU	European Union
GA	Grant Agreement
PC	Project Coordinator
SC	Steering Committee
S2R	Shift2Rail
TD	Technology Demonstrator
WP	Work Package

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Index of contents

1	EXECUTIVE SUMMARY	4
2	INTRODUCTION.....	4
3	OBJECTIVES OF QUALITY ASSURANCE AND RISK MANAGEMENT	5
4	QUALITY ASSURANCE PLAN	5
4.1	Quality Manager Role	5
4.2	Quality Assurance Procedures	5
4.3	Review Process	5
4.4	Walkthrough Procedure	6
4.5	Process Improvement	6
5	RISK MANAGEMENT PLAN	6
5.1	Risk Identification and Assessment	6
5.2	Risk Mitigation Measures.....	6
6	PROGRESS MONITORING AND EVALUATION.....	9
6.1	Quality Assurance Progress Monitoring.....	9
6.2	Risk Monitoring and Mitigation Evaluation.....	9
7	CONCLUSION	9

Tables

Table 1	Critical risks for implementation.....	7
Table 2	Barriers and overcome method	8

1 Executive Summary

The Quality Assurance and Risk Management Plan emphasises maintaining high standards in the Academics4Rail project. It details the systematic quality assurance process, including review processes, walkthroughs, and continuous improvement, overseen by a Quality Manager. Significantly, it includes a comprehensive risk analysis focusing on three key project areas: building a European rail excellence scientific community, developing PhD programmes, and disseminating and exploiting results. This analysis forms the basis of the Risk Management Plan, outlining identified risks and mitigation measures.

The summary also highlights continuous monitoring and evaluation of the project's progress, quality assurance, and technical cohesion. This involves following the Quality Assurance Plan and regularly applying risk mitigation strategies from the Risk Management Plan.

Overall, the summary presents an integrated approach to quality standards and risk management, essential for the project's success, and provides a concise overview of the plans and strategies in the main document.

2 Introduction

The Academics4Rail Consortium Agreement, involving 25 partner institutions, presents a complex and multifaceted initiative requiring a fine Quality Assurance and Risk Management. The diversity of these partners, ranging from universities to research institutions, introduces unique challenges and opportunities. The project is structured into several work packages, each with specific research and development objectives, culminating in many deliverables. A significant aspect of the project is the emphasis on PhD-level research, which integrates advanced academic insights with practical industry applications.

This collaborative endeavour's complexity necessitates an solid commitment to Quality Assurance and Risk Management. Given the numerous institutions involved, each with different methodologies and standards, ensuring a cohesive and standardised approach to project management is crucial. Also, the Consortium Agreement provides a comprehensive framework detailing meticulous strategies to effectively manage, monitor, and deliver outputs.

Quality Assurance in this context goes beyond mere compliance with standards; it involves establishing a culture of excellence where all stakeholders are committed to the highest research quality. This encompasses regular reviews and evaluations to ensure that every aspect of the project aligns with the agreed objectives and meets the expected standards.

Risk Management is equally vital, involving identifying, assessing, and mitigating potential risks that could derail the project's progress. This includes technical risks, operational challenges, financial uncertainties, and legal considerations. Given the project's scale and the number of deliverables, including those from PhD research, managing these risks is imperative for success.

In summary, the Academics4Rail project, with its extensive network of collaborators and ambitious goals, places a premium on effective Quality Assurance and Risk Management. These processes are integral to ensuring that the project achieves its objectives and significantly impacts the field of railway research and academia-industry collaboration.

3 Objectives of Quality Assurance and Risk Management

The Quality Assurance and Risk Management objectives in the Academics4Rail project focus on ensuring excellence and safety in developing PhD programs and the broader project activities. Key objectives include:

- Risk Analysis and Mitigation: Leading the risk analysis process, mainly related to constructing a European rail excellence scientific community, developing PhD programs, and disseminating and exploiting results. This involves identifying, measuring, and creating risk mitigation strategies detailed in the Risk Management Plan.
- Continuous Monitoring and Evaluation: Overseeing the continuous monitoring of the project's progress, evaluating its outcomes in terms of quality assurance and technical cohesion, and ensuring the application of risk mitigation measures as necessary.

4 Quality Assurance Plan

4.1 Quality Manager Role

The roles involve creating and supervising quality assurance protocols and criteria throughout the project. The Quality Manager implements the Quality Assurance Plan, which involves frequent review procedures and consistent enhancement of project activities. Furthermore, roles collaborate with project partners to maintain consistency in quality standards and ensure that all processes are aligned with the project's objectives and deliverables.

4.2 Quality Assurance Procedures

Aligned with the Consortium Agreement and Horizon Europe, these procedures emphasize maintaining quality, ethical research, and data management. Enhanced by training on Horizon Europe standards and systematic documentation, they incorporate structured feedback formats from work package leaders, focusing on completeness, accuracy, relevance, and depth of content. Key techniques include:

- Walkthroughs: Utilized for orientation, examining ideas, identifying defects, and improving products at any stage. Scheduled early enough for revisions and recorded in the Issue Log.
- Reviews: Independent evaluations against quality factors using checklists, interviews, and meetings. It includes systematic reviews by the Project Technical Committee, with multi-tier systems and external expert feedback. Reviewers adhere to criteria of correctness, timeliness, reliability, and productivity.
- Evaluations: Examining products/services for compliance with customer requirements.
- Process Improvement: Projects designed to reduce error rates, involving detection of problems, responsibility identification, evaluation, analysis, and implementation of preventive actions.

4.3 Review Process

Adhering to the Consortium Agreement, this process involves structured feedback addressing completeness, accuracy, relevance, and depth. It includes:

- Identification of reviews in the project schedule, min 2 reviewers per produced PhD publication and per technical deliverable.
- Verification of review procedures.
- Documentation against quality factors and product validation.

- Validation of corrections and defect tracking.
- Summary of findings for technical groups and organizations.

4.4 Walkthrough Procedure

Structured with predefined agendas and detailed minutes, this process ensures engaged and accountable consortium members. Walkthroughs focus on early problem identification and issue resolution, documented in the Issue Log, with options for acceptance or further discussion.

4.5 Process Improvement

Involving assessments and updating methodologies, this process introduces formal systems for idea implementation, cross-functional teams, and periodic revisions. Steps for process improvement include detection of quality problems, responsibility identification, importance evaluation, cause investigation, analysis, preventive action, process controls, disposition of nonconforming items, and permanent changes.

5 Risk Management Plan

5.1 Risk Identification and Assessment

In the Academics4Rail project, risk identification and assessment is a critical aspect, aligning with the Consortium Agreement. The risk identification process involves a thorough analysis of potential challenges that may impact the project's objectives, timelines, and quality. Key aspects include:

- Assessment of the probability and impact of each identified risk, categorizing them as high, medium, or low.
- Continuous monitoring and updating of the risk register, ensuring all new risks are identified and assessed promptly.
- Involvement of project stakeholders, including consortium members and external advisors, in the risk identification process.
- Utilizing a systematic approach that includes historical data analysis, expert opinion, and scenario planning to identify potential risks.
- Regular risk assessment reviews and updates to reflect the changing project environment and new information.
- Identification of risks across various technical, legal, financial, and operational categories.

5.2 Risk Mitigation Measures

Risk mitigation in Academics4Rail is a comprehensive process designed to address and reduce the impact of identified risks. The Consortium Agreement provides a framework for implementing effective risk mitigation strategies. Key components of risk mitigation measures include:

- Development of a detailed action plan for each high-priority risk, outlining specific steps to mitigate the risk.
- Allocation of responsibilities for risk mitigation to specific consortium members or teams.
- Regular training and awareness programs to educate project members about risk mitigation strategies.
- Implementation of contingency plans for critical risks that might severely impact the project.
- Regular tracking and monitoring of the effectiveness of mitigation measures, adjusting strategies as needed.
- Establishing communication protocols to ensure swift response and decision-making in

- case of risk occurrence.
- Collaboration with external experts and stakeholders to gain insights and support for complex risk mitigation.

These expanded sections for the Risk Management Plan integrate key elements from both the Academics4Rail Consortium Agreement and the Quality Manager document, ensuring a comprehensive and detailed approach to risk management in the project.

Table 1 Critical risks for implementation

Description of risk	WP, responsible leader	Proposed risk-mitigation measures	Risk status Jan 2024
Delays to acquire inputs from EU-RAIL JU (past and ongoing projects) - Likelihood: low - Severity: medium	1, 2, 3, 10	Regular meetings with appointed EU-RAIL JU contact persons to organize a smooth and regular information flow	Leaders and partners had regular meetings for WP1, WP2, WP3, and WP10, which are ongoing. The EURNEX coordinated the information flow effectively for EU-RAIL JU.
Delays to acquire inputs from ongoing PhD research activities (WP4-WP9) - Likelihood: medium - Severity: medium	1, 2, 3, 10	Regular meetings and seminars with concerned WP leaders and PhD students to ensure a smooth and regular information flow	Leaders and partners had regular meetings and seminars for WP1, WP2, WP3, and WP10, which are ongoing.
Delays in coordination with ERRAC and EU-RAIL JU bodies for joint discussion and delivery of input to next EU-RAIL JU Calls and ERRAC recommendations - Likelihood: low - Severity: medium	1, 2, 3, 10	Regular meetings with ERRAC secretariat and appointed EU-RAIL JU contact persons and early planning of common workshops and exchange of documents	Leaders and partners had regular meetings for WP1, WP2, WP3, and WP10, which are ongoing. The EURNEX coordinated the information flow effectively for EU-RAIL JU.
Inability to raise interest among relevant stakeholders about project results. - Likelihood: low - Severity: high	4,5,6,7, 8,9	The members of the consortium have a strong network with infrastructure managers, operators and relevant stakeholders of different countries. Via these networks it will be possible to maximize results dissemination potential.	In the early stages of each WP, the risk status does not exist.
Accessibility of the data from stakeholders - Likelihood: low - Severity: med	4,5,6,7, 8,9	Exploit the data from the existing projects and develop hybrid models (model-driven, data-driven, and synthetic data)	In the early stages of each WP, the risk status does not exist.
Recruitment of a PhD student (Likelihood: Low – Severity: Medium)	4,5,6,7, 8,9	Large distribution of the call for applications through European and national research networks and research groups	All PhD positions have been filled by candidates.
Rejection of submitted papers (Likelihood: Medium – Severity: Medium)	4,5,6,7, 8,9	Strong pre-selection of the more relevant journals and conferences for the research dissemination	In the early stages of each WP, the risk status does not exist.

Financial support for PhD salary and missions	4,5,6,7, 8,9	National calls for complementary financial support by PhD co-supervisors	In the early stages of each WPs, the risk status does not exist.
Poor definition of requirements for use cases, hardware and software. 1. Likelihood: low 2. Severity: low	4,5,6,7, 8,9	Develop procedures to obtain specific requirements, based on the definition and further analysis of requirements performed in tasks T8.1.1.	In the early stages of each WP, the risk status does not exist.
Unsatisfactory results and decisions made developed algorithms - Likelihood: high - Severity: med	4,5,6,7, 8,9	Ensure that data available is representative enough of the problem to be solved and that sustainable KPIs are properly specified during use case' requirements definition in T8.1.1.	In the early stages of each WP, the risk status does not exist.
Complexity in WP and tasks management due to the large number of involved partners (Task 2.1 and Task 2.3) - Likelihood: medium - Severity: high	10	Regular meetings to check the progress and the punctual availability of the contributions. Mandate to WP and task leaders to re-assign tasks and resources among partners in a flexible management approach.	WP's leaders and partners hold regular meetings to mitigate risks.
Inadequate management. · Likelihood: low · Severity: high	10	The management structures, procedures, and tasks outlined in this proposal ensure close supervision of delivery of the expected results. Meetings of the SC will take place regularly and will identify potential problems and react early.	WP's leaders and partners hold regular meetings to mitigate risks.

Table 2 Barriers and overcome method

Potential Barriers	Project Contribution to Overcome Barriers	Barrier status Jan 2024
To the activities of the Scientific Community		
Too much focus on immediate results and industrial outputs	Collaboration with industries to complement and add value to their production chains	In the early stages of each WP, the risk status does not exist.
Lack of penetration of provided knowledge	Include validating processes by industry on advice, increase of quality and rigorous validation of published results	In the early stages of each WP, the risk status does not exist.
Potential barrier to the survival of the community post-funding	Applying EURNEX principles of cohesion and cooperation among members	The Eurnex mitigates risks associated with communication
To PhDs results implementation		
Lack of confidence in the adoption of generic frameworks	Borrowing success stories from other industries, standardization processes and validation of applicability	In the early stages of each WP, the risk status does not exist.

Resistance to change due to culture and competence	Early and continual stakeholder engagement to raise awareness through demonstration	In the early stages of each WP, the risk status does not exist.
Incompatibility of deployed technology with existing systems	Development of test plans to mitigate arising concerns	In the early stages of each WP, the risk status does not exist.
Stringent Regulations hindering adoption and implementation	Engagement to include standards and regulations in early stages	Each PhD's WP is developing standards and regulations to reduce risks.

6 Progress Monitoring and Evaluation

6.1 Quality Assurance Progress Monitoring

Quality Assurance Progress Monitoring for Academics4Rail involves comprehensive measures to ensure that all project activities adhere to established standards and objectives. This process includes regular and systematic assessments, reviews conducted by designated committees or bodies within the project framework, and continuous tracking of progress against key performance indicators. Additionally, it incorporates robust feedback mechanisms, facilitating ongoing improvements and adaptations in response to both internal assessments and external evaluations. This ensures that the project maintains its alignment with the overarching goals and adheres to the high standards expected in such collaborative research endeavors.

- Ensures all project activities align with the set standards and objectives.
- Involves regular assessments and reviews by designated committees or bodies.
- Includes feedback mechanisms for continuous improvement.

6.2 Risk Monitoring and Mitigation Evaluation

Risk Monitoring and Mitigation Evaluation in Academics4Rail is an extensive process that encompasses the proactive identification, thorough assessment, and strategic mitigation of potential risks throughout the project. This involves a continuous cycle of monitoring, where risk management strategies are regularly reviewed and updated to reflect the evolving project landscape and external factors. The emphasis is on preemptive actions to minimize any adverse impacts on the project's objectives. This process includes detailed risk reporting, stakeholder involvement for broader insights, and the integration of risk considerations into project planning and decision-making. Through this rigorous approach, Academics4Rail aims to maintain project resilience and adaptability, ensuring the achievement of its goals despite the uncertainties inherent in such a comprehensive research initiative.

- Focuses on identifying, assessing, and mitigating potential risks throughout the project.
- Involves continuous monitoring and updating of risk management strategies.
- Emphasizes the importance of proactive measures to minimize impacts on the project's objectives.

7 CONCLUSION

The "Quality Assurance and Risk Management Plan" for the Academics4Rail project emphasizes the essential nature of robust quality assurance and risk management in ensuring the project's

success. It highlights that adequate quality assurance involves regular monitoring and reviews all coordinated by a dedicated Quality Manager. The plan comprehensively addresses risk identification, analysis, and mitigation, focusing on critical project areas such as building a scientific community, developing educational programs, and effectively disseminating results. The conclusion stresses the importance of ongoing monitoring and evaluation to uphold the project's quality and coherence, ensuring it meets the standards expected in collaborative research and contributes significantly to the European rail sector's advancement.