

05-06-2024

Deliverable D4.3:

Quality Assurance Methodology

Deliverable D4.3

Contractual Date: 30-08-2024
Actual Date: 01-08-2024
Grant Agreement No.: 101123118
Work Package: WP4
Task Item: T4.2
Lead Partner: UNITN

Authors: Bruno Crispo (UNITN), Tommaso Zoppi (UNITN), Andrea Biancini (EITD)

Abstract

This deliverable contains all relevant information for quality assurance, it complements the Project Handbook and describes how the quality is assured with a special focus on document management including aspects about writing, storing, reviewing, and submitting deliverables; and risk management to ensure minimum deviation between the work executed and what is described in the description of action. Furthermore, it specifies the EIT-SPECTRO label principles and operative procedures, to assure the highest quality standard of its educational programmes.

© EIT Digital on behalf of the SPECTRO project.

The activities leading to these results has received funding from the European Community's DIGITAL Programme under Grant Agreement No. 101123118 (SPECTRO).

This document is licensed under a [Creative Commons Attribution 4.0 license](https://creativecommons.org/licenses/by/4.0/)



Versioning and contribution history

Version	Date	Authors	Notes
0.1	28/04/2024	Tommaso Zoppi (UNITN)	Draft version.
0.2	06/05/2023	Bruno Crispo (UNITN)	First complete draft version of the deliverable
0.3	08/05/2024	Andrea Biancini (EIT)	Revision
0.4	27/05/2024	Bruno Crispo, Tommaso Zoppi (UNITN)	Revised full version of the deliverable.
0.5	05/06/2024	Bruno Crispo, Tommaso Zoppi (UNITN)	Templates for the EIT-SPECTRO label added. Final draft

Table of Contents

1	Introduction.....	4
1.1	SPECTRO.....	5
1.2	Scope of the Deliverable	5
2	Quality guidelines on deliverables production.....	5
2.1	Document Language	5
2.2	Quality criteria.....	6
2.2.1	Legibility.....	6
2.2.2	Readability	6
2.2.3	Comprehension	7
2.3	Deliverable review.....	7
2.3.2	Deliverable review process.....	8
2.3.3	Deliverable review process responsibility matrix	10
3	Risk Management	10
3.1	Risk Management Process.....	10
3.2	Plan Risk Management	11
3.2.1	Risk Categories.....	11
3.2.2	Roles and Responsibilities	11
3.2.3	Definitions of probability and impact.....	12
3.2.4	Risk Register	13
3.2.5	Identify Risks.....	14
3.2.6	Risk Analysis	14
3.2.7	Plan Risk Responses.....	14
3.2.8	Control Risks	15
3.2.9	Common Risk Management Errors	15
3.2.10	Risk Assessment (Living) Document.....	16
4	Quality Control and Assurance of the Educational Programs.....	16
4.1	Overarching Learning Objectives (OLOs).....	17
4.2	EIT-SPECTRO Label	18
4.2.1	Quality and Indicators.....	18
4.2.2	Review process	20
4.2.3	Review Outcomes and procedures for appeals.....	21
4.2.4	Guidance and Instructions for the Review Team	22
4.2.5	Final conclusions and Recommendations Template for Reviewers	23

5	Conclusions	25
6	Annexes	28
6.1	Annex A: Internal Review Planning and Control.....	28
6.2	Annex B: Templates for the EIT-SPECTRO Label	29

Table of Figures

Figure 1: Risk Management processes cycle.....	11
--	----

Table of Tables

Table 1: Roles and responsibilities on Deliverable Review	8
Table 2: High-level deliverable production process	8
Table 3: Review Process steps	10
Table 4: Review Process Responsibility Matrix	10
Table 5: Roles and Responsibilities – Risk MGT	11
Table 6: Scale of Probability.....	12
Table 6: Impact on Schedule.....	12
Table 8: Impact on Results.....	13
Table 9: SPECTRO Risk Register Fields.....	13

1 Introduction

Goal of this deliverable is to cover the aspects of Quality Assurance and Management of SPECTRO. It starts by outlining the quality guidelines on delivery production also specifying the process and the role involved in it. It then describes the risk management process. The second part of the deliverable instead defines the Quality Assurance Methodology applied to the outcome of SPECTRO, the two master programmes. The methodology defines the EIT-Label assigned to the program that satisfy the quality requirements specifies by the methodology. It specifies the process and the role to award such a quality label.

1.1 SPECTRO

SPecialised Education programmes in CybersecuRiTy and Robotics (SPECTRO) focuses on the design and delivery of two double-degree master's programmes (ISCED Level 7, 120 ECTS) in two key digital technology areas for the future of Europe:

- 1) Cybersecurity, and
- 2) Robotics.

The two specialised master's programmes, which will also include a minor in Innovation and Entrepreneurship, will be designed and delivered by a consortium consisting of 12 higher education institutions from 7 different countries, 2 innovative SMEs, 1 leading research centre in Information Systems and EIT Digital, a pan-European organisation with in-depth knowledge and experience in the digital skills domain. The master's programmes developed by SPECTRO partners will address the labour market needs, foster strong interactions and mobility between academia and business, strengthen knowledge triangle integration, promote entrepreneurship, and considerably boost the growth of the existing EIT Digital ecosystem, one of the largest digital ecosystems in Europe. In addition to the two master's programme, SPECTRO partners also develop and deploy a series of self-standing learning modules on topics related to Cybersecurity and Robotics. These modules will lead to four different certifications, which will be released by participating higher education institutions and EIT Digital. Both programmes will apply the quality assurance methodology defined in this deliverable to achieve the highest level of quality.

1.2 Scope of the Deliverable

This deliverable covers the various aspects of quality and quality assurance related to SPECTRO and defines the methodology to assess and mitigate risks during the execution of the project.

In particular, the deliverable specifies the quality guidelines to be followed in the production of deliverables and details the Quality and Assurance Methodology adopted by SPECTRO to assess the quality of the two educational programmes. Such methodology has two main purposes:

1. To guarantee high-quality content and management to secure effective progress.
2. to adopt quality assurance standards to the two education programmes and specify a methodology to periodically assess the achievement of such standards.

The deliverable also covers the risk issues specifying the methodology adopted to assess risks and mitigate them. Such assessment occurs continuously during the lifetime of the project.

2 Quality guidelines on deliverables production

2.1 Document Language

English is the official language in Horizon Europe's projects, therefore all the documents must be written in English, using the appropriate grammar rules. Some dissemination material (such as press releases, newsletters, etc.) can be considered as an exception to this rule and can be translated into other relevant languages for the project. Templates, versioning, and naming conventions have been already presented in SPECTRO D4.1, Section 5.

2.2 Quality criteria

All deliverables content provided by SPECTRO should follow these guidelines:

2.2.1 Legibility

- ▶ When writing, **stick to the format** provided by the template of your project, respecting fonts, sizes and styles for each text level, line spaces, indent style, margins, and layout.
- ▶ Respect the **graphical identity** of this project.
- ▶ The widespread use of capitals is not recommended.
- ▶ Consideration should be given to using **different heading levels** to enable key information to stand out and to facilitate navigation in the text.
- ▶ When referring to other parts of the text, **cross-references** should be added (instead of regular text). It ensures always referencing the right bookmark in case text gets moved to another position, or to keep up with changes in the Table of C.
- ▶ Ensure there are **no broken links** after finalizing the writing, by searching "Error!" throughout the whole document.
- ▶ When citing literal text from an external source, quote it also using italics and add the proper reference immediately after concluding the citation.
- ▶ **Deliverable leaders:** When producing the final pdf, check text legibility and positioning of pictures by quickly scanning it. Occasionally, the pictures could be moved.
- ▶ Do not use links in the text, use references instead.

2.2.2 Readability

- ▶ **Long sentences should be avoided.** It is better to use a couple of sentences rather than one longer, complicated sentence, especially for new information. Especially avoid compound sentences with many subordinate clauses and conjunctions.
- ▶ **Long paragraphs can confuse readers.** Chunking text can help solve this problem. By adding necessary white space for improved text readability, while paragraphs give structure to your written work.
- ▶ **Use connectives** to unify your writing between and within paragraphs. Examples of connectives: "Nonetheless," "Besides," "However," "Furthermore," and "Alternatively".
- ▶ **Abbreviations and acronyms should be avoided** in general unless these are appropriate. When first used in the text, the meaning should be spelt out in full. An acronyms table must be part of any deliverable in SPECTRO and as such it will appear in the official deliverable template.
- ▶ Mainly write in the **active voice**.
- ▶ Use **text levels** to separate the content.
- ▶ Use short sub-headlines.
- ▶ **Use bullet points and numbered lists** to catch attention and create structured content to enhance readability. Where possible, it is preferable to have no more than five or six bullet points in a list.
- ▶ **Avoid text wraps.** Wrapping text around figures, blocks, or other elements can cause text to break inelegantly. This disturbs a reader's rhythmic eye movement and interferes with an individual's scanning speed. For the same reason, do not justify text in tables.
- ▶ Time references

- Do not use relative time references (i.e., next month, last year)
- Use only absolute time references (i.e., July 2019, M12)
- Always refer to month including the year as well.

2.2.3 Comprehension

- ▶ Use **terms familiar** to the audience of our deliverables to ease content comprehension.
- ▶ Use an **“inverted-pyramid writing style”** **Errore. L'origine riferimento non è stata trovata.**, starting with the conclusion or an overview of the main point.
- ▶ Pictures and diagrams can sometimes explain things better than large amounts of words.
- ▶ Start with a table of contents to be discussed and agreed upon by all required contributors.
- ▶ Ensure that all sections relate to the main goal of the document and among themselves.
- ▶ Keep the document short, concise and to the point.
- ▶ Avoid unnecessary texts as repetitions from other deliverables from this project, instead just add a reference to them (i.e., for further information please refer to SPECTRO Dx.x - xxxx)

2.3 Deliverable review

The deliverable review process is initiated by the project Quality Manager. The first step is the creation of the internal review planning document. This document (the guidelines for the creation of this document can be found in Annex I. Internal review Planning and Control) lists all the project deliverables and appoints two organizations as peer reviewers for the deliverable based, if possible, on the following criteria:

- ▶ The number of deliverables assigned to an organization should be proportional to the workload of the organization within the project.
- ▶ The organizations in charge of the deliverable review should not be directly involved in the specific task and deliverable but have enough knowledge of the area in which the deliverable was based.
- ▶ The persons within the organization reviewing the document should have at least basic knowledge about the project, ideally working on the project but not directly involved in the specific task and deliverable.
- ▶ A first version of the deliverables’ peer review assignment has to be defined and agreed upon with the consortium members and is available under the work package folder in the SPECTRO repository.

2.3.1.1 Roles and responsibilities

The roles and responsibilities of the deliverable review process can be seen in the following table:

Role	Responsibilities
Project Coordinator (PC)	<ul style="list-style-type: none"> • Evaluation of the final version of the document after the deliverable review process. • Send the formally approved version of the document to the European Commission (EC).
Quality Manager (QM)	<ul style="list-style-type: none"> • Supervision of the deliverable review process from start to end, establishing the review process dates.

	<ul style="list-style-type: none"> Support the peer reviewers and DT during the deliverable review process.
Workpackage Leader (WPL)	<ul style="list-style-type: none"> Support the DT with advice if required, so that the DT can properly address the PR comments. Read the Table of Contents and check if the technical content is aligned with the general objectives of SPECTRO Perform a final format review and produce the final version to be sent to the PC and to be forwarded to the EC.
Deliverable Leader (DL)	<ul style="list-style-type: none"> Lead the deliverable team during the development of the deliverable. Contact the persons reviewing the deliverable and coordinate the review team during the process. Process the evaluation form sent by the PR and address the changes needed in the deliverable. Send the final version to the QM for format revision.
Deliverable Team (DT)	<ul style="list-style-type: none"> Produce and contribute to the draft version following the DL instructions. Support the DL in addressing feedback and implementing required changes for the deliverable.
Peer reviewer (PR)	<ul style="list-style-type: none"> Evaluate the content and format of the deliverable using the peer review evaluation template. Can require assistance from the DL in case of doubts.

Table 1: Roles and responsibilities on Deliverable Review

2.3.2 Deliverable review process

The deliverable review process aims at improving the quality of the project outputs and minimising the risk of rejections. The DT and the DL must create a draft following the next (informal) steps:

Step	Responsible	Description
S1	DL	<ul style="list-style-type: none"> Nominates and contacts the production team (contributors). Sets up the structure of the deliverable, based on the deliverable template.
S2	DT	<ul style="list-style-type: none"> Reads the Table of Contents and checks if the technical content is aligned with the general objectives of the project
S3	DL	<ul style="list-style-type: none"> Coordinates the production of the deliverable. Sends the draft to the WPL for the first check.
S4	WPL	<ul style="list-style-type: none"> Checks that the production of the deliverable is in line with the objectives of the WP
S5	DL	<ul style="list-style-type: none"> Addresses the changes suggested by the WPL (if any) and creates the candidate draft to be sent to the deliverable review process.

Table 2: High-level deliverable production process

During the whole process, the exchange of documents is made through the **project repository**. Once the final candidate draft is ready, and at least **one month before the official submission date**, the deliverable review process is initiated. This provides the reviewers with enough time to carefully evaluate the deliverable and interact with the deliverable leader as well as the deliverable team to refine the contents i.e., input from the Review Form. The following table shows the steps of the process along with the estimation (in working days) for each step.

Step	Responsible	Description	Duration (working days)
R0	QM	<ul style="list-style-type: none"> The QM sets-up a calendar for the deliverable review process using the internal review control document. Informs the interested people (DL, PC and WPL) providing advice about the procedures and dates. 	1
R1	DL	<ul style="list-style-type: none"> The DL contacts the peer reviewers with instructions about the evaluation (QM must be in Cc). Sends the candidate draft to the previously assigned reviewers to initiate the deliverable review process. 	1
R2	PR	<ul style="list-style-type: none"> The PR reviews the final draft sending a commented/edited version of the draft. 	7
R3	DL	<ul style="list-style-type: none"> According to the PRs decision, the DL: <ul style="list-style-type: none"> sends the final deliverable to the QM. (optional) reactivates the DT to implement the comments included in the internal review and send the new draft to the PR, accompanied by a report about the implementation of the changes (text in the email body is accepted). (optional) consults the WPL and/or QM for further advice, giving them one working day to reply. 	7
R4	QM	<ul style="list-style-type: none"> Receives the inputs from the DL (revised draft, peer review reports), decides and communicates the next action: publication (see RF1 below) or format refinement (see R5 below). 	2
R5	DL	<ul style="list-style-type: none"> In case of format refinement, the QM ask the DL to perform the format changes Once the format is accepted by the QM, the next action publication takes place (see RF1 in the row below) 	1
RF1	QM	<ul style="list-style-type: none"> Fills the deliverable's quality control table with DL and QM checks and sends it to the PC for final approval and release to the EC. 	1
RF2	PC	<ul style="list-style-type: none"> The PC reviews the final version of the document. Although it should not happen, the PC could ask for changes in the deliverable. In this case, the DL will set-up a calendar, including any steps from R1 to R5 above, remaining anyways within the maximum duration of the deliverable review process. Fill the deliverable's quality control table. Convert the file to PDF and deliver it to the EC services. 	3

Table 3: Review Process steps

2.3.3 Deliverable review process responsibility matrix

The following responsibility assignment matrix (RAM) summarises the roles and responsibilities within the deliverable review process, according to a RASCI [1] model:

Task	PC	QM	WPL	DL	DT	PR
Deliverable draft creation		C	A	R	S	
Deliverable review process initiation and set-up		R	I	I	I	I
Deliverable changes		C/S	A	R	S	
Deliverable draft approval	I	I	I	I	I	R
Deliverable format approval	R	I	I	S	I	
Deliverable formal approval and release to the EC	R	I	I	I		

Table 4: Review Process Responsibility Matrix

- ▶ Responsible (R): the owner of the task.
- ▶ Accountable (A): that is the role to which "R" is Accountable and is the authority who approves to sign off on work before it is effective.
- ▶ Supportive (S): that is a role that provides resources or plays a supporting role in the implementation of the task.
- ▶ Consulted (C): that is a role that provides information and/or expertise necessary to complete the task.
- ▶ Informed (I): that is a role that needs to be notified of results but need not necessarily be consulted.
- ▶ Blank: no involvement necessary

3 Risk Management

The risk management process is vital for any project as it allows for anticipating threats to the normal progress of SPECTRO, providing the SPECTRO consortium with enough information to react promptly and accordingly to minimise the impact of the risks identified. The Risk Management methodology presented in this guide follows the PMI (Project Management Institute) guidelines as presented in the PMBOK® Guide [2].

3.1 Risk Management Process

Risk management will be implemented in SPECTRO through five processes, in a continuous improvement approach during the project lifetime:

- Plan Risk Management
- Identify Risks
- Risk Analysis
- Plan Risk responses
- Control Risks



Figure 1: Risk Management processes cycle

3.2 Plan Risk Management

As depicted in the figure above, we start from the **Plan Risk Management**, where the following processes needed for the proper risk management of the project are designed. Additionally, the document defines risk categories, roles, responsibilities, probability and impact of the risks, allowing the processes of “Identify Risks” and “Risk Analysis” to take place.

3.2.1 Risk Categories

To properly define risks, the following 5 categories of risks are defined at this stage of the project. Any new category identified through the course of the project will be part of the risk management process.

- Financial risks
- Communications
- Scope
- Cost
- Resources

3.2.2 Roles and Responsibilities

The Project Coordinator will lead and supervise the risk management activities in coordination with the WPL.

Another role involved during the risk management processes with a major responsibility is the Quality Manager.

The next Risk Assessment Matrix (RAM) summarises the roles and responsibilities within the project, according to a RASCI model[1] that describes the participation of various actors (PC, WP, QM, PARTNER) in completing tasks or deliverables for a project or business process.

RASCI CHART	PC	WPL	QM	PARTNER
Plan Risk Management	R	C	C	S
Identify Risks	A	R	C	S
Risk Analysis	A	R	C	S
Plan Risk responses	A	R	C	S
Control Risks	A	R	C	S

Table 5: Roles and Responsibilities – Risk MGT

- ▶ **Responsible (R)** is the entity(s) who is the owner of the problem, i.e., the entity that does the work
- ▶ **Accountable (A)** is the entity to whom “R” is accountable and the authority who approves sign-off on work, there is max 1 entity accountable per task/process
- ▶ **Supportive (S)** is the entity(s) that provides resources or has a supporting role
- ▶ **Consulted (C)** is the entity(s) that provide information and/or expertise necessary to complete the task
- ▶ **Informed (I)** is the entity(s) that needs to be notified of the results but need not necessarily be consulted.

As in the RASCI Table 5, WPLs (WPLs) are responsible for the identification of new risks, as well its analysis and classification, and will support Task leaders and partners from the same WP on these tasks.

Once the risks are identified and analysed, and a response plan for each is designed, they will be informed to the Project Coordinator who is the main responsible for the management of all risks identified in the course of the project.

3.2.3 Definitions of probability and impact

As explained at the beginning of this chapter (Section 3), it is of utmost importance to define both the probability and impact of a risk in the scope of the project.

Probability

The following scale will be used for the project in order to rate a risk probability properly:

Scale for Probability										
Rating	1	2	3	4	5	6	7	8	9	10
Interpretation	Low		Medium		Medium-High		High		Fact	

Table 6: Scale of Probability

As it can be seen on the table above, there are two numbers for each interpretation, meaning that inside each interpretation you have also degrees, for example, a risk with Low probability can be classified as “very low” (rating 1), or “low” (rating 2), and so on.

Impact

The consortium of SPECTRO has agreed on the following types of impact and its corresponding classification:

Impact on the schedule:

Impact	Classification
Delay of 3 or more months on DoA deadlines (tasks start/end time, deliverables and milestones deadlines) – i.e., Task 1.2 delay will have an impact on task 3.4 start time by 3 months.	9-10
Delay of 2 months on DoA deadlines (tasks start/end time, deliverables and milestones deadlines)	7-8
Delay of 1 month on DoA deadlines (tasks start/end time, deliverables and milestones deadlines)	5-6
Delays on internal deliverables that internally impacts other dependent task/s postponing them by 1 – 3 months	3-4
Delays on any task or deliverable that does not have impact on other tasks or incur a delay of less than 1 month	1-2

Table 7: Impact on Schedule

Impact on the achievements of results:

Impact	Classification
One main objective of SPECTRO not achieved, i.e., major impact on DoA, which could lead to an amendment request on the Grant Agreement	9-10
WP objective not fully achieved	7-8
Objectives of more than one Tasks are not achieved	5-6
Task objective not achieved	3-4
Task objective not fully achieved	1-2

Table 8: Impact on Results

3.2.4 Risk Register

The Risk Register is the main result of the Risk Management Process, as it aims to reflect the output of many processes such as Identify Risks and Risk Analysis among others.

This document will be filled through various iterations, having the Project Coordinator as the main responsible for its management. A separate spreadsheet will be provided for the consortium for this purpose. The Risk Register has the following fields:

Item	Description
Risk ID	The identification for each risk. i.e., R01, R02
Risk	A complete description of the risk, which states the cause of the risk, the risk, and the effect that the risk causes to the project.
Risk Category	Categorization of risks by area of project affected, source of risk or another useful category.
WP related	WP number from which the risk belongs
Probability	The likelihood that a risk or opportunity will occur (check Section 4.2.3 for more info on the values accepted).
Impact	The impact of the risk on the project if the risk occurs (check Section 4.2.3 for more info on the values accepted).
Risk Score	Determined by multiplying probability and impact (scale from 0 to 100).
Risk Ranking	A priority list which is determined by the relative ranking of the risks (by their scores), within the project with the number one being the highest risk score.
Risk Response	The action which is to be taken if this risk occurs.
Trigger	Description of an event (or events) that will cause the risk to materialize. Risk Owners should be aware of this information and use it to take action.
Risk Owner	The person whom the project manager assigns to watch for triggers and manage the risk response if the risk occurs.
Risk Materialized (Y/N)	Information if the risk has already happened.
Status after Response	After the risk response took place, the status should be described.
Overall Status (Open/Closed)	Initially, risks are inserted with "open" status in the risk register. In case a risk is no longer likely to occur, its status becomes "closed".

Table 9: SPECTRO Risk Register Fields

3.2.5 Identify Risks

The main output of this process is the list of risks identified by the consortium. WPLs should provide the project coordinator with the following information for this process:

- Risk ID
- Risk
- Risk Category
- WP related

The Project Coordinator will be in charge of coordinating this process, ensuring that the required level of detail of the risks identified is present. The project should use the risks that are already present in the DoA as starting point.

Similarly to other Risk Management Processes, this is an iterative process that continuously takes place during the lifetime of the project. All WP leaders are responsible for a regular overview of new risks that could take place and were not foreseen during the start of the project. These new risks should be communicated to the Project Coordinator as soon as they occur.

The Project Coordinator also will ensure that a regular communication channel will be open for this end through teleconferences and e-mails (or other communication tools provided).

The project coordinator will also regularly inform the consortium of the status of the Risk Register, informing of the occurrence of any new risks, their impact and the agreed mitigations or countermeasures.

3.2.6 Risk Analysis

Before the project can plan any response for the identified risks, it needs a classification of each risk. This classification will be done through an analysis made by WP Leaders, where each risk will be given an impact and probability. Please check Section 4.2.3 for further details on how to classify each risk.

The quantities will be obtained throughout this process:

- Probability
- Impact
- Risk Score (computed by multiplying impact and probability)
- Risk Ranking (highest equals major risk)

3.2.7 Plan Risk Responses

Completing the risk analysis provides the consortium with sufficient information to tackle each risk.

For all identified risks, these are the following responses that should be given:

- ▶ Responses to eliminate the threats before they happen (Avoid actions)
- ▶ Responses to decrease the probability and/or impact of threats (Mitigation actions)

These are the columns to be filled in this process:

▶ **Risk Response** (Avoid / Mitigation)

- Avoid: In case an identified risk could be eliminated, the consortium should then inform this column of the measures to be taken for this risk to stop threatening the project (i.e., a risk of missing a specific deadline could be terminated if this deadline is postponed).
- Mitigation: in case a risk cannot be eliminated by the moment of its identification and analysis, a contingency plan should be prepared along with measures to minimize the probability/impact.

- ▶ **Trigger**: An event expected to cause the risk to occur. The risk owner should be aware of this information.

- ▶ **Risk Owner:** A person who will be responsible for the implementation and closure of the mitigating actions assigned to the risk.

It is very important to notice that when planning a response to a risk, the response could become the root cause of an additional risk. If this happens, this new Secondary Risk should also be noted in the risk register.

3.2.8 Control Risks

The Project Coordinator will start this process after the project produces a full risk register, with all risks identified, their impact and probability assigned and also all planned responses described.

The Control Risks process ensures that i) all risks identified are properly handled by the consortium, and ii) any newly identified risk is updated in the risk register.

The Project Coordinator, WPLs and risk owners should monitor the risk triggers and the status of all risks. Any newly identified risk should be analysed and follow the same process as described in this plan (e.g., identification, analysis, plan risk responses, etc.).

Workarounds: This process also could include the sporadic need for workarounds. Whether a risk that was not previously identified by the consortium materializes, the project should come up with a workaround for this risk and it should also be added to the risk register.

Closing Risks: The Project Coordinator is also responsible for closing risks that are no longer applicable. Any risk that is closed should remain in the risk register.

Main output: The main output of this process will be the data provided in the following columns in the risk register (although other columns could be updated if needed):

- ▶ Risk Materialized (Y/N): Information if the risk has already happened.
- ▶ Status after Response: In case the response took place, the status of the risk should be stated
- ▶ Overall Status (Open/Closed): All risks after inserted in the risk register will have the Overall status "open". In case a risk no longer can occur, it should have the status "closed".

When it happens: Finally, this is an iterative process that should be present in the day-to-day life of the project. The status of the risks as presented above will be revised periodically. When such a revision happens, it will be included as an agenda item of the following GA meeting.

Regular meetings (WP-Task Meetings): Risks should be discussed in the corresponding WP/Task meetings, and in the minutes should contain information about actions taken to deal with these risks. If any new risk or update of an existing risk is identified, the WPL should be notified immediately and start the process for compiling the information of the risk as described in Section 4.2.6. Afterwards, the WPL will notify the PC and provide the information on the risk for updating the Risk Register.

3.2.9 Common Risk Management Errors

The following is a list of common risk management errors that all partners should be aware of when managing risks:

- ▶ Risk identification is finished without fully technical knowledge of the project goals.
- ▶ Risk identification completes in a very short timeframe, resulting in an incomplete list of identified risks that may only contain partial information.
- ▶ The risks identified are too general, instead of SPECTRO project-specific risks.

- ▶ Risk management process is not given enough time or resources.
- ▶ Risk management process is not properly explained to the whole consortium.

3.2.10 Risk Assessment (Living) Document

A risk assessment document is provided under the SPECTRO main folder in the repository that defines a live version of the project's risks across all WPs. The document shall be updated at least every quarter with an updated status of risks according to project progress, the probability of risks (likelihood), severity (impact), and if mitigation actions are still aligned with the expected progress of the project. The initial version of the document includes the main risks from the DoA to be revised and extended by WPLs who are responsible for defining and updating risks under their corresponding WPs given the periodicity above. In addition, the QM is responsible for checking if and how coherent and effective are risk mitigation measures to achieve the project objectives. The PC is responsible for ensuring risk mitigation measures' effectiveness to deliver successful project governance and management.

4 Quality Control and Assurance of the Educational Programs

There exist several Quality Assurance frameworks developed within the EU to assess Higher Education programmes. However, for many reasons acknowledged also by the EU commission [3], yet there is not a single widely adopted and used framework. The European Union is funding many initiatives to establish a single Quality Assurance scheme to be adopted by all EU's member states to facilitate the recognition and comparison of University's degrees in different member states and at the same time to assess their quality with a sound methodology, yet there is still not general agreement on which framework to use.

Starting from this landscape, SPECTRO decided to start from the quality assurance framework that EIT Digital has been using for many years to assess i) the quality of their EIT Digital Master programmes and ii) the quality and issue a seal of excellence - the EIT label - for those courses and university that satisfy the framework's criteria. The EIT Label Framework [4] introduces the EIT Quality Assurance and Learning Enhancement (EIT-QALE) Model, which represents the set of key principles to ensure that the EIT Label is consistently implemented in the education provision across all the EIT education portfolios.

EIT-QALE enhances the implementation of the Overarching Learning Outcomes (OLOs) among learners and across the EIT education and training portfolios and helps to disseminate the experience across a large number of European higher education institutions, individual learners and other stakeholders. The focus of the EIT-QALE system on learning outcomes is in line with the Bologna process; it is also aligned with the Quality Assurance in the European Higher Education Area (ESG) [5].

Here we recall the general principles adopted by the EIT Label framework. Then we make the necessary changes to adopt the framework for the specific needs of SPECTRO, also in order to accommodate the quality assessment of the online modules that are not present in the existing EIT Digital Master programmes.

EIT introduced the EIT Label in 2012 as a certificate of quality that is awarded to excellent educational programmes. It is based on the EIT overarching learning outcomes and the following key principles:

- *Innovation & entrepreneurship (I&E) education.* Higher education programmes promote education and training on both I&E content and components.
- *Highly integrated, innovative learning-by-doing curriculum.* Education provision is characterised by learning by doing, which refers to a hands-on approach where learners interact with their environment to adapt and learn. Typically, this entails solving authentic challenges articulated by industry and business partners and other non-academic partners.
- *International engagement and experience* – the European dimension and openness to the world. Education provision embeds international engagement and experience, ranging from international mobility to exposure to international environment, according to the particular education format.
- *Inter-sectoral and inter-organisational experience.* Education programmes typically embed inter-sectoral or organisational experience. All degree programmes shall include inter-sectoral or organisational mobility in non-academic organisations, including business and industry, start-ups, the public sector, government, regulators etc. This can be complemented with collaborative projects with intense interaction between the learner and the external organisation.
- *Geographic inclusion.* The European dimension and openness to the world are embedded in all phases of the programme. From student recruitment to programme content and programme partner selection.
- *Inclusion, diversity and gender mainstreaming and equality.* Inclusion, diversity and gender equality are integrated in the design, implementation, monitoring and evaluation of all education programmes in line with the EU policies on equality and anti-discrimination.

4.1 Overarching Learning Objectives (OLOs)

The objective of the EIT Label is to equip learners with innovative and entrepreneurial skills and competencies. This is done by applying specific EIT Overarching Learning Outcomes (OLOs) in the design and implementation of the education provision. In SPECTRO we decided to adopt the same Overarching Learning Outcomes (OLOs) of EIT Digital. They are the following:

- Entrepreneurship skills and competencies (**EIT OLO 1**): The capacity to identify and act upon opportunities and ideas to create social, cultural and financial value for others, including translating innovations into feasible business solutions with sustainability at their core.
- Innovation skills and competencies (**EIT OLO 2**): The ability to use knowledge, ideas and technology to create new or significantly improved products, services, processes as well as policies, business models and jobs, and to mobilise system innovation to contribute to broader societal change, while evaluating the unintended consequences of innovation and technology.
- Creativity skills and competencies (**EIT OLO 3**): The ability to think beyond boundaries and systematically explore and generate new ideas.
- Intercultural skills and competencies (**EIT OLO 4**): The ability to engage internationally and to function effectively across cultures, to think and act appropriately and to communicate and work with people from different cultural backgrounds.
- Making value judgments and sustainability competencies (**EIT OLO 5**): The ability to identify the consequences of plans and decisions and to merge this into a solution-focused approach that moves towards a sustainable and green society.

- Leadership skills and competencies (**EIT OLO 6**): The ability of decision-making and leadership based on a holistic understanding of the contributions of Higher Education, research and business to value creation.

The OLOs are delivered within the EIT programmes, rather than through separate components. They complement, but do not substitute, the European (QF-EHEA) and/or the national (NQF) learning outcomes in the EIT programmes.

The EIT Label allows significant flexibility in the way the required OLOs are defined, interpreted, contextualised and seamlessly incorporated into EIT' education and training activities into thematic fields. Each OLO is applicable across different education formats and levels. Concrete instruction on how to approach and apply the learning outcomes at different levels and format will be further specified in EIT Label Handbook for degree programmes attached in Annex A.

4.2 EIT-SPECTRO Label

The EIT Label Handbook [7], offers guidance and hands-on working tools for the design, development and review of the EIT-labelled degree programmes at master's and doctoral level. By adopting the EIT Label framework, SPECTRO will adopt a similar operational procedure in implementing what we call the EIT=SPECTRO label certification to its programmes.

This section outlines the most important concepts of the process concerning the quality assessment and describes the modifications to the original EIT Label Handbook procedures to tailor them to the specific context of SPECTRO. These changes relate only to the practical implementation of the scheme, not changing the principles and the quality indicators used by the original scheme.

4.2.1 Quality and Indicators

The EIT QALE system is based on a set of four quality indicators (Qi1-Qi4), divided into different assessment fields, that apply to both master's programmes (Cybersecurity and Robotics).

- Two indicators – Qi1 and Qi2 – are used for the labelling of new programmes.
- Two indicators – Qi3 and Qi4 – are focussed on results from and impact of the programme implementation and stakeholder experience. These indicators are used for follow-up evaluations but the exact choice of the indicators will depend on the scope and focus of evaluation, defined before the evaluation taking place.
- Follow-up evaluations may include all four or some of the indicators.
- The first quality indicator (Qi1) differs from the others in that it addresses several compulsory requirements on a yes/no basis whereas the quality indicators Qi2, Qi3 and Qi4 are all evaluated on a four-grade scale.

In SPECTRO we decided to assess both programs at the end of each year of implementation. So, we repeat the assessment twice during the project lifetime.

Quality indicator 1 – Compulsory requirements

All assessment areas of Quality Indicator 1 are compulsory components of SPECTRO degrees. They are evaluated as yes/no, with room for additional comments. All assessment fields need to be filled before completing the assessment of the programme.

Quality indicator 2 – Qualitative requirements

Quality indicator 2 evaluates whether the programme sufficiently covers the OLOs concerning the thematic field as well as the key principles of the EIT-SPECTRO Label model. Additional assessment fields evaluate whether the programme is characterised by activating teaching and learning methods (student-centred) and whether it provides students with access to rules, regulations and assessment criteria regarding assessment and grading. Qualitative requirements set the ambition; modest performance in some qualitative requirements can be compensated with excellent performance in others.

Quality indicator 3 – Results, achievements, and impacts.

Quality indicator 3 consists of four assessment fields which evaluate:

1. Student’s entrepreneurship skills and competencies. Examples of student entrepreneurship skills and competencies may include projects, products, or entrepreneurial test scores
2. Achieved Learning Outcomes (ALOs). These refer to samples of actual products by SPECTRO students (e.g., master’s theses, I&E theses, summer school deliverables, business development lab deliverables etc.)
3. Student retention and completion rates. Retention and completion rates should be closely monitored and analysed.
4. Graduate employment and career progress. This assessment field is used to determine whether graduates show excellent labour market outcomes and career progress.

Quality indicator 4 — Stakeholder experiences and continuous improvement

Quality indicator 4 is divided into five assessment fields, covering feedback from, and experiences of, students, alumni, instructors, and non-academic partners (business/industry and other stakeholders); as well as the efforts to support the EIT-SPECTRO Label community of practice and continuously improve the programme.

In addition to the quantitative data, reporting will also include brief narrative reports based on qualitative data which will be delivered annually. The qualitative part of the brief narrative reports will comprise the following elements:

- A brief executive summary report (up to 2 pages) on the programme implementation against the project plan.
- Information on possible changes that have been made in the programme, their justification, accompanying documentation and also a description of how the changes affect particular assessment fields in the templates (if any). A short summary (up to 3 pages) of feedback from students, alumni and stakeholders and a summary of whether, and how, this feedback has influenced the development of the programme.
- Any other relevant information that programmes would like to share; for instance, examples of good practice, exceptional student products, start-ups or other outcomes, achievements and impacts.

Yearly Reporting by programme coordinators

The annual reporting on the programme implementation by programme coordinators will be aligned with the academic year. Brief narrative reports consisting qualitative data will be delivered at the end of each academic year.

Reporting by programme coordinators will comprise the following four elements:

- A brief executive summary (up to 2 pages) on the programme implementation against the program goals and plan (progress, performance and milestones, reflection on delivery formats, participating institutions, key principles, modules, lecture teams, syllabuses, curricula etc.)
- Information on possible changes that have been made in the programme, their justification, accompanying documentation and also a description of how the changes affect particular assessment fields in the templates (if any).
- A brief summary (up to 3 pages) of available feedback from students, alumni and stakeholders, including whether, and how, this feedback has influenced the development of the programme.

Reporting from EIT Digital

The monitoring of quantitative data will benefit from the standardisation of data flow within EIT Digital. Quantitative data on students and graduates shall be retrieved from the central EIT data model which collects data from student application, enrollment and management. Annual cut-off dates are set by EIT Digital.

Monitoring of students and graduates will cover the following key data:

- Student data: number of applicants, number of enrolled students, number of active students, gender balance, geographical background (EU/EHEA, EIT RIS countries, Third countries),
- Graduate data: number of graduates, gender, geographical background (EU/EHEA, EIT RIS countries, Third countries), graduate destinations and labour market situation.

4.2.2 Review process

The EIT label handbook foresees an external review: conversely, SPECTRO will implement only a self-assessment (internal review) of the programme conducted by each Program Leader supported by the participating University organisations. The evaluation of the review is performed by the Review Team i.e., the Project Coordinator, the Quality manager and the two Program Leaders across the following steps:

- The EIT-SPECTRO Label review process is initiated according to the deadlines specified by SPECTRO by its Program Leader – together with the respective participating Universities.
- The EIT-SPECTRO Label review must include a self-assessment report of the programme, produced by the participating Universities, per the requirements described in Section 4.2.1.
- The review file should be structured according to the quality indicators (Qi1 and Qi2) and accompanied with relevant supporting evidence. The main working document for both processes is the template that must be used by the applicants. The templates include a list of the assessment fields which represent requirements for a programme to be awarded the Label.
- Annual review deadlines are established by the Project Coordinator, and the Program Leaders are expected to submit their reviews in compliance with such deadlines.
- The EIT-SPECTRO Label review, including the accompanying documents, is submitted through the available online tool (decided by the project coordinator).

- The evaluation of the application is conducted remotely by the Review Team.
- The review team first confirms the compliance by answering “Yes” to all Template Qi1 criteria before proceeding to the review of new programmes using the Templates for Qi2.
- After considering the evaluation reports of the Program Leaders, the review team decides on the initial award of the EIT-SPECTRO Label for each of the submitted programmes.
- In case of awarding provisional Labels (Option 2 see Section 4.2.3), requirements for specific improvement measures are forwarded to the relevant participating Universities(s). The Program Leader shall submit the status report addressing the requirements at least 1 month before the expiry of the duration of the provisional Label set in the awarding decision (up to 1 year).
- All students graduating/being admitted within the validity period of an EIT-SPECTRO-labelled programme (irrespective of whether the period of study was commenced before/completed after the validity period) can be awarded an EIT-SPECTRO Label certificate.

Due to the limited (4 years) duration of SPECTRO, the project will not implement long-term monitoring or any other monitoring activity besides the annual self-assessment described above. The templates adopted for the self-assessment are an adaptation for SPECTRO of those included in the EIT Label Handbook. Those templates provide a list of self-evaluation questions for the degree programme that the universities should respond to, as well as brief instructions on what material should be provided as supporting evidence. The self-assessment report is required to include the relevant documentation to provide evidence for the specific requirements. The questions in the templates will guide this selection, together with the examples provided in each template. As – in line with the portfolio principle mentioned above – the aim is to give the best possible evidence to reviewers, material may be both added and omitted from the list.

4.2.3 Review Outcomes and procedures for appeals

The outcome of the review of each SPECTRO program can be one of the following:

Option 1: The review team may recommend urgent and substantial corrective actions rejecting the label and recommending for re-assessment where there is a need to make fundamental changes in the programme design and/or the application file and documentation provided fail to convince the review team about meeting the minimum criteria.

Option 2: Where the minimum requirements are met, but there are significant shortcomings that need to be addressed, the review team may recommend a provisional award of the EIT-SPECTRO Label until specific improvement measures are taken before the award of the full EIT-SPECTRO Label. In such cases, the review team might recommend a provisional Label for up to 2 years to allow time to address the requirements.

Option 3: The review team recommends an award of the full EIT-SPECTRO Label with no additional conditions.

The University may challenge the rejection and recommendation for re-assessment (Option 1) by presenting the arguments for their disagreement with the contested decision. Such a document should be submitted to the project coordinator within 30 days after the review decision. The decision will be made by the GA assembly of the project after the consultation with the Review Team.

4.2.4 Guidance and Instructions for the Review Team

This part details the guidance for the Review Team (RT) to take part in the evaluation of the EIT Label by the University implementing the SPECTRO's programmes. The RT assesses the issuance of the EIT-SPECTRO label by:

- verifying the self-assessment reports,
- identifying "good practices" within the submitted applications and in the programme design, and
- providing feedback on relevant aspects of EIT-SPECTRO Label and assessment process from a review perspective.

The review for the award of the EIT-SPECTRO Label covers:

- the compulsory requirements for awarding the EIT-SPECTRO Label to degree programmes – Template Qi1, and
- the qualitative requirements for the EIT-SPECTRO Label – Template Qi2.

Review of the compulsory requirements for the initial award of the EIT-SPECTRO Label - Template Qi1

The RT shall confirm the full compliance of all compulsory requirements before they can proceed to the quality review of the programme (Template Qi1). However, if in some requirements the application can convincingly document only at least partial compliance, the RT could exceptionally consider awarding the EIT-SPECTRO Label provisionally and require adjustment and changes to be made in a given time to ensure full compliance.

The criteria shall be assessed on a yes/no scale. Additional information can be requested if necessary. No written comments from the RT are required per assessment field as these are basic compliance requirements, rather than a quality assessment. However, RT can still provide suggestions and reflections towards compulsory requirements in the final general feedback section of the EIT-SPECTRO Label review report.

Results of the assessment

- If the programme receives a 'Go' decision, the RT may progress to the full quality review.
- If the programme receives a 'No Go' decision, the review team should write a short report (maximum 500 words) to make recommendations for re-evaluation or improvement prior to the award of the EIT-SPECTRO Label. In this case, the programme review is halted.

Review of the Qualitative requirements for the EIT-SPECTRO Label - Template Qi2

The RT shall assess the Universities' submission for the qualitative requirements, using a specified grading scale and a template. The RT should base their grading on the evaluation of the programme as a whole although different Universities within the same programme may show different quality on the same requirement.

Noticeably, the EIT-SPECTRO labelling process does not replace or duplicate national accreditation / quality assurance processes but aims to ensure that the students will achieve the learning outcomes and that the programmes meet the other quality requirements. The review focus is primarily on the added value proposed by the educational features specific to SPECTRO.

Grading scale: determining Quality Indicator Scores

Qualitative requirements will be assessed using the grading scale from 1 to 4. The RT members should grade each assessment field/question in line with Table 10. Each quality indicator score should build on the consensus of the RT. This consensus decision should be explained in the review report with justifications based on the evidence provided. Scoring per particular assessment question shall be accompanied by a brief narrative explanation, using concrete references to information provided in the application. The lower the evaluation score, the more thorough and elaborated explanation is expected, to provide the applicants with as detailed feedback as possible to learn from the assessment and to address the shortcomings accordingly. In case the review team does not agree on a specific recommendation, the chair of the review team shall make the final decision. In this case, the arguments for the disagreement should be specified.

Grade	Evaluation	Criteria
1	Does not meet the minimum criteria	The main part of the criteria has not been met
2	Meets the minimum criteria but improvements are needed	The criteria have been partially met.
3	Good	The criteria have been met
4	Excellent	The criteria have been met and include evidence of best practices in design and/or implementation

Table 10: Grading scale for assessing particular assessment fields in Qi2

4.2.5 Final conclusions and Recommendations Template for Reviewers

This section guides the RT in designing their conclusions and recommendations regarding the application for the award of the EIT-SPECTRO Label.

Determining the Final Evaluation Score

The final evaluation score and proposal to award the EIT-SPECTRO label should build on the consensus of the RT. An average score of indicators may be used to inform the decision; This consensus decision should be explained in the report with justifications based upon the different forms of evidence provided. In the narrative feedback, and conclusions concrete references to information provided in the application should be made. The lower the final evaluation score, the more thorough and elaborated explanation is expected, to provide the Universities with as detailed feedback as possible to learn from the assessment and to address the shortcomings accordingly. Should the review team not agree on a specific recommendation, the PC makes the final decision. This situation should be stated clearly and the arguments for the disagreement should be specified.

Grade	Evaluation	Criteria
1	Does not meet the minimum criteria	Mainly scores of 1 and no evidence that the application meets the requirements for the EIT-SPECTRO Label

2	Meets the minimum criteria but improvements are needed	Mainly scores of 2 and limited evidence that the application meets the requirements for the EIT-SPECTRO Label
3	Good	Mainly scores of 3 and evidence that the application meets the requirements for the EIT-SPECTRO Label
4	Excellent	Mainly scores of 4 and evidence of best practice in design for the EIT-SPECTRO Label

Table 11: Grading scale for Final evaluation score

When shall be the Label recommended?

Where the programme has received a final evaluation score of 3 or 4, the RT recommends that EIT-SPECTRO Label is awarded. After a positive assessment, the EIT-SPECTRO Label is awarded for the duration of the project. The consistency and quality of the programme will be monitored yearly.

If the programme meets the minimum criteria only (a final evaluation score of 2), the RT needs to propose concrete recommendations for improvement. A temporary award may be recommended for a period of between 3 to 6 months, based on the time needed to implement the required improvements satisfactorily.

If the RT does not recommend the EIT-SPECTRO Label (a final evaluation score of 1), it should provide clear reasons for this in the final report so that the University can adopt urgent measures to fill the monitored and documented deficiencies and dramatically improve the quality of the proposal.

Template for the review team - Final recommendation

Programme name:	
Final Evaluation Score (1-4):	
Final Conclusion – is Label recommended? (Yes/No/Provisionally)	

Provisional Award of EIT-SPECTRO Label - Requirements

Where a provisional award is recommended, the following requirements must be addressed before a full award can be recommended.

Comments should not exceed 1000 words and should use bullet points where possible. Statements should be qualified with examples and reference to the particular assessment questions/answers and information as provided in the application file.

The list of requirements:

<p>Recommended probationary period (3-6 months):</p>
--

<p>Review Team Overall Comments</p> <p><i>Comments should not exceed 2000 words and should use bullet points where possible. Statements should be qualified with examples.</i></p>
<p>Date</p>

5 Conclusions

The SPECTRO project aims at successfully implement a comprehensive Quality Assurance (QA) methodology, ensuring that the project meets its objectives and delivers high-quality outputs. The following conclusions summarize the key aspects and outcomes of the QA process:

1. **Robust QA Framework:** The project establishes a robust QA framework that aligns with both EU standards and project-specific requirements. This framework facilitates the systematic monitoring and evaluation of project activities, ensuring adherence to predefined quality criteria.
2. **Effective Risk Management:** Through proactive risk identification and mitigation strategies, the project will effectively manage potential challenges. Regular risk assessments and contingency planning will minimize disruptions and ensured project continuity.
3. **Continuous Improvement:** The QA methodology incorporates feedback loops and regular reviews, fostering a culture of continuous improvement. This approach enables the project team to promptly address issues and implement enhancements, contributing to the overall success of the project.
4. **Stakeholder Engagement:** Engaging stakeholders throughout the project lifecycle is pivotal in maintaining high quality standards. Regular communication and collaborative efforts with stakeholders ensure that the project outcomes meet the expectations and needs of all parties involved.
5. **Comprehensive Documentation:** Detailed documentation of processes, procedures, and outcomes will be maintained, providing a transparent and traceable record of the project's QA activities. This documentation will be essential for audits, reviews, and knowledge transfer.

6. **Compliance with EU Regulations:** The project strictly adheres to EU regulations and guidelines, ensuring compliance in all aspects of project execution. This compliance is going to be verified through regular audits and evaluations, confirming the project's alignment with EU funding requirements.
7. **Achieving Project Goals:** The systematic application of QA practices will play a critical role in achieving the project's goals. The structured approach to quality assurance will ensure that the project outputs are of high quality, relevant, and impactful.
8. **Lessons Learned and Best Practices:** The QA process will identify valuable lessons and best practices, which can be leveraged in future projects. Documenting and disseminating these insights will benefit similar initiatives and contribute to the broader knowledge base within the EU project community.

References

- [1] Wikipedia. "Responsibility assignment matrix". http://en.wikipedia.org/wiki/Responsibility_assignment_matrix ,
retrieved on 2024-6-5
- [2] Project Management Institute, 2013, Project Management Body of Knowledge - PMBOK Guide, Newton Square
- PA: Ingram International Inc, Pennsylvania
- [3] COUNCIL RECOMMENDATION on a European Quality Assurance and Recognition System in Higher Education,
2024- 3-27
- [4] Decision 11/2021 of the Governing Board of the EIT on the adoption of the new EIT Label Framework.
(Ares(2021)1930763)
- [5] Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG) 2015

Glossary

EC	European Commission
EIT	European Institute of Innovation and Technology
KIC	Knowledge and Innovation Community
GA	Grant Agreement
GDPR	General Data Protection Regulation
R&S	Research and scholarship

6 Annexes

The following annexes are presented below for reference. Please be aware that the content of these annexes is subject to change during the project's lifetime.

6.1 Annex A: Internal Review Planning and Control

The internal review planning and control document should be created by the Quality Manager as an Excel file (Internal review planning and control.xlsx is available) and agreed upon by the project consortium. This document will be filled by the Quality manager to manage the deliverable review process for each project deliverable. It will be an Excel file with 2+ sheets (additional sheets could be added if needed).

Sheet 1: The IR Planning and Control sheet:

Deliverable	Title	WP	Due month	Responsible	Reviewers	Status	Date	Comments

- Each column means the following:
- **Deliverable:** deliverable identifier (Dx.y where "x" is the work package number and "y" is then deliverable number as defined in the DoA).
 - **Title:** title of the deliverable as defined in the DoA.
 - **WP:** work package of the deliverable
 - **Due Month:** delivery date for the deliverable as defined in the DoA.
 - **Responsible:** deliverable leader organization (short name).
 - **Reviewers:** the two organizations (short name) assigned to review the deliverable.

Deliverable D4.3
 Quality Assurance Methodology
 Project: SPECTRO (101123118)

- **Status** indicating if the deliverable review process is “Not started,” “In progress” or “Approved” (additional status could be added).
- **Date** for each step of the deliverable review process.
- **Comments** for the process.

Sheet 2: The second sheet can be used to contain supporting information for the QM such as number and name of the organizations, the different work packages of the project with their responsible organization and contact information, etc.

6.2 Annex B: Templates for the EIT-SPECTRO Label

Template Qi1 for EIT-SPECTRO Label – Compulsory requirements for degree programmes

This section outlines the compulsory Quality Indicators and requirements for the EIT-SPECTRO labelled degree programmes. All applications for the EIT-SPECTRO Label must demonstrate full compliance with these requirements. Each compulsory requirement is supported by questions. All requirements apply to both master’s degrees.

How to use this template

Please respond to all questions by providing a positive/affirmative narrative response (‘Yes, the programme ...’) as well as additional evidence that best supports your application as it relates to the disciplinary field.

Minor contextual deviation from the requirement could be accepted – in such cases please fully explain and justify the case. However, the notion of the requirement must be satisfied.

The supporting documents may vary according to the programme and may consist of programme descriptions, project descriptions, websites, partner agreements etc. The list of examples should not be considered exhaustive; other evidence can be included in the EIT SPECTRO Label applications. The supporting documents and evidence must be concise and limited – the idea is not to provide as much as possible but only to clearly and briefly document how the particular requirement is achieved.

Compulsory requirements

Qi1.1 UNIVERSITY AND NON-ACADEMIC PARTNER COLLABORATION IN THE CURRICULUM: The degree programme features collaboration between universities and non-academic partners in the design and implementation of the curriculum.

- *Q1.1.1 Are at least 2 partner universities engaged in the implementation of the programme?*
- *Q1.1.2 Are there students carrying on their final project in non-academic organizations?*
- *Q1.1.3 Do all students receive both academic and non-academic support on their mandatory thesis?*

Examples of supporting evidence:

- Official description of the SPECTRO M.Sc. programme’s courses
- List of students performing the thesis project in non-academic organizations.

Qi1.2. COMPLIANCE WITH NATIONAL AND EUROPEAN QUALITY STANDARDS AND RECOGNITION REQUIREMENTS:

The degree programme meets the national requirements and the European quality standards: EHEA¹ requirements for Master's level as well as Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESGs)².

- *Q1.2.1 Is the master's programme aligned with the European guidelines on EHEA requirements and is the degree accredited or recognized in all the countries of the awarding universities?*
- *Q1.2.2 Will each graduate receive a Diploma Supplement (DS) for the degree?*

Examples of supporting evidence:

- National accreditation documents or other relevant documentation
- Copy of diploma supplement

Qi1.3 STUDENT SELECTION AND ADMISSION: The degree programme selection processes are jointly organised by the partner universities (and EIT Digital) and they identify students' entrepreneurial potential.

- *Q1.3.1 Does the student selection process include criteria for the assessment of students' entrepreneurial potential?*
- *Q1.3.2 Do all the partner universities - and the EIT Digital where relevant - implement jointly a shared process of application, selection and admission?*

Examples of supporting evidence:

- Information on selection procedures
- Information on how the selection addresses students' entrepreneurial potential

Qi1.4 GRADUATE TRACKING: The degree programme has in place a graduate tracking system

- *Q1.4.1 Does the project have a system in place to track graduates, or advanced plans to introduce it?*
- *Q1.4.2 Is there a SPECTRO alumni organisation in place to track graduates or advanced plans to establish an alumni organisation?*

Examples of supporting evidence:

¹ <http://www.ehea.info/page-tools>

² https://enqa.eu/wp-content/uploads/2015/11/ESG_2015.pdf

- Description of the graduate tracking system or related plans
- Description of alumni organisation and its graduate tracking system or related plans

Qi1.5 CROSS-ORGANISATIONAL AND INTERNATIONAL MOBILITY: The degree programme includes cross-organisational and international mobility.

- *Q1.5.1 Does the programme include a compulsory cross-organisational mobility, with the workload equivalent of at least 15 ECTS?*
- *Q1.5.2 Does the programme include a compulsory international mobility, with the workload equivalent of at least 15 ECTS?*
- *Q1.5.3. In case of a combined cross-organisational and international mobility, is the workload equivalent of at least 30 ECTS?*

Examples of supporting evidence:

- Description of cross-sectoral mobility opportunities
- Description of international mobility opportunities
- Declaration confirming that all students shall undergo cross-organisational mobility
- Declaration confirming that all students shall undergo physical international mobility

Qi1.6 LANGUAGE OF INSTRUCTION: The degree programme is taught in English.

- *Q1.6.1 Is the programme taught in English?*

Examples of supporting evidence:

- Declaration confirming that all students receive teaching in English

Template Qi2 for EIT-SPECTRO Label – Qualitative requirements for degree programmes

This section outlines the qualitative requirements for the EIT-SPECTRO labelled degree programmes in connection to the OLOs and key principles of EIT Digital Educational programmes.

Quality requirements set the ambitions for the SPECTRO degree programmes. Therefore, good performance on one quality requirement compensates for a more modest performance on another.

The OLOs and the key principles are part of the requirements for labelling, and they need to be integrated into the programme design and implementation. The applicants are therefore requested to detail the programme's intended learning outcomes that relate to OLOs and key principles in order to ensure that students can achieve these OLOs, and that the programme can meet the key principles.

The EIT-SPECTRO labelling process shall not replace or duplicate national accreditation or quality assurance processes. Most of the qualitative requirements apply to both master's programmes.

How to use this template

Please answer by using thematic information from the relevant specialisation, subject, programme or field. Start with the key words and concepts, by indicating how they relate to the degree programme to clarify meaning. As an example: *"In the context of this programme, this is what is meant by 'sustainable society'",* etc. Narrative answers must provide justification which may be based on the programme-specific approach to the terms and concepts, and subject areas concerned.

Please outline how the learning experience will ensure that the students achieve the OLOs. For example, in relation to the requirement on OLO on entrepreneurial skills and competencies, make the intended learning outcomes contextual to the degree programme and illustrate how they simultaneously fulfil OLOs; propose a narrative about the student experience.

- Include a table for the *Coverage of EIT Overarching Learning Outcomes* to ensure that all required OLOs are covered.

Please outline how the degree programme delivers on the key principles. Propose a narrative about the student experience.

- Include a table for the *Coverage of Key Principles* to ensure that all required principles are addressed

Qualitative requirements

Q12.1 OLO COVERAGE: The degree programme enables students to achieve all Overarching Learning Outcomes. Innovative pedagogies including active teaching and learning methods are implemented to enable the achievement of intended learning outcomes.

- Q2.1.1 *Does the programme ensure that students develop all the OLOs?*
- Q2.1.2 *Are teaching and learning methods in the programme appropriate for achieving the intended learning outcomes which relate to the OLOs?*
- Q2.1.3 *What other innovative pedagogies are integrated into the programme design, particularly regarding the elements which relate to the OLOs?*

Examples of supporting evidence:

- OLO Coverage table
- Evidence and documents how the OLOs are achieved by the student through the course of the programme, examples from all involved universities, relevant module outlines
- Descriptions on teaching and learning methods, including alternatives to in-class teaching and learning methods, and how they are supporting student development related to the OLOs
- A list of all compulsory courses that are included in the programme and relate to OLOs and competences

Qi2.2 ASSESSMENT AND GRADING: The intended learning outcomes are transparent and assessable. The student assessment is fit for purpose irrespective of the mode of delivery and allows feedback from students. Appropriate grading is used.

- *Q2.2.1 Are the programme's intended learning outcomes (which relate to OLOs) transparent and assessable, and skills and competencies clearly described?*
- *Q2.2.2 Is the student assessment fit for purpose regarding the content and mode of learning, competencies and the OLOs, allowing feedback from students?*
- *Q2.2.3 Are the rules and regulations for assessing and grading the programme in relation to EIT OLOs available to students before they begin the respective module?*
- *Q2.2.4 Are the assessment criteria (grade descriptors) used when assessing and grading student work in relation to the OLOs?*

Examples of supporting evidence:

- National accreditation documents as appropriate (with English translation where relevant)
- Highlighted sections of appropriate official documents such as Exam and teaching regulations bwhere they relate to assessment of EIT KIC thematic content
- Course descriptors/teaching units files including assessment methods connected to OLOs, covering also potential alternatives to standard in-class assessments
- Module/Course descriptors with assessment methods
- Information on the nature of the examinations, possibilities for re-sits, access to trial exams, post-exam inspection session
- Examples how assignments and examinations will be/are presented to students
- Document with the assessment criteria (grade descriptors) that are applied at each university when assessing students' attainment on modules in relation to OLOs

Qi2.3 KNOWLEDGE TRIANGLE INTEGRATION: The degree programme is based on bridging the academic and the non-academic world, and co-creation and collaboration which brings together universities and business and other non-academic partners whether public or third sector and civic society.

- *Q2.3.1 Are industrial and non-academic partners actively involved in the curriculum development?*
- *Q2.3.2 Are industrial and non-academic partners actively involved in teaching and learning activities?*

Examples of supporting evidence:

- Advisory Board records
- Testimonies from industrial/non-academic partners including from local public authorities or third sector
- List of educational activities provided by industrial/non-academic partners
- Examples of educational materials developed for the programme with industrial/non-academic partners which are provided to students (e.g. case studies)
- List of placements for internships
- List of guest lectures from industrial / non-academic partners given in courses
- Description of mentorships and student counselling involving industrial/non-academic partners

Qi2.4 INNOVATION AND ENTREPRENEURSHIP EDUCATION AND INTERDISCIPLINARITY: The degree programme develops an entrepreneurial mindset and capacity for innovation.

- *Q2.4.1 Are students exposed/actively offered an access to the university-based innovation and entrepreneurship ecosystem, including technical, financial and human services (incubators, mentoring and coaching, seed funding etc.) in order to develop their entrepreneurial skills and competencies and to test out the commercial potential and viability of their ideas/learning/research outcomes?*
- *Q.2.4.2 Does the programme provide students with information and guidance on intellectual property rights (IPR) aligned with the respective (inter)disciplinary field?*
- *Q2.4.3 Does the programme have a continuous improvement plan in place to support instructors covering e.g. training, shared learning or continuous professional development in the area of I&E education?*
- *Q2.4.4 Does the programme adopt inter-/transdisciplinary approaches and bring together science/technology/knowledge in order to address broad societal and global challenges and/or link up with new business and innovation processes?*

Examples of supporting evidence:

- Description of incubators, entrepreneurship labs, summer school, seminar, or any other facility or mechanism designed to support entrepreneurial students, including both curricular and extra-curricular opportunities
- Description of the integration of IPR awareness in the programme
- Description of opportunities for instructors to gain and update their pedagogical skills in innovation and entrepreneurship

Qi2. 5 HIGHLY INTEGRATED, INNOVATIVE “LEARNING-BY-DOING” CURRICULA: The programme utilises hands-on approached where learners interact with their environment in order to adapt and learn.

- *Q2.5.1 Does the programme provide students with opportunities for learning by doing, exposure to the reality of professional life outside university and the future labour market needs?*

Examples of supporting evidence:

- Real-life industrial/non-academic challenges integrated into the curriculum
- Non-academic internships
- Documents detailing the internship length and requirements

Qi2.6 INTERNATIONAL ENGAGEMENT AND MOBILITY EXPERIENCE: Mandatory physical mobility supports the achievements of OLOs.

- *Q2.6.1 Is the international physical mobility organized so that it enables the achievement of the intended learning outcomes?*

Examples of supporting evidence:

- Mobility agreements

- Course descriptions
- Description of the organisation of the support for faculty/staff in the facilitation of the mobility

Qi2.7 INTER-SECTORAL EXPERIENCE AND CROSS-ORGANISATIONAL MOBILITY: The programme include inter-sectoral or organisational mobility in non-academic organisations, (business and industry, public sector, government, regulators, third sector, start-ups).

- *Q2.7.1 Is the cross-organisational mobility organized so that it enables the achievement of the intended learning outcomes in relation to the EIT OLOs?*
- *Q2.7.2 Does the programme offer support for the university staff in the facilitation of cross- organisational mobility?*

Examples of supporting evidence:

- — Mobility agreements
- — Objectives of associated modules

Qi2.8 GEOGRAPHIC INCLUSION: Geographic inclusion, the European dimension and openness to the world are embedded in the student recruitment, programme content and programme partner selection. Special efforts are made to enhance the participation from the countries eligible to take part in the EIT Regional Innovation Scheme (RIS).

- *Q2.8.1 Are appropriate plans in place to ensure recruitment of European students, including targets and monitoring mechanisms?*
- *Q2.8.2 Are appropriate plans in place to enhance recruitment of students from the EIT RIS- eligible countries, including appropriate monitoring mechanisms?*

Examples of supporting evidence:

- Description of marketing and recruitment plans for European students as well as from the EIT RIS-eligible countries
- Report on recruitment data at host institution and historical performance of related programmes, with comparison against proposed programme application
- Description of plans to enhance participation of instructors from EIT RIS-eligible countries

Qi2.9 INCLUSION, DIVERSITY AND GENDER MAINSTREAMING: Recruitment and enrolment policies, alternative pathways and recognition of prior learning are promoted to improve social inclusion and diversity. Investments in the student support enable equal access and success. Balanced gender representation among learners and instructors is promoted.

- *Q2.9.1 Are appropriate strategies and policies in place to enhance inclusion, diversity and non- discrimination, including targets and monitoring mechanisms?*
- *Q2.9.2 Are appropriate strategies and policies in place to enhance gender equality and mainstreaming in line with the EU policies, including targets and monitoring mechanisms?*

Examples of supporting evidence:

- Description of marketing and recruitment plans and policies for inclusion including financial, social and academic support
- Description of marketing and recruitment plans and policies for gender inclusion
- Strategies, policies and actions plans for gender equality and mainstreaming in institutional staff and student policies
- Data on inclusion, diversity and non-discrimination and gender equality