

Curriculum Development in Data Science and Artificial Intelligence

599600-EPP-1-2018-1-TH-EPPKA2-CBHE-JP

Quality Assurance Plan

Version 1: 15 August 2019



PROJECT INFORMATION

| | |
|-----------------|--|
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| | |
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Abstract

The Quality Assurance Plan (QAP) aims at the establishment of a comprehensible and efficient evaluation framework, which will ensure the successful implementation of project's tasks and the production of deliverables of high quality, by applying minimum burden and avoiding obsessions with processes at the expense of progress and conflicts over priorities. The document analyses the progress monitoring indicators and the quality evaluation areas and specific criteria as well as the mechanisms and the tools that will be employed by the internal Quality Boards during the project lifetime.

QAP includes all the relevant information regarding the progress monitoring and the quality evaluation related issues that will be implemented during the project lifetime. It presents the aims and objectives of the plan in order to successfully spread and disseminate the quality evaluation culture within the consortium. The organization of the internal Quality Board (QB), the cooperation with the Management Board (MB) along with the clear roles and responsibilities of the Task Leader and consortium members that are involved in project's tasks are presented. The evaluation factors/areas, the specific criteria, the methods and the tools are then analyzed in detail while the specific evaluation forms and feedback questionnaires are included in the Annexes of the document. Standardized processes regarding the review and the submission of deliverables are described. The plan is based on specific criteria and mechanisms that focus on measuring and evaluating the impact of project's results. Specific paragraphs are devoted to the risk assessment strategy and the method used for evaluating the impact of the risks identified by the Quality Board at the proposal phase and also, at the initial phase of the project. Finally, the plan refers to the evaluation of the MSc programme, which will be based on the guidelines of the ESG framework for the higher education in the European Union (EU).

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1. Aims and Objectives

The implementation of the quality plan will be carried out by all consortium partners. The contribution of all partners regarding the necessary input and their response to improvements are critical for the successful implementation of tasks and the production of deliverables of high quality. Quality monitoring and evaluation is expected to motivate partners to discuss and review the performance of project activities, to analyse strengths and weaknesses, to plan and apply corrective action in order to improve the quality of the implementation of tasks and project outputs and outcomes. One of the most important concerns is to develop a culture of quality assurance among the whole partnership by monitoring the relevance, the effectiveness, the efficiency, the impact and the sustainability of the project results.

The overall aim of the QAP is to establish the framework of the quality evaluation procedures that will be implemented during the project lifetime. According to the project description, the specific objectives of the plan are related to:

- Continuous monitoring of tasks progress according to indicators included in the logical framework matrix
- Overall monitoring of project implementation according to the work plan, the identification of warning signs as well as planning and activation of mechanisms for better implementation
- Standardization of processes regarding communication among partners, sharing of documents, review procedures, and delivery of project tangible and intangible results
- Specification of tools and criteria which will be used for evaluating the quality of project results
- Evaluation of the quality of outputs/outcomes based on the above criteria
- Risk Management, decision making, crisis management and conflicts resolution
- Survey and the dissemination of the results of evaluation on a yearly basis and after critical milestones of the projects, including events
- Planning and applying corrective actions, in order to respond to any deviation of the project outcomes in terms of time, quality and cost, by applying a plan-do-check-act (PDCA) procedure.

For the successful implementation of the project as a whole, the establishment of comprehensible, transparent and efficient processes for quality monitoring and evaluation is crucial. High-quality standards and quality evaluation processes have to be welcomed by all partners. On the other hand, in order to avoid risks related to possible obsessions with processes at the expense of implementation and prioritize issues so that possible conflicts and disagreements become opportunities for lessons to be learned by partners, all partners should have in mind that the main purpose of the plan is to facilitate work by proposing standardized mechanisms and tools, maximize the quality and impact of the project without applying barriers or additional burden with respect to the tasks described in the work plan.

2. Quality Board

AMC is the leader of the Work Package – Quality Assurance & Monitoring. AMC is responsible for the development of the Quality Assurance Plan. At the beginning of the project, AMC works in close cooperation with the Coordinator, with the aim to organize the internal Quality Board (QB), circulate and acquire feedback on the Quality Plan and more importantly, disseminate a quality evaluation culture within the consortium. AMC has already designed the evaluation tools and the mechanism that will be used by partners to monitor progress and evaluate the project plenary meetings and events, the project outputs and outcome, the MSc programme itself while during the project it will be responsible for collecting, analyzing and disseminating the results with the Consortium along with warning signs and suggestions for continuous improvement. During the project, AMC will be responsible for the delivery of the periodic and events-based reports.

QB will be responsible for:

- Monitoring the work plan, inform the coordinator and the MB on warning signs and deviations and provide recommendations for better implementation.
- Planning and applying corrective actions, in order to respond to any deviation of the project outcomes in terms of time, quality and cost, in cooperation with task leaders and the MT.
- Preparing questionnaires to be delivered to task leaders and the scientific staff involved in the project before the implementation of tasks. (Task leaders in collaboration with the MB will have the opportunity to enhance questionnaires; They will be responsible for providing the guidelines regarding research, preparing the templates for the corresponding deliverables, and disseminate the quality evaluation forms (questionnaires) so that staff involved in the tasks/deliverables is aware about the progress indicators and the quality evaluation criteria.)
- Monitoring and evaluating the quality of the deliverables as well as the efficiency of the reviewing/deliverables submission processes described in the QAP, in close cooperation with task leaders and MT.
- Disseminating quality evaluation results to the partnership and the stakeholders, according to the nature of the subject under investigation
- Providing guidelines and recommendations for the improvement of the quality of the deliverables.
- Reviewing and delivering the final version of the Quality Plan and also, periodic Quality Evaluation reports events-based reports produced after critical milestones, i.e. training seminars, workshops, laboratory demonstrations, etc.

Regarding in particular project's events, QB will be also responsible for:

- Developing D4.2: Toolkit for the evaluation of the DS&AI programme. The toolkit will contain different types of evaluation techniques (e.g. questionnaires, interviews and observation) and templates in order to assess the delivery of the DS&AI programme in the Asian partners HEIs. Its

findings will inform the two reports on programme delivery (see below) and the subsequent programme revision as well as the project evaluation report.

All Consortium members will be represented in the QB with one representative per partner preferably with personnel that will not be involved in day-to-day project implementation. The members of the QB along with contact information are listed in Table 1. QB will organize additional face-to-face meetings at the side-lines of management meetings or other events if possible and skype/telecommunication meetings on a regular basis (at least once per 3 months).

Table 1 Quality Board Members

| Quality Assurance Board Members | | | |
|---------------------------------|--------------------------------|----------------------------|-----------------------------------|
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| | | | email, phone, skype name) |
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3. Quality Plan Roadmap

The QAP will be implemented to assess the quality of the:

- Research on related MSc programmes and best practices
- Communication and information exchange with stakeholders (including representatives of HEIs outside the consortium) which will support the above research
- Study visits organised to support the design of the MSc programme
- Design of the MSc programme and courses, based on the level of stakeholders involvement and achievement of expectations
- Infrastructures developed during the project and the equipment purchased based on its relevance to the educational programme developed
- Training seminars in terms of teachers/learners opinions about the level of expectations
- Courses developed during the project, including educational material and VLE
- Delivery of the MSc programme, by monitoring the educational methodologies adopted, the competences of teachers, the educational material and the additional learning resources, and further development of links with companies, the achievement of expectations of target groups and the performance of attendees. Evaluation of the MSc programme itself will be based on the “Standards and Guidelines for Quality Assurance in the European Higher Education Area” report (ESG), taking into consideration the provision and the diversities of educational systems, the needs and the expectations of students, stakeholders and the society at large.
- Dissemination campaign, material and events by monitoring the number of the attendees
- Linking with labour market and the society at large and the actions related to the sustainability, multiplication and up scaling of the MSc programme after the project lifetime
- Management of the project, by monitoring the communication among partners, the quality of collaboration among partners, and also, the planning of proactive activities, the procedures of decision making and voting

- Implementation of the quality plan itself, by monitoring the overall progress of project’s tasks and changes/improvements/simplifications applied in order to avoid possible obsessions on processes at the expense of the implementation of tasks.

Quality evaluation of project results will be presented in the periodic reports while additional reports will focus on the evaluation of project’s events.

4. Progress Monitoring

QB will cooperate with Task leaders in order to monitor the progress of project’s tasks and ensure the on-time submission of deliverables. (The exact procedure of deliverables preparation, review and final submission is presented in 5). A number of progress indicators are already included in the Logical Framework Matrix (LFM) of the project while task leaders and members of the QB will have the opportunity to enrich the initial list during the project. Modifications of the original LFM should be included in the Quality Evaluation periodic reports.

In addition, the roles and tasks per WP defined in the detailed description of the plan will act as the basis for implementing project activities and delivering results.

Table 2 Progress indicators per WP

| Outputs and outcomes | Indicators of progress |
|--|---|
| <i>WP1 Identification of similar curricula in the subject area</i> | |
| D1.1 Report on similar curricula in Asia D1.2 Report on similar curricula in Europe D1.3 Needs analysis report on relevant VET courses and internship demand D1.4 Final report with recommendations | <ul style="list-style-type: none"> - HEIs and companies contacted (over 40) - Questionnaires delivered, acquired and processed (135) - Focus Groups with key stakeholders in partner countries (3) - 90 academics reached in Europe - 40 companies reached in Asian partner countries - Variety of diverse opinions expressed - Relevant MSc programmes analyzed - Best practices reported - Stakeholders convinced to engage with project activities - Standard mechanisms established for continuous contribution and communication |
| <i>WP2 Capacity-building and Curricula development</i> | |
| D2.1 Specifications of VLE D2.2 Study visits to Europe for Curricula Development | <ul style="list-style-type: none"> - Faculty members joining the study visits (24) - ICT-based teaching/learning environments utilised/demonstrated (over 10) |

| | |
|--|--|
| <p>D2.3 VLE D2.4 Description of methodology and tools D2.5 Course outlines D2.6 Teacher's guide D2.7 VET courses and development of certification</p> | <ul style="list-style-type: none"> - 16 new MSc Course outlines designed - 3 new professional courses designed - Data Science and AI subjects and innovative concepts included/analysed in the content of courses - Quality of scientific and educational approaches demonstrated/discussed, analysed and adopted - Quality of Virtual Learning Environment (Design and appropriateness) - Quality of educational material and tools - Level and quality of collaboration between consortium partners |
| <p><i>WP3 Academic staff training and preparation for delivery</i></p> | |
| <p>D3.1 Training material D3.2 Study visits to Asia for academic staff training D3.3 Online training of academic personnel D3.4 Common framework report for the establishment of "Data Science Laboratories" D3.5 Info days in partner countries (to attract sector SMEs and prospective students) D3.6 Report on internship programme</p> | <ul style="list-style-type: none"> - Academic professionals' participation in seminars and lectures (36) - Administrative staff participation in seminars and lectures (24) - Level and quality of collaboration and synergies developed between consortium partners - Establishment of a "Data Science Laboratory" (8) - 8 Info days organised to attract companies for providing internships - Involvement of companies - Synergies between HEIs and companies |
| <p><i>WP4 Accreditation and delivery of the courses</i></p> | |
| <p>D4.1 Accreditation report of developed curricula in partner countries D4.2 Toolkit for the evaluation of the programme D4.3 Delivery of the programme in partner countries D4.4 Interim programme delivery evaluation report D4.5 Final programme delivery evaluation report</p> | <ul style="list-style-type: none"> - Accreditation of the DS&AI programme - Students joining the MSc programme (between 8-12 per HEI) - Participants in the professional courses (12 per HEI) - Students' expectations achieved - Students' performance |
| <p><i>WP5 Quality Assurance & Monitoring</i></p> | |
| <p>D5.1 Quality Board D5.2 Quality Assurance Plan D5.3 Periodic Quality and Evaluation Reports</p> | <ul style="list-style-type: none"> - No of internal evaluation reports - Internal quality evaluation of deliverables |
| <p><i>WP6 Dissemination and Exploitation</i></p> | |
| <p>D6.1 Dissemination Plan D6.2 Project Website D6.3 Stakeholders' list D6.4 Portfolio of dissemination material</p> | <ul style="list-style-type: none"> - Volume and quality of dissemination activities/material |

| | |
|--|---|
| D6.5 Final Conference D6.6 Exploitation and Sustainability Plan | - HEIs perception in the society at large and enhancement of their role in reforms in education and social and economic development |
|--|---|

5. Deliverables preparation, review and final submission

Project outputs/deliverables are the most important target for quality control (this includes several intermediate or non-tangible project outputs). The methodology employed targets to ensure efficient QA of project actions and results based on the design and development of a detailed quality strategy and criteria for project intellectual outputs. General quality criteria are set by the QB. Special output-related criteria (if needed) are set with the assistance of WP leaders (these criteria are mapped to specific output objectives and quality goals). Quality control is performed by members of the QB to assure the conformity of all project results with the initial criteria defined for them and guaranteeing they are in line with the technical proposal. The table below provides a description of the review process in a structured way in DS&AI:

Table 3 Review process of DS&AI deliverables

| Step nr. | Action | Owner/From | To | When |
|----------|--|-------------------------|--------------------------|--|
| 1 | Submission of deliverable for review | Deliverable responsible | QB | 15 days prior to contractual delivery date |
| 2 | Assigned Reviewers | QB | 2 project members | As soon as possible after action no 1 |
| 3 | Submit evaluation | Reviewers | QB | 1 week after action no 2 |
| 4 | Conflict resolution | QB | 4 th reviewer | 1 week after action no 3 |
| 5 | Submit new version of deliverable | Deliverable responsible | Internal space or QB | 2 days or 1 week after step 4 |
| 6 | Review new version of the deliverable | Reviewers | Deliverable responsible | 1 week after action no 5 |
| 7 | Submit final version | Deliverable responsible | Internal Space | 2 days after action no 6 |
| 8 | Inform project MB if deliverable is rejected for the second time (not obligatory step) | QB | Management Board (MB) | 2 days after action no 6 |

Reviewers should check the quality of all outputs submitted, and provide the WP Leaders with guidance (upon request) on the expected characteristics and contents of the relevant project results. Two reviewers review each project deliverable. Each reviewer must evaluate it with respect to a set of key points and must conclude whether the deliverable/output should be accepted or not. The key points to be taken into consideration during the review include:

- Layout of the Intellectual output
- Contents thoroughness
- Correspondence to project and programme objectives
- Remarks in format, spelling, etc.
- Relevance and response to user needs
- Methodological framework soundness
- Quality of presentation of achievements
- Quality of achievements

A detailed analysis of the above aspects, the related quality factors and criteria is given in the respective Annex. The reviewers are always members of the consortium who were not involved in the production of the deliverable. Each reviewer provides his/her comments to the QB using the Deliverable Review Form (see Annex I). 4 statuses are foreseen as a final review remark:

- Accept as is
- Accept with minor revision
- Accept with major revision
- Reject

The QB considers the reviewer's comments and in case of deviations (for example "Accept as is" vs "Accept with major revision") may assign a third reviewer or ask the deliverable responsible to produce a new version of the deliverable.

6. Quality Evaluation of Project's Results

The QA methodology consists of three major elements that are analysed in the following sections, while a specific section is devoted to risk identification and management.

- Definition of quality assurance factors and specific criteria
- Design of evaluation tools and mechanisms
- Process results, keep track of the quality assurance process, provide feedback and provide suggestions for improvement of quality control

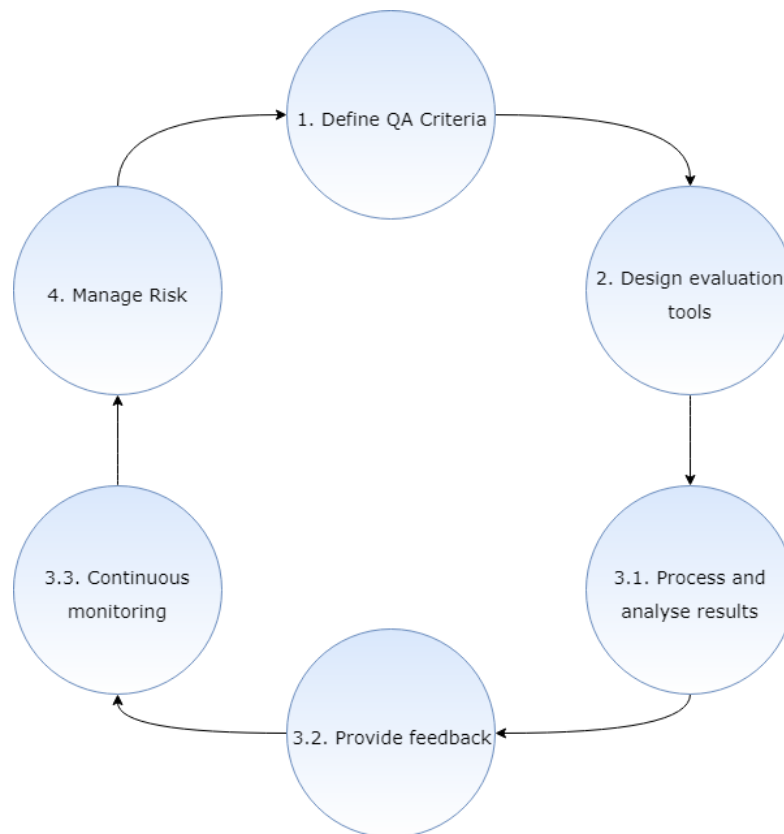


Figure 1 The Quality Evaluation Cycle

As a first step, it is necessary to define the evaluation areas such as Project Results, Project Management Outputs and related activities, cooperation among the consortium and organization/impact of events (project meetings, special sessions, dissemination events). Then, specific criteria are defined to provide indicators for the quality management/evaluation of the project. For some areas, metrics are quite qualitative and thus subjective. On the other hand, quantitative metrics provide indications but not conclusive results. DS&AI incorporates a mixed evaluation method so as to collect a wider range of opinions

and ideas and pay less attention on formal metrics. However, the latter will be used to a point, in order to provide concrete measures useful for assessment.

Evaluation instruments are designed based on the type of output to be assessed and the design uses the criteria defined in the previous step. Popular evaluation instruments include closed and open question questionnaires and guided interviews. In this step, the appropriate timing for deploying each instrument is also defined to capture information on key project outputs and/or provide valuable feedback to project formation strategists. The evaluation tools are listed in the Annexes section of this document.

Reporting will take place mainly through the:

- The presentation of evaluation results in project meetings by AMC. It will be heavily based on the processing of the collected data coming from the utilization of the evaluation forms as they are described in Annex I–V. Documentation of project outputs, their delivery date, name of the reviewers and their status in relation to the quality assessment process are horizontal elements that are going to be present in every quality driven created document towards consistency and accuracy.
- Creation of the 2 annual internal quality reports

6.1 Quality Factors

Quality factors are user–perceived aspects of project components, which determine whether the project meets the requirements. The following table presents important factors, identifies each one and ranks the top factors that are considered critical for the success of the project.

Table 4 Project results quality factors

| Quality Factor (project results) | Description | Rank |
|----------------------------------|--|------|
| Timeliness | The extent to which project results are delivered in a timeframe, which meets the initial planning | 1 |
| Correctness | The extent to which main project outputs satisfy real world specifications and fulfils educational stakeholder needs. | 1 |
| Usability | The extent to which main project results are understandable and applicable by the end–users. | 2 |
| Accessibility | That ability of the target group to access project results whenever and wherever they need access. | 3 |
| Portability | The ease with which main project results (e.g. the Virtual Learning Platform) can be modified to add more functionality. | 4 |
| Expandability | The degree to which the results described in the outcome can be expanded within the target sector | 5 |
| Interoperability | The extent to which main project results can be applied to new, near–future user needs formed by the ever–changing economic and political environment. | 6 |

| | | |
|----------------------------------|--|---|
| Profitability | The ability of the project to exchange information with other systems/environments that affect and are affected (e.g. legislation, local or national economic environment, technology, etc.). To mutually use the information that has been exchanged. | 7 |
| Future Business Potential | The extent to which the initial target group is likely to provide a positive reference to other potential stakeholders. | 8 |

6.2 Quality Criteria

Each of the above-mentioned Quality Factors is mapped into one or more quality Criteria, which should be monitored throughout the project life cycle. These criteria may serve as strategic-level input to the process of monitoring results of the project. The following tables provide a detailed analysis of the criteria described in the previous paragraph.

Table 5 Mapping of Quality Factors to Quality Criteria

| Quality Factor | Criterion | Description |
|-----------------------|-------------------|---|
| Correctness | a. Completeness | a. The degree to which main project results provide full implementation of the functions envisaged in the project plan. |
| | b. Consistency | b. The degree to which main project results provide uniform design and notation. |
| | c. Accuracy | c. The degree to which main project results provide the required precision with respect to real life sectorial requirements. |
| Usability | a. Simplicity | a. The degree to which the project implements project results in the most non-complex and understandable manner. |
| | b. Virtuality | b. The extent to which the target group does not require knowledge of the physical, logical, or topological characteristics of the project results. |
| | c. Learning Curve | c. The extent to which the project provides familiarization of functions and operations of project results to its target group. |
| Accessibility | a. Permeation | a. The extent to which project achievements are successfully disseminated to the intended target community. |

| | | |
|----------------------------------|-------------------------------|--|
| | b. Virtuality | b. The extent to which end-users do not require any special knowledge (physical, logical, or topological characteristics) in order to make use of the project results. |
| Portability | a. Independence | a. The degree to which project results are non-dependent to fast changing factors (such as technology, geography, economy). |
| | b. Standardization | b. The extent to which project results conform to standards (or EU/national guidelines) that maximize portability |
| Expandability | a. Augmentability | a. The degree to which the results described in the outcome can be expanded within the target sector |
| | b. Modularity | b. The degree to which parts of the outcome can be used independently |
| Interoperability | a. Commonality | a. The extent to which project results utilize interface standards for data representations |
| | b. Contribution to standards | b. The extent to which the outcome can potentially contribute to existing or new standards |
| Profitability | a. Productivity | a. The extent to which project results demonstrate an improvement in the productivity of those who use it. |
| | b. Cost vs Benefit | b. The degree to which the benefits of using the project results out-weigh the costs (e.g. time spend for training). |
| Timeliness | Performance to time scheduled | The extent to which Project Activities are delivering results according the established schedule. |
| Future Business potential | a. Stakeholder satisfaction | a. The extent to which sectorial stakeholders are satisfied with project outputs. |
| | b. Sustainability | b. The likelihood of benefits produced by the project to continue to positively affect the stakeholders after project completion |
| | c. Impact | c. the effect of project results to wider sectorial objectives |

6.3 Quality Evaluation Tools

Quality assurance and evaluation mainly relies on the utilization of questionnaires and/or semi-structured interviews. The goal is to capture both qualitative and quantitative information at various stages of the DS&AI project. Therefore the following plan and tools will be employed:

- Evaluation of **DS&AI deliverables/outcomes** based on multiple quality criteria. This is achieved via the Deliverable Evaluation Form (Annex I).
- A partner **questionnaire survey upon project meeting/event** completion in order to capture partner expectations and goals vs actual results achieved during the meeting/event including study visits and training seminars. This is achieved by the project meetings/events Evaluation Form (Annex II).
- A stakeholder questionnaire survey after each project session where tangible project results are presented. This is focused on events or meetings where stakeholders are engaged such as info days that will take place in the Partner Countries (Annex III).
- A questionnaire survey that will be used for the internal evaluation of the project (Annex IV). This form will circulate inside the Consortium on a periodic basis. Results will be included in the annual Quality Evaluation reports.

Table 6 Timeline and evaluation tools of DS&AI Quality Assurance

| <i>Evaluation timeline</i> | <i>Evaluation tool</i> | <i>Title of tool</i> | <i>Annex</i> | <i>Comment</i> |
|---|------------------------|-----------------------------|--------------|--|
| When a deliverable/output is submitted | Questionnaire | Deliverable Evaluation Form | I | |
| After each project meeting or even | Questionnaire | Meeting/ Evaluation Form | II | May vary slightly depending on type of event |
| After Project events or near project ends | Questionnaires | Stakeholder Evaluation Form | III | Stakeholders have participated in the event |
| Annually | Questionnaires | Internal Evaluation Form | IV | |

For the DS&AI project, it is critical to evaluate the quality of DS&AI meetings and events. The Meeting/Event Evaluation Form (see Annex II) will be used as a generic template and will be adjusted taking into account the specific nature of each event and national/institutional specific context. The following table summarizes the time plan of DS&AI events and their respective type.

Table 7 Time plan of DS&AI study visits

| <i>Month nr.</i> | <i>City/Country</i> | <i>Host Organisation</i> | <i>Event</i> |
|------------------|-----------------------|--------------------------|-------------------|
| 7 | Athens/Greece | AUEB | Study visit |
| 11 | Leiden/Netherlands | LEU | Study visit |
| 17 | Pathumthani/Thailand | AIT | Academic Training |
| 20 | Bandung /Indonesia | ITB | Academic Training |
| 23 | Peradeniya /Sri Lanka | UoP | Academic Training |

6.4 Data Processing and Presentation of Results

Within the DS&AI context the data collection for defined quality criteria will be heavily based on the utilisation of surveys/questionnaires filled in by the target group (see ANNExes section). The data processing will rely on the utilisation of statistical techniques tailored to the nature of data collected. DS&AI QB is going to employ a set of different data processing techniques and statistical analysis including through:

- Histogram for accurate representation of the distribution of numerical data.
- Calculate variance of responses and Completeness % (i.e. applicable in delivery dates of deliverables)
- Usage of pivot tables if applicable for processing combination of data/responses

QA reporting will take place through:

- The three annual internal evaluation reports
- The presentation of evaluation results in project meetings by AMC.

It will be heavily based on the processing of the collected data coming from the utilization of the evaluation forms as they are described in Annex I–V. Documentation of project outputs, their delivery date, name of the reviewers and their status in relation to the quality assessment process are horizontal elements that are going to be present in every quality driven created document towards consistency and accuracy. The most important quality evaluation results and related issues will be shared and discussed within the partnership during project meetings.

7. DS&AI MSc Programme Evaluation

As a part of the project, evaluation of the MSc programme will be performed based on the Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG), considering the design of courses (stakeholders involvement, learning outcomes, ECTS), student-centred approaches, goals, staff competences, students support, learning resources etc. (<http://www.ehea.info/cid105593/esg.html>).

ESG constitute a reasonably generic framework in order to ensure that different standards and procedures in institutional and national level are applicable with a view to create a common understanding of quality assurance. Therefore, the ESG are based on the following four principles:

- Higher Education Institutions have primary responsibility for the quality of their provision and its assurance
- Quality Assurance related issues are applied periodically and promote the sustainability and the continuous improvement of educational programmes
- Quality assurance responds to the diversity of higher education systems, institutions, programmes and students
- Quality assurance takes into account the needs and expectations of students, all other stakeholders and society
- Quality assurance supports the development of a quality culture;

The table below provides a structured view of evaluation areas within the DS&AI MSc programme.

Table 8 Evaluation areas

| <i>Evaluation Area</i> | <i>DS&AI MSc Quality Criteria</i> |
|---|---|
| Policy for Quality Assurance | <ul style="list-style-type: none"> - Quality assurance system in place and involves instruments with different scopes including course evaluations, evaluations of student workloads, progression and completion rates, evaluations on the learning environment and support services - Curriculum documentation is accurate and up-to date with clearly defined expectations |
| Design and Approval of DS&AI programme | <ul style="list-style-type: none"> - Overall program objectives are inline the institutional strategy - Design process involves students and other stakeholders in the work - Benefit from external expertise and reference points - Define the expected student workload e.g. in ECTS - Proof of learning outcomes appropriateness through student surveys and/or feedback from labour market |

| | |
|--|--|
| Student centred learning and teaching | <ul style="list-style-type: none"> - Respects and attends to the diversity of students and their needs - Has appropriate procedures for dealing with students' complaints - Flexibly uses a variety of pedagogical methods - utilization of different modes of delivery - Methods of teaching and learning are appropriate to and correspond to the Intended Learning Outcomes - Requirements for the examinations are transparent and made known to the students |
| Assessment of students' progression | <ul style="list-style-type: none"> - Assessors are familiar with existing testing and examination methods and receive support in developing their own skills in the field - The criteria for and method of assessment are published in advance - Students' feedback if necessary is linked to review learning process - The selection procedure for the study programme follows defined criteria and procedures that are publicly available |
| Teaching Staff | <ul style="list-style-type: none"> - Clear and transparent processes for MSc staff recruiting - Support and training of involved academic staff - Encouragement of innovation in teaching methods and the use of new technologies - Required resources are checked regarding the capacity of the institution. The successful completion of this check is documented |
| Learning Resources and student support | <ul style="list-style-type: none"> - Appropriate material resources (computer workplaces, laboratories etc.) are available for the study programme as necessary to achieve the Intended Learning Outcomes - Strategies are defined to ensure that course offerings are coordinated on both content and organizational levels to avoid overlap. The programme is implemented in such a way that students are able to complete their studies within the expected period of time as defined in the curriculum |
| Information management (data collection related to the DS&AI MSc) | <ul style="list-style-type: none"> - Profile of student population - Student progression, success and drop-out rates - Student satisfaction - Career paths of graduates - Public information is provided on: the programme, intended learning outcomes, selection procedure, qualifications awarded and teaching, learning assessment procedures |

8. Measuring Impact and Sustainability

Continuous improvement and adaptability of the DS&AI MSc programme in order to meet societal and market needs are the most critical aspects towards sustainability. Development of synergies between academic staff inside HEIs, with staff working for HEIs outside the consortium as well as with enterprises are critical regarding mainstreaming the MSc programme, beyond project lifetime. The establishment of the MSc programme as a paradigm shift, supported by the national authorities, the hierarchy of own and other institutions, academics and scientific staff, is, in addition, the key towards multiplication and up-scaling. Lessons learned are expected to equip partners with experience, knowledge and vision which can be transferred to existing and new educational programmes. HEIs representatives will demonstrate the quality of the programme, its relevance and perception outside the consortium and prompt academics, ministries and stakeholders for the development of similarly designed educational programmes in partner countries HEIs.

Sustainability and impact are quality characteristic that are often measured after project's completion. However, specific actions such as those described below are envisaged to boost sustainability and impact during the project lifetime. On the other hand, specific indicators and targets are considered to reflect the short- and long-term impact of the implementation of project's tasks, the exploitation of outputs/outcomes and their sustainability potentials.

Table 9 Short term impact indicators and targets

| Short term impact | Target groups/potential beneficiaries | Quantitative indicators | Qualitative indicators |
|---|--|---|--|
| Activities to assess existing gaps in HEI courses | Academic professionals Administrative staff Students | Number of academic professionals, administrative staff and students reached | External feedback on D1.4 |
| Capacity building in the training of academic professionals | Academic professionals (academics) | Number of trained academic professionals (32) | Quality of training material |
| Capacity building in the training of administrative staff | Administrative staff | Number of trained administrative staff (24) | Quality of training material |
| Development of new and innovative curricula | Academic professionals | Number of new MSc courses developed (16) | Quality of new courses Quality of teaching material |

| | | | |
|---|--|---|--|
| Activities to assess the industry's skills and training needs | SMEs, larger companies from all relevant industries and industry professionals | Number of SMEs, larger companies from all relevant industries that will participate in A1.3 (40) | Quality of feedback provided |
| New professional training courses tailor made to region's and business training needs | SMEs, larger companies from all relevant industries and industry professionals | Number of new professional training courses developed (3) | Quality of new professional training courses |
| Exchange good practices and know-how between European and Asian HEIs | Academic professionals & Administrative staff | Number of Study Visits Number of Academic professionals & Administrative staff that will attend study visits (around 32) Number of Academic professionals & Administrative staff that will join the DS&AI VLE and successfully complete (at least 56) | Evaluation of effectiveness (using questionnaires) of study visits by participants |
| Delivery of DS&AI MSc programme | Academic professionals & Administrative staff Students | Number of Academic professionals & Administrative staff involved in delivery (at least 56) Number of students that will participate in the delivery (64-96) | Feedback and satisfaction of students and university staff in D4.4 and D4.5 Successful completion by students |
| DS&AI internship programme | Students SMEs, larger companies from all relevant industries and industry professionals | Number of students that will participate in the internship programme (64-96) Number of SMEs, larger companies that will offer internship placements | Level of satisfaction of students and businesses with internship programme |

| | | | |
|--|--|---|---|
| Delivery of DS&AI professional training Component | Students SMEs, larger companies from all relevant industries and industry professionals | Number of participants attending the professional training courses (up to 96) | Level of satisfaction by professional training courses participants |
| Capacity building in infrastructure | Academic professionals & Administrative staff Students | Number of DSLs established (8) | Use of DSL for the delivery of the MSc programme |

Table 10 Long term impact indicators and targets

| Long term impact | Target groups/potential beneficiaries | Quantitative indicators | Qualitative indicators |
|--|--|---|--|
| Data Science Laboratories (DSLs) | Academic professionals & Administrative staff Researchers, experts, associations or networks of HEIs, research institutes and industry actors | Number of research publications issued Number of new researchers working in DSLs Number of new DSLs in other HEIs | Overall Success of DS&AI MSc programme |
| Employability of students and addressing labour needs of the market in specialised personnel | Students SMEs, larger companies from all relevant industries | Number of students working in ICT SMEs, larger companies after they complete their master. | |
| Delivery of DS&AI MSc programme | Students HEIs Academic professionals & Administrative staff | Increase in the intake of students in the years after project Other HEIs adopting the same or similar MSc programmes | |
| Updating the skills of company personnel | SMEs, larger companies from all relevant industries and industry professionals | Increase in the number of professional retrained in the DS&AI professional training courses | |

| | | | |
|--|--|--|--|
| DS&AI VLE | Academic professionals & Administrative staff Researchers, experts, associations or networks of HEIs, research institutes and industry actors | Number of participants in the VLE Number of research publications and other relevant academic material uploaded in VLE | |
| Long-term impact on Data Science and Artificial Intelligence | SMEs, larger companies from all relevant industries and industry professionals in the Asia Pacific region | Increase in the supply and employment of highly skilled Data Scientists and other relevant professionals in the ICT and relevant sectors | |

Measuring the long-term effects of impact, exploitation and sustainability actions relies heavily on an internal review of the project having in mind more fundamental areas, such as those included in the table below. For this purpose QB will contact and interview staff involved in the project in order to include information in periodic, annual reports.

Table 11 Long-term sustainability aspects and related questions to be answered

| <i>Sustainability area</i> | <i>Measurement method</i> |
|------------------------------------|--|
| Ownership | What is the evidence that all target groups support (or are involved in) the project? How many and how actively are they involved? Are they encouraged to take initiatives? Does the project build on their demands? |
| Policy support | Is there a sectorial policy that supports the project? Are there any plans to encourage local policy reforms? |
| Methods used | Is there enough evidence that the methods used for producing project results is up- to - date and realistic? |
| Socio-cultural issues | Does the project take into account local or national socio-cultural norms and attitudes that may affect the use of project results? |
| Capacity building | How many and effectively target groups have been trained? Are they motivated to use/expand project results? Have the DS&AI labs the required personnel to operate long after project completion? |
| Management and organization | Are there any activities that integrate with or add to existing sectorial structures? |

| | |
|-------------------|--|
| Technology | Is the technology required by users to use project results affordable and non-complex? |
| Financial | Are there any plans to establish links with private sector stakeholders? Are there any plans for charging of use project results or encouraging policy reforms? |

9. Risk Management

Risk management identifies potential risk that may become a hazard for the project. Common risks include low quality of DS&AI results, non-conformance to project objectives, failure to include stakeholders into the project processes, low usefulness of project outcomes, etc. These risks must be recognized at an early stage and necessary prevention measures need to be taken to avoid them. If it is deemed not possible to avoid them, then the necessary DS&AI to reduce their impact must be designed in advance. Risk management, as a prevention method, is essential to QA. Based on the quality criteria identified in step 1 and the results of step 3, risks to the DS&AI project will be identified, assessed and measures will be formulated to prevent them or minimize their impact. Risk management is a continuous process. The method used for risk management shall conform with the Project Management Institute's PMBOK guide (standardized as IEEE 1490-2011).

It is widely accepted that a major risk in Erasmus+ projects is the low exploitability of project outcomes. Step 4 will be used for mainly pinpointing the characteristics (present or desired) of exploitable results (based on general quality criteria), which will provide data for the analysis of risks. The goal of step 4 is therefore:

- identify, categorize and analyze the basic characteristics of the project's exploitable results as envisaged by the project partners. Comparison with stakeholder expectations,
- gather critical information on the necessary DS&AI that need to be taken in an early stage so as partners may later be able to better exploit the results,
- identify potential risks in the critical area of project exploitation and communicate the results especially to the leader of the Exploitation WP.

Information gathered at a relatively early stage (although not as such from a risk management point of view) will help partners express their vision on the future form of project results, identify gaps and inconsistencies that may lead to high risks.

DS&AI risk management procedure includes an initial definition of risks along with their respective impact level and probability to occur. The detailed procedure planned to be implemented in the DS&AI project is analyzed in the following.

9.1 Basics

A Risk is a measure of the likelihood and consequences of not achieving one or more project objectives. Risk includes uncertainty. It is associated with probabilities (the risk to become a problem) and impact (e.g. on project activities). These two parameters should be treated jointly rather than separately.

In general, risk comprises three parameters:

- An event (which is usually an undesirable change)
- A possibility for the specific event to occur
- Consequences on one or more project objectives.

Risk Management usually includes the following processes:

- **Risk Management Planning:** deciding on how to design and implement the risk management procedures. Proper design ensures the proper functioning of the remaining five activities for Risk Management. It focuses on the way in which risk management procedures are enacted.
- **Risk identification:** identification of risks that may affect the work and recording of their characteristics. Risk identification is performed by project members such as the project manager, the development team, etc. or by external experts. This process is continuous since new risks may arise during the project life-cycle. The tools that are used to identify risks include meetings between key actors of the project (brain storming), the application of techniques such as the Delphi method, SWOT analysis and diagrammatic techniques (cause and effect diagram, flow charts, etc.).
- **Qualitative Risk Analysis:** Ranking of risks based on the probability of occurrence and the impact.
- **Quantitative Risk Analysis:** Quantitative analysis on the impact of identified risks to project goals.
- **Risk Response Planning:** design of actions for the mitigation of risks that have a great probability to become problems for the project. This process defines the actions that should be followed to reduce the possibility of these risks becoming a problem. The most common tactic used is to draw a Contingency Plan. This plan records all the actions to be taken when a risk becomes a problem:
 - the strategy to be followed if the risk becomes a problem
 - the time frame in which the plan is to be active
 - who is responsible for the activation of the plan
 - a list of people (internal or external to the project) which will be notified that the plan is active.
- **Monitoring and controlling risks:** tracking identified risks, identifying new application response plans and on-going evaluation of risk management processes.

In order to provide a DS&AI risk identification, first we need to define the impact and probability levels that should characterize each identified risk. The methodology for defining Risk Impact level and Risk Probability level is:

The **impact of a risk** has three statuses: High, Medium, Low. Based on this 3-state classification the impact of each risk can be further identified through the following Risk impact Matrix:

Table 12 Risk Impact matrix

| <i>Impact level</i> | <i>Impact on scheduling</i> | <i>Impact on project quality</i> | <i>Impact on the costs</i> |
|---------------------|--|---|----------------------------|
| High | Significant deviation of over than 30%. Milestones need to be reset. | Significant effects. Major project objectives not reached | Cost increase >20% |
| Medium | Medium deviation between 10% and 30%. Some | Some effects | 5% < Cost increase < 20% |

| | | | |
|-----|--|-----------------|--------------------|
| | milestones need to be readjusted. | | |
| Low | Small deviation of about 10%. No need for adjustments. | Minimum effects | Cost increase <20% |

The probability of a risk to occur is defined as:

- Risk Probability = High (Probability to occur > 30%)
- Risk Probability = Medium (10% < Probability to occur < 30%)
- Risk Probability = Low (Probability to occur < 10%)

9.2 Initial Risk Identification

Initial risk identification in the DS&AI project stems from the general objectives of the project as they are stated in the detailed description of the action. Since the project sought to actively involve external stakeholders not only as end-users but as co-designers of main project policies, special attention is given to user enactment, sustainability, relevance and impact of results. Risks are directly mapped to quality factors and criteria of section 4. Common risks to project management (time and economic scheduling) are ignored since they are continuously monitored by the Management Team. The following table depicts the initial risk identification:

Table 13 DS&AI risks identification

| <i>Risk</i> | <i>Description</i> | <i>Probability to occur</i> | <i>Impact</i> |
|---|---|-----------------------------|---------------|
| Stakeholders become disengaged | <ul style="list-style-type: none"> – Key stakeholders are not identified – No efficient communication – Stakeholders are not contributing to DS&AI objectives (provide internships and scholarships) | Medium | High |
| DS&AI Master Courses do not get accreditation | – Complex and time consuming procedures for getting the Accreditation (bureaucracy, national legislations) | Low | High |
| DS&AI labs not been established | <ul style="list-style-type: none"> – Purchase of equipment not on time – Equipment not in-line with the STAPS MSc courses | Low | High |
| DS&AI results poorly communicated | Not efficiently communicated to DS&AI stakeholders | Medium | High |

| | | | |
|------------------------------------|--|--------|------|
| DS&AI results difficult to be used | DS&AI results are difficult to be used by end-users and stakeholders | Medium | High |
|------------------------------------|--|--------|------|

9.3 Initial Risk Assessment Analysis

The next step is to define the priority of each identified risk. In DS&AI, each risk may have a priority of HIGH, MEDIUM or LOW. To this end QB will utilize the Risk Priority Matrix (Table 14).

Table 14 Risk Priority Matrix

| <i>Impact vs probability</i> | <i>High probability</i> | <i>Medium Probability</i> | <i>Low Probability</i> |
|------------------------------|-------------------------|---------------------------|------------------------|
| High Impact | HIGH (1) | HIGH (1) | MEDIUM (2) |
| Medium Impact | MEDIUM (2) | MEDIUM (2) | LOW (3) |
| Low Impact | LOW (3) | LOW (3) | LOW (3) |

9.4 Risk Response

Risk Response is the final process of determining actions that reduce risks before they become threats (risk mitigation) or reduce their impact when they do become threats (contingency planning). DS&AI utilizes a proactive approach based more on risk mitigation than contingency. That is, risk probability/impact is reduced by taking early actions such as conducting multi-level assessments of project outputs (engaging stakeholders at an early stage, consulting experts with different areas of specialization, beta testing early versions of tangible outputs before scaling up). On the other hand, contingency is difficult to implement since most risks become threats near or right after project-end where the consortium momentum (at least in most funded projects) is somewhat lower.

Risk response planning includes the identification of risk owners, that is, the persons or committees responsible for monitoring risks. In DS&AI risks span the whole range of project's deliverables and results. Thus, every project partner which is responsible for a deliverable/output is the owner of the risks associated with it. It is, however, most probable that a risk that becomes a hazard creates a domino effect increasing the probability/impact of risks in other outputs. The interlinked nature of risks is a matter to be monitored by the Management Team. Corrective action may be decided during risk audit sessions, if appropriate. The possible mitigation actions per identified risk are depicted in the following table:

Table 15 DS&AI initial risk mitigation actions

| <i>Risk</i> | <i>Indicative mitigation action</i> |
|--------------------------------|--|
| Stakeholders become disengaged | <ul style="list-style-type: none"> - Use appropriate stakeholder management techniques (stakeholder identification, recurring analysis, communication plan, attitude identification for risk planning) - Draft stakeholder engagement plan |

| | |
|---|---|
| | <ul style="list-style-type: none"> - Form a stakeholders' planning forum |
| DS&AI Master Courses do not get accreditation | <ul style="list-style-type: none"> - Identify specific risk areas early in the Project |
| DS&AI labs not been established | <ul style="list-style-type: none"> - Define the appropriate equipment early enough (during kick-off Meeting in Bangkok) |
| DS&AI results poorly communicated | <ul style="list-style-type: none"> - Benchmarking (identify and use best practices in communication with stakeholders) - Design and continuously test communication plan - Tailor the information to the different affected stakeholders |
| DS&AI results difficult to be used | <ul style="list-style-type: none"> - Beta testing |

List of Annexes

- Annex I Deliverable Evaluation Form
- Annex II Meetings/Events Evaluation Form
- Annex III Stakeholder Project Evaluation Form
- Annex IV Internal Project Evaluation Form

Annex I: Deliverable Evaluation Form

| | | | | | |
|--|--|--------------------------|--------------------------|-------------------------------------|-------------------------------------|
| Number | Outcome 5.2 | | | | |
| Title | Quality Assurance Plan | | | | |
| Version | | | | | |
| Type | <input type="checkbox"/> Report/Survey <input type="checkbox"/> Dissemination Material <input type="checkbox"/> Software <input type="checkbox"/> Event/Action <input checked="" type="checkbox"/> Other (please specify) Quality Assurance Plan | | | | |
| Deliverable submitted by: | <i>AMC</i> | | | | |
| Due Date according to project plan | 14.02.2019 | | | | |
| Actual date of submission | 17.05.2019 | | | | |
| Evaluation Form submitted by | <i>Sofia Barbosa Pereira University of Minho</i> | | | | |
| Date | 27.05.2019 | | | | |
| Overall Assessment | <input type="checkbox"/> Accept as is <input checked="" type="checkbox"/> Accept with minor revisions <input type="checkbox"/> Accept with major revisions <input type="checkbox"/> Reject | | | | |
| General Quality Criteria | | | | | |
| Please rate the following (1 Poor, 5 Excellent) | 1 | 2 | 3 | 4 | 5 |
| Understandability <i>Is clear and concise language used?</i> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Structure <i>Is the deliverable well structured? Does it contain all necessary sections?</i> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Grammar and Syntax <i>Are there many typos or spelling mistakes that make it hard to read?</i> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Formatting <i>Is the formatting of the document appropriate?</i> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Completeness | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

| | | | | | |
|---|--------------------------|--------------------------|--------------------------|--------------------------|-------------------------------------|
| <i>Does it contain all necessary information according to DS&AI technical application?</i> | | | | | |
| Soundness of methods used | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| <i>Is the research/study/development/evaluation etc. method appropriate?</i> | | | | | |
| Quality of results | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| <i>Do the results correspond to the stated objectives of the activity?</i> | | | | | |
| Comments <i>(In case a criterion gets less than 3, please provide written explanation)</i> | | | | | |
| | | | | | |

| Specific Quality Criteria <i>(Please rate ONLY those of the following criteria that apply to the deliverable)</i> | | | | | |
|---|--------------------------|--------------------------|--------------------------|--------------------------|-------------------------------------|
| Please rate the following (1 Poor, 5 Excellent) | 1 | 2 | 3 | 4 | 5 |
| Correctness | | | | | |
| Completeness <i>The degree to which the outcome implements fully the requirements/functions envisaged in the project plan</i> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Consistency <i>The degree to which the outcome uses uniform design and notation</i> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Accuracy <i>The degree to which the outcome provides the required precision with respect to real life sectorial requirements</i> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Usability | | | | | |
| Simplicity <i>The degree to which the outcome is structured in a non-complex and understandable manner</i> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Learning Curve <i>The pace in which the project target group will be able to use the outcome (after training if necessary)</i> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Accessibility | | | | | |
| Permeation <i>The extent to which the outcome has been / can be successfully disseminated to the target community</i> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Virtuality <i>The extent to which usage of the outcome does not require knowledge of the physical, logical, or topological characteristics of the project</i> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Profitability | | | | | |
| Productivity | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

| | | | | | |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| <i>The extent to which the outcome leads to an improvement in the productivity of those who use</i> | | | | | |
| Cost vs Benefit <i>The degree to which the benefits of using the outcome out-weigh the costs</i> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Expandability | | | | | |
| Augmentability <i>The degree to which the results described in the outcome can be expanded within the target sector</i> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Modularity <i>The degree to which parts of the outcome can be used independently</i> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Portability | | | | | |
| Independence <i>The degree to which the results described in the outcome do not depend on fast changing factors</i> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Standardisation <i>The extent to which the contents of the outcome use or conform to standards</i> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Interoperability | | | | | |
| Commonality <i>The extent to which the outcome uses commonly accepted metaphors (for access, usage, data representation etc)</i> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Contribution to standards <i>The extent to which the outcome can potentially contribute to existing or new standards</i> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Comments (In case a criterion gets less than 3, please provide written explanation) | | | | | |
| | | | | | |

| Specific Quality for Process <i>(Please rate ONLY those of the following criteria that apply to the deliverable)</i> | | | | | |
|---|--------------------------|--------------------------|-------------------------------------|--------------------------|--------------------------|
| Please rate the following (1 Poor, 5 Excellent) | 1 | 2 | 3 | 4 | 5 |
| Timeliness <i>Refers to timelines of activities and results</i> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Stakeholder satisfaction <i>Refers to the extent to which stakeholders are or will be satisfied with the content and quality of deliverable</i> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Sustainability <i>The likelihood that any benefits produced by the outcome will continue to positively affect the stakeholders after project end</i> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Impact <i>Estimated effect of the specific outcome to the broader sector, taking into account the corresponding impact indicators listed in the DS&AI Technical Application</i> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Comments <i>(In case a criterion gets less than 3, please provide written explanation)</i> | | | | | |

Annex II: Meetings / Events Evaluation Form

| | | | | | |
|--|---|--------------------------|--------------------------|--------------------------|--------------------------------|
| Meeting Name | | | | | |
| Date | | | | | |
| Place | | | | | |
| Hosting Organisation | | | | | |
| Evaluation Form submitted by | <i>(Reviewer Name & Organisation)</i> | | | | |
| Date of submission | | | | | |
| Project Meeting/Event Quality Criteria | | | | | |
| How satisfied are you: | Completely satisfied | Satisfied | Neutral | Dissatisfied | Completely dissatisfied |
| with the preparations made to organize the meeting? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| with venue arrangements and accommodation? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| with support (meeting rooms, equipment) provided during the meeting? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| with the participation of project partners in discussions and decision making? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| with the structure of the agenda (subjects/issues covered)? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| with the time assigned to the discussion of important issues? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| with the scope of information presented? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| with the meeting's overall value in helping you achieve project goals? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| with the quality of the overall meeting | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

What were the strengths of this meeting?

What were the weaknesses of this meeting?

Ideas for improving project meetings

Other comments

Annex III: Stakeholder Project Evaluation Form

| | | | | | |
|---|--|--------------------------|--------------------------|--------------------------|--------------------------|
| Stakeholder name | <i>Name of Person</i> | | | | |
| Stakeholder organisation | <i>Name of organisation</i> | | | | |
| Position within organisation or title | | | | | |
| Type and sector of organisation | <i>e.g. Public/Private, Education, Information technology, etc</i> | | | | |
| Date of submission: | | | | | |
| What is your primary interest in DS&AI? | | | | | |
| Is there a way that you could contribute to DS&AI' goals? | | | | | |
| Are there any other objectives that should be pursued during the project or in a future endeavour? | | | | | |
| Do you find DS&AI results useful/beneficial for your organization (rate from 1 to 5)? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Rating ≥ 3 : In what way? Rating < 3 : Why not? | | | | | |
| Project results are easy to use: | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Rating < 3 : Why not? How can this be improved? | | | | | |
| Project results are expandable: | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Rating < 3 : Why not? How can this be improved? | | | | | |

| | | | | | |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| <p>Are you satisfied with the way the project results/achievements were communicated to you?</p> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <p><i>If not (rating <=3), in what ways could this communication be improved?</i></p> | | | | | |
| <p>Which of the DS&AI results are of interest to your organisation and why?</p> | | | | | |
| <p>How can they be improved and make them more interesting and applicable?</p> | | | | | |
| <p>Do you have any proposal on how to reach more stakeholders and/or increase the impact of DS&AI' results?</p> | | | | | |

Annex IV: Internal Project Evaluation Form

| | | | | | |
|--|--------------------------|-------------------------------------|--------------------------|--------------------------|--------------------------|
| Submitted by | <i>Partner Name</i> | | | | |
| Date of submission | | | | | |
| Internal Project Quality Criteria | | | | | |
| How satisfied are you: | Completely satisfied | Satisfied | Neutral | Dissatisfied | Completely dissatisfied |
| with the work plan and the organisation of the activities? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| with the way the project proceeds to meet the planned objectives? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| With the cooperation among team member? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Please provide ideas and feedback for improving organisation and efficiency | | | | | |
| with the way the activities and tasks are distributed among partners? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| With the communication and information flow within the consortium? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| With the use of resources for achieving project objectives? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| With the procedures used for reaching decisions? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Ideas for improving cooperation and communication between partners | | | | | |
| With the number of stakeholders involved in the project? | | | | | |
| With the way project results are communicated to target groups? | | | | | |
| With the way stakeholders provide input to the project? | | | | | |
| With networking and dissemination activities | | | | | |
| Ideas for improving dissemination/sustainability and impact | | | | | |