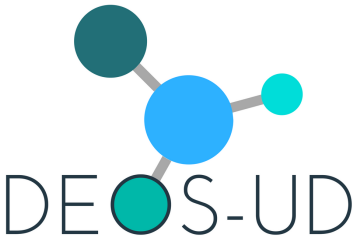

Project DEOS-UD

Disruptive Earth Observation Sensing for Urban Developement

Deliverable 3
Procurement, Quality, Risks and Communication Management

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1 Plan procurement management

On the following sections, procurement decisions will be exposed, determining whether to acquire outside support, and if so, what to acquire, how to acquire it, how much is needed, and when to acquire it.

1.1 Make or Buy decisions

WBS ID	Work Package Name	Reasons for BUY	Cost estimate	Type of contract	Possible risks	List of suppliers	Special considerations or constraints
5.1.1.	Manufacturing of payload sensors	Create sensors with the designed parameters, using high performance industry standards.	125.900 €	FFP (Firm Fixed Price contract)	Delay in delivering the products Faulty products	SUPLIERS FOR SENSORS	Products must satisfy design parameters Maximum due date 16/04/21
5.1.2.	Manufacturing of modular system	Use sensor interface specific outsource facilities for manufacturing the modular system	123.086 €	FFP (Firm Fixed Price contract)	Delay in delivery Specifications not met.	SUPPLIERS FOR INTERFACE	Product must satisfy design parameters Maximum due date 16/04/21
5.6.	Quality of the product	Outside of the project entity must do quality tests	93.248 €	FFP (Firm Fixed Price contract)	Quality standards of the products not met.	QUALITY agency	Due date of quality study is fixed on 21/01/22
7.2.1.	Web site development	Quick launch the project professional website.	17.957 €	FFP (Fixed Price Contract)	Late delivery Not meeting communiation plan specifications		Due date before 21/01/22

1.2 Statement Of Work

SOW - 5.1.1. Manufacturing of payload sensors	
Description	The fabrication of the sensors that will conform the payload will be outsourced. From the final design of each of the sensors, the suppliers have to be able to manufacture them accordingly.
Requirements	Build sensors described by the 4.2.1.0. Payloads final design, related to the Earth Observation project. Seller can manufacture one part of the required items, but budget will be adjusted accordingly.
Type of contract	A Firm Fixed Price contract is stipulated because, for this tasks there are clear requirements and determined deadlines. Also, a budget has been assigned and a final product version is clearly decided.
Scheduled date	To be delivered no later than 16/04/2021. Starts after the 4.2.1.0. Payloads final design delivery and is part of the 5.0. Prototype manufacturing milestone.
Constraints	Manufactured sensors should meet all 4.2.1.0. Payloads final design constraints without exception.
Risk control actions	As one of the principal risks of this item consists on the delay of the delivery, an action regarding periodic monitoring of the fabrication progress. That way a potential delay can be detected and corrected before affecting the delivery date. In order to control that the products manufactured are not faulty, a report specifying the fabrication methods and that everything has been done according to the applying regulations will be requested from the suppliers and analysed by the technical team to assure that the risk of the fabricated product being faulty is reduced to a minimum.
Form and format	Each sensor will be delivered properly packed, with all the correspondent documentation.
Pre qualified sellers	description
Procurement metrics	description

SOW - 5.1.2. Manufacturing of modular system	
Description	The fabrication of the modular system that will house the payloads will be outsourced. The supplier have to follow the final design specified and assure that fulfils all the requirements.
Requirements	Build the modular system described by the 4.2.2.0. Modular system final design, related to the Earth Observation project.
Type of contract	A Firm Fixed Price contract is stipulated because, for this tasks there are clear requirements and determined deadlines. Also, a budget has been assigned and a final product version is clearly decided.
Scheduled date	To be delivered no later than 16/04/2021. Starts after the 4.2.2.0. Modular system final design delivery and is part of the 5.0. Prototype manufacturing milestone.
Constraints	The manufactured modular system should meet all 4.2.2.0. Modular system final design constraints without exception.
Risk control actions	As one of the principal risks of this item consists on the delay of the delivery, an action regarding periodic monitoring of the fabrication progress. That way a potential delay can be detected and corrected before affecting the delivery date. In order to assure that the specifications defined in the design are met, a technical report specifying the manufacturing process will be required from the supplier and will be reviewed to check that all the fabrication processes are being correctly done.
Form and format	The modular system needs to be delivered in a safe package that guarantees its integrity throughout the transportation from de manufacturing site to its destination, accompanied with the due documentation.
Pre qualified sellers	description
Procurement metrics	description

SOW - 5.6. Quality of the product	
Description	The review of the quality of the product will be outsourced. This review will not focus on the correct operation of the systems but it will rather review the efficiency and order of their operation.
Requirements	The product must comply with the quality standards determined by the team.
Type of contract	A Firm Fixed Price contract is stipulated because, for this tasks there are clear requirements and determined deadlines. Also, a budget has been assigned and a final product version is clearly decided.
Scheduled date	To be delivered no later than 21/01/2022. Starts after the 5.02. Full system testing.
Constraints	The product must comply with all the quality constraints defined for each of the subsystem and element.
Risk control actions	In order to prevent the failure of meeting the quality standards of the product, they have to be perfectly defined before starting the quality review of it.
Form and format	description
Pre qualified sellers	description
Procurement metrics	description

SOW - 7.2.1. Web site development	
Description	The creation of a functioning professional web site will be outsourced. The presence in the internet is key to get to all kind of public and make the work done available to anyone interested in knowing more about it.
Requirements	The website must help the visibility of the project and give understandable information to anyone willing to obtain more information about what HIRO is and does. It needs to have also all the on-line dissemination material specified in the communication plan.
Type of contract	A Firm Fixed Price contract is stipulated because, for this tasks there are clear requirements and determined deadlines. Also, a budget has been assigned and a final product version is clearly decided.
Scheduled date	To be delivered no later than 21/01/2022. Starts after the 7.0. Communication plan.
Constraints	The information that the site will make available has to be that that can be disclosed to the public without breaking any kind of confidentiality agreements.
Risk control actions	The contents of the website need to be the ones specified in the communication plan. To prevent any unwanted content to be included in the website, a previous analysis of the content before making it available to the public could help prevent this risk.
Form and format	The website's URL has to be delivered.
Pre qualified sellers	description
Procurement metrics	description

2 Quality management plan

The Quality management Plan defines the quality levels that must be achieved in order to accept the final product developed and the methods to ensure these levels. Throughout this section the different subsections regarding the quality manegement plan are detailed:

2.1 Quality Assurance Approach

TEXTO

2.2 Quality Control Approach

The quality control plan of the project is divided in three main areas:

- Documentation quality plan
- Technical quality plan
- Software quality plan

2.2.1 Documentation quality plan

All the documentation of the project has to follow a strict quality plan in order to ensure that no information is lost. This plan refers to the deliverables but also to the internal documents of the company. The processes that have to be followed are:

1. Definition of the document
    - Define the type of document and its content as well as the standards that it has to follow.

- Define the responsible of the document, the team that is going to work in it and the team that is going to verify it.
- Define the deadline of the document as well as any milestone that may be related to it.

2. Redaction of the document: While the document is in progress there may be some periodic quality controls to ensure that the quality plan is met.
3. Review and approval: Once the document is finished, it is delivered to the quality department. They have to verify that the documentation follows the quality standards defined by the company.

2.2.2 Technical quality plan

Since the project consists in the design and construction of the prototype, it is necessary to ensure that the product of the project meets all the quality requirements. To do so, before beginning with the design, a quality plan has to be defined. Once the plan is finished and the design phase starts, there are some procedures that will have to be done regularly:

- Check that the design fulfils the requirements of the project.
- Check for possible incompatibilities between the payload and the modular system.
- Review that the milestones are met in the given deadlines.

Finally, when the design is over and the prototype is constructed, a validation must be done in order to check that it fulfils all the requirements of the project as well as to verify that it complies the quality plan. This validation process has to follow the standards given by the industry.

2.2.3 Software quality plan

The project not only consists of a prototype that should be constructed, but it also has a software that has to be verified. In order to do so, before stating with the coding, a software quality plan has to be defined. According to this document, some standards have to be followed in the making of the interaction platform, such as coding and comment standards, to ensure a correct flow of information between the people who work on it as well as to avoid possible errors. During the design phase, some procedures will be done regularly:

- Check that the standards are being followed.

- Avoid possible incompatibilities between the interaction platform and the payload or modular system.
- Review the latest modifications before making them definitive.

Once an error is detected, it has to be immediately reported to the responsible of the software development. Then, an engineer will be assigned to solve it, and he/she will report it once the problem is solved.

Finally, once the interaction platform is operative, a validation has to be performed in order to ensure that it fulfils all the requirements of the project as well as to verify it complies the software quality plan. This validation process has to follow the standards given by the industry.

2.3 Quality Improvement Approach

Quality improvement (QI) is a formal analysis of practice performance and efforts done in order to improve the performance of the project with the main objective of increasing its efficiency. The information shown here about QI models and tools has been extracted from [1] and [2]. A proper QI process requires of some basics to succeed. These basics are the following ones:

- Establish a culture of quality in the project: Creation of QI teams, QI meetings and QI goals.
- Determine and prioritize potential areas of improvement: Define, according to the acceptance criteria of the project, the main areas of improvement.
- Collect and analyse data: Determine the type of data to be collect and analyse it properly according to the project objectives.
- Communication of results: Quality improvements should be transparent to the stakeholders in order to keep them satisfy.

In this project the six-sigma working philosophy will be implemented in order to improve quality. The objective of this philosophy is to adjust the existing processes in order to improve the quality and minimizing variability by reducing defects and irregularities. The model related with six-sigma philosophy that will be used is DMAIC. This model includes the following steps:

- Define: Set the objective of the problem or the existent defect. In this project this definition will be done according to the acceptance criteria. The improvement of the quality plan is one of the objectives that will need to be taken into account.

- Measurement: Measures are needed in order to have values for the problem or defect. In this project the measurements according to the effectiveness of the quality plan are:
  - Number of iterations of a document/design to be approved.
  - Stakeholders satisfaction
  - Time needed to approve a document/design.
  - Number of defects detected by the quality department
- Analyse: Figure out the causes of the problem or defect and propose solutions.
- Improve: Implement the solution approved.
- Control: Control the implementation of the improvement, assure continuity and success.

2.4 Quality Roles and Responsibilities

Role	Responsibilities
Project Manager	Final responsible for the quality of the project. Schedules meetings with the Quality Department in order to discuss the quality aspects of the project. Establishes the quality plan of the project.
Project Manager Secretary	Helps the Project Manager in the tasks that he/she delegates.
Quality Manager	Main quality responsible of the project. Fixes the quality guidelines that all documents are required to fulfill. Reviews all the deliverables to make sure they fulfill the required quality.
Quality Manager Assessor	Helps the Quality Manager in the tasks that he/she delegates.

Role	Responsibilities
Technical Manager	Coordinates the work done by the engineers and technicians. Reviews the technical aspects of the deliverables before approving them. Makes sure the technical procedures have been correctly. Provides assistance to the engineers and technicians in order to fulfill the quality requirements.
Engineers and technicians	Make sure that the technical aspects of the project follow the quality standards.

Table 2.4.1: List of quality roles and responsibilities

3 Risk management plan

3.1 Definitions of Probability

Two parameters are commonly used in order to model risk: the probability that something might happen and the impact it would have if it did happen. Therefore, to evaluate the probability of the potential risk to occur it is crucial to define and quantify it properly.

A scale of 1% to 100% will be used for Probability, which is linearly divided in five sections represented in the table below. In fact, the 1% is associated with the minimum probability meaning it is very rare it occurs and the maximum 100% means a risk is unavoidable.

Probability	Description	Probability Score
Very High	Means it is a fact because it is very likely to occur	(81-100)%
High	Likely to occur	(61-80)%
Medium	May occur about half of the time	(41-60)%
Low	Unlikely to occur	(21-40)%
Very Low	Very unlikely to occur	(1-20)%

Table 3.1.1: Definitions of probability

3.2 Definitions of impacts by objective

To evaluate the impact into the overall project if a certain risk did happen, a numerical estimate is provided to quantify the effects of the risks in terms of Scope and Quality, Schedule and Cost. Those three categories are scaled from 1 to 5 in a linear way in order to quantify the

impact, where 1 is the minimum and 5 is the maximum. Moreover, each effect is defined qualitatively depending on its category and its impact.

Scope/Quality Impact	Description	Scope Impact Score
Very High	Be unable to achieve the desired objectives. The project end item is effectively useless.	5
High	Scope and quality reduction hardly acceptable. The impact makes that the project item quality is below the desired objectives and under the acceptance criteria.	4
Medium	The risk produces moderate impact in the project and the results. Major areas of the scope are affected and quality is reduced but still above the acceptance criteria.	3
Low	It produces a low impact. Minor areas of the scope are affected and quality is slightly reduced affecting very demanding applications.	2
Very Low	It produces and insignificant impact in the project. Scope and quality decrease barely noticeable.	1

Table 3.2.1: Scope/Quality impacts

Schedule Impact	Description	Schedule Impact Score
Very High	Very significant delay in the schedule, increasing the milestone duration more than a 20%.	5
High	Significant delay in the schedule, increasing the milestone duration between a 10% and 20%.	4
Medium	Moderate delay in the schedule, increasing the milestone duration between a 5% and 10%.	3

Schedule Impact	Description	Schedule Impact Score
Low	Slightly significant delay in the schedule, increasing the milestone duration less than 5%.	2
Very Low	Insignificant delay and time increase.	1

Table 3.2.2: Schedule imapcts

Cost Impact	Description	Cost Impact Score
Very High	Several impact on the project cost, increasing the cost about more than 30%.	5
High	Important impact on the project cost, increasing the cost about 15% to 30%.	4
Medium	Moderate impact on the project cost, increasing the cost about 10% to 15%.	3
Low	Reduced impact on the project cost, increasing the cost about less than 10	
Very Low	Insignificant impact on the project cost.	1

Table 3.2.3: Cost impacts

3.3 Probability and impact matrix

Beyond the definitions of probability and impact, a further quantitative analysis of risk is required. Every risk is assigned a rate based on the probability and impact scores. This evaluation of risks is the way in which they are classified by their importance: the higher the risk rating, the higher their priority for attention. To manage ratings in a more organized manner, the probability and impact matrix is defined. This matrix specifies combinations of probability and impact that lead to rating the risks as very low, low, moderate, high or extreme. The following table shows the risk rating legend used for the elaboration of this project risk matrix:

Risk Rating	Score	Colour
Extreme Risk	[4 - 5]	
High Risk	[3 - 4)	
Moderate Risk	[2 - 3)	
Low Risk	[1 - 2)	
Very Low Risk	[0 - 1)	

Table 3.3.1: Risk Rating Legend

		Probability				
		Very Low/.2	Low/.4	Medium/.6	High/.8	Very High/1
Impact	Very High/5	1	2	3	4	5
	High/4	0.8	1.6	2.4	3.2	4
	Medium/3	0.6	1.2	1.8	2.4	3
	Low/2	0.4	0.8	1.2	1.6	2
	Very Low/1	0.2	0.4	0.6	0.8	1

Table 3.3.2: Probability and Impact Matrix

Depending on the risk score, the response and priority assigned to a risk will change. For example, risks that are in the red area of the matrix (high probability and high impact) may require priority action and aggressive response strategies while risks in the light green area may not require proactive management action beyond being considered as a warning. Throughout the project risks may vary so, using this matrix, risks will be reconsidered, changing their rating if necessary.

3.4 Risk rating

As already mentioned, risk rate is determined through probability and impact scores. In fact, it is the result of multiplying both scores. Hence, to identify a risk's position in the matrix, first it is necessary to assess probability and impact score as explained in sections 3.1 and 3.2. The previously defined matrix, represents impact as an overall score but in our case, different impact scores have been defined depending on the project objective that is threatened (scope, schedule, or cost). Hence, to determine the general impact grade the following equation is defined:

$$I_{general} = \sum_{i} (W_i \cdot I_i) \tag{3.4.1}$$

Where:

- i represents the different types of impact (scope, schedule, cost)

- W_i represents the importance or weight (from 0 to 1) of each of the impact types and it is satisfied that $Wscope + Wschedule + Wcost = 1$
- I_i represents the impact score of each of the types (from 0 to 5)

Consequently, the overall impact will have a value of (0-5] calculated doing a balance between each type of impact importance. Regarding the weights defined for this project, it has been decided that cost is the most important, followed by scope and finally, the schedule. Hence, the values assigned are the ones shown below:

$$W_{scope} = 0.3$$

$$W_{schedule} = 0.2$$

$$W_{cost} = 0.5$$

Once the general impact is calculated, the risk rating is defined as: Risk Rating = Probability Score $\times$ Impact Score

3.5 Risk identification and assessment

In this section as risk identification and assessment is provided by taking into account the defined data of the previous sections. Here it is also provided the information about the revised-risks.

The factors that have been used in the identification process are: enterprise environmental factors, organizational process assets, the project scope statement and the project management plan.

It is worth to mention that after analyzing these points, risks have been classified in two main groups: External risks, which are risks the project team cannot control and therefor no response nor action can be defined, and Internal risks, which can be detected in advance and be addressed properly.

Risk ID	Risk Statement	Probability	Impact			Score	Response
			Scope/Quality	Schedule	Cost		
Identifier	Description of the risk event or circumstance	Likelihood of occurrence				Probab. x Impact	Description of the planned response strategy to the risk event
R.1	Deliverable delays	Medium	1	4	3	1.6	Mitigation: Dedicate more resources than expected.
R.2	Inaccurate cost forecast	High	3	2	4	2.6	Transfer: Consider new funding sources and revise the financial management plan.
R.3	Lack of communication	High	3	4	3	2.6	Avoidance: Periodical meetings and use of collaborative software.
R.4	Lack of technology improvement	Low	3	2	1	0.7	Avoidance: Guarantee the development with thorough search of the actual technology.
R.5	Lack of access to project needed information	Very Low	2	2	2	0.4	Avoidance: A previous accurate research is needed before the development of the project.

R.6	Low team motivation	Medium	3	5	1	1.4	Acceptance: Personal control and team building projects.
R.7	Unsuccessfully quality control	Low	4	2	2	1.0	Mitigation: Improve or increase the quality controls.
R.8	Conflicts between members	High	2	4	2	1.9	Acceptance: Personal conflicts resolution meetings.
R.9	Infeasible design	Low	2	4	4	1.4	Transfer: Periodical reviews with experts and managers.
R.10	Technologies components with security vulnerabilities	High	4	2	2	2.1	Transfer: Check for possible security problems during development through specialized companies.
R.11	Organization issues	Very High	3	4	3	3.2	Transfer: Ask for help from an external company specialized in project management.
R.12	Stakeholder desertion	Low	2	4	3	1.2	Acceptance: Try to transfer the responsibilities to another stakeholder or contract a new one.

R.13	Competitors appearance	Very Low	4	1	4	0.7	Acceptance: Improvement of the quality/price ratio of the service.
R.14	Delay in external deliverables	Medium	2	4	2	1.4	Acceptance: Control the delivery schedules and change provider if necessary.
R.15	Economical market issues	Low	2	1	4	1.1	Acceptance: Control cost evolution due to external changes throughout the project.
R.16	Components or row material quality	Low	4	2	3	1.2	Mitigation: Have exhaustive and regular quality controls to avoid problems in components in the final test.

Table 3.5.1: Risk identification and assessment

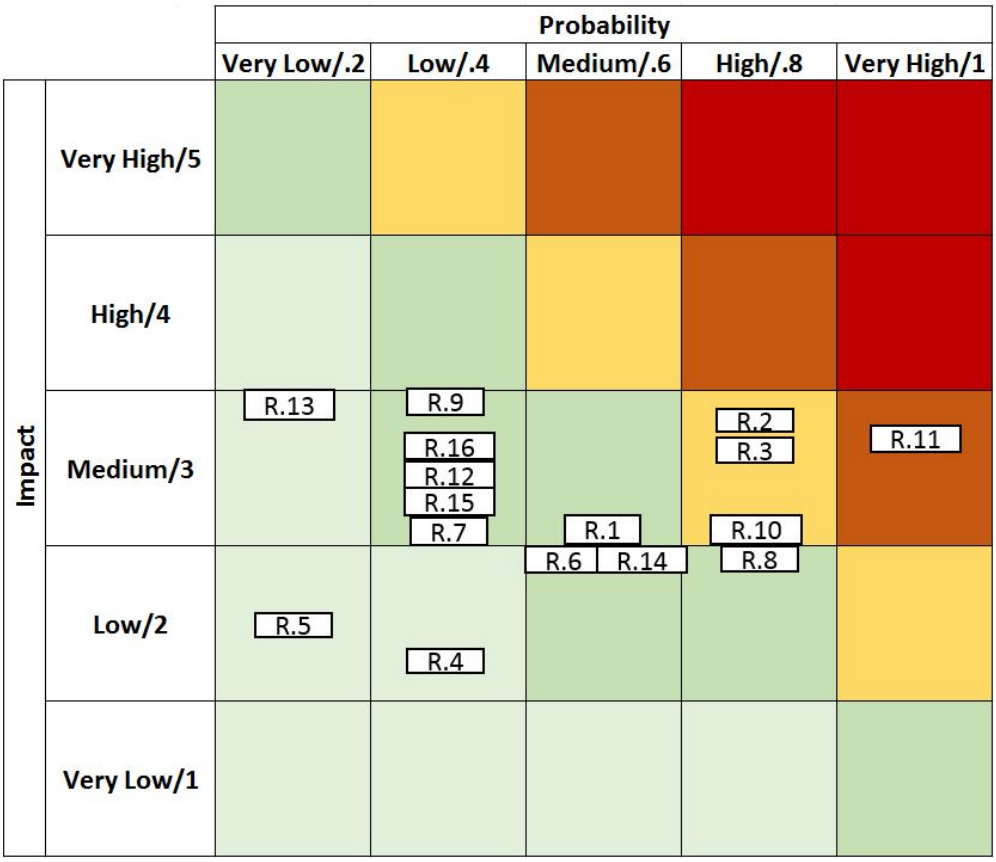

Table 3.5.2: Risk assessment

Risk ID	Revised Probability	Revised Impact			Revised Score	Owner	Action
		Scope/Quality	Schedule	Cost			
Identifier	Likelihood after the response strategy				Revised probability x Impact	Person who will manage the risk	Actions to be taken to address the risk
R.1	Low	1	2	2	0.7	Project Manager	Increase the number of control meetings. Allocate more human resources in delayed tasks.
R.2	Medium	2	2	2	1.2	Project Manager and Financial Manager	Highly periodical cost and expense controls.
R.3	Low	1	2	1	0.5	Project Manager secretary	Impart communicative skills courses to team members. Enhance use of collaborative software.
R.4	Very Low	2	1	1	0.3	Project Manager	Use all resources that are needed to guarantee the innovation expected. Propose redesigns and alternatives if needed.

R.5	Very Low	1	1	2	0.3	The manager of the corresponding department	Maintain contact with scientific and technological centers to be up to date of last technological improvements.
R.6	Low	2	3	1	0.7	Human Resources Manager	Interview team members to know their level of satisfaction with their work and request for their suggestions to improve their motivation.
R.7	Low	2	1	2	0.7	Quality Manager	Use higher qualified personnel, and buy better quality control resources.
R.8	Medium	1	2	2	1.0	Project Manager	Encourage communication among team members. Look for possible causes of conflicts. Establish teambuilding activities.

R.9	Very Low	1	2	4	0.5	Engineering Department Manager	Follow the specified design standards. Stick to the available technology.
R.10	Low	2	2	2	0.8	Engineering Department Manager	Establish regular contact with outsourced companies responsible for technological safety.
R.11	Medium	2	2	2	1.2	Project Manager	Establish weekly meetings between the department responsibles. Enhance the use of organization software.
R.12	Very Low	1	2	2	0.3	Project Manager	An in-depth research of alternatives to the current members would allow fast solutions.
R.13	Very Low	3	1	3	0.5	Quality Manager	Improve the image that HIRO gives to the European Union. Use our resources more efficiently.
R.14	Low	2	1	2	0.7	Sales Department Manager	Buy the resources in advance and keep them in stock.

R.15	Low	2	1	3	0.9	Sales Department Manager	Reconsider budget estimations with market variations.
R.16	Low	2	1	2	0.7	Software Engineering Manager	Establish quality inspections of the acquired materials.

Table 3.5.3: Revised risk identification and assessment

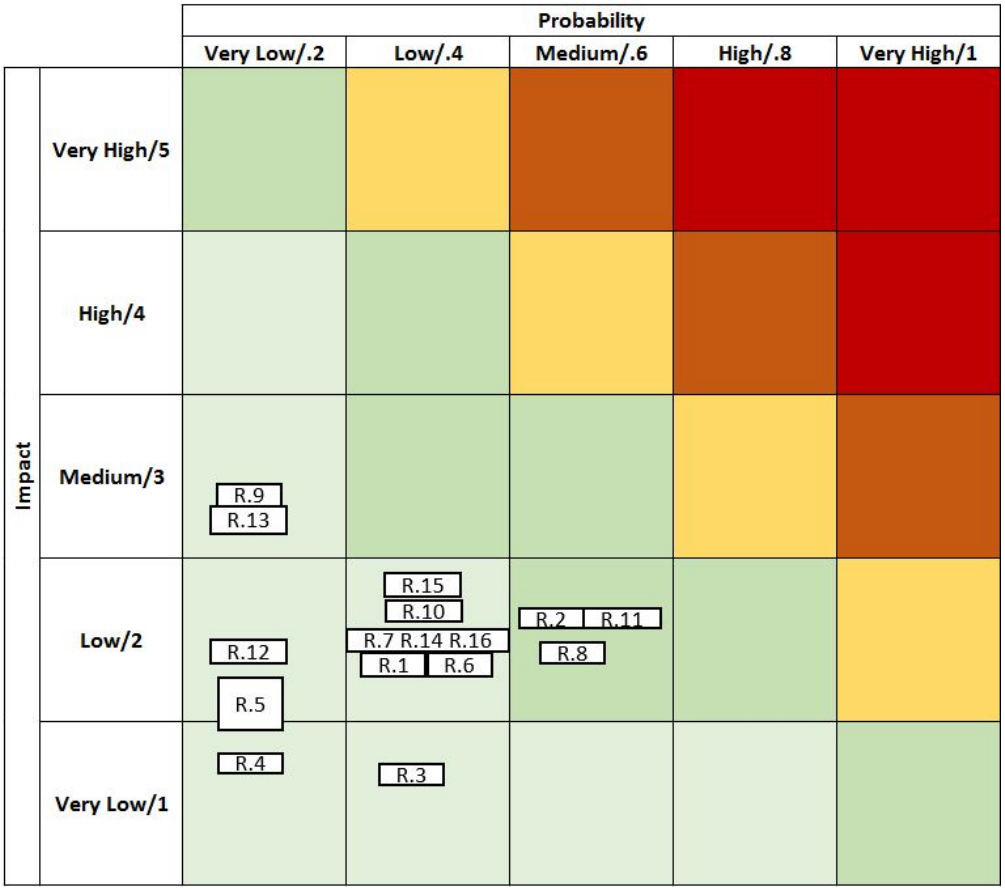

Table 3.5.4: Revised Risk assessment

3.6 Risk data sheet

<table>
<tr><td>Risk-ID:
R.1</td><td colspan="6">Risk Description:
Deliverables delays: The deliverables could not be completed at the time of their corresponding deadlines, leading to an increase of costs and a delay of all the schedule of the project.</td></tr>
<tr><td>Status:
Open or Closed</td><td colspan="6">Risk Cause:
Description of the circumstances or drivers that are the source of the risk</td></tr>
<tr><td rowspan="2">Probability</td><td colspan="3">Impact</td><td rowspan="2">Score</td><td colspan="2" rowspan="2">Responses</td></tr>
<tr><td>Scope/Quality</td><td>Schedule</td><td>Cost</td></tr>
<tr><td>Medium</td><td>1</td><td>4</td><td>3</td><td>1.6</td><td colspan="2">Mitigation: Dedicate more resources than expected.</td></tr>
<tr><td rowspan="2">Revised Probability</td><td colspan="3">Revised Impact</td><td rowspan="2">Revised Score</td><td rowspan="2">Owner</td><td rowspan="2">Actions</td></tr>
<tr><td>Scope/Quality</td><td>Schedule</td><td>Cost</td></tr>
<tr><td>Low</td><td>1</td><td>2</td><td>2</td><td>0.7</td><td>Project Manager</td><td>Increase the number of control meetings. Allocate more human resources in delayed tasks.</td></tr>
<tr><td colspan="7">Secondary Risks:
Description of the risk that arise out of the response strategies taken to address the risk</td></tr>
<tr><td colspan="7">Residual Risks:
Description of the remaining risk after response strategies</td></tr>
<tr><td colspan="5" rowspan="2">Contengency Plan:</td><td colspan="2">Contengency Funds:
Funds needed to protect the budged from overrun</td></tr>
<tr><td colspan="2">Contengency Time:
Time needed to protect the schedule from overrun</td></tr>
<tr><td colspan="7">Comments:
Any other information on the risk, the status of the risk, or response strategies.</td></tr>
</table>

Table 3.6.1: Risk 1 data sheet

<table>
<tr><td>Risk-ID:
R.2</td><td colspan="6">Risk Description:
Inaccurate cost forecast: The financial predictions could be wrong or different issues may occur increasing the total cost of the project.</td></tr>
<tr><td>Status:
Open or Closed</td><td colspan="6">Risk Cause:
Description of the circumstances or drivers that are the source of the risk</td></tr>
<tr><td rowspan="2">Probability</td><td colspan="3">Impact</td><td rowspan="2">Score</td><td colspan="2" rowspan="2">Responses</td></tr>
<tr><td>Scope/Quality</td><td>Schedule</td><td>Cost</td></tr>
<tr><td>High</td><td>3</td><td>2</td><td>4</td><td>2.6</td><td colspan="2">Transfer: Consider new funding sources and revise the financial management plan.</td></tr>
<tr><td rowspan="2">Revised Probability</td><td colspan="3">Revised Impact</td><td rowspan="2">Revised Score</td><td rowspan="2">Owner</td><td rowspan="2">Actions</td></tr>
<tr><td>Scope/Quality</td><td>Schedule</td><td>Cost</td></tr>
<tr><td>Medium</td><td>2</td><td>2</td><td>2</td><td>1.2</td><td>Project Manager and Financial Manager</td><td>Highly periodical cost and expense controls.</td></tr>
<tr><td colspan="7">Secondary Risks:
Description of the risk that arise out of the response strategies taken to address the risk</td></tr>
<tr><td colspan="7">Residual Risks:
Description of the remaining risk after response strategies</td></tr>
<tr><td colspan="5" rowspan="2">Contengency Plan:</td><td colspan="2">Contengency Funds:
Funds needed to protect the budged from overrun</td></tr>
<tr><td colspan="2">Contengency Time:
Time needed to protect the schedule from overrun</td></tr>
<tr><td colspan="7">Comments:
Any other information on the risk, the status of the risk, or response strategies.</td></tr>
</table>

Table 3.6.2: Risk 2 data sheet

<table>
<tr><td>Risk-ID:
R.3</td><td colspan="6">Risk Description:
Lack of communication: The absence of a proper communication method or channel might affect the quality of the product, the fulfilment of the deadlines or a good coordination between members and departments.</td></tr>
<tr><td>Status:
Open or Closed</td><td colspan="6">Risk Cause:
Description of the circumstances or drivers that are the source of the risk</td></tr>
<tr><td rowspan="2">Probability</td><td colspan="3">Impact</td><td rowspan="2">Score</td><td colspan="2" rowspan="2">Responses</td></tr>
<tr><td>Scope/Quality</td><td>Schedule</td><td>Cost</td></tr>
<tr><td>High</td><td>3</td><td>4</td><td>3</td><td>2.6</td><td colspan="2">Avoidance: Periodical meetings and use of collaborative software.</td></tr>
<tr><td rowspan="2">Revised Probability</td><td colspan="3">Revised Impact</td><td rowspan="2">Revised Score</td><td rowspan="2">Owner</td><td rowspan="2">Actions</td></tr>
<tr><td>Scope/Quality</td><td>Schedule</td><td>Cost</td></tr>
<tr><td>Low</td><td>1</td><td>2</td><td>1</td><td>0.5</td><td>Project Manager secretary</td><td>Impart communicative skills courses to team members. Enhance use of collaborative software.</td></tr>
<tr><td colspan="7">Secondary Risks:
Description of the risk that arise out of the response strategies taken to address the risk</td></tr>
<tr><td colspan="7">Residual Risks:
Description of the remaining risk after response strategies</td></tr>
<tr><td colspan="5" rowspan="2">Contengency Plan:</td><td colspan="2">Contengency Funds:
Funds needed to protect the budged from overrun</td></tr>
<tr><td colspan="2">Contengency Time:
Time needed to protect the schedule from overrun</td></tr>
<tr><td colspan="7">Comments:
Any other information on the risk, the status of the risk, or response strategies.</td></tr>
</table>

Table 3.6.3: Risk 3 data sheet

<table>
<tr><td>Risk-ID:
R.4</td><td colspan="5">Risk Description:
Lack of technology improvement: The main goal of the project is to innovate but it could happen that the company did not find the way to improve enough the different technologies.</td></tr>
<tr><td>Status:
Open or Closed</td><td colspan="5">Risk Cause:
Description of the circumstances or drivers that are the source of the risk</td></tr>
<tr><td rowspan="2">Probability</td><td colspan="3">Impact</td><td rowspan="2">Score</td><td rowspan="2">Responses</td></tr>
<tr><td>Scope/Quality</td><td>Schedule</td><td>Cost</td></tr>
<tr><td>Low</td><td>3</td><td>2</td><td>1</td><td>0.7</td><td colspan="2">Avoidance: Guarantee the development with thorough search of the actual technology.</td></tr>
<tr><td rowspan="2">Revised Probability</td><td colspan="3">Revised Impact</td><td rowspan="2">Revised Score</td><td rowspan="2">Owner</td><td rowspan="2">Actions</td></tr>
<tr><td>Scope/Quality</td><td>Schedule</td><td>Cost</td></tr>
<tr><td>Very low</td><td>2</td><td>1</td><td>1</td><td>0.3</td><td>Project Manager</td><td>Use all resources that are needed to guarantee the innovation expected. Propose redesigns and alternatives if needed.</td></tr>
<tr><td colspan="6">Secondary Risks:
Description of the risk that arise out of the response strategies taken to address the risk</td></tr>
<tr><td colspan="6">Residual Risks:
Description of the remaining risk after response strategies</td></tr>
<tr><td colspan="4" rowspan="2">Contengency Plan:</td><td colspan="2">Contengency Funds:
Funds needed to protect the budged from overrun</td></tr>
<tr><td colspan="2">Contengency Time:
Time needed to protect the schedule from overrun</td></tr>
<tr><td colspan="6">Comments:
Any other information on the risk, the status of the risk, or response strategies.</td></tr>
</table>

Table 3.6.4: Risk 4 data sheet

Risk-ID: R.5	Risk Description: Lack of access to project needed information: Discovering new technologies implies working with leading-edge science. It could occur that the team does not have access to the last improvements or patents.					
Status: Open or Closed	**Risk Cause:** Description of the circumstances or drivers that are the source of the risk					
Probability	**Impact**			**Score**	**Responses**	
	Scope/Quality	**Schedule**	**Cost**			
Very low	2	2	2	0.4	Avoidance: A previous accurate research is needed before the development of the project.	
Revised Probability	**Revised Impact**			**Revised Score**	**Owner**	**Actions**
	Scope/Quality	**Schedule**	**Cost**			
Very low	1	1	2	0.3	The manager of the corresponding department	Maintain contact with scientific and technological centers to be up to date of last technological improvements.
Secondary Risks: Description of the risk that arise out of the response strategies taken to address the risk						
Residual Risks: Description of the remaining risk after response strategies						
Contengency Plan:					**Contengency Funds:** Funds needed to protect the budged from overrun	
					Contengency Time: Time needed to protect the schedule from overrun	
Comments: Any other information on the risk, the status of the risk, or response strategies.						

Table 3.6.5: Risk 5 data sheet

Risk-ID: R.6	**Risk Description:** Low team motivation: The team could lose motivation, which would lead the project to take more time and costs to be completed.					
Status: Open or Closed	**Risk Cause:** Description of the circumstances or drivers that are the source of the risk					
Probability	**Impact**			**Score**	**Responses**	
	Scope/Quality	**Schedule**	**Cost**			
Medium	3	5	1	1.4	Acceptance: Personal control and team building projects.	
Revised Probability	**Revised Impact**			**Revised Score**	**Owner**	**Actions**
	Scope/Quality	**Schedule**	**Cost**			
Low	2	3	1	0.7	Human Resources Manager	Interview team members to know their level of satisfaction with their work and request for their suggestions to improve their motivation.
Secondary Risks: Description of the risk that arise out of the response strategies taken to address the risk						
Residual Risks: Description of the remaining risk after response strategies						
Contengency Plan:					**Contengency Funds:** Funds needed to protect the budged from overrun	
					Contengency Time: Time needed to protect the schedule from overrun	
Comments: Any other information on the risk, the status of the risk, or response strategies.						

Table 3.6.6: Risk 2 data sheet

<table>
<tr><td>Risk-ID:
R.7</td><td colspan="6">Risk Description:
Unsuccessfully quality control: The quality of some component, product or deliverable may not be as it is expected and established in the acceptance criteria.</td></tr>
<tr><td>Status:
Open or Closed</td><td colspan="6">Risk Cause:
Description of the circumstances or drivers that are the source of the risk</td></tr>
<tr><td rowspan="2">Probability</td><td colspan="3">Impact</td><td rowspan="2">Score</td><td colspan="2" rowspan="2">Responses</td></tr>
<tr><td>Scope/Quality</td><td>Schedule</td><td>Cost</td></tr>
<tr><td>Low</td><td>4</td><td>2</td><td>2</td><td>1</td><td colspan="2">Mitigation: Improve or increase the quality controls.</td></tr>
<tr><td rowspan="2">Revised Probability</td><td colspan="3">Revised Impact</td><td rowspan="2">Revised Score</td><td rowspan="2">Owner</td><td rowspan="2">Actions</td></tr>
<tr><td>Scope/Quality</td><td>Schedule</td><td>Cost</td></tr>
<tr><td>Low</td><td>2</td><td>1</td><td>2</td><td>0.7</td><td>Quality Manager</td><td>Use higher qualified personnel, and buy better quality control resources.</td></tr>
<tr><td colspan="7">Secondary Risks:
Description of the risk that arise out of the response strategies taken to address the risk</td></tr>
<tr><td colspan="7">Residual Risks:
Description of the remaining risk after response strategies</td></tr>
<tr><td colspan="5" rowspan="2">Contengency Plan:</td><td colspan="2">Contengency Funds:
Funds needed to protect the budged from overrun</td></tr>
<tr><td colspan="2">Contengency Time:
Time needed to protect the schedule from overrun</td></tr>
<tr><td colspan="7">Comments:
Any other information on the risk, the status of the risk, or response strategies.</td></tr>
</table>

Table 3.6.7: Risk 7 data sheet

<table>
<tr><td>Risk-ID:
R.8</td><td colspan="6">Risk Description:
Conflicts between members: There could be a disagreement over the project issues between executive members.</td></tr>
<tr><td>Status:
Open or Closed</td><td colspan="6">Risk Cause:
Description of the circumstances or drivers that are the source of the risk</td></tr>
<tr><td rowspan="2">Probability</td><td colspan="3">Impact</td><td rowspan="2">Score</td><td colspan="2" rowspan="2">Responses</td></tr>
<tr><td>Scope/Quality</td><td>Schedule</td><td>Cost</td></tr>
<tr><td>High</td><td>2</td><td>4</td><td>2</td><td>1.9</td><td colspan="2">Acceptance: Personal conflicts resolution meetings.</td></tr>
<tr><td rowspan="2">Revised Probability</td><td colspan="3">Revised Impact</td><td rowspan="2">Revised Score</td><td rowspan="2">Owner</td><td rowspan="2">Actions</td></tr>
<tr><td>Scope/Quality</td><td>Schedule</td><td>Cost</td></tr>
<tr><td>Medium</td><td>1</td><td>2</td><td>2</td><td>1</td><td>Project Manager</td><td>Encourage communication among team members. Look for possible causes of conflicts. Establish teambuilding activities.</td></tr>
<tr><td colspan="7">Secondary Risks:
Description of the risk that arise out of the response strategies taken to address the risk</td></tr>
<tr><td colspan="7">Residual Risks:
Description of the remaining risk after response strategies</td></tr>
<tr><td colspan="5" rowspan="2">Contengency Plan:</td><td colspan="2">Contengency Funds:
Funds needed to protect the budged from overrun</td></tr>
<tr><td colspan="2">Contengency Time:
Time needed to protect the schedule from overrun</td></tr>
<tr><td colspan="7">Comments:
Any other information on the risk, the status of the risk, or response strategies.</td></tr>
</table>

Table 3.6.8: Risk 8 data sheet

Risk-ID: R.9	**Risk Description:** Infeasible design: The design could turn out to be excessively costly or not possible to be built.					
Status: Open or Closed	**Risk Cause:** Description of the circumstances or drivers that are the source of the risk					
Probability	**Impact**			**Score**	**Responses**	
	Scope/Quality	**Schedule**	**Cost**			
Low	2	4	4	1.4	Transfer: Periodical reviews with experts and managers.	
Revised Probability	**Revised Impact**			**Revised Score**	**Owner**	**Actions**
	Scope/Quality	**Schedule**	**Cost**			
Very low	1	2	4	0.5	Engine Department Manager	Follow the specified design standards. Stick to the available technology.
Secondary Risks: Description of the risk that arise out of the response strategies taken to address the risk						
Residual Risks: Description of the remaining risk after response strategies						
Contengency Plan:					**Contengency Funds:** Funds needed to protect the budged from overrun	
					Contengency Time: Time needed to protect the schedule from overrun	
Comments: Any other information on the risk, the status of the risk, or response strategies.						

Table 3.6.9: Risk 9 data sheet

Risk-ID: R.10	**Risk Description:** Technologies components with security vulnerabilities: Security vulnerabilities are unwanted in high-tech projects if some government is interested in using the technology.					
Status: Open or Closed	**Risk Cause:** Description of the circumstances or drivers that are the source of the risk					
Probability	**Impact**			**Score**	**Responses**	
	Scope/Quality	**Schedule**	**Cost**			
High	4	2	2	2.1	Transfer: Check for possible security problems during development through specialized companies.	
Revised Probability	**Revised Impact**			**Revised Score**	**Owner**	**Actions**
	Scope/Quality	**Schedule**	**Cost**			
Low	2	2	2	0.8	Engineering Department Manager	Establish regular contact with outsourced companies responsible for technological safety.
Secondary Risks: Description of the risk that arise out of the response strategies taken to address the risk						
Residual Risks: Description of the remaining risk after response strategies						
Contengency Plan:					**Contengency Funds:** Funds needed to protect the budged from overrun	
					Contengency Time: Time needed to protect the schedule from overrun	
Comments: Any other information on the risk, the status of the risk, or response strategies.						

Table 3.6.10: Risk 10 data sheet

<table>
<tr><td>Risk-ID:
R.11</td><td colspan="6">Risk Description:
Organization Issues: The project could be not well organized in terms of timing, activities, etc. and the schedule may be always changing.</td></tr>
<tr><td>Status:
Open or Closed</td><td colspan="6">Risk Cause:
Description of the circumstances or drivers that are the source of the risk</td></tr>
<tr><td rowspan="2">Probability</td><td colspan="3">Impact</td><td rowspan="2">Score</td><td colspan="2" rowspan="2">Responses</td></tr>
<tr><td>Scope/Quality</td><td>Schedule</td><td>Cost</td></tr>
<tr><td>Very High</td><td>3</td><td>4</td><td>3</td><td>3.2</td><td colspan="2">Transfer: Ask for help from an external company specialized in project management.</td></tr>
<tr><td rowspan="2">Revised Probability</td><td colspan="3">Revised Impact</td><td rowspan="2">Revised Score</td><td rowspan="2">Owner</td><td rowspan="2">Actions</td></tr>
<tr><td>Scope/Quality</td><td>Schedule</td><td>Cost</td></tr>
<tr><td>Medium</td><td>2</td><td>2</td><td>2</td><td>1.2</td><td>Project Manager</td><td>Establish weekly meetings between the department responsible. Enhance the use of organization software.</td></tr>
<tr><td colspan="7">Secondary Risks:
Description of the risk that arise out of the response strategies taken to address the risk</td></tr>
<tr><td colspan="7">Residual Risks:
Description of the remaining risk after response strategies</td></tr>
<tr><td colspan="5" rowspan="2">Contengency Plan:</td><td colspan="2">Contengency Funds:
Funds needed to protect the budged from overrun</td></tr>
<tr><td colspan="2">Contengency Time:
Time needed to protect the schedule from overrun</td></tr>
<tr><td colspan="7">Comments:
Any other information on the risk, the status of the risk, or response strategies.</td></tr>
</table>

Table 3.6.11: Risk 11 data sheet

<table>
<tr><td>Risk-ID:
R.12</td><td colspan="6">Risk Description:
Stakeholder desertion: The abandonment of a stakeholder could occur for several reasons, leaving the project without its contribution.</td></tr>
<tr><td>Status:
Open or Closed</td><td colspan="6">Risk Cause:
Description of the circumstances or drivers that are the source of the risk</td></tr>
<tr><td rowspan="2">Probability</td><td colspan="3">Impact</td><td rowspan="2">Score</td><td colspan="2" rowspan="2">Responses</td></tr>
<tr><td>Scope/Quality</td><td>Schedule</td><td>Cost</td></tr>
<tr><td>Low</td><td>2</td><td>4</td><td>3</td><td>1.2</td><td colspan="2">Acceptance: Try to transfer the responsibilities to another stakeholder or contract a new one.</td></tr>
<tr><td rowspan="2">Revised Probability</td><td colspan="3">Revised Impact</td><td rowspan="2">Revised Score</td><td rowspan="2">Owner</td><td rowspan="2">Actions</td></tr>
<tr><td>Scope/Quality</td><td>Schedule</td><td>Cost</td></tr>
<tr><td>Very low</td><td>1</td><td>2</td><td>2</td><td>0.3</td><td>Project Manager</td><td>An in-depth research of alternatives to the current members would allow fast solutions.</td></tr>
<tr><td colspan="7">Secondary Risks:
Description of the risk that arise out of the response strategies taken to address the risk</td></tr>
<tr><td colspan="7">Residual Risks:
Description of the remaining risk after response strategies</td></tr>
<tr><td colspan="5" rowspan="2">Contengency Plan:</td><td colspan="2">Contengency Funds:
Funds needed to protect the budged from overrun</td></tr>
<tr><td colspan="2">Contengency Time:
Time needed to protect the schedule from overrun</td></tr>
<tr><td colspan="7">Comments:
Any other information on the risk, the status of the risk, or response strategies.</td></tr>
</table>

Table 3.6.12: Risk 12 data sheet

<table>
<tr><td>Risk-ID:
R.13</td><td colspan="6">Risk Description:
Competitors appearance: The emergence of other companies that could offer the same product. This could modify the benefits of our company.</td></tr>
<tr><td>Status:
Open or Closed</td><td colspan="6">Risk Cause:
Description of the circumstances or drivers that are the source of the risk</td></tr>
<tr><td rowspan="2">Probability</td><td colspan="3">Impact</td><td rowspan="2">Score</td><td colspan="2" rowspan="2">Responses</td></tr>
<tr><td>Scope/Quality</td><td>Schedule</td><td>Cost</td></tr>
<tr><td>Very low</td><td>4</td><td>1</td><td>4</td><td>0.7</td><td colspan="2">Acceptance:
Improvement of the quality/price ratio of the service.</td></tr>
<tr><td rowspan="2">Revised Probability</td><td colspan="3">Revised Impact</td><td rowspan="2">Revised Score</td><td rowspan="2">Owner</td><td rowspan="2">Actions</td></tr>
<tr><td>Scope/Quality</td><td>Schedule</td><td>Cost</td></tr>
<tr><td>Very Low</td><td>3</td><td>1</td><td>3</td><td>0.5</td><td>Quality Manager</td><td>Improve the image that HIRO gives to the European Union. Use our resources more efficiently.</td></tr>
<tr><td colspan="7">Secondary Risks:
Description of the risk that arise out of the response strategies taken to address the risk</td></tr>
<tr><td colspan="7">Residual Risks:
Description of the remaining risk after response strategies</td></tr>
<tr><td colspan="5" rowspan="2">Contengency Plan:</td><td colspan="2">Contengency Funds:
Funds needed to protect the budged from overrun</td></tr>
<tr><td colspan="2">Contengency Time:
Time needed to protect the schedule from overrun</td></tr>
<tr><td colspan="7">Comments:
Any other information on the risk, the status of the risk, or response strategies.</td></tr>
</table>

Table 3.6.13: Risk 13 data sheet

<table>
<tr><td>Risk-ID:
R.14</td><td colspan="5">Risk Description:
Delay in external deliverables: If the products that the company orders do not arrive at the predicted time all the processes can experience a delay, incrementing costs.</td></tr>
<tr><td>Status:
Open or Closed</td><td colspan="5">Risk Cause:
Description of the circumstances or drivers that are the source of the risk</td></tr>
<tr><td rowspan="2">Probability</td><td colspan="3">Impact</td><td rowspan="2">Score</td><td rowspan="2">Responses</td></tr>
<tr><td>Scope/Quality</td><td>Schedule</td><td>Cost</td></tr>
<tr><td>Medium</td><td>2</td><td>4</td><td>2</td><td>1.4</td><td colspan="2">Acceptance: Control the delivery schedules and change provider if necessary.</td></tr>
<tr><td rowspan="2">Revised Probability</td><td colspan="3">Revised Impact</td><td rowspan="2">Revised Score</td><td rowspan="2">Owner</td><td rowspan="2">Actions</td></tr>
<tr><td>Scope/Quality</td><td>Schedule</td><td>Cost</td></tr>
<tr><td>Low</td><td>2</td><td>1</td><td>2</td><td>0.7</td><td>Sales Department Manager</td><td>Buy the resources in advance and keep them in stock.</td></tr>
<tr><td colspan="6">Secondary Risks:
Description of the risk that arise out of the response strategies taken to address the risk</td></tr>
<tr><td colspan="6">Residual Risks:
Description of the remaining risk after response strategies</td></tr>
<tr><td colspan="4" rowspan="2">Contengency Plan:</td><td colspan="2">Contengency Funds:
Funds needed to protect the budged from overrun</td></tr>
<tr><td colspan="2">Contengency Time:
Time needed to protect the schedule from overrun</td></tr>
<tr><td colspan="6">Comments:
Any other information on the risk, the status of the risk, or response strategies.</td></tr>
</table>

Table 3.6.14: Risk 14 data sheet

<table>
<tr><td>Risk-ID:
R.15</td><td colspan="6">Risk Description:
Economical market issues: During the period of time that the project is executed, there could be large-scale economic crisis.</td></tr>
<tr><td>Status:
Open or Closed</td><td colspan="6">Risk Cause:
Description of the circumstances or drivers that are the source of the risk</td></tr>
<tr><td rowspan="2">Probability</td><td colspan="3">Impact</td><td rowspan="2">Score</td><td colspan="2" rowspan="2">Responses</td></tr>
<tr><td>Scope/Quality</td><td>Schedule</td><td>Cost</td></tr>
<tr><td>Low</td><td>2</td><td>1</td><td>4</td><td>1.1</td><td colspan="2">Acceptance: Control cost evolution due to external changes throughout the project.</td></tr>
<tr><td rowspan="2">Revised Probability</td><td colspan="3">Revised Impact</td><td rowspan="2">Revised Score</td><td rowspan="2">Owner</td><td rowspan="2">Actions</td></tr>
<tr><td>Scope/Quality</td><td>Schedule</td><td>Cost</td></tr>
<tr><td>Low</td><td>2</td><td>1</td><td>3</td><td>0.9</td><td>Sales Department Manager</td><td>Reconsider budget estimations with market variations.</td></tr>
<tr><td colspan="7">Secondary Risks:
Description of the risk that arise out of the response strategies taken to address the risk</td></tr>
<tr><td colspan="7">Residual Risks:
Description of the remaining risk after response strategies</td></tr>
<tr><td colspan="5" rowspan="2">Contengency Plan:</td><td colspan="2">Contengency Funds:
Funds needed to protect the budged from overrun</td></tr>
<tr><td colspan="2">Contengency Time:
Time needed to protect the schedule from overrun.</td></tr>
<tr><td colspan="7">Comments:
Any other information on the risk, the status of the risk, or response strategies.</td></tr>
</table>

Table 3.6.15: Risk 15 data sheet

<table>
<tr><td>Risk-ID:
R.16</td><td colspan="5">Risk Description:
Components or row material quality: The ordered equipment or materials could not be in good condition, delaying processes and increasing costs.</td></tr>
<tr><td>Status:
Open or Closed</td><td colspan="5">Risk Cause:
Description of the circumstances or drivers that are the source of the risk</td></tr>
<tr><td rowspan="2">Probability</td><td colspan="3">Impact</td><td rowspan="2">Score</td><td rowspan="2">Responses</td></tr>
<tr><td>Scope/Quality</td><td>Schedule</td><td>Cost</td></tr>
<tr><td>Low</td><td>4</td><td>2</td><td>3</td><td>1.2</td><td colspan="2">Mitigation: Have exhaustive and regular quality controls to avoid problems in components in the final test.</td></tr>
<tr><td rowspan="2">Revised Probability</td><td colspan="3">Revised Impact</td><td rowspan="2">Revised Score</td><td rowspan="2">Owner</td><td rowspan="2">Actions</td></tr>
<tr><td>Scope/Quality</td><td>Schedule</td><td>Cost</td></tr>
<tr><td>Low</td><td>2</td><td>1</td><td>2</td><td>0.7</td><td>Software Engineering Manager</td><td>Establish quality inspections of the acquired materials.</td></tr>
<tr><td colspan="6">Secondary Risks:
Description of the risk that arise out of the response strategies taken to address the risk</td></tr>
<tr><td colspan="6">Residual Risks:
Description of the remaining risk after response strategies</td></tr>
<tr><td colspan="4" rowspan="2">Contengency Plan:</td><td colspan="2">Contengency Funds:
Funds needed to protect the budged from overrun</td></tr>
<tr><td colspan="2">Contengency Time:
Time needed to protect the schedule from overrun</td></tr>
<tr><td colspan="6">Comments:
Any other information on the risk, the status of the risk, or response strategies.</td></tr>
</table>

Table 3.6.16: Risk 16 data sheet

4 Plan communication management

This section stands for an accurate description of the communication management inside the DEOS-UD Project, as communication is one of the keys to a successful development of any project. In the first insight, the different roles and responsibilities will be described as well as the different relations between people, teams and committees inside DEOS-UD. Along with the detailed roles and responsibilities of teams and committees, every member's specific task inside them will be mentioned. Secondly, the different communication procedures will be carefully detailed to provide the maximum information possible in order to allow a correct development of meetings and communications between people and departments, thus increasing the overall project efficiency. The section will end with a communication management plan matrix, which will summarize all the previously descripted procedures by mapping all the communication requirements of the project.

4.1 Participants roles and responsabilities

As previously stated, this section will provide the reader with the roles and responsibilities of the different DEOS-UD staff in terms of the Communication Plan. In this section, different committees and teams will also be described.

Steering Committee

The steering committee will provide DEOS-UD with solutions to problems along with strategic command in order to ensure a correct and efficient development of the project. As this team's role is of extreme importance when it comes to the project's success, a careful selection of its representatives must be performed. The steering committee will be composed of the members with key roles in DEOS-UD project; these members are listed in the following table, extracted from the first project charter.

Role	Resource Name	Organization	Responsibilities
Project Sponsor	Luís Manuel Pérez Llera	European Commission	Supervise the project.
Project Manager	Pol Fontanes Molina	HIRO	Manage the project.
Project Secretary	Sílvia González García	HIRO	Administrate the internal documents and information of the group.
Financial Manager	Santiago Lopezbarrena Arenas	HIRO	Estimate and control the costs of the project.
Stakeholders & Procurement Manager	Eva María Urbano González	HIRO	Identify the stakeholders of the project and manage and control their engagement. Plan, conduct and control the procurements of the project.
Scope & Time Manager	Marina Pons Daza	HIRO	Define and control the scope and deadlines of the project.
Risk Manager	Borja Calderón Rosario	HIRO	Identify and manage the possible risks of the project.
Quality Manager	Guillermo Escartín Vivancos	HIRO	Control that the quality requirements of the project are met.
Technical Managers	David Pérez Sánchez, Hamza Nachett, Laura Pla Olea	HIRO	Analyse and control the technical aspects of the project.
Marketing & Communications Managers	Albert Herrando Moraira, María De Benedicto Barba	HIRO	Promote the project and its final product. Search for possible customers. Ensure communication between the different members of the group.

Table 4.1.1: Roles and responsibilities

As described, the team will not only work as a steering committee but also as an advisory committee, for this reason it will be composed by multiple consortium members that will act as advisors in diverse fields. The key roles developed by the steering committee are detailed below.

- Take and implement management decisions that affect a significant part of the

stakeholders.

- Take action in important schedule delays as well as cost overruns by modifying resources assigned to departments, staff planning, or anything necessary to redirect situations that endanger a correct development of the project.
- Offer leadership, guidance and support to problems that smaller groups have not been able to solve by themselves.
- Enhance communication skills along with communications procedures in order to avoid communication-related problems.

Project Manager

DEOS-UD Project manager, Pol Fontanes Molina, is the person in charge of assuring that every aspect of the project is functioning as planned. He is ought to detect, communicate and correct any deviations (schedule variances, cost overruns and scope changes) from the original plans. The decisions taken by the PM, will be communicated directly to the steering committee, members of which will communicate to the rest of the staff.

Advisory committee

Participants in the advisory committee are detailed here.

- Research and Development assessors:
  - Matthew Perren (Airbus Defence and Space GmbH)
  - Ismael López (Deimos Space)
- Legal and Business Assessor
  - Oliver Heinrich (BHO Legal)
- Application collaborators
  - Jean François Rapp (ICUBE-SERTIT)
  - Vessela Samoungi (ReSAC)
- Development and Application collaborator
  - Steven Krekels (VITO nv)

The function of this committee will be that of providing tailored assistance in anything related with the project in order to solve issues and avoid risks during DEOS-UD development. Given

the importance of this group itself, its participants will meet with the steering group regularly to ensure a correct use and implementation of their know-hoy inside DEOS-UD.

Business Project Team

This team will be directed by Santiago Lopezbarrena Arenas, the financial manager, and is in charge of assuring an economical resources correct management by providing careful tracing in the use of the budget along with a proper staff training in means of economical performance. This team is also ought to communicate the project manager with the latest information on earned value management parameters in order for the latter to know at what point exactly the development of the project is found.

Technical Project Team

The Technical Project Team, conducted by its three leaders David Pérez Sánchez, Hamza Nachett and Laura Pla Olea, will be in charge of analysing and controlling every single technical aspect of the project. The team itself must assure that everything done during DEOS-UD project development meets the requirements of the contract by successfully following all de documentation and activities received from the overall project staff, including contractors and subcontractors as well. As part of its essential activities, the Technical Project Team is expected to resolve and to give advice in any inconveniences or issues that may appear during the course of the project. The Technical Project Team's leaders will be part of the Steering group and will report regularly to the project manager on topics that concern the technical progresses of DEOS-UD project, by having gathered all the information related to this subject from the different departments developing such activities.

Oversight

For the sake of a reliable accomplishment of the project's goals along with a recognized meeting of the contract's specifications, an oversight agency will actively work with DEOS-UD mostly when different milestones are achieved and a certification in the results is needed. The company auditing DEOS-UD results will be Bureau Veritas and its specific responsibilities are detailed here.

- Auditing a correct implementation of the different requirements of the contract regarding privacy policies with data management.
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Given that an auditory is an external agency, it has not been included the advisory team; yet its collaboration inside the project is key to a successful accomplishment of the project's goals.

4.2 Communication process

This section approaches the way in which the information is transmitted. In order to communicate efficiently it is important to bear in mind who are we addressing to. The communication process can be divided into three main categories: informal communications, formal communications, and external communications.

4.2.1 Informal

Informal communications consist of e-mail, conversations, or phone calls and serve to supplement and enhance formal communications. Due to the varied types and ad-hoc nature of informal communications, they are not discussed in this plan.

4.2.2 Formal

The DEOS-UD Project will engage in various types of formal communication. The general types and their purpose are described below as "Status Meetings" and "Status Reports".

4.2.2.1 Status Meetings

There are five basic types of status meetings for the DEOS-UD Project:

- Status meetings internal to the DEOS-UD business team to discuss assignments, activities, and to share information
- Status meetings and reports between the DEOS-UD business team, and the technical project team
- Advisory Committee meetings with the project stakeholders, and project manager to review progress, risks, and issues
- Status meetings and reports between the DEOS-UD project manager and the steering committee
- Status meetings and reports to stakeholders, such as oversight agencies

4.2.2.2 Status Reports

A variety of status reports will be produced during the project. The status reports will be produced on regular intervals to provide stakeholders project information on the status and progress of the DEOS-UD project. At a minimum the reports will contain:

- Project status on major activities
- Project schedule
- Budget and cost tracking
- Status of issues and risks
- Health status
- Status of action items, if applicable.
- Future or planned activities

The intent of the status reports is to inform stakeholders of the project's progress and keep them actively involved in the project. The information provided will contain enough detail to allow stakeholders to make informed decisions and maintain oversight of the project.

4.2.3 External Communication

Although internal communication is very important for the proper development of the project, we must not forget that external communication is also crucial in a project of this magnitude. Having a good dissemination plan involves explaining how the outcomes of the project will be shared with stakeholders, relevant institutions, organisations, and individuals.
In order to achieve the proposed objectives in terms of external communication, the process of dissemination will be focused in two different ways depending on whether we want to reach the general public or aerospace sector.

4.2.3.1 General public

It is important to find an adequate channel to reach the less specialized public in the aeroespace field. In order to achieve the maximum diffusion of the project in this sector, the following resources will be used.

- Social Networking. Social networks are the best way to reach the widest possible audience. Posting regularly is also crucial to keep people interested in the project. Some of the platforms that will be used during the project development are: Twitter, Facebook and Instagram. There will be at least one update a week in order to keep people informed of the progress of the project.
- Website. A project website is one of the most versatile dissemiation tools and will help reaching people unfamiliar with social networks. It can contain information intended to different profiles. As in the previous case, it has to be kept updated.

4.2.3.2 Aerospace sector

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- Trade shows. Trade shows, fairs and exhibitions are a great way to get in close contact with people from other regions and countries that we would ordinarily never be face to face with. They are also helpfull in terms of finding new prospects, nurture current client relationships and stay up to date on the latest industry developments.
- Conferences. National and international conferences will help sharing the achievements of the project with specialists of the field.
- Journal Articles. To promote project ideas and results in scientific research.

4.3 Communication management plan matrix

Communication Type	Objective of Communication	Medium	Frequency	Audience	Owner	Deliverable	Format
Internal Business Status Meetings	Discuss assignments, activities and sharing information	Face to Face	Weekly	Business Team	Financial Manager	Agenda, Meeting Minutes	Soft copy archived on SharePoint site and project website
Technical and Business Status Meetings and Reports	Discuss assignments, activities, sharing information and reporting the project status	Face to Face	Weekly	Project Manager, Business Team, Technical Team, Project Secretary	Project Manager	Agenda, Meeting Minutes, Status Reports	Soft copy archived on SharePoint site and project website
Advisory Committe Meetings	Review progress, risks and issues	Face to Face	Monthly	Adivsory Committee, Project Stakeholders, Project Manager, Project Secretary	Project Manager	Agenda, Meeting Minutes	Soft copy archived on SharePoint site and project website

Steering Committee Status Meetings	Enhance communication and coordination of the project	Face to Face	Monthly	Steering Committee, Project Manager, Project Secretary	Project Manager	Agenda, Meeting Minutes	Soft copy archived on SharePoint site and project website
Status Meetings and Reports to Stakeholders	Report the status of the project including activities, progress, costs and issues	Face to Face or Video Conference	Monthly	Stakeholders, Project Manager, Project Secretary	Project Manager	Agenda, Meeting Minutes, Status Reports	Soft copy archived on SharePoint site and project website
Project Status Reports	Provide Stakeholders information on the status and progress of the project	Email	Monthly	Project Stakeholders, Stakeholder and Procurement Manager, Project Manager	Stakeholder and Procurement Manager	Project status, schedule, budget and cost tracking, status of issues and riskes, health status, status of action items, future or planned activies	Soft copy archived on SharePoint site and project website

Social Networking	Share any updates on the project	Facebook, Twitter, Intagram	Weekly	General Public	Marketing and Communication Manager	Online Posts	Online
Website	Contain varied information about the project	Website	Updated with any change	General Public	Marketing and Communication Manager	Online Posts	Online
Trade Shows	Face to face contact with potential customers as well as finding new prospects, nurture client relationshps and stay up to date with lastes developments	On site stands	Scheduled	Potential Customers, Genera Public and Industry Professionals	Marketing and Communication Manager	None	Face to Face
Conferences	Sharing achievements with industry specialists	Conferences	Scheduled	Industry Professionals	Project Manager	Presentation	Face to Face

Journal Articles	Promoting project ideas, concepts and results in scientific and applied research communities and getting feedback from relevant stakeholders	Digital and Written platforms	When Available	Potential Customers, General Public and Industry Professionals	Project Manager	Journal Article	Hard Copy

Table 4.3.1: Revised risk identification and assessment

5 Bibliography

[1] AAFP. Basics of Quality Improvement – Practice Management.

[2] Lean Solutions. ¿Que es Six Sigma?