



Project DEOS-UD

Disruptive Earth Observation Sensing for Urban Development

Deliverable 3

Procurement, Quality, Risks and Communication Management

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Contents

List of Tables	iii
List of Figures	iv
1 Plan procurement management	1
1.1 Make or Buy decisions	1
1.2 Statement Of Work	5
2 Quality management plan	6
2.1 Quality Assurance Approach	6
2.2 Quality Control Approach	6
2.2.1 Documentation quality plan	6
2.2.2 Technical quality plan	7
2.2.3 Software quality plan	7
2.3 Quality Improvement Approach	8
2.4 Quality Roles and Responsibilities	9
3 Risk management plan	11
3.1 Definitions of Probability	11
3.2 Definitions of impacts by objective	11
3.3 Probability and impact matrix	13
3.4 Risk rating	13
3.5 Risk identification and assessment	13
3.6 Risk data sheet	18
4 Plan communication management	19
4.1 Participants roles and responsibilities	19
4.2 Communication process	23
4.2.1 Informal	23
4.2.2 Formal	23
4.2.2.1 Status Meetings	23
4.2.2.2 Status Reports	24
4.2.3 External Communication	24
4.2.3.1 General public	24

4.2.3.2 Aerospace sector	25
4.3 Communication management plan matrix	25
5 Bibliography	27

List of Tables

2.4.1	List of quality roles and responsibilities	10
3.1.1	Definitions of probability	11
3.2.1	Scope/Quality impacts	12
3.2.2	Schedule imapcts	13
3.2.3	Cost impacts	13
3.5.1	Risk identification and assessment	16
3.5.2	Revised risk identification and assessment	17
3.6.1	Risk 1 data sheet	18
4.1.1	Roles and responsibilities	20
4.3.1	Revised risk identification and assessment	26

List of Figures

1 | Plan procurement management

TEXT

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
3.1.	State of the art - Payloads	c	10.178 €	e	f	Airbus Defence and Space GmbH	h
3.2.	State of the art - Modular system	c	10.274 €	e	f	Thales Alenia Space S.A.S	h
3.3.	State of the art - Interaction platform	c	18.403 €	e	f	ICUBE-SERTIT	h
4.1.1.	Product development - Preliminary design - Payloads	c	48.874 €	e	f	Airbus Defence and Space GmbH	h
4.1.2.	Product development - Preliminary design - Modular system	c	20.097 €	e	f	Thales Alenia Space S.A.S	h

4.1.3.	Product development - Preliminary design - Interaction platform	c	12.898 €	e	f	ICUBE-SERTIT	h
4.2.1.	Product development - Final design - Payloads	c	120.220 €	e	f	Airbus Defence and Space GmbH	h
4.2.2.	Product development - Final design - Modular system	c	101.312 €	e	f	Thales Alenia Space S.A.S	h
4.2.3.	Product development - Final design - Interaction platform	c	93.586 €	e	f	ICUBE-SERTIT	h
5.1.	Technology demonstrator prototype manufacturing	c	290.993 €	e	f	Thales Alenia Space S.A.S	h
5.2.	Payload validation	c	62.010 €	e	f	Thales Alenia Space S.A.S	h

5.3.	Modular system validation	c	50.434 €	e	f	Thales Alenia Space S.A.S	h
5.4.	Interaction platform validation	c	20.343 €	e	f	ReSAC	h
6.	Business planning and exploitation of results	c	6.186 €	e	f	BHO Legal Rechtsanwälte Partnership	h

1.2 Statement Of Work

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2 | Quality management plan

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2.1 Quality Assurance Approach

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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 starting 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 success. 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 to be approved.
 - Stakeholders satisfaction
 - Time needed to approve a document.
 - 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	<p>Coordinates the work done by the engineers and technicians.</p> <p>Reviews the technical aspects of the deliverables before approving them.</p> <p>Makes sure the technical procedures have been correctly.</p> <p>Provides assistance to the engineers and technicians in order to fulfill the quality requirements.</p>
Engineers and technicians	<p>Make sure that the technical aspects of the project follow the quality standards.</p>

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 lightly 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 impacts

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

MATRIZ

3.4 Risk rating

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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 identification and assessment

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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						
R.2	Inaccurate cost forecast						
R.3	Lack of communication						
R.4	Lack of technology improvement						
R.5	Lack of access to project needed information						
R.6	Low team motivation						
R.7	Unsuccessfully quality control						
R.8	Conflicts between members						
R.9	Infeasible design						
R.10	Technologies components with security vulnerabilities						
R.11	Organization issues						
R.12	Stakeholder desertion						
R.13	Competitors appearance						
R.14	Delay in external deliverables						
R.15	Economical market issues					External Risk	
R.16	Components or raw material quality						

Table 3.5.1: Risk identification and assessment

Risk ID	Revised Probability	Revised Impact			Revised Score	Owner	Action
		Scope/Quality	Schedule	Cost			
Identifier	Likelihood after the response strategy				Revised probability × Impact	Person who will manage the risk	Actions to be taken to address the risk

Table 3.5.2: Revised risk identification and assessment

3.6 Risk data sheet

Risk-ID: R.1	Risk Description: Detailed description of the risk					
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			
Qualitative or quantitative	Qualitative or quantitative assessment of the impact on each objective			Probab. x Impact	Response strategies for the event. Use multiple strategies where appropriate	
Revised Probability	Revised Impact			Revised Score	Owner	Actions
	Scope/Quality	Schedule	Cost			
Qualitative or quantitative					Person who will manage the risk	Actions needed to implement responses
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						
Contingency Plan:					Contingency Funds: Funds needed to protect the budget from overrun	
					Contingency 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 3.6.1: Risk 1 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 described procedures by mapping all the communication requirements of the project.

4.1 Participants roles and responsibilities

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	Administrative 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 aerospace 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 dissemination 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, concepts and results in scientific research and applied research communities, and get feedback from relevant stakeholders in these communities

Any and every opportunity should be taken to get articles published about the project. Consider peer reviewed journals in relevant disciplines near the end of the project when you have data and results to report. Make sure to post a copy of all publications on your website.

4.3 Communication management plan matrix

Aquí hay que poner las tablas de este apartado

Communication Type	Objective of Communication	Medium	Frequency	Audience	Owner	Deliverable	Format
Kickoff Meeting	Introduce the project team and the project. Review project objectives and management approach.	- Face to Face	Once	- Project Sponsor - Project Team - Stakeholders	Project Manager	- Agenda - Meeting Minutes	Soft copy archived on SharePoint site and project website.

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?