

MODAPTO [101091996]: Modular Manufacturing and Distributed Control via Interoperable Digital Twins



D1.1- Project Handbook, Quality Plan & Risk Management

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Executive Summary

This document is the MODAPTO deliverable D1.1 “Project Handbook, Quality Plan & Risk Management”. It includes a detailed description of MODAPTO management structure, procedures and communications used to ensure the continuous project monitoring, in terms of delay and quality. Its core purpose is to support the development of the technical and scientific objectives of the project and to ensure process and output quality. This deliverable covers the following topics:

- Project’s decision making mechanisms
- Project organization and responsibilities, within the management structure and procedures.
- Means of internal Planning, Monitoring and Risk Management, with the plans set up by the consortium for monitoring project resources in the development of the activities and the approach to evaluate, assess and mitigate risks in the project.
- Communication and Documentation standards, with the reference formatting guidelines to be used in the project for a uniform project image and experience: logo, document templates, language, storage, etc, as well as Document management style and templates
- Reviewing and reporting, with the efforts to continuously monitor the project progress and ensure quality of project deliverables and outcomes.

This covers also the means of communication to be used by the consortium, such as mailing list, email.



Table of Contents

1	INTRODUCTION.....	7
1.1	PURPOSE AND SCOPE.....	7
1.2	RELATION TO OTHER WORK PACKAGES AND DELIVERABLES.....	7
1.3	METHODOLOGY AND STRUCTURE OF THE DELIVERABLE.....	8
2	MODAPTO MANAGEMENT STRUCTURE	9
3	DECISION MAKING.....	11
3.1	CONSORTIUM DECISIONS	11
3.2	AD-HOC CONSORTIUM DECISIONS	11
4	INTERNAL COMMUNICATION & MONITORING	13
4.1	COMMUNICATION WITH THE EUROPEAN COMMISSION	13
4.2	COMMUNICATION AMONG CONSORTIUM PARTNERS	13
4.2.1	<i>Contact Information</i>	13
4.2.2	<i>Emails and Mailing Lists</i>	13
4.3	MEETINGS	13
4.3.1	<i>Plenary Meetings</i>	14
4.3.2	<i>Review Meetings</i>	14
4.3.3	<i>Other Meetings</i>	14
5	DOCUMENT MANAGEMENT AND TEMPLATES	17
5.1	DOCUMENT STYLE GUIDE.....	17
5.1.1	<i>Heading Levels</i>	17
5.1.2	<i>Bullets</i>	17
5.1.3	<i>Images</i>	18
5.1.4	<i>Tables</i>	18
5.1.5	<i>References</i>	19
5.2	TEMPLATES	19
5.2.1	<i>Presentation Template</i>	19
5.2.2	<i>Deliverables Template</i>	20
5.2.3	<i>Agenda and Minutes Templates</i>	22
5.2.4	<i>Internal reporting templates</i>	23
6	TECHNICAL & SCIENTIFIC MANAGEMENT.....	26
6.1	TECHNICAL MANAGEMENT	26
6.2	SCIENTIFIC MANAGEMENT	27
7	RISK MANAGEMENT.....	28
7.1	RISKS AND MITIGATION ACTIONS	32
8	QUALITY ASSURANCE.....	35
8.1	PRINCIPLES OF QUALITY ASSURANCE	36
8.2	QUALITY ASSURANCE PROCEDURES	36
8.2.1	<i>QA relevant to Deliverables</i>	36
8.2.2	<i>QA relevant to Deliverable Preparation / Review process</i>	36
8.2.3	<i>QA relevant to Software</i>	38
8.2.4	<i>QA relevant to Publications</i>	39
8.3	FUNDING & GRANT ACKNOWLEDGEMENT	40
8.4	PRESENTATIONS AND OTHER MATERIAL	40

9	REPORTING	41
9.1	INTERNAL TECHNICAL REPORTING.....	41
9.1.1	<i>Internal Progress Report per Work Package</i>	41
9.1.2	<i>Internal Progress Report per Partner</i>	41
9.2	OFFICIAL PERIODIC REPORTS AND FINAL REPORT	41
9.2.1	<i>Official Technical Report</i>	42
9.2.2	<i>Official Financial Report</i>	42
10	CONCLUSIONS	43
11	REFERENCES	44

List of Figures

Figure 1:	Example for images addition.....	18
Figure 2:	MODAPTO template for presentations.....	20
Figure 3:	MODAPTO’s template for Deliverables.....	21
Figure 4:	MODAPTO’s template for meetings agenda.....	22
Figure 5:	MODAPTO’s template for meetings minutes.....	23
Figure 6:	MODAPTO’s template for internal reporting per partner.....	24
Figure 7:	MODAPTO’s template for internal reporting per WP.....	25
Figure 8:	MODAPTO Risk Management Process.....	28
Figure 9:	Risk Assessment Matrix	30

List of Tables

Table 1:	MODAPTO Management Roles	10
Table 2:	Plan for MODAPTO meetings	15
Table 3:	Example of MODAPTO default tables.....	18
Table 4:	Project risks identification template table.....	29
Table 5:	Risk treatment form	31
Table 6:	List of deliverables and reviewers.....	35

List of Terms and Abbreviations

Abbreviation	Definition
D	Deliverable
DoA	Description of Action
EC	European Commission
EU	European Union
FERMA	Federation of European Risk Management Associations



FM	Financial Manager
GA	General Assembly
GA/CA	Grant Agreement/ Consortium Agreement
PC	Project Coordinator
PDF	Portable Document Format
PM	Project Manager
PO	Project Officer
QAM	Quality Assurance Manager
SC	Scientific Coordinator
STC	Steering Committee
SCC	Scientific Committee
TC	Technical Coordinator
TEC	Technical Committee
TOC	Table of Contents
UCs	Use Cases
WPLs	Work Package Leaders
WPs	Work Packages

1 Introduction

Over the past few years, the concept of modularity has been utilized to enhance the sustainability of production systems, since contemporary manufacturing requires production systems that can be quickly reconfigured to respond to consumer needs. MODAPTO project aims to assist in the creation of flexible industrial systems that are composed of production modules enhanced by distributed intelligence via interoperable Digital Twins (DTs). The project is divided into six interrelated Work Packages (WPs).

This deliverable falls into the scope of WP1, which aims to ensure coordination, cooperation, cohesion and overall smooth operation of all aspects of the project in terms of day-to-day management and interfacing with the EC in all the foreseen activities of the approved work plan. More specifically, MODAPTO management structures and techniques will focus on the creation of:

- A strong project management scheme
- The appropriate communication and reporting channels to the EC
- A common scientific and technical direction within the project
- The coordination for achievement of the project objectives, milestones and deliverables
- Continuous quality assurance activities for the project operation and the production of its scientific and technical results
- Continuous monitoring of the project's agile work and timely initiation of corrective actions
- Risk analysis

To that end, Project Coordination is led by ATC, Technical Management by Fraunhofer and Scientific Management by UL, while DMP development by AEGIS.

1.1 Purpose and Scope

The scope of this deliverable is to describe the overall activities for day-to-day management that will be based on the definition of responsibilities of the Governing Bodies and established at first in the Grant Agreement during the kick-off meeting and the objective framework.

The Deliverable describes the Management Structure of the project, including description of the technical coordination of the project, the Technical Committee (TEC) and the Technical Coordinator (Fraunhofer), along with their roles and initiatives they undertake with regards to the technical aspects of the project. Moreover, the description of issues for the scientific coordination of the project that will be performed by the Scientific Coordinator (UL), is realized in this document.

Also, one of the aims of this document is to define and describe the methodology to be followed for risk management, including risk identification, risk quantification, risk response and risk control and report. Finally, this document will also further refine the project organization, roles and responsibilities with emphasis on quality control and assurance activities that will be carried out.

1.2 Relation to other Work Packages and Deliverables



The purpose of this deliverable, is to act as a manual for all project procedures and internal communications. This document provides the foundation for the practical work in the project throughout its duration and will help ensure that the project partners will follow the same well defined procedures and practices.

It is possible to read the Handbook in a non-linear way, make use of it in appropriate situations to refresh knowledge about the handling of aspects within MODAPTO. Every person involved in the project should read it completely at least once, regardless of the fact if they were involved from the very beginning of the project or if they joined the project later.

This deliverable is directly associated with all MODAPTO WPs since it describes all Quality and Risk Management procedures. Thus, it will be used in all the WPs for ensuring quality output, homogenized appearance of all MODAPTO documents, while maintaining the overall timing and resources.

1.3 Methodology and Structure of the Deliverable

This deliverable envisages to incorporate partners' discussions during the Kick Off meeting and Virtual Project Management Coordination calls, and establish a common approach for Project Management, Technical/Scientific Coordination, Risk Assessment and Quality plan. The Deliverable consists of 10 chapters as follows:

- Chapter 2 acts as an introduction in MODAPTO general management structure
- Chapter 3 explains the Decision making procedure that will be followed
- Chapter 4 describes internal and official communication and monitoring procedures
- Chapter 5 describes and illustrates the official MODAPTO templates that should be used by all partners
- Chapter 6 refers in details into the technical and scientific management schema
- Chapter 7 provides the guidelines for the preparation of the risks and mitigations plans
- Chapter 8 explains the principles of the quality assurance procedures that will be followed by all MODAPTO members
- Chapter 9 gives attention to the internal and official reporting procedures
- Finally, Chapter 10 concludes the document

2 MODAPTO Management Structure

The MODAPTO management schema is designed so as to facilitate the project partners to address issues speedily and effectively. For the efficient design of the management structure, the nature of this project and the target outcome has been taken into consideration. The main bodies of the project are:

GA: At the top of the management schema is the General Assembly (GA), which will be the core organizational and decision-making body. The GA, chaired by the PC, is responsible for the successful completion of the project and the exploitation of its results. The GA consists of one representative of each partner.

PC: The overall management and administration are undertaken by the Project Coordinator (PC), who ensures coordination in the management structure. The PC will act as the intermediary between the partners and the EC, monitor compliance by the partners with their obligations, control the implementation of the whole project, control the project's resources and budget, handle the financial aspects of the project, control the schedule of activities and the allocation of manpower. Also the PC will ensure the effectiveness of the project's internal communication, apply quality assurance, deal with risk assessment and mitigation plans, undertakes quality control of contractual deliverables, ensures that all deliverables will be available on time to the EC and/or project partners, liaise with and report to the EC on all matters concerning the project. PC is also responsible for issues regarding the infrastructure and resources as a combination of administration, financial management, project document repository and archive e-mail list administration, which all support administration. The PC, will be represented by the Financial Manager (FM) and the Project Manager (PM) who will serve infrastructure and resources supporting to the project management structure in the day-to-day management and coordination of the project.

SC & TC: Moreover, the Scientific Coordinator (SC) and the Technical Coordinator (TC) will be responsible for research aspects of the project progress beyond the state of the art and all technical aspects, accordingly, in close collaboration with the Work Package Leaders (WPLs) and will be supervised by the GA for proper coordination between the different Work Packages (WPs).

TEC: The technical coordination of the project, will be performed by the Technical Committee (TEC) that is led by the Technical Coordinator (Fraunhofer) in collaboration with the Project Coordinator and all WP leaders. TEC, among other important activities, will coordinate and assist WP leaders on technical issues, undertake initiatives to propose technical solutions and fine-tune technical orientations when necessary.

STC: The Steering Committee (STC) will consist of the PC, the TC and SC and the WP leaders. The STC will be responsible for the facilitation of the project management and will supervise the progress of the project from its start up to its completion, guaranteeing its continuity and consistency and allocating the resources adequately.

PO: The Project Officer (PO) will provide a single point of communication with the EU to ensure exchange of information, resolve EU-related administrative issues and provide guidelines in accordance with EU strategies during project implementation.

The procedures governing the MODAPTO consortium include Decision-Making and Conflict Resolution Processes based on consent and transparency, a clear conflict resolution procedure, several layers and steps regarding both external and internal communication, an agile approach with iterative validation phases that sustains requirements and artefacts and continuous innovation management. In the following table, the management roles that have been assigned to project partners, are depicted.

Table 1: MODAPTO Management Roles

Role	Person	Organization
Project Coordinator (PC)	Giorgos Triantafyllou	ATC
Financial Manager (FM)	Stathis Dimakos	ATC
Project Manager (PM)	Maritini Kalogerini	ATC
Technical Coordinator (TC)	Stojanovic Ljiljana	Fraunhofer
Scientific Coordinator (SC)	Alexandre Voisin	UL
Quality Assurance Manager (QAM)	Yiannis Mourtos	AUEB
Project Officer (PO)	Stela Stancheva	-
WP1 Leader (WP1L)	Maritini Kalogerini	ATC
WP2 Leader (WP2L)	Stavros Lounis	AUEB
WP3 Leader - Use Case Coordinator (WP3L)	Marco Costantino	CRF
WP4 Leader (WP4L)	Michael Jacoby	Fraunhofer
WP5 Leader (WP5L)	Phuc Do	UL
WP6 Leader (WP6L)	Giorgos Triantafyllou	ATC

3 Decision Making

3.1 Consortium Decisions

A Consortium Agreement, that legally binds all Consortium partners, has been signed by all partners. The information in this major Section is based on the MODAPTO Consortium Agreement, in order to make the Project Handbook self-contained. As the Consortium Agreement is a legally binding document, its content is overruling. If there will be an amendment to the Consortium Agreement during the project that makes any information given in the Project Handbook invalid, the (new) content of the Consortium Agreement is overriding the content of the Project Handbook.

Decisions without a meeting

Any decision may also be taken without a meeting if:

- a) the Coordinator circulates to all Members of the General Assembly a suggested decision with a deadline for responses of at least 10 calendar days after receipt by a Party and
- b) the decision is agreed by 51 % of all Parties.

The Coordinator shall inform all the Members of the outcome of the vote.

A veto according rules specified in the Consortium Agreement may be submitted up to 15 calendar days after receipt of this information.

The decision will be binding after the Coordinator sends a notification to all Members. The Coordinator will keep records of the votes and make them available to the Parties on request.

Voting rules and quorum

The GA shall not deliberate and decide validly unless a quorum of two-thirds (2/3) of the Voting Parties are present or represented. Each Party shall have one vote, and Defaulting Parties shall not vote. Only the Member representatives have voting rights at the GA meeting. Decisions shall be taken by a majority of two-thirds (2/3) of the votes of the meeting.

Veto rights

A Party which can show that its own work, time for performance, costs, liabilities, intellectual property rights or other legitimate interests would be severely affected by a decision of the GA may exercise a veto with respect to the corresponding decision or relevant part of the decision. When the decision is foreseen on the original agenda, a Party may veto such a decision during the meeting only. When a decision has been taken on a new item added to the agenda before or during the meeting, a member may veto such a decision during the meeting and within 15 days after the minutes of the meeting are sent.

In case of the exercise of veto, the Parties shall make every effort to resolve the matter which occasioned the veto to the general satisfaction of all of the Parties. A Party may not veto decisions relating to its identification as a Defaulting Party. The Defaulting Party may not veto decisions relating to its participation and termination in the Consortium or the consequences of them. A Party requesting to leave the Consortium may not veto decisions relating thereto.

3.2 Ad-hoc Consortium Decisions

Ad hoc consortium decisions are those decisions necessary to achieve the project results but involve only internal resources. This includes, but is not limited to, decisions taken by Work Package and Task meetings as well as specific requests for decisions by the Project Coordinator, e.g. for the location of a meeting or the timing of conference calls and meetings. Broadly speaking, the same rules as for the consortium decisions shall be followed, but the following shall prevail:



- There can be no conflict with consortium decisions.
- Decisions made can be overruled/adjusted by more senior instruments in the decision-making hierarchy.
- In the case of physical meetings, remote voting will be accepted provided remote attendance has been formally requested to –and accepted by– the meeting organizer. If partners do not vote within the predefined period, their vote will not be counted. The decision coordinator (e.g. Project Coordinator, WP Lead, or Task Lead) will define times in which responses are valid.
- A missing response is perceived as approval (in the case of a clear approve/disapprove vote). This rule does not apply if a partner flags that they are not able to take a decision in the period and justify it. In this case, a missing response should be taken as an abstention.

4 Internal Communication & Monitoring

Ensuring operative communication among the project partners and among the project partners and the European Commission (EC) is critical for the success implementation of the project goals. The MODAPTO internal communication main objective is to ensure that all partners are exclusively informed about main issues of the project such as planning, work in progress, and challenges ahead.

4.1 Communication with the European Commission

Concerning communication of the consortium with the EC, the Project Coordinator (ATC) will act as a communication channel - except in circumstances explicitly defined in the GA/CA- to unify and facilitate the communication procedures. This way, the Project Officer and other officers at the EC will be provided with a dedicated contact. This process is mandated both by the GA and CA.

4.2 Communication among consortium partners

The primary means of communication among MODAPTO partners are email exchanging and tele conferencing. Particularly sensitive information will be exchanged more preferably by ordinary mail than by e-mail. Project meetings, workshops and online conferences will preferably be organized through TEAMS, which is suggested for bilateral and for multilateral conference calls.

4.2.1 Contact Information

The management team, created an online document for gathering and preserving important contact information for all involved partners.

The list is securely stored and will be constantly updated/maintained during project's lifetime. All MODAPTO members have access in an online XLS on TEAMS and are responsible for 1) updating these contacts whenever necessary and 2) informing the Project Management team for any modification.

4.2.2 Emails and Mailing Lists

Using the contact information (above), the following mailing lists have been created in order to support the communication inside the project: 1) the project's General mailing list (general@modapto.eu), which includes the e-mails of the project partners and is being used for the needs of the MODAPTO Consortium; 2) the project's Admin mailing list (admin@modapto.eu), which includes the e-mails of the project partners and is being used for the administrative/financial issues of the project; 3) mailing lists for all WPs: wp2@modapto.eu, wp3@modapto.eu, wp4@modapto.eu, wp5@modapto.eu, and wp6@modapto.eu.

4.3 Meetings

In the following subsections, information about project-internal plenary meetings, as well as the requested review meetings is given. To ensure that all MODAPTO team members are aware of the relevant teleconferences, physical meetings and other management or related events (i.e., workshops), calendar invitations should be sent to the appropriate mailing lists.

The project will follow a six-month cycle of co-ordination and follow-up procedures for monitoring progress and responding to changes. This cyclic approach enables the consortium, especially the operational and financial administrators, the STC and the PC, to monitor and control time, cost and quality. Project progress and achievements will be evaluated at all levels

based on the appropriate reporting scheme. Each task responsible has to report latest during the regular (typically bi-annual) GA meetings on formal aspects of the work (technology, costs, timing) and non-formal aspects.

This procedure is done recursively through all sub-tasks, tasks and work packages and gives a qualitative picture on the progress of work. At the same time, risks arising out of deflections from the work plan can be identified at a very early stage and corrective measures initiated. The same procedure will be executed for the review meetings.

4.3.1 Plenary Meetings

Plenary meetings will take place 2 times a year and run over 2-3 days, while the duration of a meeting may be adapted where necessary. All organizations **should be physically represented by -at least- one person**. When a physical meeting is organized, no parallel means of virtual access will be offered to the attendants, thus no hybrid meetings will be organized, since physical presence is obligatory so that all actions are smoothly coordinated and cooperation among partners is enhanced. If meetings cannot be realized with physical presence due to reasons outside the control of the consortium (e.g., Covid-19 pandemic), the whole consortium will have a Virtual (online) meeting, using the appropriate means of telecommunication and teleconference as defined above in the *paragraph 4.2 - Communication among consortium partners*

For every plenary meeting, the Project Management team - in cooperation with the local host of the meeting- will draft an initial agenda detailing logistics, duration/timing, and primary objectives and desired outcomes. The initial version of the agenda must be finalized at least two weeks (or seven calendar days in the case of an extraordinary meeting) before the actual meeting including full timing. All partners can propose modifications to the shape of the agenda by providing feedback regarding the topics to be discussed and sessions in general. The agenda, minutes, all presentations, and other documents provided at the meeting are collected in a specific meeting subfolder of the MODAPTO Workspace. Partners must share presentations and documents within one week after the meeting, but where possible already before or during the meeting. Table 2 below identifies the planning for the meetings and the relevant requirements for a smooth project implementation.

4.3.2 Review Meetings

As defined in the MODAPTO Grant Agreement, regular reviews will take place during the implementation or after the end of the project. For the preparation of a review meeting, the participants will participate in dedicated rehearsals, in due time before the review meeting via virtual (online) channels and also one day before the actual review meeting, at the same location or via online channels. The duration of this preparation meeting is 1 day, but it may be adapted if justified. The aim of reviews is to assess the work carried out during the past review period, including all the project reports and deliverables that fall into the scope of the review period. Financial periods, and thus formal review periods, for MODAPTO will be created (nominally) on M18 and M36 as stated in the GA. All information relevant to review meetings is available within the Grant Agreement and the Consortium Agreement, thus all partners are considered to be knowledgeable on the subject.

4.3.3 Other Meetings

In order to synchronize the work in progress inside all the work packages, independent WP conference calls will be organized. It is the responsibility of the WP leader to define the frequency, the duration, the objectives as well as the documentation of the WP meetings. The work-package leaders will present the progress:



- At regular telephone conferences, organised at regular intervals
- At the project general meetings.

Prior to these meetings, each partner will also draw up a short statement of progress as requested by the WP, task and sub-task leaders. This includes:

- Steps taken to implement elements of work packages for which they are responsible,
- Milestone targets achieved,
- Difficulties encountered, and
- Suggestions for modification in order to meet targets.

To guarantee optimal resource allocation to the project activities, the MODAPTO management bodies, in close cooperation with the PC and the MODAPTO steering committee (STC) will be responsible for regularly monitoring and updating tasks, responsibilities and partner involvement.

Moreover, in order to synchronize the work among all the work packages, frequent calls will be organized, where all (active) work package leaders are supposed to present their WP progress. This regular conference call will also be used for updating all new staff members on the current status of the project.

Apart from the regular meetings that are described below, the PC may request additional meetings when necessary, e.g. meetings with a special focus on technical or implementation issues.

Table 2: Plan for MODAPTO meetings

Type of Meeting	Main Objectives	Audience	Frequency / Timing	Prior Notice	Chair	Medium /Location	Mandatory Documentation
Kick-Off Meeting	Formal initiation of the project, definition of partners' responsibilities.	All project partners	ONCE M1	2 months	PC	Face-to-Face	Agenda, Meeting Minutes, Presentations
Plenary Meetings	Direct the project, ensure correct implementation of activities at all project levels, monitor the project's progress, and examine future plans	All project partners	Every six months	2 months	PC	Face-to-Face, or fully Virtual	Agenda, Meeting Minutes, Presentations
Working meetings and workshops	Take upon request from the SC or PC	WPL & the involved project partners	According to the needs	t.b.d	SC or PC or DM	Face-to-Face	Agenda, Meeting Minutes, Presentations
Review Meetings & Rehearsals	Evaluation of project results by the EC	All project partners	M18, M36	2 months, unless the EC	PC	Face-to-Face	Agenda Review Report Meeting Minutes Presentations



				does not set a date early enough			
WP internal meetings	Coordinating actions inside the WP, among Task leaders & involved parties	WPL & the involved project partners	Ad-hoc	t.b.d.	WPL	Teleconferences	Meeting Minutes, (including action plan) & Presentations
Inter- WPs meetings	Synchronize the work among all the work packages	WPL & the involved project partners	Monthly	t.b.d.	WPL, PC, TC, SC	Teleconferences	Meeting Minutes (including action plan) & Presentations

5 Document Management and Templates

5.1 Document Style Guide

The instructions that are included in next sub-sections should be followed by all MODAPTO partners, who are responsible for creating deliverables in the type of “report”. For standard formatting text, the following characteristics should be followed:

- Font: Lucida Sans
- Font size: 11
- Line spacing: 1
- Line spacing before paragraph: 0pt
- Line spacing after paragraph: 0pt
- Alignment: Justify (Ctrl+J)
- All bullet lists should be justified
- In tables all text (including bullets) should be left justified

5.1.1 Heading Levels

While drafting a “report” in MODAPTO project, the heading levels and their characteristics, should exclusively follow the structure (size, color, etc.) defined below:

- Heading 1: [Font: Lucida Sans, Font size: 18, Emphasis: Bold, Color: Custom Color (RGB: 44,54,135)]
- Heading 2: [Font: Lucida Sans, Font size: 14, Emphasis: Bold, Color: Custom Color (RGB: 91,158,210)]
- Heading 3: [Font: Lucida Sans, Font size: 13, Emphasis: Bold, Color: Custom Color (RGB: 44,54,135)]
- Heading 4: [Font: Lucida Sans, Font size: 12, Emphasis: Bold, Italic, Color: Custom Color (RGB:72,72,72)]
- Heading 5: [Font: Lucida Sans, Font size: 12, Emphasis: Italic, Color: Custom Color (RGB:72,72,72)]

Additional guidelines for the usage of headings in MODAPTO are:

- No additional headings should be added
- A page break should be added before all new Sections
- No breaking line should be used after the heading
- The number of each heading should always start in the left margin
- For the numbering, dots should be used instead of any different separation mark (i.e. 5.1.1)

5.1.2 Bullets

If there is a need of inserting bullets in MODAPTO documents, there is only one acceptable format, which is the default round black bullet as seen bellow. No spaces before or after the bullets should be added -except for the case of beginning of new (sub) chapter. Other general guidelines are described below:

- Do not use sequential bullets (1, 2, 3...a, b, c) unless there is a real need; e.g., because it is a step of a process.
- The same rules as for normal bullets also applies for sequential bullets
- Use solid round bullets for all levels
- Capitalize first words, unless first word is specifically un-capitalized

5.1.3 Images

When there is a need of inserting images in MODAPTO documents the following guidelines should be applied, as shown in the example (Figure 1):

- The position of the image should be preferably at the centre, but it can depend significantly on the type of the image and the text context
- Image captions are mandatory for every image
- The only acceptable way to insert captions is by selecting the image and using the option (References-> Insert Caption)
- Image captions should be placed under the figure in the form of “Figure X: Abc abc” where X is the consecutive number and a figure reference. The caption automatically follows the rules to be centred, justified and under the image, with font size 11, Lucida Sans (Headings) theme font and it is non-italic & bold.
- No space line should be added before the caption
- If there are several figures in a document, e.g. showing architecture, class diagrams, or similar structures in general, they should have a similar “look & feel” and in general be aligned with the ‘theme of MODAPTO’



Figure 1: Example for images addition

5.1.4 Tables

The only acceptable formatting for the insertion of tables is the default one, as depicted below.

Table 3: Example of MODAPTO default tables

Title	Title	Title
Text	Text	Text
Text	Text	Text
Text	Text	Text

When there is a need of inserting tables in MODAPTO documents the following guidelines should be followed:

- The position of the table should be preferably at the centre, but it could be placed differently if needed
- Table captions are mandatory for every table
- The only acceptable way to insert captions is by selecting the table and using the option (References-> Insert Caption)
- Table captions should be placed over the table in the form of “Table X: Abc abc” where X is the consecutive number and a table reference. The caption automatically follows the rules to be centred justified and over the table, with font size 11, Lucida Sans (Headings) theme fond and it is non-italic & bold
- The left side column should not always be bold, if this is not required.



- No space line should be added after the caption
- Single space line should be added after the table and before the caption

5.1.5 References

It is highly recommended to use references in every chapter that contains general information or theoretical context (including mathematical formulas, etc.). The “References chapter” should always start in a separate page. The references in the main text should be added in brackets following the format: [Author(s), year]. The references in the “References Chapter” should be appeared in alphabetic order, as indicated in the following example: [Author1, 2023]. The format of the “References chapter” will follow the general format of the main text, but in *Italics*. An example of the exact order of the information and the formatting can be found in the following 2 lines following the order [Author(s), Publication Title, Journal/Book Title, Date]:

Abbott-Halpin, E. and Rankin, C., Introduction: Public Library Governance and Wicked Problems. In Public Library Governance (pp. 5-16). De Gruyter Saur, 2020.

5.2 Templates

Specific templates are mandatory to be used for all formal deliverables and informal ones that are submitted to the EU. It is also mandatory to make use of the MODAPTO Microsoft PowerPoint template for external presentations regarding MODAPTO. In MODAPTO, Microsoft Word, Excel, and PowerPoint, as part of the Microsoft Office suite, are used for most template documents. Dedicated templates have been created and are available in the MODAPTO TEAMS repository. Due to the fact that minor changes could be made in the templates, all partners are requested to directly download the templates every time they want to use them, directly from the repository.

5.2.1 Presentation Template

The PowerPoint template defines certain styles and special attention should be given when filling-in this template, in order not to overwrite existing Cover and Transition slides, or the styles and the identity of the document. The editor of the presentation should use these slides and styles in order to structure a presentation, respecting the visual identity of the project and overall consistent with the Project Identity.

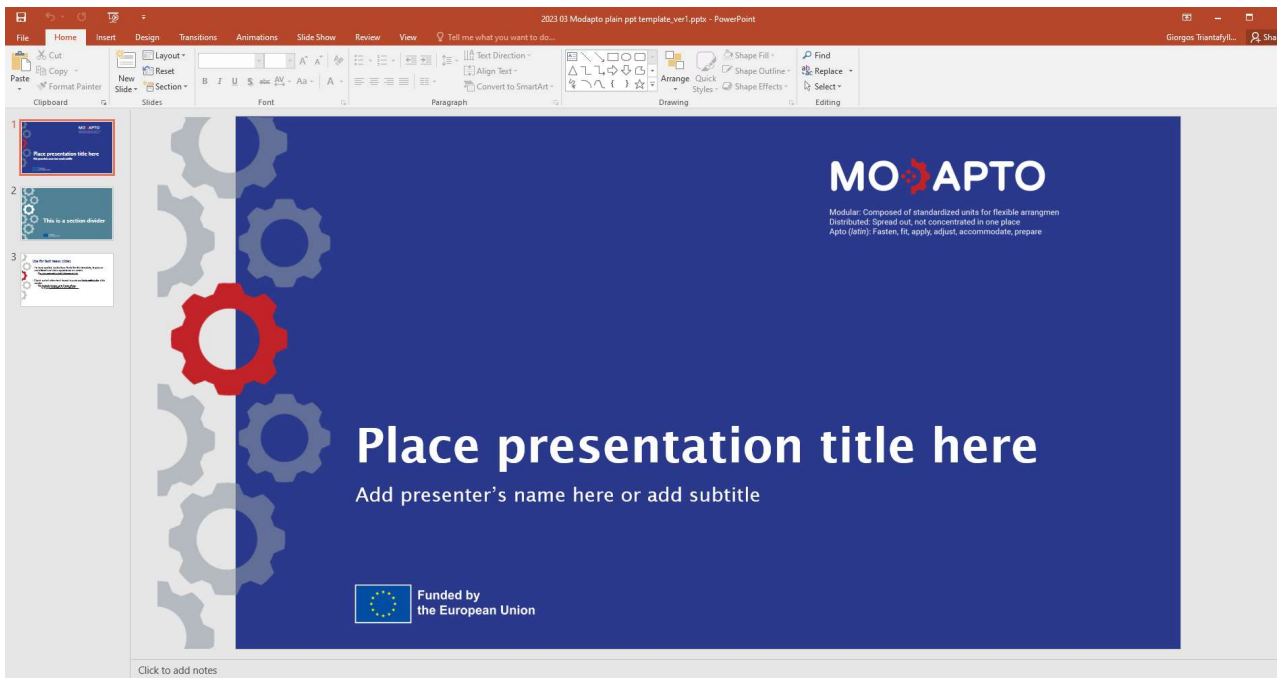


Figure 2: MODAPTO template for presentations

5.2.2 Deliverables Template

The Word deliverable template defines certain styles and special attention should be given when filling-in this template, in order not to overwrite the styles and the identity of the document. The mandatory structure of the deliverables includes

- the table with the main information in the first page, the disclaimer *“MODAPTO project is funded by the European Union under grant agreement ID 101091996. The information and views set out in this publication are those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.”*,
- the Document Revision History,
- the Executive summary,
- the Table of contents,
- the List of Figures,
- the List of Tables,
- the List of Terms and Abbreviations,
- all the subchapters of the Chapter 1 “Introduction”, as appeared in the current document: Purpose and Scope, Relation to other Work Packages and Deliverables, Methodology and Structure of the Deliverable.

The main editor of each deliverable, should decide whether changes should be tracked or not during the work on the first draft versions of a deliverable. Before the submission of this version for internal review, all track changes mark-up and comments should have been addressed and erased. The documents that contain comments and suggestions from the

internal reviewers should be stored in the dedicated file on projects repository. Each deliverable must be maintained by the deliverable editor during original content composition and checked by the reviewers during the internal review process for abbreviations or necessary additions to the project glossary. The glossary will contain the definitions of relevant terms and roles as well as a list of abbreviations. The internal reviewers must check the abbreviations as well as the glossary resources regarding the completeness.

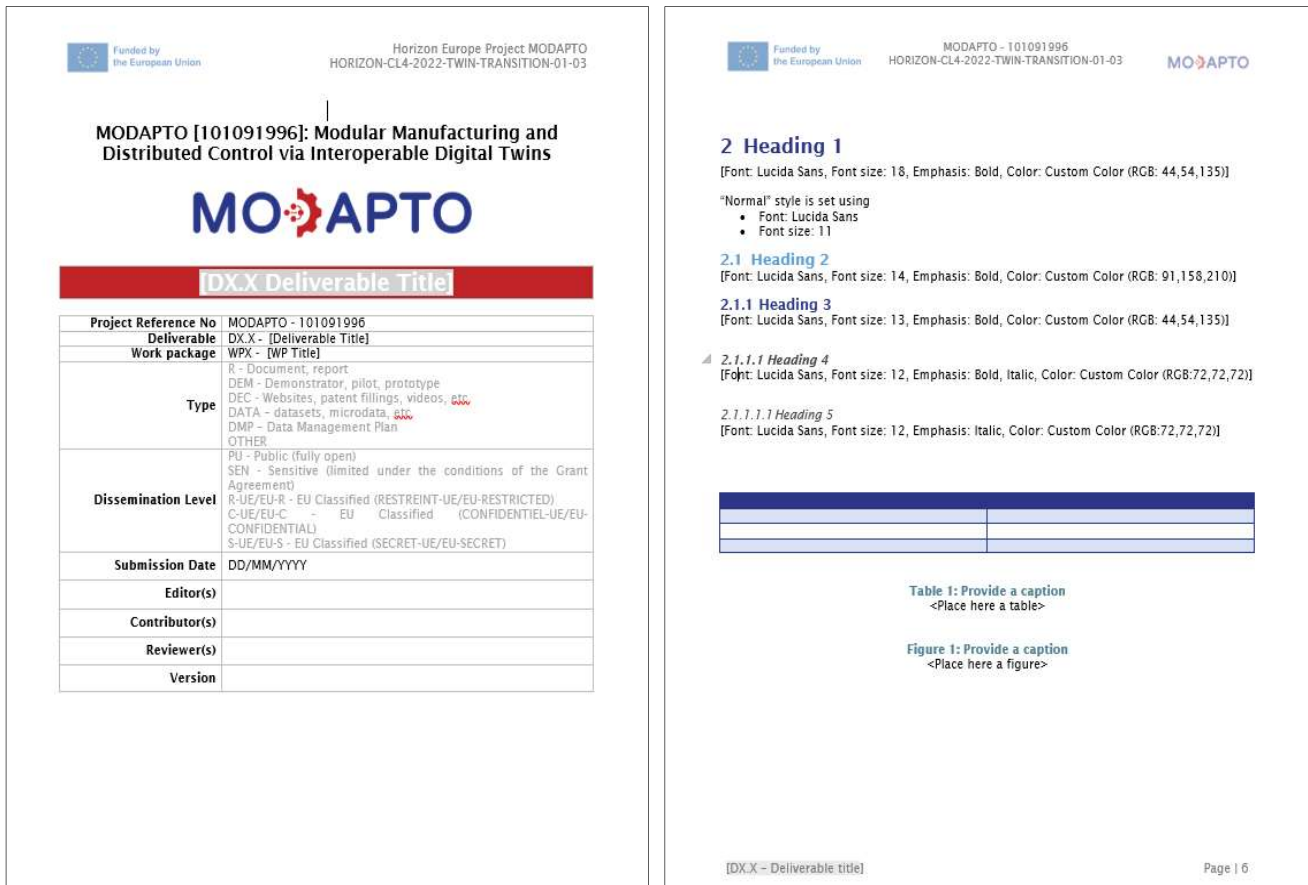


Figure 3: MODAPTO's template for Deliverables

5.2.2.1 EU Response to deliverables

Once a document has been submitted to the EU by the PC, it will typically be assessed by a review committee and either approved as-is, or approved with a request for modification or rejected with a request for more significant modification. The actions to be taken here are as follows:

- If approved: The deliverable should be stored and, if public, should be made available on relevant channels. Version number of the document should change accordingly, as well as the document status.
- If Rejected: All comments of the reviewers are treated as significant and must be addressed. Thus, the Deliverable leader must ensure that the team is involved in the deliverable re-production. Invariably, it should cause a conference call/meeting between the deliverable editor, the Lead of the relevant WP and other important members of the Management Structure, such as the TC, the SC, the STC and the QAM to discuss the approach to be followed, as well as the possible impact on other

deliverables. The involvement of each partner or committee, is highly depended on the nature of the deliverable (technical, report etc.).

5.2.3 Agenda and Minutes Templates

For the official meetings, specific templates will be used for the creation of the agenda and the production of the corresponding minutes.

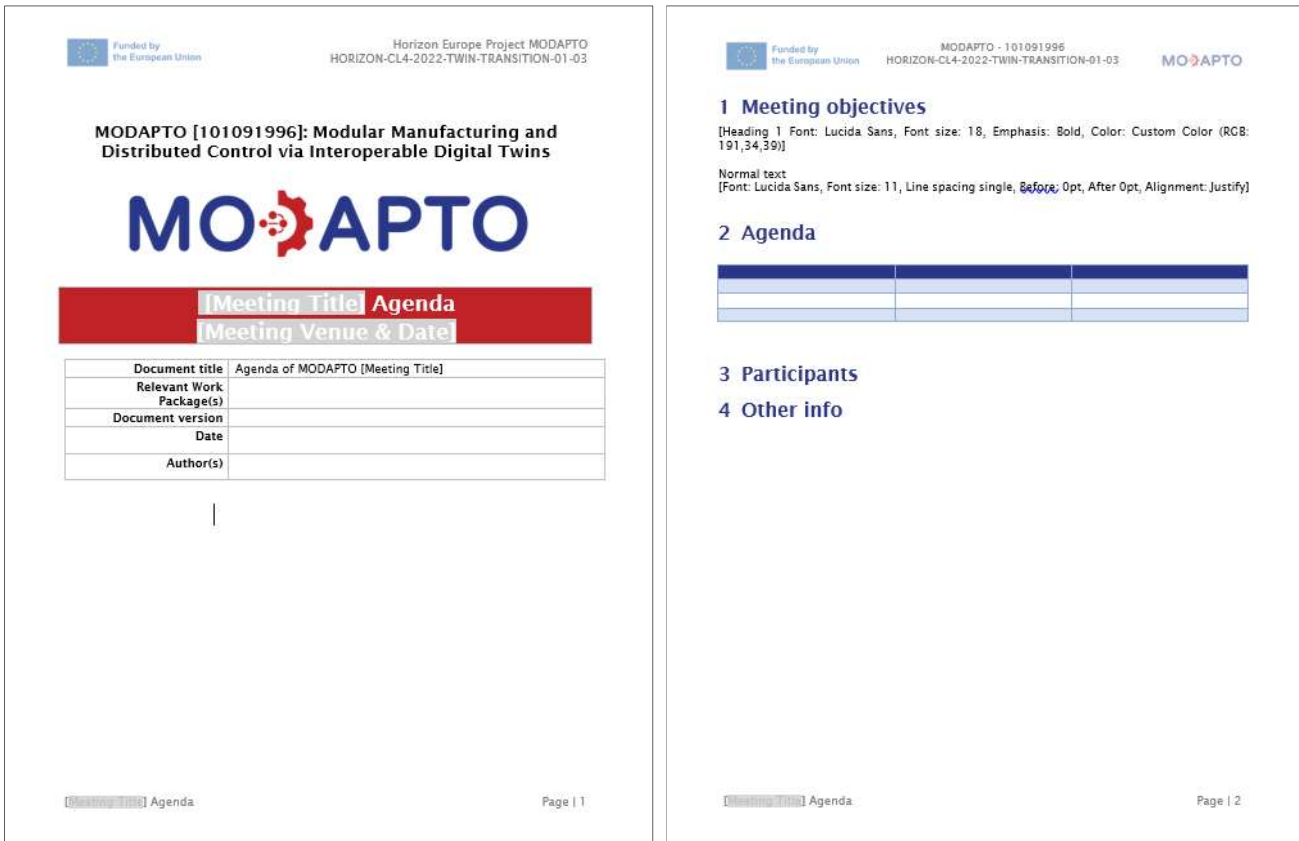


Figure 4: MODAPTO’s template for meetings agenda

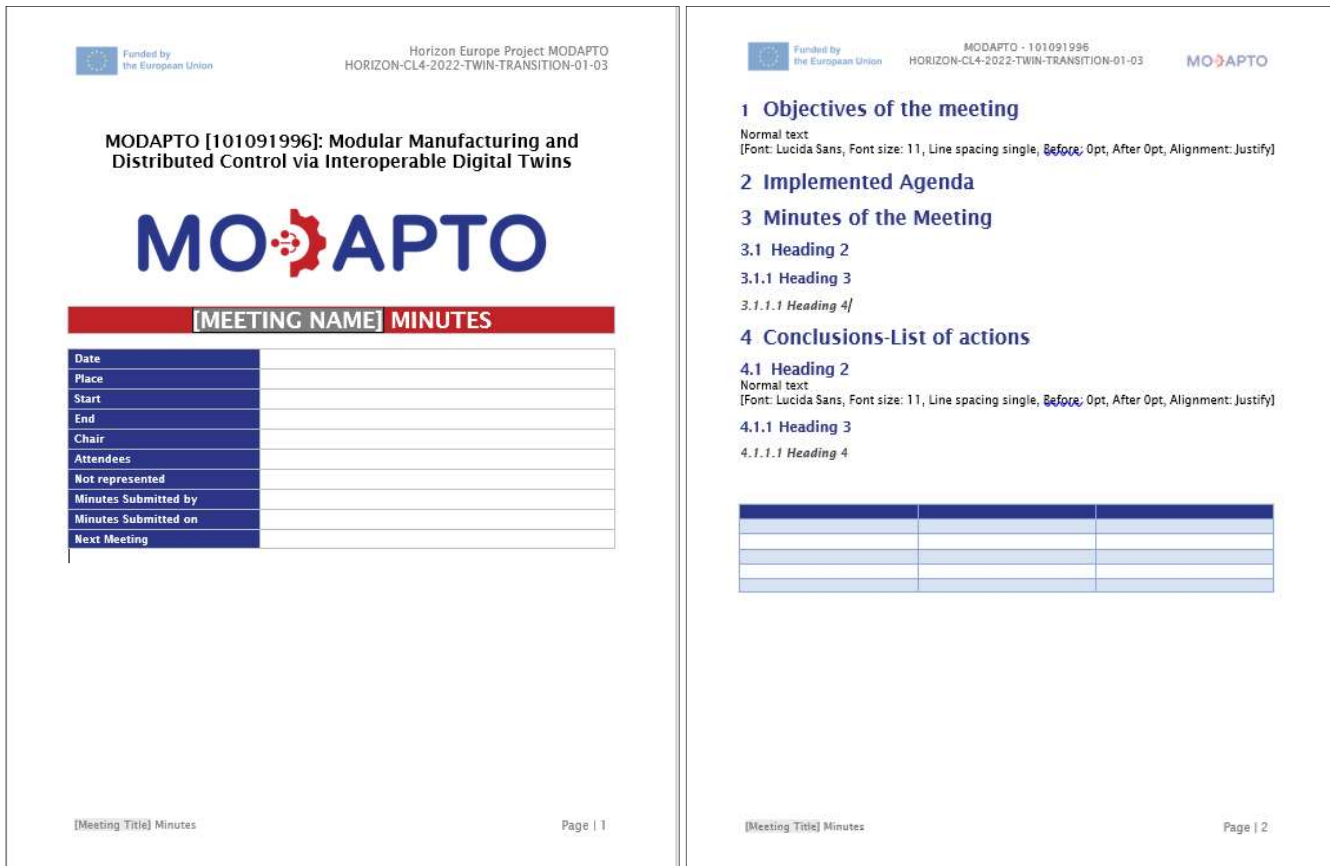


Figure 5: MODAPTO’s template for meetings minutes

5.2.4 Internal reporting templates

For the reporting of the project’s progress two different templates have been created. The one will be used for gathering the reports per partner and one for gathering the reports per work package. The creation on the mid-term and final reports will be based on the templates below.



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Horizon Europe Project MODAPTO
HORIZON-CL4-2022-TWIN-TRANSITION-01-03

MODAPTO [101091996]: Modular Manufacturing and Distributed Control via Interoperable Digital Twins

Internal Progress Report per Partner

Partner	
Period covered ¹	
Date ²	

WP No	Work Package title	Planned Effort for M[x] - M[x] (person-months)	Actual Effort for M[x] - M[x] (person-months)
WP1	Project Management		
WP2	Dissemination, Exploitation, Business & Knowledge Transfer		
WP3	Modular Manufacturing Use Cases & Lessons Learnt		
WP4	Distributed Control via Interoperable DTs		
WP5	Modular Production & Collective Intelligence Tools		
WP6	Deployment & Integration		

Table 1: Effort per WP for [Insert Partners Name]

¹ From MM/YYYY to MM/YYYY
² Date of reporting

Page | 1

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MODAPTO

WP No	Work-package No & Title	Description of related work
WP1	Project Management	
WP2	Dissemination, Exploitation, Business & Knowledge Transfer	
WP3	Modular Manufacturing Use Cases & Lessons Learnt	
WP4	Distributed Control via Interoperable DTs	
WP5	Modular Production & Collective Intelligence Tools	
WP6	Deployment & Integration	

Table 2: Description of work per WP for [Insert Partners Name]

1 Deliverables under partner's responsibility for the reporting period

Deliverable No & Title	Related WP/Task	Date due	Date of submission	Status / Notes

Table 3: Deliverables

2 Deviations from plan / corrective mechanisms
3 Planned activities for the next period
4 Any other issue

Internal Progress Report per Partner

Page | 2

Figure 6: MODAPTO's template for internal reporting per partner



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Horizon Europe Project MODAPTO
HORIZON-CL4-2022-TWIN-TRANSITION-01-03

MODAPTO (101091996): Modular Manufacturing and Distributed Control via Interoperable Digital Twins

Internal Progress Report per Work Package

Work Package No and Name	
Period covered ¹	
Date ²	
Completed by the WP Leader	

¹ From MM/YYYY to MM/YYYY
² Date of reporting

Page | 1

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MODAPTO

- 1 Work Package objectives in the reporting period
- 2 Work Package progress and achievements per task
- 3 Related Work Package Deliverables

Deliverable No & Title	Date due	Date of submission	Status / Notes

- 4 Risks monitoring/ mitigation actions

Problem/Risk	Actual/Potential Impact on the Project	Risk Exposure	Proposed solution / mitigation strategy	Actual related activities performed this period

- 5 Deviations from plan / corrective mechanisms
- 6 Planned Work Package activities for the next reporting period
- 7 Any other issue

Internal Progress Report per WP

Page | 2

Figure 7: MODAPTO’s template for internal reporting per WP

6 Technical & Scientific Management

6.1 Technical Management

The technical management of the MODAPTO project will be done by the Technical Committee (TEC). TEC is led by the Technical Coordinator in collaboration with the Project Coordinator and all WP leaders. The goal is to coordinate and assist WP leaders on technical issues, undertake initiatives to propose technical solutions and fine-tune technical orientations when necessary. During this task, the Technical Coordinator will also monitor the technical work carried out in related tasks and if needed make suggestions for technical modifications and/or resource reallocation. These activities should ensure consistency, harmonization and convergence of the technical activities and results of the project.

The Technical Coordinator will follow all MODAPTO project management procedures, such as those for internal communication and monitoring. In addition, some specific means for software design, development, and management will be considered. They are described below:

- Collaborative software development

To enable collaborative software development where project participants can work together and be as efficient as possible, a collaborative environment will be provided for MODAPTO component providers. The software-related activities will start in M8 of the project and therefore it is not defined yet exactly what tools will be used. Github is initially suggested as a code repository to be used and features provided by Github could be also used for a planning and issue tracking system (if it will be selected as code repository) or a dedicated issue tracking system like e.g. JIRA. In addition, tools for continuous integration and deployment will be used. Since this will happen in the second period of the project, when integration and deployment will begin, the decision on which tool to use will be made later in the project.

The decision on which tools to use will be made based on the project requirements, the partners' experience with the tools, the tools' licenses, etc. If needed, the Technical Coordinator will also organize training to ensure proper use of the collaborative environment.

The collaborative software environment will be provided, administrated and maintained by the WP6-Deployment and Integration leader. The usage of this infrastructure is mandatory for all consortium members.

- Technical discussion and communication

For technical discussion, the Technical Coordinator will organize regular meetings to discuss open issues and make decisions. This will start in M3 even before the software development starts. By discussing and agreeing on the specification of DT-modular manufacturing and the architecture for it, the Technical Coordinator wants to ensure that reference architecture(s) as well as standards and best practices will be considered. The technical discussion will require close collaboration on requirements, architecture, and validation not only with the WP leaders, but also with the task leaders.

Software development will be done according to the agile development model. The first step is to start with monthly sprints and apply 2-weekly sprints when development starts. This will be supported by the previously mentioned tools.

For communication, appropriate communication tools will be used, such as a dedicated Teams channel, and issues posted in the issue tracking system will be monitored and followed up. Through these communication channels the technical partners can communicate on daily basis. If necessary, a face-to-face technical meeting will be organized.

- **Documentation & quality control**
Both the software development process (e.g. a backlog or list of sprints and associated tasks executed in each sprint) and the software itself will be documented. If additional documents would be needed (e.g. UML diagrams), the MODAPTO repository will be used for them. Documents will be stored, shared and collaboratively worked on. Additional documents for software developers will be provided to provide more details on the MODAPTO software components and their usage. This will also contain the examples of use.
Finally, it is expected that test cases will be provided for each MODAPTO component. The software components developed in MODAPTO will be reviewed to control their quality, completeness and correctness and ensure that best practices are considered. Each component will be validated by at least one developer who has not been involved in the development of the component. This will ensure that an objective validation is performed. Quality control tools will also be used. The decision on which tools to use will be made later in the project.

6.2 Scientific Management

The scientific management within MODAPTO will be ensured by the Scientific Committee (SCC). The SCC is led by the Scientific Coordinator (SC) in collaboration with the PC, the TC and all WP leaders. The SCC aims at providing smooth transition toward implementation (i.e., TRL increase) of WPs/Tasks development to the end-user use cases. To that end, its goals will be to:

- coordinate and assist WP and Task leader on scientific questions,
- ensure consistency, harmonization and convergence of the scientific and technical activities,
- ensure the alignment of the pilot preparation and operation and the technical developments,
- report scientific deviations from project work plan
- ensure that social aspects of the project are properly implemented,
- ensure practices for Open science: Open Access Publications, Early Access to MODAPTO results, Open Peer Review, Open Research Europe Publishing Platform Open Data and FAIR Data
- ensure the realization of the scientific related dissemination KPIs.

To achieve these objectives, the SCC will organize regular meetings to discuss open issues and make decisions. The foreseen frequency will start with monthly sprints and apply 2-weekly sprints when development will start. In addition, at the beginning of the project, the meeting will be organized in coordination with the TEC meeting in order to align the project, WP work on both technical and scientific objectives.

A specific communication channel will be set up thanks to a dedicated Teams channel.

7 Risk Management

Risk management is a vital component of every project since it assists in identifying, assessing, and prioritizing any risks that may develop throughout the project promptly and address them in a timely manner. By proactively managing these risks, project participants can minimize their impact on the project timeline, budget, overall objectives and resulting output. This not only helps to ensure the project's success but also protects the investment of time and resources. Additionally, effective risk management helps to increase the transparency and accountability of the project, as stakeholders can be confident that potential problems have been identified and addressed. Ultimately, implementing a robust risk management plan helps build trust in the research project, both within the project team and among external stakeholders.

The MODAPTO project is quite a complicated and demanding project, and its success highly depends on the efficiency of the risk management process. The objective of the risk management process is to provide the overall process, techniques and tools for the evaluation and control of potential project risks, focusing on their precautionary diagnosis and handling. In the process of risk management, the governing bodies of the consortium, in parallel with the project partners, will follow a predefined process based on the FERMA standard¹ in order to effectively manage risks. In particular, the PC, with the cooperation of the GA, the SC and TC and the rest of the project management roles (WP and Task Leaders) will be mainly responsible for handling risks identified in the project implementation and informing all partners when necessary.

The MODAPTO process of risk management consists of distinct steps that include: Risk Planning, Risk Identification, Risk Assessment, Formulation of Risk Reduction Plan, Monitoring and Review and lastly, Post Mitigation Feedback collection, as presented in the following figure:



Figure 8: MODAPTO Risk Management Process

In the proposed methodology, risk management is based on the following risk management process and cross-partner risk awareness. During the Project risk management process, risks are managed using the template Table 4 shown below.

In particular, the proposed methodology includes the steps:

- **Risk Planning** which is concerned with identifying and documenting the risk management procedures and respective responsibilities within the MODAPTO project that will enable the consortium to effectively manage the risks. Risk planning is an iterative process that itself can evolve over time during the project.

¹ Federation of European Risk Management Associations (<http://www.ferma.eu/>)



- **Risk Identification** is about uncovering risks before they turn into problems. Like risk planning, risk identification is an iterative process, taking place when the projects start as well as repeatedly throughout the project. Participants in risk identification include subject-matter experts, WP leads, and project management and team members. Risk identification techniques used comprise pre-existing checklists and brainstorming activities. A risk statement involves the conditions that are causing concern for a potential loss to the project, followed by a brief description of the potential consequences of these conditions. Unless a risk is written down, there is a good chance that it will not be managed. Project-specific risks that can be identified at this stage and are described in the first three rows of Table 4.
- **Risk Assessment** is the most detailed phase of the entire risk management process. It involves evaluating the risk attributes, using the remaining of the Table 4, and prioritizing (ranking) the risks according to the risk exposure. Evaluating the attributes of risk involves establishing values for probability (the likelihood the risk will occur) and the impact (in terms of significance for the project).
- **Formulation of Risk Reduction Plan** following the assessment where the different actions relevant to all the mitigation actions to be taken per risk is conducted as presented in the following paragraphs
- **Monitoring and Review** This is an iterative process that is ongoing in parallel to the successful implementation of risk mitigation where the overall risk plan is re-examined and updated driven by the new findings.
- **Post Mitigation Feedback Introduction**, where the learning from experience is re-introduced in the overall process and the MODAPTO project partners.

Table 4: Project risks identification template table

Risk ID:		Related WP / activity:	
Date Identified:		Originator²:	
Risk Statement:			
Actual / Potential Impact on the Project:			
Effect (Level of Impact)³:	Probability⁴	Risk exposure:	
Proposed solution / Mitigation strategy:			

² Name, Company

³ 5 — uncontrollable, 4 — critical, 3 — medium, 2 — marginal, 1 — negligible

⁴ 5 — high ... 1 — low



Status⁵:		Status Date:	
Comments:			
Closing date⁶:		Approval⁷:	

In particular, for the two steps of Risk Assessment and Risk Response, the following key essential aspects are taken under consideration in MODAPTO.

Risk Assessment

Once a risk is identified utilizing the three top rows of Table 4, MODAPTO initiates the process of Risk Assessment where the identified risks are assessed based on a two-dimensional model that enables MODAPTO to measure the **Likelihood** and the potential **Impact** on the project as follows:

- **Probability (Likelihood):** A measurement to describe the perception of the probability that the risk materializes in an X amount of time. X for the MODAPTO project is set to a period of 6 Months.
 - **5 – High:** A high probability that the risk is (or will be) affecting the project in the next X months’ duration
 - **3 – Medium:** A medium probability that risk could potentially affect the project in the next X months’ duration
 - **1 – Low:** A low probability (or no probability) that the risk could affect the project in the next X months’ duration
- **Impact:** A measurement to describe the perceived impact of a risk on a part of the project or the whole project that when combined with the probability will denote the risks that require urgent attention, thus enabling prioritization
 - **5. Uncontrollable:** the majority of objectives/targets/goals will not be met.
 - **4. Critical:** business-critical objectives/targets/goals will be missed.
 - **3. Moderate:** local performance objectives/targets/goals will be missed.
 - **2. Marginal:** limited effect on objectives/targets/goals.
 - **1. Negligible:** insignificant or low effect of objectives/targets/goals.

When Probability and Impact are combined, they produce the Exposure Level of the MODAPTO project to the risk as presented in the following table:

		Likelihood		
		(1) Low	(3) Medium	(5) High
Impact	(1) Negligible	L (1)	L (3)	M (5)
	(2) Marginal	L (2)	M (6)	MH (10)
	(3) Moderate	L (3)	M (9)	MH (15)
	(4) Critical	M (4)	MH (12)	H (20)
	(5) Uncontrollable	M (5)	MH (15)	H (25)

Figure 9: Risk Assessment Matrix

⁵ Identified, Monitored, Contained

⁶ Date when related activity is completed

⁷ WP Leader

This process is responsible for defining the actions and the procedures in order to avoid, mitigate or accept each of the identified risks. Any risk with a score higher than ten will be marked as priority. As a standard rule, higher-priority risks should receive more attention than lower-priority risks. Every risk that poses a threat should be assigned to a responsible party during response planning. Therefore, each risk is given an owner (usually the WP/Task leader that the risk affects) who is responsible for its assessment, monitoring and reporting. The aforementioned leader proposes preventing as well as corrective measures and every time one or more risks marked as high-priority arrives the PC should organize a STC to decide on how to manage the Risk. In particular, if the risk is deemed to pose an impact on the broader project, its mitigation strategy will be voted on by the STC. If the risk is deemed to pose an impact only on a sub-set of partners, the proposed mitigation strategy will be shared with the STC by way for tacit approval.

Risk Response

For each risk identified in the course of the project, three possible policies can/will be applied in order to deal with it:

- **Avoid:** Conduct small adjustment to the project schedule in order to avoid some risks.
- **Mitigate:** Conduct a mitigation action to manage the impact in the project. The actions should be detailed in a Contingency Plan to manage the risk alongside timing of each action and partner(s) responsible.
- **Accept:** Some risks can be accepted in the sense that the needed actions that can be applied towards impact minimization are more expensive resource wise than accepting the result of the outcome of the Risk materialization.

The aforementioned are presented in Table 5.

Table 5: Risk treatment form

Risk ID		Category ⁸	
Related WP(s)/Task(s)			
Risk description			
Probability		Impact	
Date		Owner	
Summary of recommended mitigation measures			
Actions / controls (What can you do about that?)			
1.	Due date		Status (in progress / completed)
2.	Due date		Status (in progress / completed)
3.	Due date		Status (in progress / completed)
Resource requirements			

⁸ **MGM:** management, **TECH:** technical, **ETH:** ethical, **EXP:** exploitation and outreach, **EXT:** external



Responsibility	
Monitoring and reporting required	
Level of risk after the implementation of actions / controls	
Probability	Impact

7.1 Risks and Mitigation Actions

Work Package Leaders are responsible for the continuous monitoring of risks relevant (or potential) in their WPs throughout the course of the project. In the following table, we present the initial set of identified risks only to notify that it is indicative and motivating rather than exhaustive. This list will be updated, if necessary, on a bimonthly basis.

N°	Type	WP	Risk Description	Exposure Level	Risk Mitigation measures	Role of Partners
1	Management	WP1-WP6	Reluctance from pilot partners to provide data due to confidentiality and security issues.	Impact: Critical Probability: Medium Exp. Level: Medium	<ul style="list-style-type: none"> • Consortium agreement with terms regarding access to data and existing knowledge • Additional confidentiality agreements between the pilot partners and the supporting technology partners 	<ul style="list-style-type: none"> • Partners will seek alternative data definitions, data types and size of data sets to address that reluctance. • Pilot partners, whenever expressing such a reluctance, will offer a concrete alternative in terms of data.
2	Management	WP2-WP6	Unavailability of data that would lead to inefficient methods/algorithms	Impact: Critical Probability: Medium Exp. Level: Medium	<ul style="list-style-type: none"> • WP3 (pilot activities) will start early on ,when the pilots will be requested to provide respective data as well as configure the data input and output streams. 	<ul style="list-style-type: none"> • Partners will seek alternative datasets from the literature or open data repositories. • Pilot partners will provide data features (e.g., average values, standard deviations) as means to randomly generate 'realistic' artificial data.



3	Management	ALL	A partner leaves the consortium either by its own decision or by a decision from the Project Steering Committee.	Impact: Critical Probability: Low Exp. Level: Medium	<ul style="list-style-type: none"> • Continuous and Effective Monitoring of Partners' progress in WP1 and discussion in project boards and plenary in case a partner is reluctant to cooperate. • Inform the EU for the partner's withdrawal and reallocation. Communication with all partners and redistribution of tasks with parallel Re-allocation of the partner's effort to the remaining partners. • If the leaving party concerns the service provider or pilot case, the consortium will identify new ones with the same profile through participation in relevant projects and clusters as a potential pool of partners. 	<ul style="list-style-type: none"> • Partners will look for an alternative industrial partner and vice-versa, to avoid conflicts of interest. At least two alternative partners should be suggested to replace a leaving partner and the STC will vote among them until one of the suggested partners is selected by majority votes, according to relevant rules in the Consortium Agreement, which determine the majority votes.
4	Management	ALL	Delays in a Milestone / Delays in the submission of a Deliverable	Impact: Critical Probability: Medium Exp. Level: Medium	<ul style="list-style-type: none"> • Continuous monitoring of the WP activities and thorough communication with WP leaders. • Analysis of causes for delay and actions towards: • Assigning activities to other partners. • Re-allocation of the effort to the partners. • Definition of a more analytical schedule to monitor the progress of the activity in a more detailed manner. 	<ul style="list-style-type: none"> • Partners will seek to speed up deliverable content in terms of technical and scientific contributions. • Pilot partners will speed up any items of the deliverable related to industrial cases, pilots, and use case specification, implementation, deployment and testing.



5	Technical / Scientific	ALL	Failure to provide comprehensive UCs and extract requirements for the MODAPTO Tools	Impact: Critical Probability: Low Exp. Level: Medium	<ul style="list-style-type: none"> • The consortium includes end-user stakeholders and strong complementarities in all relevant domains. • Even in the case of failure from one partner, failover will ensure the comprehensiveness of requirements. 	<ul style="list-style-type: none"> • Partners will offer alternatives or polish existing UCs and requirements by drawing experience from the expanding academic literature. • Industrial partners will improve the UC description and the requirements by consulting best industrial practices and interacting with professional bodies, federations and sectoral clusters.
6	Technical / Scientific	WP6	Failure to provide a concrete architecture specification for DT-based modular manufacturing	Impact: Critical Probability: Low Exp. Level: Medium	<ul style="list-style-type: none"> • MODAPTO consortium consists of important players in ICT, very experienced in EU projects and large systems development, as well as ICT systems for the market. • The project incorporates all the necessary know-how and technical expertise. 	<ul style="list-style-type: none"> • Industrial partners will scrutinize the architecture specification and highlight the main areas missing concreteness and convincing support. • The scientific partners will elaborate on the architecture specification using the criticism of the industrial partners and also against the current academic and research state-of-the-art, along all topics listed in the 'Ambition' section of MODAPTO's Part B.
7	Technical / Scientific	WP4, WP5, WP6	Failure to provide the core toolsets and interoperability framework of MODAPTO	Impact: Critical Probability: Low Exp. Level: Medium	<ul style="list-style-type: none"> • MODAPTO consortium consists of partners with vertical expertise in all proposed modules relevant to the DTs. • The phases introduced in the project are placed in such a way to spot early if (and any) problems arise per tool. 	<ul style="list-style-type: none"> • Industrial partners will detail the interoperability pitfalls and the shortcomings of the core toolset. • Scientific and technological partners will provide a thorough revision and clear indication of MODAPTO's toolset against analogous toolsets proposed by ICT companies or academic institutes or innovative start-ups.

8 Quality Assurance

Quality assurance is a crucial aspect of any project as it helps to ensure the validity and reliability of the results obtained. The objective of quality assurance is to minimize errors and biases in the research process and to increase the credibility of the findings. This can be achieved through proper planning, documentation, and implementation of standard operating procedures and outcomes generation. Quality assurance also helps minimize the risk of errors and mistakes that can lead to incorrect conclusions and negatively impact the reputation of the researcher and the research project, as well as identify potential risks on the WP level as well as Project-wide. Quality assurance is a continuous process integrated into every step of the research project and helps maintain the highest accuracy, precision, and integrity of the research results.

Every partner must have an authorized person, for controlling quality related issues, which is the management representative in the GA. The responsibilities of this quality member are to ensure that all outputs from his organization are consistent to the quality standards defined here and that the reports and every document have the highest quality regarding their overview and context. For each deliverable at least two (plus one final reviewer) members of the project are to be involved in the reviewing process with experience in the technical issues and who did not lead to the deliverable itself. The following table summarizes the assignment of reviewing partners per deliverable.

Table 6: List of deliverables and reviewers

Del. no.	Deliverable name	Lead	Reviewer 1	Reviewer 2	Due Month
D1.1	Project Handbook, Quality Plan & Risk Management	ATC	UL	Fraunhofer	M3
D1.2	Data Management Plan	AEGIS	BOC	EKS	M6, M36
D2.1	Dissemination and Communication Strategy	ATC	AUEB	LIC	M6
D2.2	Dissemination and Communication Report	ATC	SEW	UL	M36
D2.3	Business Models and Industrial Strategies	AUEB	LIC	BOC	M36
D2.4	SME Engagement and Training	LIC	AUEB	ILTAR	M36
D2.5	Standardization and Open Contributions	Fraunhofer	AEGIS	BOC	M27, M36
D3.1	Requirements and KPIs	UNIPI	UL	AEGIS	M12
D3.2	UC Execution, Evaluation & Lessons Learnt	Fraunhofer	AUEB	UL	M26, M36
D4.1	New Module Design and Interoperable DTs	EKS	UNIPI	AEGIS	M30
D4.2	Distributed Intelligence, Self-awareness & Sustainability	UL	Fraunhofer	ATC	M30
D5.1	Modular Production Framework & Toolkit	BOC	FFT	ILTAR	M36
D5.2	Collective Intelligence for Modular Manuf.	UL	Fraunhofer	ATC	M30



D6.1	Specifications and Architecture	AEGIS	ATC	EKS	M10, M22
D6.2	DT Integration and Framework Deployment	ATC	BOC	EKS	M36

8.1 Principles of Quality Assurance

Quality assurance is based on several principles:

- Provision of appropriate methods, standards and procedures for the project objectives that define the organization of the work teams as well as the roles and responsibilities, the time scheduling, the quality criteria for deliverables, publications, reports and software as well as the formal project procedures for evaluation and acceptance of the aforementioned.
- Overall and continuous support towards producing results of the highest possible quality within project duration and given resources and
- Formulation and implementation of quality checks that enable the appropriate overview of MODAPTO progress in relation to contractual objectives.

8.2 Quality Assurance Procedures

8.2.1 QA relevant to Deliverables

The MODAPTO project produces a number of formal documents (presented in *Section 5.2-Templates*) which are collaboratively produced. All deliverables will be made available to the consortium partners via the project repository. After submission in the EU portal they will be made available in the project website (for the public deliverables). For the deliverables to be produced, the project partners will follow a process to ensure the timely delivery whilst ensuring the highest quality. The process and respective key factors relevant to deliverables is presented in the following paragraphs.

QA Factors relevant to Deliverables and Document(s)

- **Editing Tools:** All deliverables should be prepared utilizing standard tools as Microsoft office (preferable version 2019 or later). Microsoft Word, Excel and PowerPoint are selected as the standard tools for collaborative authoring in MODAPTO. However, depending on project needs other editing tools may be used (e.g. LaTeX for scientific publications) if necessary. Final Versions of all deliverables and documents should be released in Portable Document Format (PDF). All other files (e.g. graphics, audio and video) should be based on standards as JPG, PNG, MP3 etc.
- **Document History:** All documents should include a document history placeholder that provides information relevant to the contributions collected from partners, the date of document change, the organization contributing and specific authors, as well as the current Version of the document.

8.2.2 QA relevant to Deliverable Preparation / Review process

In MODAPTO as each deliverable addresses a specific topic, all deliverables have been assigned a Deliverable Lead on a partner level. Within each responsible partner a person will be assigned as the Deliverable Owner responsible for the preparation of the deliverable, collection and introduction of all contributions as well as releasing the deliverable in a timely manner for the sets of reviews prior to submission and in a timely manner.



The overall process of Deliverables' preparation and Review in MODAPTO is as described in the following steps:

1. The partner responsible for the deliverable issues a draft of the deliverable following the provided template (see *Section 5.2-Templates*), which contains a standard timeline for delivery and the respective Table of Contents (TOC). In particular, the draft for internal review should be available at least 30 days before the expected due date.. Draft deliverable is expected to have information pertinent to:
 - Table of Contents
 - Organizations responsible per chapter/section
 - Timetable with deadlines of (a) Submission of Contributions, (b) Internal review from partners/contributions round #2, (c) Creation of consolidated draft, (d) Peer review process, (e) Creation of Final version and (f) EU Submission.
2. The partner that is responsible for managing the deliverable preparation (see list of deliverables above) assigns clear responsibilities for elaborating specific parts of the deliverable and circulates the document for partners' contributions no later than 60 days before the expected due date. Afterwards involved partners are given 10 days to provide initial input which is consolidated and circulated for review and second-round input/corrections.
3. Following the second round of input, the first complete draft is prepared and sent for review to two reviewers (see list of reviewers above)
4. The initial review is performed by two partners, following a check-list to ensure good technical quality with respect to the requirements of the DoA. The reviewers return the reviewed deliverable no later than fifteen days than the expected due date. In their review the reviewers are expected to produce a series of modifications, comments and suggestions within the Deliverable, where they present and discuss the identified problems in order to identify if minor or substantial revisions are necessary and proceed to the creation of the final version of the deliverable before due submission date.
5. The results from the internal review are integrated before issuing a reviewed deliverable. This will be coordinated by the deliverable leader.
6. The final deliverable is submitted to the PC, who makes a final check.
7. The PC finally submits the deliverable to the EC and Reviewers as requested by the project officer by due date.

The timing of the deliverable review process is of crucial importance to be followed. Deliverables submitted outside this time horizon will (i) be reported as a risk to be handled using the procedure of *Section 7-Risk Management* and (ii) delayed.

Deliverables' Quality Review Aspects

Deliverables must adhere to the following quality aspects:

- The deliverable should have a 1-page Executive Summary that summarizes the findings of the deliverable and its scientific, technical, or business value.
- The objectives of the deliverable should be clearly expressed in the Introduction Section. Specifically, the deliverable should feature a short 1-2 paragraphs introduction that clearly states the role and duty of said document and in particular, the Purpose and Scope, the Relation to other Work Packages and their respective deliverables, as well as the Structure of the Document
- The Contribution to the scientific, technical and business objectives of the project, the main innovation introduced and reported in the document should be concisely reported in terms of added value from the scientific, technical or business point of view.



- The deliverable should be a self-contained document, which can be understood without knowledge of the DoA (or previous deliverables) and delivered in an appropriate standard format.
- The deliverable contents should be consistent with its description in the DoA; if not, the deviation should be explained.
- The deliverable should be cohesive and concise.
- The deliverable should not contain any claims which are not proven or supported by references.
- The deliverable should address recommendations from previous project reviews where applicable
- The terminology in the deliverable should- as far as possible - be aligned, and all abbreviations utilized should be explicated in the beginning of the document.
- Concerning the use of notations (modelling languages and the like): A deliverable should clearly state if the standard semantics of the notation is used, or not. Deviations from the standard semantics need to be explained in the text.

The Review of documents shall generally use the change tracking mode in Word as well as the comment feature to add further details and feedback to facilitate the deliverable improvement.

8.2.3 QA relevant to Software

As the successful accomplishment of the MODAPTO objectives relies heavily on software created by various institutions, it is essential to implement a quality control procedure for the produced software.

Software Development Processes

The MODAPTO software development will adhere to the following phases:

- Requirements definition and analysis: In this phase conducted in the respective WPs the set of requirements (functional and non-functional) will be produced utilizing Use-Cases towards the creation of the overall architecture, design and performance.
- Design: In this phase, the requirements will be transformed into a detailed design and functional specifications that describe how the required functionality is delivered. All documentation will serve as the reference for the actual code development.
- Development: In this phase, implementation starts based on the technical design and designed modules/services are being developed and inserted into the complete information system, which finally hosts the project platform
- Integration and Testing: In this phase, the developed modules are put together and checked for errors, bugs and interoperability.
- Installation and deployment: In this phase, the software will be introduced into production and will become operational toward pilot evaluation.
- Testing and Validation: Testing and validation will take place on different aspects throughout the software development process in line with:
 - Unit tests for the smallest parts of software design
 - Integration tests for several software components and
 - System tests to focus on the user's perspective

Software Development Management

In MODAPTO, software will be managed online in a relevant web-based collaborative hosting service for software development where project participants can work together as described in *Section 6.1-Technical Management* of the current deliverable. In terms of integrity and for safe keeping, each partner is required (and responsible) to always maintain a secure copy of their code on their premises and also upload the relevant required part of the source code.

Additionally, each partner providing internally developed software should follow a clearly recognizable and agreed-upon scheme falling under the principles of the Tools that the TC will specify. Additionally, on request, a partner that provides a software package should be able to provide a new copy of the package ready for installation alongside installation instructions and required assistance (online and on-site as needed).

8.2.4 QA relevant to Publications

The dissemination of MODAPTO's results is crucial for the entire consortium, and all partners are required to ensure that their produced results are disseminated as widely as possible, as per the provisions of the GA/CA towards all interested communities. However, this dissemination should not obstruct potential commercial exploitation or divulge confidential/proprietary information or results that partners intend to safeguard through patents or promotion as standards or through academic publishing. To this end, a partner cannot publish any result developed (fully or partially) by another partner without obtaining written approval, which can be communicated through email. This also applies to joint results produced through collaboration between multiple partners, where co-authorship constitutes written approval, provided that the co-authors were involved in preparing the paper. Scientific customs require that all written or oral publications concerning project results expressly reflect each party's contributions through acknowledgement or co-authorship, as appropriate, unless legally obligated to do otherwise. All such publications must include an appropriate reference to the EU contribution in accordance with the GA and presented in the following *Section 8.3-Funding & Grant Acknowledgement*.

The process followed towards the publication of project results is as follows:

1. The partner(s) wishing to proceed to a publication must provide the consortium with prior notice of any planned publication at least 30 calendar days before the manuscript compilation stating information relevant to (a) the planned dissemination activity, (b) a copy/summary of proposed publication (if applicable), (c) data from the project assets/factory/production envisaged to be disseminated, since they are important for the author to demonstrate the publication results, but the owner of the project assets may need to restrict and deny public dissemination of these data.
2. An objection to the planned publication can be made in writing to the PC and the Party/Parties proposing the publication within 30 calendar days after the receipt of the notice. If no objection is raised within the time limit the publication is permitted. The objection has to include a precise request for necessary modifications, and justified objections include:
 - a. The protection of the objecting Party's Results or Background would be adversely affected or
 - b. The objecting Party's legitimate interests in relation to its Results or Background would not significantly harmed or
 - c. The proposed publication includes Confidential Information of the objecting Party.

When an objection is raised, the involved parties must have timely discussions to resolve the legitimate grounds for the objection. This can be achieved through means such as amending the planned publication and/or protecting information before publication. If appropriate measures are taken following the discussion, the objecting party must not unreasonably persist with the opposition.

The objecting Party can request a publication delay of not more than 90 calendar days from the time it raises such an objection. After 90 calendar days the publication is permitted, provided that the objections of the objecting Party have been addressed.

- Upon the finalization of writing of the paper, the lead author creates a new entry in the project publication list and notifies the PC and the Leader of the respective Work Package.
- Upon the submission of the paper, the submitted version is made available in the shared project directory.
- Upon the acceptance of the publication, the lead author must notify the consortium about the acceptance before the it is included in any official proceedings.

All accepted publications should be updated with the officially published version together with the final information, and reported in the Participant Portal in the section “Continuous reporting > Publications”. The partner (lead author) shall also include it in the next relevant report (e.g., periodic report, dissemination report, etc.).

8.3 Funding & Grant Acknowledgement

In the MODAPTO project, it is essential to ensure that the funding received from the European Commission (EC) is properly acknowledged and visible. To this end, procedures for the visibility of funding are outlined in the Grant Agreement and must be followed to ensure compliance with EC requirements. One key aspect of these procedures is the use of the EC logo, which must be included in all forms of publicity, information or promotional material related to the project. This includes events such as conferences or seminars, as well as any other forms of communication. The EC logo serves as a visual representation of the EC's support for the project and helps raise stakeholders' awareness of the project. In addition to the EC logo, it is essential to specify in all forms of publicity that the project has received EC research funding. This helps to highlight the project's significance and emphasizes the EC's support for the research being conducted. Lastly, all publications must also indicate that they reflect only the author's view and that the EC is not responsible for any use that may be made of the information in it. The phrases that are to be used are presented in the following:

“The MODAPTO project has received funding from the European Union’s Horizon Europe research and innovation program under grant agreement No 101091996. “
and

“The content of this publication reflects the opinion of its authors and does not, in any way, represent opinions of the European Union. The European Commission is not responsible for any use that may be made of the information that this publication contains”

8.4 Presentations and other material

In the MODAPTO project, it is essential to maintain a consistent and professional image in all presentations, both internal and external. This helps to promote the project, increase its visibility, and ensure that it is properly represented in all forms of communication.

To achieve this goal, all presentations must use the official MODAPTO template, which is available in the project repository. This template provides a consistent look and feel for all presentations and helps to reinforce the project's image and brand.

In addition to presentations, all newsletters, factsheets, and other forms of dissemination material must also follow the project's guidelines for branding and visibility. This includes the use of the project logo, a statement acknowledging the EU funding along with the EU flag, and the project's color palette.

By using a consistent and professional image in all forms of communication, the MODAPTO project can increase its visibility and credibility among stakeholders and ensure that its work is properly acknowledged and recognized.

9 Reporting

Reporting activities within MODAPTO project will be divided into two categories: the internal reporting that will take place every twelve months and the official reporting that is requested by the EC for M18 and M36. The following subsections summarize the procedures that will be followed by all partners, for both reporting activities.

9.1 Internal Technical Reporting

The procedure of the internal management reporting will be conducted every twelve months and a relevant report will be sending to the PC. The main objective of the internal reports will be to describe a continuous overview regarding the project progress. The internal progress report document will consist of two main documents: a) the Internal Progress Report per Work Package, and b) the Internal Progress Report per Partner.

9.1.1 Internal Progress Report per Work Package

It is under the responsibility of each WP Leader to create the Internal Progress Report per Work Package, for the corresponding WP. The WP leader should collaborate with the Task Leaders to create the report. The main chapters of this report include the WP progress and achievements per Task, information about all the (WP related) deliverables that have been submitted during the reporting period, the description of risks and potential impact on the project as well as the relevant proposed solutions. Also, possible deviations from the initial plan and the corresponding corrective mechanisms should be described, in the report. Finally, a concrete plan for the next reporting period – for the WP – will be added in the report, along with any other possible issues, that the WP leader could extract. Specific templates have been created for the Internal Progress Report per Partner, as it is illustrated in the corresponding *Section 5.2.4-Internal*.

9.1.2 Internal Progress Report per Partner

It is under the responsibility of every partner to create the “Internal Progress Report per Partner”. For the reporting period, each partner should describe the work done as well as the planned and actual effort per WP. Every partner should also list the deliverables that fall into the scope of partner’s responsibility. Also, the deviations from the initial plan, the corrective mechanisms and the planned activities for the next reporting period – per partner – should be added in the internal report. Specific templates have been created for the Internal Progress Report per Partner, as it is illustrated in the corresponding *Section 5.2.4-Internal*.

9.2 Official Periodic Reports and Final Report

It is highly recommended to all partners of MODAPTO project, to advice the article 21 of the MODAPTO G.A. According to the article 21, the beneficiaries must continuously report on the progress of the action (e.g. deliverables, milestones, outputs/outcomes, critical risks, indicators, etc.; if any), in the Portal Continuous Reporting tool and in accordance with the timing and conditions it sets out. The PC with contributions from all participants as described above must submit periodic reports to the EC within 60 calendar days from the end of the reporting period (period 1 M1 to M18 and period 2 M19 to M36). More specifically, the PC

must submit two periodic reports to the EC on behalf of the Consortium. Each periodic report consists of two parts, the Technical Report (Parts A and B) and the Financial Report.

9.2.1 Official Technical Report

The technical part includes an overview of the action implementation. It must be prepared using the template available in the Portal Periodic Reporting tool. The parts A and B of the technical report should contain:

- Part A: contains the structured tables with project information (retrieved from the Grant Management System).
- Part B: Prepared by all beneficiaries as a word document and submitted by the PC as PDF document. It will be based on the internal technical report (described above) and it must include: (i) What was done and achieved? (ii) Which problems were encountered? (iii) How can progress so far be assessed? (iv) Were there any deviations or corrective actions? (v) Delays, work not implemented, new subcontracts, budget overruns, etc.

9.2.2 Official Financial Report

The official financial report must contain:

- Individual financial statements, prepared by all beneficiaries (and third parties) on the Grant Management System. The financial statements must detail the eligible costs and contributions for each budget category and, for the final payment, also the revenues for the action, as described in Articles 6 and 22.
- Detailed cost reporting table for each budget category;
- Explanation of the use of resources and information on subcontracting;
- The certificates on the financial statements (CFS), for payments above a certain threshold.



10 Conclusions

The present document has established the basic guidelines for the management of the project. It described how the project is organized according to what was stated in the DoA. It described how the project will execute its day-to-day activities from a quality perspective, and ensure that processes and procedures are defined and their execution is continuously monitored and improved. Additionally, the risk management plan was presented aiming at reporting risk identification, analysis and mitigation strategies for the project.

The document also describes how the deliverables of the project must be produced: which templates to follow, guidelines for generating the documents and delivery and peer review process to warranty the deliverables quality. Furthermore, it explains how the reporting will be produced in every required period.

11 References

MODAPTO Consortium Agreement
MODAPTO Grant Agreement