ReliablE in-Vehicle pErception and decisioN-making in complex environmenTal conditionS

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D.1.1: Quality and Risk Management Plan

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Project Coordinator	Angelos Amditis (ICCS)	28/11/2022

Executive Summary

The Quality and Risk Management Plan is a public document of the EVENTS project. it is delivered in the context of the management work package (WP1) and more specifically as part of task T1.3: Quality and risk management, with the main objective to set up the project quality control procedures, monitor project milestones, create a risk register and define the appropriate mitigation strategies.

The document provides the quality control processes and risk management procedures, and can be considered complementary to the Consortium Agreement (CA) with respect to quality assessment and risk control. These procedures and rules will be the backbone of all processes of the EVENTS project.

The document is structured in seven sections. After a short introduction on the EVENTS project and the purpose of the current report in Section 1, the organizational structure of the project is described in detail, in Section 2. Based on this structure, it is highlighted how quality management is embedded in the project including the allocation of responsibilities to the different roles, the decision making and communication procedures.

In Section 3, quality measures and related rules to assure high quality project deliverables are defined. Clearly specified document management and review processes, as well as criteria for the assignment of reviewers per deliverable, an indicative checklist for carrying out the review and the codification of the project documents are described into detail to ensure the high quality of the EVENTS deliverables.

In Section 4, the quality assurance processes for dissemination material and activities are thoroughly described. This includes the key performance indicators relevant for publications and procedures for publication. A high quality of dissemination activities and material will support broad visibility and easy uptake of EVENTS materials.

In Section 5, the risk management procedures are defined. This includes the monitoring and identification of risks as well as risk assessment and mitigation measures. Proper risk management will contribute to decrease the impact of unforeseen events and to reach the objectives defined in the description of work.

In Section 6, rules and conventions to support information exchange and communication in EVENTS are described. The procedures and processes described in this document may also be updated if additional needs arise during the execution of the project.

Finally, in Section 7, final remarks are made with regards to this deliverable.

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Abbreviations & Acronyms

Abbreviation / acronym	Description
ASAM	Association for Standardisation of Automation and Measuring
AV	Automated Vehicle
CA	Consortium Agreement
CAV	Connected Automated Vehicle
DCM	Dissemination and Communication Manager
Dx.y	Deliverable number y belonging to WP x
EC	European Commission
GA	Grant Agreement/General Assembly
ISO	International Organization for Standardization
Mx	Month x of the project
MSx	Milestone x
ODD	Operational Design Domain
PC	Project Coordinator
PO	Project officer
QRM	Quality & Risk Manager
Rx	Reviewer x
SAE	Society of Automotive Engineers
Tx.y	Task y belonging to WP x

Abbreviation / acronym	Description
TL	Task Leader
TM	Technical Manager
VRU	Vulnerable Road User
WP	Work Package
WPL	Work Package Leader

1. Introduction

1.1 Aim of the project

Driving is a challenging task. In our everyday life as drivers, we are facing unexpected situations we need to handle in a safe and efficient way. The same is valid for Connected and Automated Vehicles (CAVs), which also need to handle these situations, to a certain extent, depending on their automation level. The higher the automation level is, the higher the expectations for the system to cope with these situations are.

In the context of this project, these unexpected situations where the normal operation of the CAV is close to be disrupted (e.g. ODD limit is reached due to traffic changes, harsh weather/light conditions, imperfect data, sensor/communication failures, etc.), are called “events”. EVENTS is also the acronym of this project.

Today, CAVs are facing several challenges (e.g. perception in complex urban environments, Vulnerable Road Users (VRUs) detection, perception in adverse weather and low visibility conditions) that should be overcome in order to be able to drive through these events in a safe and reliable way.

Within our scope, and in order to cover a wide area of scenarios, these kinds of events are clustered under three main use cases: a) Interaction with VRUs, b) Non-Standard and Unstructured Road Conditions and c) Low Visibility and Adverse Weather Conditions.

Our vision in EVENTS is to create a robust and self-resilient perception and decision-making system for AVs to manage different kind of “events” on the horizon. These events result in reaching the AV ODD limitations due to the dynamic changing road environment (VRUs, obstacles) and/or due to imperfect data (e.g. sensor and communication failures). The AV should continue and operate safely no matter what. When the system cannot handle the situation, an improved minimum risk manoeuvre should be put in place.

1.2 Purpose of the document

An essential measure to reach the highly ambitious and challenging objectives of the EVENTS project is to set, well in advance, the appropriate quality management procedures and rules. These procedures and rules, detailed described in this document, will be the acting-basis for all EVENTS project partners, in order to successfully ensure high quality project outcomes. If necessary, the present document will be further updated to reflect any changes that may occur during the project lifetime. This might especially be necessary once the technical implementation of EVENTS have been further defined.

1.3 Intended readership

This deliverable is addressed to any interested reader (i.e., PU dissemination level). Compared to others, D1.1 can be practically useful for the consortium members who can use it as a basis for the general management of all project activities.

2. Quality Management in EVENTS

2.1 Management roles in EVENTS

The consortium is composed of 11 partners, who will collaborate to deliver the project ambition and fulfil its expectations and objectives. In order to guarantee and achieve an effective and efficient interaction between them and avoid any management difficulties, partners have agreed to follow a simple management hierarchy which will ensure smooth project management, while at the same time it will provide the necessary control and participation mechanisms. The General Assembly (GA) will be the body responsible for decision making. In the GA, each project partner is represented by one vote.

The overall management entities of the project are the following:

The Project Coordinator (ICCS)

The Project Coordinator (PC) – **Dr. Angelos Amditis** – is responsible for the overall project monitoring and supervision. The PC has the administrative and financial responsibility for the organisation, planning and controlling of the project. The PC will be the main point of contact with the EC and will be responsible for the timely submission of the project deliverables to the EC.

The Technical Manager (HIT-FR)

The Technical Manager (TM) – **Dr. Anthony Ohazulike (HIT-FR)** – is taking care of all technical management activities in EVENTS. The main responsibility of the TM is the technical coordination of the project, which means to coordinate all relevant technical developments to ensure that technical milestones are achieved on time and according to specifications laid down in the workplan. To achieve that the TM will work closely with the WP leaders as well as the PC.

The Quality and Risk Manager (ICCS)

The Quality and Risk Manager (QRM) – **Dr. Panagiotis Lytrivis (ICCS) –** is responsible for formulating a detailed Quality Control Strategy and for continuously monitoring project risks. The QRM is setting the quality criteria for each deliverable in order to assure high quality and is also responsible for updating the risk registry and creating a mitigation strategy plan.

The Dissemination and Communication Manager (SEAB)

The Dissemination and Communication Manager (DCM) – **Mrs. Elena Krikigianni (SEAB)** – is coordinating all issues related to dissemination and communication activities. The DCM will oversee the entire process and will be responsible for internal

reporting and management. The DCM will be the main point of contact for day-to-day communications matters as well as maintenance of the website, social media accounts, liaison and networking activities.

The General Assembly

The General Assembly (GA) is the superior governing body of EVENTS. The GA must review the project progress with regard to its goals and achievements, will decide on contingency actions in case of major deviations from plan, and will take final decisions on policy and contractual issues and conflicts as requested by the PC. It will be comprised of one delegate per member organisation and will convene every six months either physically or virtually. Each delegate will have one vote; decisions will be made by consensus whenever possible. Only in cases where no consensus is possible, decisions will be made by majority voting. Details for voting are laid down in the EVENTS Consortium Agreement (CA).

The Work Package Leaders

Work Package Leaders (WPLs) are responsible for coordinating the technical work within their respective WPs, in close collaboration with the TM. WPLs set WP objectives, oversee milestones and are responsible for monitoring progress. Each task within the WP has a defined leader and it is up to the WPL to coordinate the activities between task leaders (TLs). TLs report directly to the WPLs, who in turn report to the PC and GA. WPLs are responsible for:

- Coordinating the activities of task leaders.
- Presenting progress reports at meetings and contributing to management reports.
- Documenting any major decisions to a deviation of the already defined work plan.
- Reporting to PC any partner whose contributions are considered insufficient.

The Task Leaders

Task Leaders (TLs) have to manage, supervise, monitor the activities within their tasks and produce the corresponding deliverables associated with their tasks. They are responsible for the timely completion of the activities within their tasks and for supporting the WPLs in managing the WPs by contributing to annual reports, adhering to budget guidelines and informing the WPLs of any deviations from the work plan.

The aforementioned lean structure is considered sufficient to manage EVENTS, towards the definition of clear roles and responsibilities for each partner and project body. It also allows cost-effective management of the project, while ensuring timely

delivery of high-quality results and early warning if any deviations from the work plan may occur.

2.2 Reporting processes and project meetings

2.2.1 Internal reporting processes

All participants are requested to send a brief technical and financial report for the work performed and resources spent for each active WP to the PC and the relevant WP leader, every 6 months. The WP leaders may use these forms to produce warning milestones for the PC and the particular partner(s) involved, e.g., if there is an overspending in resources which does not correspond to concrete outputs of work. Also, when other key issues/problems are found, the reports will be further evaluated and may cause alarm warnings by the WP leader. For any issues/problems may occur on the reporting of the WP activities, WP leaders should always inform the PC.

Six-monthly Progress Reports

The procedure to be followed for the six-monthly progress reports within the EVENTS project is the following:

- The Coordinator initiates the reporting process by sending out a request for six-monthly technical report and the time plan to all partners.
- Partners create one Report, with the technical work they performed per each active WP and send it to the relevant WP leaders.
- WP leaders review the work presented per Partner and compile one integrated report per WP, incorporating also the feedback of each participating Partner.
- The integrated report per WP is sent by the WP leader to the PC.
- The PC, in collaboration with the TM, gathers all reports, integrates them, prepares the consolidated report and finally, uploads it in Redmine and informs all Partners.

Six-Monthly Financial Reports

All partners report estimations of person months spent for each reporting period (i.e., the past six months). These will be estimations as the exact figures will be provided in the official periodic reports. The procedure followed for the six-monthly financial reports within the EVENTS project is the following:

- The PC initiates the reporting process by sending out a request for six-monthly financial report and time plan to all partners.
- Partners fill in the fields of the tables of an Excel sheet for the reporting period, referring specifically to the person months that have been spent per WP, and they upload it in Redmine, informing the relevant WP leaders and the PC.

- WP leaders review the reported resources by each Partner and they send their comments, if they note any discrepancy between costs and work conducted to the PC.
- The Coordinator gathers all reports, integrates them, prepares the financial report and finally, uploads it in Redmine and informs all Partners.
- Partners send any comments on the integrated financial report before its finalisation by the PC.

2.2.2 Project meetings and communication procedures

Process for meetings organisation

Regular communication through both physical and virtual meetings is considered as a vital procedure for the project. The GA, which is the main decision body of the project, will meet every six months, either physically or virtually, while extraordinary meetings can be requested by any partner if there is an urgency. Technical meetings will be carried out in regular intervals, both physical and virtual, whatever is deemed most appropriate by the respective WPLs. E-mail, web-conferencing and telephone will be the primary means for internal communication and document exchange. A web conference tool (e.g., GoToMeeting) will be used for online meetings. At each meeting, minutes will be kept, by the meeting's organiser, and made available within the consortium. The project already uses a web-based tool (Redmine) as a document repository and file exchange system, ensuring both safe storage of documents and supporting efficient collaboration among partners.

Communication protocols

Files will not be shared as attachments to e-mails, but instead will be uploaded in Redmine. Afterwards, a notification e-mail will be sent to all partners concerned (separate mailing lists have been created for every WP, the WP leaders, the overall consortium and one for Administrative issues), including a short description of file contents and the respective Redmine links.

The consortium partners will use a variety of tools for communicating, exchange/store files and taking decision on day-to-day management issues. The tools and means to be used for internal communication are:

- Virtual meetings to be organised via GoToMeeting or other web meeting tool available to each chairman convening a meeting.
- Doodle or other online voting tools to be used for voting and taking decisions.
- Redmine to be used as document repository.

2.3 Embedding quality management in EVENTS

Each project partner is responsible to contribute to the overall quality of the project outputs. In addition, specific roles and responsibilities have been clearly assigned to ensure effective quality management for all key aspects of the project, as shown in Table 1.

Table 1: Roles and responsibilities in Events

Role in Project	Responsible for
Project coordinator (PC) - **ICCS**	Overall responsibility
Technical manager (TM) – **HIT-FR**	Technical developments
Quality and Risk Manager (QRM)- **ICCS**	Quality of timely submission of the deliverables
Leader of WP Communication, Dissemination and Exploitation - **SEAB**	Coordination of all communication and dissemination activities
Work package leaders (WPLs)	Responsible to carry out the assigned work package in sufficient quality and in the expected time frame.
Task leaders (TLs)	Responsible to carry out the assigned tasks in sufficient quality and in the expected time frame.
Reviewers of deliverables	Responsible to assure that only high-quality deliverables are handed over.
Project partners	Must ensure that all ethical requirements are met. In case of doubts the partner must inform the PC in order to solve open issues. In any case, if ethical issues are encountered, these must be communicated to the PC, who will document on how these issues were addressed in the project.

Tracking of progress and use of resources is based on a half year reporting (i.e., reports presented in Section 2.2). This reporting consists of two parts, information on resources used and activities carried out including any deviations to the work plan. The templates for this reporting will be provided to the project partners (see Appendix). Each partner must send this information two weeks before the set deadline by the PC. In case of major deviations, the coordinator and the technical manager must be informed as soon as they become apparent.

3. Quality Assurance of Deliverables

Deliverables, which are a key element of the project, are used to provide information on project developments, to communicate results to the public and to hand over definitions, results, etc. to other work packages and tasks in the project. Quality assurance process is therefore focused on formulating a strategy to ensure high quality of deliverables and conformity with the Grand Agreement. For that purpose, two main processes are described: the document management process and the deliverable review process. The former aims at defining the procedures needed to be followed for the production and the management of a deliverable, while the latter is targeted on checking the deliverable compliance with the quality standards defined for the project.

3.1 Document management process

The QRM is responsible for ensuring that all documents are consistent and easily traceable through a unique codification. There are two levels of control by the QRM:

- Level 1: The control of deliverables registration and all documents referencing.
- Level 2: The control of consistency of documents layout and appropriate storing inside the project repository.

3.1.1 Document referencing

There will be a unique project document coding system for all internal documents, as indicated in

Table 2 below. The following does not apply to official project deliverables. The nomenclature of deliverables is presented in section 3.1.2. The unique document referencing scheme is not applicable for informal data and views exchange between Partners via simple e-mail.

Table 2: Document coding system

Code	Type
R	Document, report (excluding the periodic and final reports)
DEM	Demonstrator, pilot, prototype, plan designs
DEC	Websites, patents filing, press & media actions, videos, etc.
ETHICS	Ethics deliverables
ORDP	Open Research Data Pilot

DATA	Data
PROG	Software packages
OTHER	Technical diagrams, etc.

3.1.2 Deliverable nomenclature

In order to ensure consistency, the filename of deliverables must adhere to the codification shown in Table 3.

Table 3: Deliverables' coding system

Position	Entry
First digits:	"EVENTS"
Underscore	
Next 3-4 digits:	"D" + <X.X> deliverable number according to the Description of Action
Underscore	
Next digits:	Deliverable title as in the Description of Action
Underscore	
Next digits:	"v" and number of revision <X.X> of the deliverable.
Underscore	
Next digits:	The document save date, "yyyymmdd".

Example: "EVENTS_D1.1_Quality and Risk Management Plan_v0.1_20220921". The version number of the deliverable will be set to 1.0 after the deliverable has been approved.

3.1.3 List of templates to be used

The templates, which correspond to each type of document that is foreseen to be circulated in terms of the EVENTS project, are provided as Annexes of the present document.

The types of documents, addressing both internal communication and official documentation towards the EC, are namely:

Annex 1: Deliverable/Word Template

Annex 2: Deliverable Review Report Template

Annex 3: Meeting Agenda Template

Annex 4: Meeting Minutes Template

Annex 5: Six-Monthly Technical Progress Report Template

Annex 6: Six-Monthly Financial Report Template

Annex 7: Slides/Presentation template

3.2 Deliverable review process

The deliverable review process ensures the high quality of the project deliverables, which should meet the expectations of project objectives and results as defined in the Grant Agreement. It also improves the quality of the project outputs and it minimizes the risks of rejections. Once the deliverable final draft is ready, the review process is initiated. The list of deliverables with the due date and the corresponding reviewers is shown in Table 4 (R1 & R2 are Reviewer 1 & Reviewer 2 respectively), while the steps of the review process along with an estimation (in calendar days) for each step are the following:

1. **Draft version**: The deliverable is handed over to the Quality Manager, who contacts the internal reviewers and at the same time to all partners 30 calendar days before the due date (this follows the dissemination rules defined in the consortium).
2. **Internal review**: Internal reviewers carry out a review of the deliverable and must send their comments to the authors of the deliverable, and a copy to the technical manager and the coordinator (10 days after receipt). Partners wishing to comment on the deliverable can do so within 10 days by sending the comments directly to the authors. For each deliverable, two reviewers are assigned. The reviewers are not the main authors of the document and, if possible, the reviewers' organization is a user of the output of the deliverable in a later stage of the project.

   The reviewers after having studied the Deliverable, must evaluate it with respect to the following issues and must conclude whether the deliverable is accepted or not.

   - General comments
     - Deliverable contents thoroughness.
     - Correspondence to project objectives as in the Description of Action.
     - Correspondence to programme objectives.
   - Specific comments
     - Relevance.

- Response to user needs.
- Methodological framework soundness.
- Quality of achievements.
- Quality of presentation of achievements.
- Deliverable layout (format, language, spelling, etc.).

➢ The final rating of the Deliverable draft will be marked as:

- Fully accepted.
- Accepted with reservation (minor comments/changes).
- Rejected unless modified as suggested.
- Fully Rejected.

3. Within 10 days after receipt of comments, a new draft based on comments from reviewers and project partners have to be provided to the internal reviewers, the project coordinator and the technical manager. In case of disagreement between authors and reviewers, the technical manager and the coordinator must be involved.
4. If all comments have been addressed properly the deliverable is uploaded to the EC portal by the project coordinator. Otherwise, an additional review cycle has to be carried out (step 3).

Table 4: List of deliverables and corresponding reviewers

Code	Name	WP	Leader	Due Date	R1	R2
D1.1	Quality and Risk Management Plan	1	ICCS	3	SEAB	HIT-FR
D1.2	Project repository and collaboration tool	1	ICCS	4	UULM	WMG
D1.3	Data Management Plan	1	WMG	6	ICCS	TUD
D1.3	Data Management Plan	1	WMG	30	HIT-FR	SEAB
D2.1	User and system requirements for selected use cases	2	CRF	7	ICCS	APTIV
D2.2	Full Stack Architecture & Interfaces	2	HIT-FR	10	APTIV	UULM
D2.3	Vehicle System Hazard Analysis & Risk Assessment	2	APTIV	12	WMG	ICCS
D3.1	Perception Components Methods	3	TUD	16	ICCS	APTIV
D3.2	Perception System and Self-Assessment	3	TUD	24	UULM	WMG
D4.1	Initial version of motion planning and behavioural decision-making components	4	TECN	17	CRF	ICCS
D4.2	Motion planning	4	TECN	24	HIT-UK	TUD
D4.3	Behavioural decision-making	4	HIT-FR	24	S4	TUD
D4.4	Fail-Safe vehicle control	4	CRF	24	TECN	S4
D5.1	System integration in the virtual testing setup	5	TECN	26	ICCS	APTIV
D5.2	System integration in the prototype vehicles	5	CRF	30	WMG	APTIV
D5.3	System SOTIF compliance test report	5	APTIV	30	ICCS	WMG

D6.1	Experimental procedures and evaluation methods	6	ICCS	21	CRF	SEAB
D6.2	Technical evaluation results	6	CRF	36	TUD	S4
D6.3	Sensor suites analysis	6	HIT-FR	36	APTIV	TUD
D7.1	EVENTS Communication, Dissemination, and social awareness	7	SEAB	6	ICCS	HIT-UK
D7.1	EVENTS Communication, Dissemination, and social awareness	7	SEAB	18	TECN	TUD
D7.1	EVENTS Communication, Dissemination, and social awareness	7	SEAB	36	HIT-FR	CRF
D7.2	EVENTS Exploitation plan, Innovation map & Standardization activities	7	WMG	12	SEAB	S4
D7.2	EVENTS Exploitation plan, Innovation map & Standardization activities	7	WMG	36	APTIV	TUD

4. Quality Assurance of Dissemination Activities

4.1 Key Performance Indicators (KPIs)

The effectiveness of EVENTS strategic approach and planning for communication and dissemination will be constantly evaluated through dedicated key performance indicators, shown in Table 5, and will be thoroughly reported in the D7.1 and its periodic updates.

Table 5: KPIs for communication and dissemination activities

KPIs	Base Values
EVENTS brand identity (inc. logo, guidelines, templates, illustrations/graphics)	1
Factsheet & standard presentation	1 & 1
Brochure	2
Poster	2
Roll-up	2
Project video	1
E-newsletter	8, with a total number of 200 e-newsletter recipients
Website	1 with 100 visitors/views per month
Social Media	2 accounts with 400 members each
Media articles	15
Publications in Horizon Europe communication tools	5
Media campaigns	1
Advisory board members	6-8 (at least 3-4 of them to be outside EU)
Number of peer reviewed journal articles	5
Conference publications	10
Conference presentations	20
Organisation of workshops/special sessions	4
Number of International, EU and national projects networked	5 (at least 2 of them to be outside EU)
Number of liaison activities performed	10 (at least 4 of them to be outside EU)

Number of discussions in fora, committees, associations & organisations	12
Number of standardisation bodies and TCs networked	2
Use case demonstrations	3, with 30 people attending per event
Final Event participants	120

4.2 Procedures for publications

Dissemination activities conditions are described in the EVENTS Consortium Agreement. Among other obligations and conditions agreed, the following excerpts have to be highlighted:

- During the Project and for a period of one (1) year after the end of the Project, the dissemination of own Results by one or several Parties including publications and presentations, shall be governed by the procedures of Articles 8.4, 16.3 and 17, plus Annex 5 of EVENTS Grant Agreement subject to the following provisions.
- Prior notice of any planned publication shall be given to the other Parties at least 45 calendar days before the publication. Any objection to the planned publication shall be made in accordance with the Grant Agreement by written notice to the Coordinator and to the Party or Parties proposing the dissemination within 30 calendar days after receipt of the notice. If no objection is made within the time limit stated above, the publication is permitted.

An objection is justified if:

- The protection of the objecting Party's Results or Background would be adversely affected, or
- The objecting Party's legitimate interests in relation to its Results or Background would be significantly harmed provided that the scientific integrity of the publication would not be compromised, or
- The proposed publication includes Confidential Information of the objecting Party.

The objection has to include a precise request for necessary modifications.

If an objection has been raised, the involved Parties shall discuss how to overcome the justified grounds for the objection on a timely basis (for example by amendment to the planned publication and/or by protecting information before publication). The objecting Party shall not unreasonably continue the opposition, if appropriate measures are taken following the discussion. In this context, appropriate measures

would be taken on a case-by-case basis and always in accordance to the procedures described in the Consortium Agreement.

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

A Party shall not include in any dissemination activity another Party's Results or Background without obtaining the owning Party's prior written approval, unless they are already published.

The Parties cooperate, in order to allow the timely submission, examination, publication and defence of any dissertation or thesis for a degree that includes their Results or Background subject to the confidentiality and publication provisions agreed in the EVENTS Consortium Agreement.

Nothing in EVENTS Consortium Agreement shall be construed as conferring rights to use in advertising, publicity or otherwise the name of the Parties or any of their logos or trademarks without their prior written approval.

Supporting this framework, any dissemination/communication activity will be built upon the following guidelines:

- For articles, papers and similar publications, WP7 leader will follow a specific procedure complementary to the CA rules (as detailed mentioned above) that will be documented in D7.1 (M06). This procedure will ensure 1) the quality and correctness of the information about EVENTS being communicated, and 2) the confidentiality aspects.
- For participations at events (workshops, congresses, conferences, etc.), in a similar way, WP7 leader will follow a specific procedure, that will be documented in D7.1 (M06), concerning the materials to be used during the event. With regards to the publication of information in EVENTS electronic tools (e.g., website, newsletter, twitter or LinkedIn groups), given its agile nature, the Project Coordinator, Project Technical Coordinator and WP7 leader will analyse if a given piece of information could have a confidentiality issue; if so, it will be decided either to check for agreement with partners or to cancel the publication in these means.

The detailed procedures (for hard copy material and event attendance), in conformity with GA and CA articles, has been, already, available for all consortium partners, through a dedicated wiki page in the internal document repository since M01 and they will be thoroughly documented in D7.1, in M06.

5. Risk Management

In EVENTS, the recognition of risks is considered as an integral and vital part of the project management, in order to anticipate situations that can affect the normal progress of the project. The diversity and complexity of the potential problem increase the number of challenges that may cause issues in the project execution lifecycle.

However, all these issues will be resolved by exploiting the accumulated project implementation experience of the partners and by applying a well laid-out management scheme. Potential risks and related risk mitigation measures have been identified and elaborated since the proposal phase (Table 6). In this chapter, the risk management procedures in EVENTS are thoroughly described.

Starting point for the risk management are the objectives that the consortium wants to reach with the execution of EVENTS and which might be affected by the occurrence of potential risks. The relevance of the single risks is determined by the combination of two parameters, namely the *probability of occurrence* and the *severity of the impact*. The main risks associated with the project can be divided in two categories: risks internal to the project and risk related to external factors. The consortium will ensure that throughout the project, achievements will be measured and the risks will be re-evaluated. Assessment and mitigation of project risks is carried out as follows:

Monitoring and identification of risks:

- Based on the six-month internal financial and technical reports, mid-term reports and deliverables, the coordinator (administrative part) and the technical manager (technical part) monitor progress in order to identify as early as possible any deviations from the work plan.
- Potential risks defined in the risk matrix are evaluated regularly and updated based on the six-month internal reports.
- Work package leaders, task leaders and project partners must report any problems to (depending on the specific problem) the work package leader, technical manager and/or coordinator.

Assessment risks and mitigation measures:

- Based on the risk matrix, proper measures are elaborated and are implemented (according to the concrete measure, directly with single partners, with work package leaders, etc.).
- If changes have to be made to the risk assessment, this will be communicated and discussed with the WP leaders and if needed in the General Assembly and the risk matrix will be updated accordingly by the Risk and Quality Manager.

Table 6: Critical risks & risk management strategy

Risk Number	Description	WP	Proposed Mitigation Measures
1	Wrong strategic decisions; Diverts developments from major to minor issues due to status misconception [Likelihood: Low | Severity: High]	WP1	Periodic interim reports where the coordinator asks from all partners and WP leaders an updated status of technical activities and resource consumption; Frequent information exchange in a WP level and also in a consortium-level (plenary meetings, project management teleconferences).
2	A slow start-up phase may endanger the timing of outcomes expected [Likelihood: Low | Severity: Low]	WP1	A kick-off meeting held early in the project. Shorter duration milestones to make project manageable. In case risk occurs, tasks split into smaller more manageable sub-tasks to push project developments and aid project be on schedule.
3	Project risks are neglected or not adequately managed [Likelihood: Medium | Severity: High]	WP1	Implementation of a project risk management with a Risk Registry and regular review of project risks.
4	System requirements not covering all user needs for specified use cases [Likelihood: Medium | Severity: Medium]	WP2, WP3, WP4	Arrange consortium workshops to scrutinise the system requirements prior to the delivery of system requirements deliverable.
5	Hazard analysis and risk assessment revealing major vehicle system safety issues [Likelihood: Low | Severity: High]	WP2, WP3, WP4, WP5	Create modular software stack architecture and interfaces to allow fast development, integration, testing cycles.
6	Datasets for the implementation and the adaptation of perception components for the project use cases are not sufficient to assess the perception performance in some scenarios where objects suddenly occur [Likelihood: Medium | Severity: High]	WP3, WP6	Several prototype vehicles are available in the consortium to collect data. In additions T3.1 will take care of using already available datasets and customising them for the needs of the project.
7	Potential delay in delivering the final perception algorithms on time for the integration in the prototype vehicles or in simulation [Likelihood: Low | Severity: High]	WP3, WP5	Initial perception components will be available earlier in the project i.e. on M17 (MS8).

8	Possible delay delivering the motion planning SW (T4.1) due to use case definition and specifications, and the architecture and interfaces [Likelihood: Low | Severity: High]	WP2, WP4, WP5, WP6	It is proposed a first functional version of the SW module (MS10) ready before tests and system upgrades (T5.4).
9	Possible delay delivering the behavioural decision-making SW (T4.2) due to use case definition and specifications, and the architecture and interfaces [Likelihood: Medium | Severity: Medium]	WP2, WP4, WP5, WP6	It is proposed a first functional version of the SW module (MS11) ready before tests and system upgrades (T5.4).
10	Possible delay delivering the fail-Safe vehicle control SW (T4.3) due to use case definition and specifications, and the architecture and interfaces [Likelihood: Low | Severity: High]	WP2, WP4, WP5, WP6	It is proposed a first functional version of the SW module (MS12) ready before tests and system upgrades (T5.4).
11	Perception and/or decision-making algorithms do not perform as expected [Likelihood: Low | Severity: High]	WP3, WP4	Overall the project is developing various perception and decision-making algorithms from different partners that will be integrated in several prototype vehicles and in simulation. Moreover, the workplan is organised in cycles. So, in case an algorithm is not working as planned, this will be identified early in the project and corrected. In the unfortunate case this is not feasible a similar algorithm could be developed by another partner in another prototype vehicle or in simulation (considering a shift of resources between the involved partners if appropriate).
12	Not enough time to mitigate possible results of the functional safety analysis through reconfiguration and testing in the development WPs [Likelihood: Medium | Severity: Medium]	WP3, WP4, WP5	Early identification of hazards and preliminary performance targets by T2.4 so that WP3 and WP4 design phase takes them into account. Provide T5.3 preliminary results before M24.
13	Evaluation methodology is not ready by the deadline [Likelihood: Low | Severity: Medium]	WP6	T6.1 starts well in advance compared to the rest of WP6 tasks which leaves space for a small delay. Several competent partners have been allocated in this task making the

			probability of realisation of that risk low.
14	Low penetration of EVENTS brand name to the national, EU and international audiences [Likelihood: Low | Severity: High]	WP7	EVENTS team will proceed, at the early stages of the project with: the development of a precise communication & dissemination strategy [M06], the design of EVENTS brand story [M03] and website [M03] and the creation of dedicated social media accounts [M02].
15	Low engagement of consortium partners in dissemination/communication activities [Likelihood: Low | Severity: High]	WP7	Close collaboration of WP7 Leader with all consortium partners and continuous triggering of the inactive members through bi-lateral communication and regular WP7 meetings.
16	Conferences and relevant exhibitions/fairs may be cancelled or postponed [Likelihood: Medium | Severity: Medium]	WP7	Follow closely any relevant opportunities and strive for virtual attendance.
17	Exploitation plan for EVENTS results and respective innovation roadmap not viable [Likelihood: Medium | Severity: High]	WP7	During the proposal phase key stakeholders have been identified and engaged to ensure a user-led business partnership. This activity will continue during the project to ensure realistic and sustainable business and exploitations plans.
18	EVENTS results are not properly promoted to standardisation bodies [Likelihood: Medium | Severity: Medium]	WP7	Several partners are active in standardisation bodies. WMG, responsible for these activities, has prominent roles in ISO, SAE and ASAM.

6. Information Management

In order to support information exchange and communication within EVENTS, the following rules and conventions have been defined. In addition, tools have been provided.

Document repository

The project uses the Redmine web-based tool as a document repository and file exchange system, ensuring both safe storage of documents and supporting collaboration among partners.

File naming conventions

Filenames must adhere to the description provided in Section 3.

E-mail conventions

In order to allow efficient use of e-mail the subject must start with “EVENTS”.

Language conventions

For deliverables and all publications, British English must be used.

Confidentiality

Confidentiality is a very important aspect for the work in EVENTS. Rules and processes concerning confidentiality are described in the Consortium Agreement.

Gender neutral

All communications must be formulated in a gender-neutral fashion.

7. Conclusions

The deliverable provides a description of the necessary procedures to be applied by all EVENTS partners and the consortium as a whole, in order to achieve a high quality of project results and a successful management of the project risks. As a result, all required project templates have been produced, which includes the agenda, attendance form, meeting minutes, presentation and peer review evaluation form, for facilitating the abovementioned actions.

The proposed quality and risk management plan is flexible and clearly defined, allowing for the monitoring of the project and handling any problems that may occur. It must be noted that the present quality and risk management plan is applicable to all the project activities, hence compliance with the established procedures is mandatory for all partners involved.

Annex 1: Deliverable Template

ReliablE in-Vehicle pErception and decisioN-making in complex environmenTal conditionS

D.x.x: Title must be placed here

Grant Agreement Number: 101069614

Document Identification			
Status	Draft	**Due Date**	Monday, 05 September 2022
Version	1.0	**Submission Date**	
Related WP	WP1	**Document Reference**	D.x.x
Related Deliverable(s)	Insert Related Deliverables	**Dissemination Level**	PU
Lead Participant	Insert Lead Participant (partner short name)	**Document Type:**	R/DEM/DEC/Other/ETHICS/ ORDP/DATA
Contributors	Insert Contributors (partners short name)	**Lead Author**	Insert Author (first name, last name)
		Reviewers	Insert 1st reviewer (first name, last name,company)
			Insert 2nd reviewer (first name, last name,company)

Document Information

Author(s) – in alphabetical order		
First Name	**Last Name**	**Partner**
		Beneficiary short name

Document History			
Version	**Date**	**Modified by**	**Modification reason**
0.1	dd/mm/yyyy		
0.2			
0.3			
0.4			
0.5			
1.0			Final version to be submitted

Quality Control		
Role	**Who (Partner short name)**	**Approval Date**
Deliverable leader		dd/mm/yyyy
Quality manager		
Project Coordinator		

Executive Summary

The following text is a generic guideline for the authors to produce the Executive Summary section. This text marked in purple should be deleted before submitting for internal review.

Please follow these guidelines:

- ***Length:** please limit it to 1 page (2 pages in exceptional cases).*
- ***ALL deliverables** must have conclusions*
- ***Goal:** The Executive summary is not an "introduction" to the deliverable. The main goal of this section is to provide readers with a whole picture of the document (i.e. the Abstract section from the papers), so that they can understand the content of the deliverable at once without further reading.*
- ***Self-contained:** If there is any input coming from other deliverables, it must be mentioned here.*
- ***Motivation for the reader** (Recommended: 1 –10 lines):*
  - *What is the reason for being for this deliverable? Which challenges it addresses?*
  - *What will the reader learn from it?*
- *Main results and findings (Recommended: 5 to 50 lines):*
  - *What are the main results achieved?*
  - *How does it contribute in the EVENTS context?*
- *Short conclusions (Recommended: 1 to 10 lines):*
  - *Key take away messages*

Add your text here.

Table of Contents

List of Tables

List of Figures

Abbreviations & Acronyms

Abbreviation / acronym	Description
EC	European Commission
D1.1	Deliverable number 1 belonging to WP 1
WP	Work Package

1. Introduction

1.1 Purpose of the document

Explain why the document is created, what purpose it serves in the project, who are the "customers" e.g. what WPs or Tasks are going to use the deliverable – what question it answers …

Text

1.2 Intended readership

Explain who is the intended audience for the deliverables, e.g. the clients of this deliverables, if public, who is likely to be interested in the content, research, policy, business …

Text

1.3 Document Structure

Explain the structure of the document, what will be in the next chapters …

Text

2. Chapter title comes here

Text…

2.1 Sub-Heading 1

Text

2.2 Sub-Heading 2

Text

2.3 Sub-Heading 3

Text

2.3.1 xxxx

Text

2.3.2 xxxx

Text

…as shown in Table 1 below…

Table 7 Title

Text		
Text		

…as shown in Figure 1 below…

Figure 1 Title

3. Conclusions

References

[1] Papadopoulos, M. (2022). *Reliable in-Vehicle perception* [online] NewYorkNews. Available at: https://www.vehicle.com [Accessed 05 September 2022].

[2] Papadopoulos, S., Li, R., Crome, B. and Graham, J. (2022). *Reliable in-Vehicle perception: Transport and Environment*, 15, pp.362-369.

Annex 1: ‘Title comes here’

Annex 2: ‘Title comes here’

Annex 2: Deliverable Review Report Template

ReliablE in-Vehicle pErception and decisioN-making in complex environmenTal conditionS

Grant Agreement Number: 101069614

Deliverable Review Report Template

Document Identification			
Status	Draft	**Due Date**	Monday, 05 September 2022
Version	1.0	**Submission Date**	
Related WP	WP1	**Document Reference**	D.x.x
Related Deliverable(s)	Insert Related Deliverables	**Dissemination Level**	PU
Quality Manager	Insert QM (first name, last name)	**Document Type:**	R/DEM/DEC/Other/ETHICS/ ORDP/DATA
Reviewer 1	Insert 1st reviewer (first name, last name,company)	**Reviewer 2**	Insert 2nd reviewer (first name, last name,company)

The EVENTS Consortium uses the Deliverable Review process for its internal quality assurance for deliverables to assure consistency and high standard for documented project results.

The Review is done individually by selected reviewers. The author of the document has the final responsibility to collect the comments and suggestions from the Reviewers and decide which changes to the document and actions are to be undertaken.

Overall Review Result

Deliverable is:

☐ Fully accepted	☐ Accepted with reservation	☐ Rejected unless modified as suggested	☐ Fully rejected

(Double click on the check box you wish to check – a window will open to allow you to check it)

CRITERIA	DEFINITELY	SATISFACTORILY	SOMEWHAT	NOT AT ALL	NOT APPLICABLE
Deliverable matches the description of the task it relates to					
Objectives are clear and in line with the planned task activities					
Issues at project level are properly treated (e.g. conflict with other WPs)					
Authors responds to readers' needs (defined through deliverable objectives)					
Technical approaches used are appropriate					
Content is well organised					
Issues raised are relevant					
Achievements are clearly stated					
Contents contribute to the state of the art					
Conclusions (if any) are valid					
Deliverable is complete (no major parts missing)					
Deliverable is formally correct (aligned with the quality management plan)					

Suggested Actions to the Authors

1. The following changes should be implemented

2. Specify missing chapters / subjects

3. Required changes on deliverable essence and contents

4. Further relevant required improvements

Annex 3: Meeting Agenda Template

ReliablE in-Vehicle pErception and decisioN-making in complex environmenTal conditionS

Grant Agreement Number: 101069614

EVENTS xxxxx meeting

AGENDA

Date:	DD MM YY
Time	00.00 -00.00 CET/CEST
Venue:	City, Country
Organiser:	
Version:	Draft or Final

CONSORTIUM

1	INSTITUTE OF COMMUNICATION AND COMPUTER SYSTEMS (ICCS)
2	CENTRO RICERCHE FIAT SCPA (CRF)
3	UNIVERSITAET ULM (UULM)
4	NAYTILIAKES METAFORIKES KAI EPIKOINONIAKES EPIXEIRISEIS SEABILITY EPE (SEAB)
5	FUNDACION TECNALIA RESEARCH & INNOVATION (TECN)
6	TECHNISCHE UNIVERSITEIT DELFT (TUD)
7	HITACHI EUROPE SAS (HIT-FR)
8	APTIV SERVICES DEUTSCHLAND GMBH (APTIV)
9	SENSIBLE 4 OY (S4)
10	HITACHI EUROPE LIMITED (HIT-UK)
11	THE UNIVERSITY OF WARWICK (WMG)

Day 1 (DD/MM/YY):

Session time slot	Session title	
Time slot	- Description of the topics to be discussed	Presenter
Time slot	- Description of the topics to be discussed	Presenter
Time slot	- Description of the topics to be discussed	Presenter
Session time slot	**Session title**	
Time slot	- Description of the topics to be discussed	Presenter
Time slot	- Description of the topics to be discussed	Presenter
Time slot	- Description of the topics to be discussed	Presenter
	End of Day 1	

Day 2 (DD/MM/YY):

Session time slot	Session title	
Time slot	- Description of the topics to be discussed	Presenter
Time slot	- Description of the topics to be discussed	Presenter
Time slot	- Description of the topics to be discussed	Presenter
Session time slot	**Session title**	
Time slot	- Description of the topics to be discussed	Presenter
Time slot	- Description of the topics to be discussed	Presenter
Time slot	- Description of the topics to be discussed	Presenter
	End of Day 2	

Annex 4: Meeting Minutes Template

ReliablE in-Vehicle pErception and decisioN-making in complex environmenTal conditionS

Grant Agreement Number: 101069614

EVENTS xxxxx meeting

MoM

Status	Draft, for consortium approval
Distribution	Confidential
Version:	0.1

CONSORTIUM

1	INSTITUTE OF COMMUNICATION AND COMPUTER SYSTEMS (ICCS)
2	CENTRO RICERCHE FIAT SCPA (CRF)
3	UNIVERSITAET ULM (UULM)
4	NAYTILIAKES METAFORIKES KAI EPIKOINONIAKES EPIXEIRISEIS SEABILITY EPE (SEAB)
5	FUNDACION TECNALIA RESEARCH & INNOVATION (TECN)
6	TECHNISCHE UNIVERSITEIT DELFT (TUD)
7	HITACHI EUROPE SAS (HIT-FR)
8	APTIV SERVICES DEUTSCHLAND GMBH (APTIV)
9	SENSIBLE 4 OY (S4)
10	HITACHI EUROPE LIMITED (HIT-UK)
11	THE UNIVERSITY OF WARWICK (WMG)

AGENDA

Day 1 (DD/MM/YY):

Session time slot	Session title	
Time slot	- Description of the topics to be discussed	Presenter
Time slot	- Description of the topics to be discussed	Presenter
Time slot	- Description of the topics to be discussed	Presenter
Session time slot	**Session title**	
Time slot	- Description of the topics to be discussed	Presenter
Time slot	- Description of the topics to be discussed	Presenter
Time slot	- Description of the topics to be discussed	Presenter
	End of Day 1	

Day 2 (DD/MM/YY):

Session time slot	Session title	
Time slot	- Description of the topics to be discussed	Presenter
Time slot	- Description of the topics to be discussed	Presenter
Time slot	- Description of the topics to be discussed	Presenter
Session time slot	**Session title**	
Time slot	- Description of the topics to be discussed	Presenter
Time slot	- Description of the topics to be discussed	Presenter
Time slot	- Description of the topics to be discussed	Presenter
	End of Day 2	

LIST OF PARTICIPANTS

List of Participants			
No.	**First Name**	**Last Name**	**Affiliation**
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			

Minutes of Meeting

Minutes of Day 1 (dd/mm/yy):

Minutes of Day 2 (dd/mm/yy):

List of decisions:

No.	Action	Partner	Deadline
1			
2			
3			
4			
5			

List of actions:

No.	Action	Partner	Deadline
1			
2			
3			
4			
5			

Annex 5: Six-monthly Technical Progress Report Template

ReliablE in-Vehicle pErception and decisioN-making in complex environmenTal conditionS

Grant Agreement Number: 101069614

D.1.1: Quality and Risk Management Plan

Document Identification			
Partner	<Name, Organisation>	Date	Day, XX Month 20XX
Version	1.0	Status	Draft

Instructions

For each WP in which you participated in the reporting period please summarise:

WPx

1. **Work performed by you**

2. **Your achievements in the period**

3. **Problems encountered (if any)**

4. **Deviations from plan and corrective actions (if needed)**

5. **Deliverables and milestones (status), if you are responsible for one of them**

6. **Planned activities for the next reporting period**

Annex 6: Six-monthly Financial Report Template

ReliablE in-Vehicle pErception and decisioN-making in complex environmenTal conditionS

Grant Agreement Number: 101069614

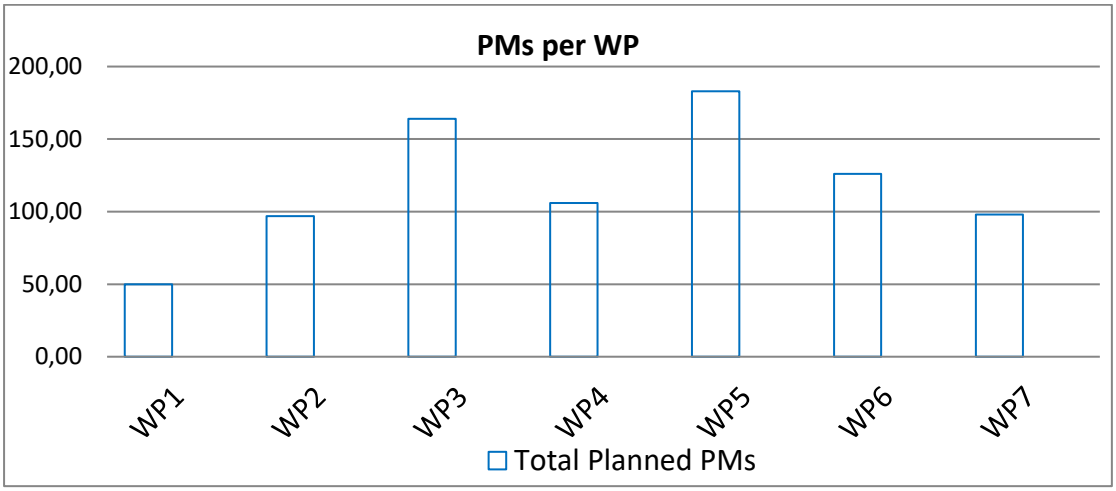
Six-Monthly Financial Report Template

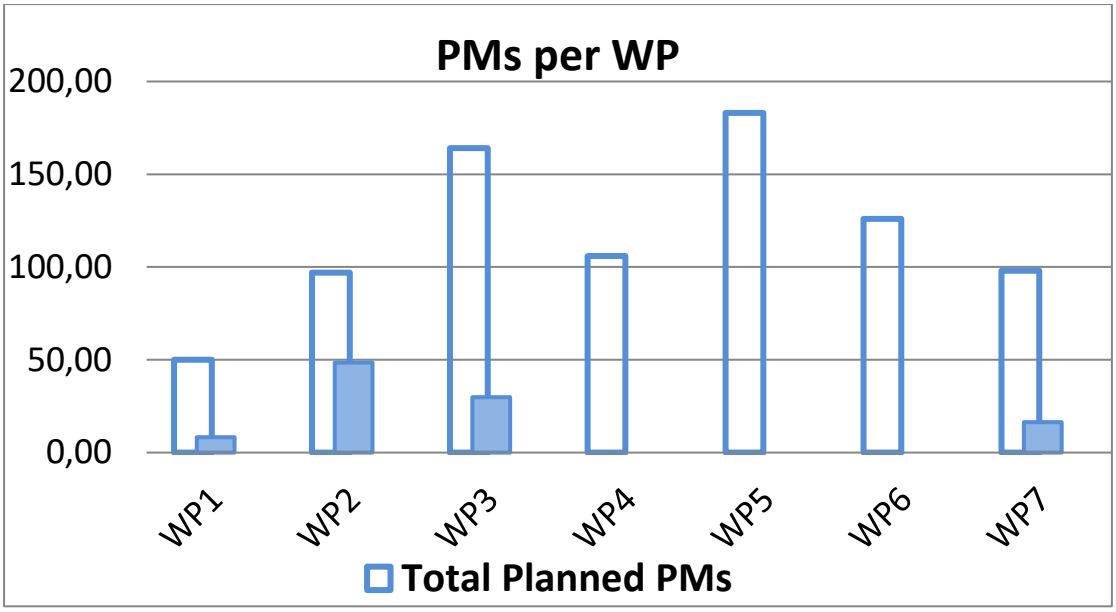
Document Identification			
Partner	<Name, Organisation>	Date	Day, XX Month 20XX
Version	1.0	Status	Draft

An Excel file with the following information.

WP	start	end	Total PlanPMs	Total PMs Spent	Plan PMs P1 (M1-M18)	Spent PMs P1 (M1-M18)	Plan PMs P2 (M19-M36)	Spent PMs P2 (M19-M36)
WP1	1	36	xx	0,00	xx	0,00	xx	0,00
WP2	1	12	xx	0,00	xx	0,00	xx	0,00
WP3	3	24	xx	0,00	xx	0,00	xx	0,00
WP4	8	24	xx	0,00	xx	0,00	xx	0,00
WP5	13	30	xx	0,00	xx	0,00	xx	0,00
WP6	16	36	xx	0,00	xx	0,00	xx	0,00
WP7	1	36	xx	0,00	xx	0,00	xx	0,00
Total			**xx**	**0,00**	**xx**	**0,00**	**xx**	**0,00**

Plan PMs up to M6	Spent PMs up to M6	STATUS	Justification of deviation	SPENT M1-M6	SPENT M7-M12	SPENT M13-M18	SPENT M19-M24	SPENT M25-M30	SPENT M31-M36
3,50	0,00	**UNDER**		0,00	0,00	0,00	0,00	0,00	0,00
7,50	0,00	**UNDER**		0,00	0,00	0,00	0,00	0,00	0,00
4,91	0,00	**UNDER**		0,00	0,00	0,00	0,00	0,00	0,00
0,00	0,00			0,00	0,00	0,00	0,00	0,00	0,00
0,00	0,00			0,00	0,00	0,00	0,00	0,00	0,00
0,00	0,00			0,00	0,00	0,00	0,00	0,00	0,00
1,00	0,00	**UNDER**		0,00	0,00	0,00	0,00	0,00	0,00
16,91	**0,00**	**UNDER**		**0,00**	**0,00**	**0,00**	**0,00**	**0,00**	**0,00**




PMs per WP
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150,00
100,00
50,00
0,00
WP1
WP2
WP3
WP4
WP5
WP6
WP7
Total Planned PMs

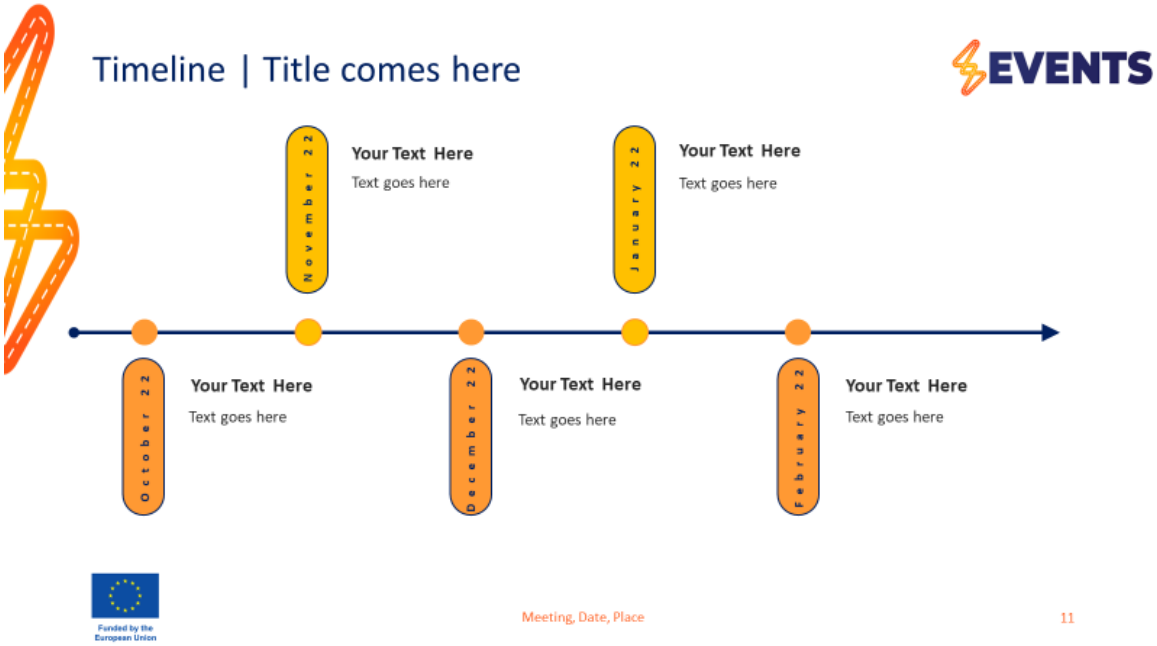
Annex 7: Presentation Template

Section Header

Section sub-header

Table | Title comes here

Title	Title	Title	Title
Text			


Timeline | Title comes here
EVENTS
November 22
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Text goes here
January 22
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Text goes here
October 22
Your Text Here
Text goes here
December 22
Your Text Here
Text goes here
February 22
Your Text Here
Text goes here
Funded by the European Union
Meeting, Date, Place
11


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EVENTS project
EVENTS
Thank you for your attention!
Speaker, Institution, email
Funded by the European Union
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