Quality Assurance and Risk Assessment Plan

CHIST-ERA-19-CES-005

SUSTAINABLE WATERSHED MANAGEMENT THROUGH INTERNET OF THINGS DRIVEN ARTIFICIAL INTELLIGENCE

DOCUMENT RECORD

Deliverable Title	D1.5 Quality Assurance and Risk Assessment Plan
Corresponding Work Package	WP1 Project Management, Organization, and Dissemination
Related Tasks	T1.1 Project Management
Dissemination Level	Public
Due Submission Date	18.02.2021
Actual Submission Date	
Responsible Partner	University of Vienna

Version	Date	Author	Comments
0.1	28.05.2021	Daniel Luger	First draft

1. TABLE OF CONTENTS

2. EXECUTIVE SUMMARY

This document is the deliverable D1.5 Quality Assurance & Risk Assessment Plan of the CHIST-ERA-19-CES-005 project SWAIN - Sustainable Watershed Management Through Internet of Things Driven Artificial Intelligence (referred to as SWAIN in the rest of the document). The purpose of the SWAIN Quality Assurance & Risk Assessment Plan is to provide guidance regarding quality and risk. Therefore, it includes:

- Quality guidelines for software, written deliverables, and usability
- Key performance guidelines for software and written deliverables
- Possible risks
- Probability, Impact and mitigation measures of the risks
- What can be done to fulfil the QA & RAP

This document is intended for the SWAIN consortium partner. It complements the previously signed consortium agreement.

3. INTRODUCTION

The project management plan is a deliverable in the scope of Work Package 1 of the SWAIN project. It aims to reduce the risk of potential failure of the project by listing possible risks and the associated probability, impact and risk measures. Furthermore, guidelines for the quality of the project in terms of software quality and written quality are evaluated, to ensure a high quality of deliverables.

This plan is prepared based on previous documents and discussions as listed below.

- SWAIN project full proposal, 09.02.2022
- Software Evaluation Criteria, 09.02.2022 (https://www.software.ac.uk/sites/default/files/SSI-SoftwareEvaluationCriteria.pdf)

The QA and RAP is intended to be continuously monitored and used in every WP to ensure a good quality as well to reduce risk in the overall project. Furthermore, if a possible risk occurs the risk must be discussed in a board meeting.

4. QUALITY ASSURANCE

Quality assurance is very important in nearly every project, especially when multiple different partners work together. Furthermore, the project will be made public and hopefully others can use it to extend the existing. Therefore, it is urgently requested to fulfill the quality standards in this section. In order to ensure that those quality standards are fulfilled each board member must keep the QAP in mind and make use of it.

4.1. TIME OF DELIVERABLES

The first important aspect of quality is the timing, to deliver the different deliverables at the right time to the right person. The overall plan is the work plan where the time for each WP and deliverable is listed. The project manager then has the assignment to sum up the already started deliverables and their status at each board meeting and priories deliverables with high importance.

4.2. QUALITY OF THE WRITTEN

When deliverables include or consist out of a written part, the quality of it should be guaranteed as well. Since different partners are involved in this project different tools and styles are mixed. However, to ensure the quality of the written deliverables guidelines and templates must be set. Questions like the following should be asked after each deliverable.

- Is the document easy to read and well written?
- Has the document a fitting number of figures and tables?
- Has the document all references included?

All those questions are listed in detail in the section 4.4.

4.3. QUALITY OF THE SOFTWARE

Since WP2, WP3, WP4 and WP5 contains software it is important to define principal guidelines and minimum quality criteria to ensure code excellence. The SWAIN project has a duration of three years and therefore if code is not documented or well-structured it is not possible for a programmer to read even its own code after such a long time. Furthermore, this project is not only for the partners in this project, moreover the research done in this project should be used by others and in best case should be extended and improved. This requires an understandable code. To set guidelines we use the indicators from the Software Sustainability Institute's criteria-based assessment (https://www.software.ac.uk/sites/default/files/SSI-SoftwareEvaluationCriteria.pdf). Those criteria are used to evaluate quantitatively the quality of a software in different areas. Since not all criteria are relevant for the SWAIN project, only the relevant ones are selected and described in section 4.4.

4.4. KEY PERFORMANCE INDICATORS (KPIS)

ID	KPI	Justification	Reachable Target
	Written Deliverables		
1	Layout Quality	With the use of templates, a standard for the report has been set. Each written deliverable must use a existing template.	Use Templates given by the board.
2	Text and figures and tables	For a good readability figures and tables should be added to the deliverable. The text and the illustrations should be in a good partitioning.	A good balance.
3	Correctness of the text	It is mandatory to use a spellchecker for each deliverable to ensure a correct written text.	Use spellchecker and grammar checker.
4	Validity of deliverable	Is the documentation matching the data? Check if da data could be plausible. Possible contractions should be found.	At least second person needs to check if the deliverable is correct.
	Aim of the deliverable	Is the deliverable contributing something new to the deliverable	The WP leader must check if the specific deliverable is contributing something new.
	References	Are all references added, and are all references correct?	Use a plagiarism software before publishing a paper.
	Clear structure	Is there a clear structure of the work, to ensure a good readability.	Use templates.
	Software		
	Developer Documentation	The developers need to comment unclear code to ensure a fast understanding for developer which are not familiar with the code.	Document all methods, and if necessary extra documentation for complex functions.
	Architectural overview	By creating diagrams of the software system, the developer doesn't leave the overall system out of sight.	Describe 70% or more of the used

		Therefore, it is strongly recommended to do so.	models in the code in the map.
	Portability	Software systems should be possible to run on multiple platforms if feasible, to make an IT stack change easier.	Make sure to use platform independent software frameworks or use container platforms to ensure portability.
	Performance	Since performance is especially in this project important, it must be made sure that if not a new feature is implemented a change should increase the performance of the system.	The performance should be measured in time.
	Usability	Ensure that the final tool for this project is easy to understand and held simple.	Easy-to-use
	Maintainability	Since multiple partners are working on this project changes can easily occur. Therefore it is essential to produce code which is good to maintain.	Use interfaces and use presentation, business, persistence and database layer to reach a high maintainability.
	Testability	Since this project is a research project and fast development is mandatory, tests should only be done for the core features of the system. Because otherwise the tests consume too much time.	Test only core systems. Integration tests are recommended.

4.5. RISK ASSESSMENT PLAN

During project, unexpected risks could come up and cause delays or errors. To reduce the probability of such a scenario, a detailed analysis of the possible risks is done in this section along with risk-mitigation measures. To make sure the risks are easy understandable, they are presented in a list with four columns. First the id, second the description of the possible risk, third the belonging WP (if all WP are affected, "ALL" is filled in) and fourth the risk-mitigation measures. To ensure that those measures are applied and used correctly following rules must be applied:

1) each WP leader is responsible to monitor the protential risks
2) each WP leader must inform the board if a described risk occurs, and other WPs are affected
3) if a risk occurs with multiple WPs affected, a strategy must be created by the board

#	Description	WP	Likelihood	Impact	Risk-mitigation measures
1	Lack of communication between different partners	ALL	Medium	High	Monthly team meetings with all board members must be done. Furthermore, teams working on the same deliverable has to meet more frequently.
2	Conflict of interest	ALL	Low	High	Currently no conflict of interest is detected, although if so, the coordinator must be informed, and he must inform the responsible stakeholders.
3	Delay of important WP	ALL	High	Medium	To ensure the delay of a WP is not stopping the hole project, each WP could be started with a dummy, which could then be replaced by the delayed WP.
4	Partners lose interest in project	ALL	Low	High	Every partner of this project has personal profit and therefore there is a small probability that a partner stop working.
5	Insufficient experience of partner	ALL	Low	Medium	Each partner has been chosen because of their know-how and their experience, furthermore a partner has multiple experts

					which reduce the risk of insufficient experience.
8	Personal leaves the project	WP1	Medium	High	It is made sure that at least two persons have two competences to finish a task. However if the deliverable signed to the leaving person could not be finished, other group members could work with dummy data, until a new expert is found.
9	Partners follow their own interests	WP1	Medium	Medium	To ensure that a partner do not move in another direction, deliverables are made and required. Everything extra is welcome. To also ensure that the correct deliverable is delivered in time a workplan has been created.
10	Quality Assurance & Risk Assessment plan is not executed	WP1	Medium	Medium	The leader of a WP has to keep the QA & RAP in mind and remind the team of those criteria.
11	Reporting to CHIST-ERA is delayed	WP1	Low	High	University of Vienna ensures that every partner delivers its reporting to a specific day. The partners on their sides has to deliver their WP to the announced deadline.
13	Not enough funding	WP1	Low	High	The coordinator must ensure that every partner has enough money to finish the project. Therefore, only necessary expenditures should be allowed.
14	Partners miss the findings of a finished deliverable	WP1	Medium	Low	To ensure that every partner knows when a deliverable is finished everyone gets notified via email
15	Shared documents are not consistent	WP1	Medium	Medium	To ensure the consistency of documents google drive is used.

16	Software is not overwritten or de- leted	WP2, WP3, WP4, WP5	Low	High	To make sure no used code is deleted or overwritten a VC software (GitHub recom- mended) for every software.
17	Continuation of Covid19 pan- demic, restrictions to travel etc	WP1	Medium	High	The work will be moved online as much as possible.
18	Collection of near- real-time data de- lays or fails	WP2, WP3, WP4	Medium	High	We will resort to large data sets available at BOUN and SYKE as well as publicly available re- positories such as NORMAN
19	Fault proneness and limited energy availability at the remote stations	WP4, WP5	Medium	Medium	It will be duly addressed by con- sidering a set of communication methods in combination for in- formation aggregation and dis- semination among the meas- urement stations
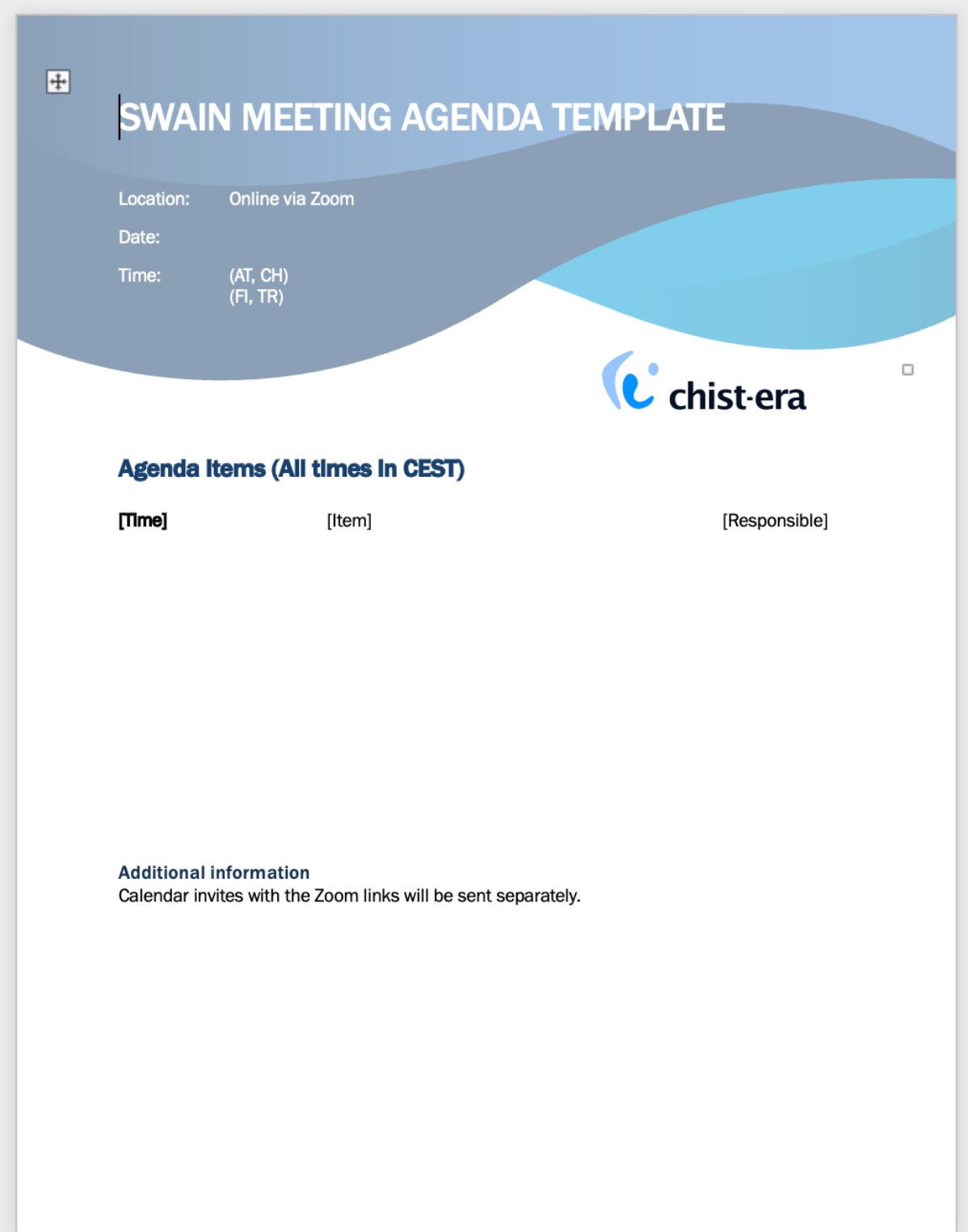
ANNEX A: Deliverable Report Template

The template is available in the shared Google Drive folder. The following is a preview.

ANNEX B: MEETING AGENDA TEMPLATE

The template is available in the shared Google Drive folder. The following is a preview.

ANNEX C: MEETING MINUTES TEMPLATE

The template is available in the shared Google Drive folder. The following is a preview.

ANNEX D: PRESENTATION TEMPLATE

The template is available in the shared Google Drive folder. The following is a preview.