European Commission, Horizon 2020

D1.1 Project Manual including Quality Assurance Guidelines

SHOTPROS

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Deliverable Lead	USECON
Related work package	WP1
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Versions

Vers.	Date	Author	Description
V0.1	23/08/19	Markus Murtinger (USE) Valerie Schlagenhaufen (USE) Gerhard Helletzgruber (USE)	First Draft
V0.2	27/08/2019	All partners	Revisions
V1.0	30/08/2019	Markus Murtinger (USE) Valerie Schlagenhaufen (USE) Gerhard Helletzgruber (USE)	Integration of feedback / finalisation
V1.1	07/01/2021	Markus Murtinger (USE) Birgit Harthum (USE) Valerie Schlagenhaufen (USE) Gerhard Helletzgruber (USE)	Revision based on EC Feedback from Review
V1.2	18/01/2021	Helmut Schrom-Feiertag (AIT)	Feedback on revised Deliverable
V1.3	25/01/2021	Birgit Harthum (USE) Valerie Schlagenhaufen (USE)	Integration of feedback and finalisation
V2.0	30/01/2021	Gerhard Helletzgruber (USE)	Re-submission
V 2.1+ V2.2	18-25/02/2021	Birgit Harthum (USE)	Integration of feedback based on 2nd review by EC
V 2.3	25/02/2021	Gerhard Helletzgruber (USE)	Revision financial planning/reporting + general revision
V 2.3	26/02/20121	Markus Murtinger (USE)	Feedback Processes

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V 2.4	01/03/2021	Birgit Harthum (USE)	Feedback incorporation – ready for partner review
V 2.5	01-05/2021	Berend Kemperman (RL) Raôul Oudejans (VUA) Manfred Tscheligi (AIT) Emma Jaspaert (KUL)	Review
V 2.6	06/03/2021	Birgit Harthum (USE)	Feedback incorporation & final formatting
V 3.0	15/03/2021	Valerie Schlagenhaufen (USE) Gerhard Helletzgruber (USE)	Finalisation and upload

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Revisions after EC Review

Section	Revisions
Executive Summary	Added information on agile and collaborative project management tool for higher quality and agile development
3. Project Structure	Updated and simplified structure of participants (figure)
4. Internal Communication	Adapted regular online meetings for higher collaboration (more frequent and objective based reporting for closer monitoring of challenges and deviations) and to close the loop on different partners
5. Reporting	Higher frequency of internal reporting to improve monitoring
7. IPR	Added clear plan for intellectual property management
9. Project Management and QA	Enhanced agile project implementation including release and sprint plan and peer review process (more integrated end user – LEA and advisors)
Annex	Adapted GANTT chart and list of deliverables as part of the enhanced project management tool Peer review template and factsheet on agile development and scrum was included Explanation of the contribution of the SHOT-COVID study was added

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List of Acronyms and Abbreviations

Acronym / Abbrevation	Description
EC	European Commission
VR	Virtual Reality
LEA	Law Enforcement Agency
DMA-SR	Decision-making and acting in stressful and high-risk situations
HF	Human factors
SME	Small and Medium Enterprise
WP	Work Package
WPL	Work Package Lead
IPR	Intellectual Property Rights
PC	Project Coordinator
SC	Steering Committee
DoA	Description of the Action
GA	Grant Agreement

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Content

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Executive Summary

This deliverable is the official Project Manual that defines the Consortium operating procedures, the financial management, the project management and the quality assurance of SHOTPROS. It contains:

- Reference to key documents and tools
- Project structure and the project organisation
- Internal communication
- Project management and quality assurance guidelines
- Reporting procedures
- Resources to be committed
- Work packages, deliverables, and schedules
- Innovation and intellectual property (IP) management

The close collaboration of the different partner is a key success factor of SHOTPROS, therefore an agile and collaborative approach needs to be reflected in the project management of SHOTPROS to close the loop within all project partners.

The SHOTPROS Project Management Tool is provided to the partners. This tool includes an overall **GANTT view** on timing, deliverables, agile software releases and by this combines the 3 major project streams (agile development & product management, end user involvement and human factors quality implications – see chapter 5.1 Project Management) at one sight. For the detailed day-to day management and reporting we included different sections in the tool:

- An **agile plan** on sprints and releases to closer involve the end user and to manage the technology stream according to the agile principles
- a **deliverables management** section including a peer review process to extend the multi-disciplinarity of the project
- A **reporting** and risk assessment section to compare planned and actual **efforts** (person months) and all deviations are visualised in different overview tables to identify financial and time risks and to address them early in the project.

Reporting and quality assurance measures support the objective oriented and agile project management of SHOTPROS.

The Project Manual is a dynamic document that will be updated in accordance with expected outcomes whenever necessary during the project. The Steering Committee should approve in principle any changes and the Consortium will be informed about them.

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1 Introduction

The Project Manual is the first deliverable (D1.1) from work package 1 (Project management) This document has two main functions:

- It provides an overview for all partners with the project's governance structure, work plans and the agreed processes and procedures, tasks, milestones and deliverables.
- It intends to standardise various elements of the project to ensure an appropriate level of control, quality assurance and consistency across all activities.

It is a dynamic document and will be updated as required throughout the project.

2 Key Documents and Tools

This is the list of key documents and tools that will be addressed all along the project execution:

- **Grant Agreement (No. 833672**): The contract concluded between the Research Executive Agency (REA) ('the Agency'), under the powers delegated by the European Commission ('the Commission'), and the beneficiaries under which the parties receive the rights and obligations (e.g. the right of the Union's financial contribution and the obligation to carry out the research and development work). The Grant Agreement consists of the basic text and annexes, including Annex 1– Description of the action (DoA) - part A and part B. The DoA comprehends the specific description of the tasks that will be carried out along the project and the expected results, deliverables and milestones to be obtained.

1. **Consortium Agreement**: The internal agreement signed between the 13 members of the consortium: It specifies the rights and obligations of the project partners and contains provisions about internal organisation and decision-making, financial questions and the handling of intellectual property rights.

2. **SHOTPROS Project Management Tool:** Provides an agile, real time overview on the actual WP and corresponding tasks, deliverables, software increments and releases and the efforts and their deviations. To show the status of the project against time and responsibilities a Gantt view is provided. The tool also includes an agile plan of delivering software increments available for feedback by the end users and a template to manage the single WPs in detail. (see chapter 5.4 SHOTPROS Project Management Tool)

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3 Project Structure and Organisation

The project is managed at three different levels:

- Administrative, financial, overall coordination: **Project Coordinator** (PC) assisted by Administrative and Financial Management
- Strategic and vision management, decision-making: **Steering Committee**
- Technical and content coordination: **Executive Board**

In addition, an **End User Advisory Board** and the **LEA partners** are lead and managed by VESTA.

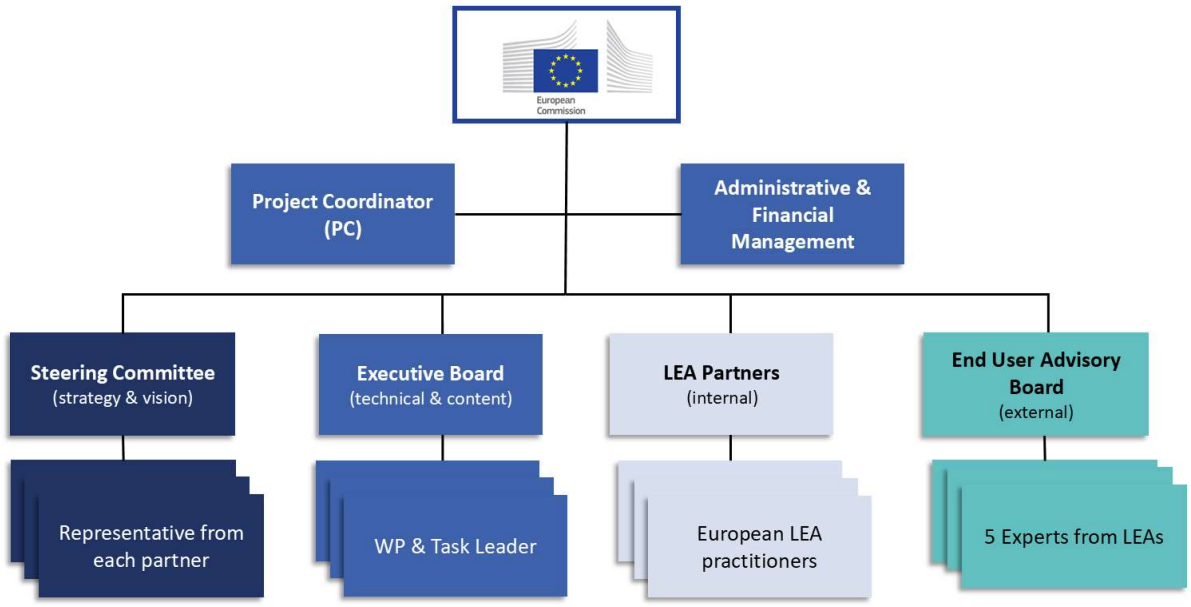

Figure 1: SHOTPROS Organisational structure

3.1 Consortium

SHOTPROS is primarily a Human Centered Research (HCR) project, the consortium and tasks are built around this requirement placing close attention to the LEAs´ needs and involving end users in every step of the project. The synergy of the human factor studies and the end user involvement drive the technological process towards critical scenario development in the VR.

Therefore, several meetings and interviews will be held with European Police Forces across Europe to plan the requirements, deliverables and impacts of the project and defined project

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partners from research and business. All 13 project partners have a strong relation with LEAs and a lot of experience conducting European-wide Police projects in crime and anti-terrorism topics.

3.1.1 Description of the Consortium

The consortium comprises 13 partners of 6 European countries, offering wide experience and knowledge in the areas of daily police work and police training, crisis management, human factors, psychology, movement science, social and impact research, stress measurement, VR technology, human computer interaction, criminology, law enforcement, international police cooperation and training of law enforcement personnel.

6 consortium members are law enforcement agencies (LEA) and highly experienced in police training and education and have a strong knowledge in creating training programs for different police areas. All law enforcement partners must deal with the topic of decision-making under high-stress situations and have an urgent need for a HF DMA-SR Training Framework. Therefore, they strongly support the objectives, concepts and results of SHOTPROS. Project representatives from the LEAs are involved in the topic of police training and the daily combat against crime and terrorism and will have a high impact on opportunities for education possibilities and programs. Especially the possibilities of VR environments (e.g. possibility to change context factors, training of larger groups, performance and stress measurement, repetition of sessions, etc.) will play an important role in future DMA police training.

4 members of the consortium are universities or research centres that are experts in the human factors area and domain requirements (criminology, police training and law enforcement, stress measurement, movement science, behaviour research, etc.) of this project, and together they complement the various academic needs.

The 2 industrial members are SMEs specialising in development of VR training, emergency management & training, HF research & design and networking in safety and security issues, and both industrial members are in close connection to LEAs (based on previous projects).

1 consortium member is a governmental non-profit organisation and End-User-Platform and will share its experience in organising national, European and international field exercises, training demos and events.

3.1.2 Complementarity of the Partners

This is a multi-disciplinary project, and great attention has been placed to ensure that the consortium covers the various aspects involved in SHOTPROS. Not only are the partners capable of dealing as effectively as possible with the tasks they have chosen to participate, but also attention has been given to balancing the research implementation and evaluation

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aspects of this consortium. Some of the partners have already collaborated before in other European projects or other frameworks and are aware of each of the capabilities and expertise. Personal acquaintance and past cooperation between some of the law-enforcement end users and researchers further enhances the complementarity and cohesion of this Consortium.

The partners complement each other in the focus of their research, domain knowledge and technologies, as is reflected by the specific tasks in the roles they have taken upon themselves to lead:

- KU LEUVEN focuses on the LEAs' requirements and ethical, gender & legal issues
- VUA creates the DMA-SR Model and the Training Framework & Curriculum (incl. tools, methods, concepts)
- AIT plans the HF Studies and designs the innovative VR features and prototype and together with UHEI a stress measurement tool suite
- ADCC IBZ creates a risk assessment tool
- RL will than develop and integrate these concepts, based on LEAs' needs and provide the VR environment (hardware & software)
- VESTA will be responsible for the evaluation of all results and manage all LEAs which are involved in all major project steps and establish a "VR Training Network" for LEAs.
- USECON will disseminate, exploit and communicate the results and the vision of SHOTPROS and coordinate all partners and manage the project.

LEAs have real-life and field experience of police training and development of training programs and the high need for an innovative training framework and curriculum for DMA-SR for their police forces. They will utilise their experience in training and define the requirements for SHOTPROS from several perspectives.

3.1.3 Participants list and contact details

To facilitate the collaborative work on this project, each partner nominates at least 2 contact persons and provides their name, e-mail address and project responsibility (content and / or administrative). The coordinator is responsible for maintaining the contact list (see Figure 2) and informing AIT about any new contacts that must be added to the project mailing list and to the SharePoint. The list is available on the internal project SharePoint and can be accessed by all partners but will not be published due to GDPR reasons.

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3.1.4 Roles of the partners in the project

All LEAs (BP, NPN, SPA, LAFP NRW, RMIA-DGL and ADCC IBZ) utilise their experience in police training and add their needs, wishes, concerns to the requirements and specifications of the future (VR) DMA-SR Framework and Training (WP2). They contribute from their experience to the development of scenarios and methodology of training and will participate in the Human Factor Studies and Experiments (WP4) and in the field tests for evaluation (WP7). They are an important part in SHOTPROS´ dissemination and exploitation strategy (WP8) and help to make our final conference to a top-notch experience event for the international LEA community. To ensure a high involvement and expectation management, the end user management is established as a task within the project (see D1.4).

USECON, with its senior project management team will coordinate, control and manage the project (WP1). USE will also utilise its experience and understanding of the commercial and policy arena and lead the dissemination, communication and exploitation of the project (WP8). USECON will also participate in the end user studies and trials with their user research & Human Factors experts and will contribute from its long experience of understanding user requirements and needs in contextual situations and domains.

KU LEUVEN has a strong experience in psychology and user-based requirement research. Therefore, they are responsible for WP2 “Requirement Analysis and User Research” from different perspectives and stakeholder views. Furthermore, KUL overtakes the topic for ethical reviews for all deliverables (WP1) and will organise together with VESTA the final conference (WP8).

VUA has a world-class expertise on performing under pressure, training for high-stakes performance settings, perception-action coupling, and decision-making and acting. Therefore, VUA is responsible for comparison actual trainings programs, creating and validating the HF based Multi-Dimensional DMA-SR model (WP3) and compile a European framework for training and assessment, using VR, of DMA-SR behaviour of LEAS professionals (WP3 and final version in WP7).

AIT will build on its strong research experience in technology experience and its recent advances in designing and assessing virtual reality bases training approaches. Together with AIT's strong history in successful research project execution on an international level, this ensures that AIT will successfully lead the work on Training Experience Assessment, Modelling and Scenario Development (WP4) and the creation and validation of a VR cue repository. Furthermore, the execution of numerous human factor studies and experiments and the

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quantitative modelling of trainee behaviour (WP6) will create novel datasets and experience and behaviour models.

RL will be responsible for the development of defined police VR scenarios, the integration of stress measurements and creation of the innovative after-review dashboard and will led therefore WP5. Furthermore, RL will provisioning the existing VR environment and hardware for the human factor studies (WP6) and the field-trials (WP7). RL will be responsible for the setup of the VR environment at the LEAs premises and the technical planning with them. RL will also overtake the important role as technical advisor in all WPs. In WP8 RL will develop the VR showcase for dissemination.

UHEI has long experience in conducting ethical, well-designed experiments which fulfil the international scientific standards and critical peer reviews. They have extended knowledge in the psychophysiology of stress. Therefore, they will support to outline study designs involving biomarkers, they will supervise the valid and ethical conduction of bio sampling and they will be responsible for the laboratory analyses of biodata (WP4, 6). As sport psychologists, they will contribute to the interdisciplinarity of the project by sharing their understanding of decision-making and performance under stress of elite athletes, as elite athletes- similar to police officers – are required to perform well under stressful circumstances (WP2).

ADCC IBZ is the Coordination and Crisis Centre of the Belgian Federal Government. Their expertise and experience are focused upon events which, by reason of their nature or consequences, threaten the vital interests of the country or the essential needs of the population. Among others, they consist of a Risk Analysis Department and a CBRN Expertise Centre. ADCC IBZ will aid in the identification of high-risk situations through the development of a risk assessment tool and the design of VR-scenarios which correspond to these high-risk situations (WP4).
Furthermore, crisis and risk communication expertise will allow ADCC IBZ to develop relevant strategies, decision-making support and toolkits for policy-makers (WP8).

VESTA has extended experience in training, teaching, disseminating new knowledge and organisation of mono- and multidisciplinary table top and field exercises. Two departments of VESTA will be particularly involved: The Police Academy, responsible for basic police training, having its own training infrastructure; and VESTA's Research Department with extensive experience in national and EU research projects. VESTA is responsible for the end user Management (see D1.4) and for planning and managing the field tests (WP7). Because of their expert knowledge in networking and setup communities they are responsible for establishing the planned VR Training Network and organise the final conference (WP8).

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Almost all partners have participated in previous Framework Program projects related to development of training methodologies and tools or in the development of technological platforms like that of SHOTPROS. All partners are committed to participating in SHOTPROS.

The long-term commitment of the end user partners (LEAs) relates to their ability to exploit the results of SHOTPROS and bring the impacts of the project to the daily Police work and training. The interest of the law enforcement end users is obvious, as they will gain access to a new way of conducting DMA training (enhanced by VR). Also, the possibility to gain expert experiences in the area of police training and VR scenarios are a big impact for them. The interest of the universities and research centres is to gain a new understanding of VR & Training possibilities, new ways to examine and measure stress levels and to set the methodological and theoretical foundations for cross national trainings in the area of DMA processes.

3.2 Project Coordinator

The SHOTPROS project is coordinated by USECON, represented by Markus Murtinger, the Project Coordinator (PC), who has successfully developed and managed large scaled international projects in the last 12 years in different areas related to human factors research and innovation.

The PC is assisted by Gerhard Helletzgruber (USECON) who has over 20 years of experience in the financial and legal management of EU projects in different areas, notably in the Human Factors and ICT areas. Gerhard Helletzgruber as Financial Officer (FO) is responsible for the administrative, financial and legal tasks for the Coordinator.

The strategic decision-making body (Steering Committee) is led by the PC. The Steering Committee as the key decision-making body is responsible for decisions related to strategic developments of the project, intellectual property rights and the evolution of the consortium (e.g. entry or withdrawal of a new party).

The PC is responsible for the operational, day-to-day decisions, working together with the Executive Board that has been designated at the kick-off meeting and is chaired the PC. The Executive Board as the supervisory body for the execution of the Project reports to and is accountable to the Steering Committee.

Description of work

- Prepare, update, and manage the Consortium Agreement and the GA between the partners.

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- Ensure overall legal, ethical, financial, and administrative management.
- Develop a project manual including quality assurance guidelines (D1.1).
- Project planning and internal reporting.
- Monitor the project progress of the agile development plan, milestones, and deliverables.
- Enforce quality assurance measures to ensure the production of coherent reports and deliverables (e.g., formats, review steps).
- Risk management: implementing procedures to handle and counter events that jeopardise the successful accomplishment of the project's objectives.
- Prepare and co-organise all bi-annual consortium meetings, general assembly meetings, executive board meetings and meetings with the external expert advisory board.
- Follow-up the communication with and reporting to the EC.

3.3 Executive Board

The PC is assisted by representatives of the work package leaders from the other partners in the consortium forming the Executive Board:

- **Markus Murtinger (USECON):** Markus Murtinger is the Director of Marketing and Sales at USECON. As project coordinator he is responsible for WP1 – Project Management and WP9 – Ethic requirements.
- **Valerie Schlagenhaufen (USECON):** As Marketing and Business Development Manager at USECON, Valerie Schlagenhaufen leads the WP8 – Dissemination, Exploitation & Communication.
- **Sebastian Egger-Lampl (AIT):** As a researcher at the Austrian Institute of Technology-Center for Technology Experience, Sebastian Egger-Lampl takes the Technology and User Experience view in the Executive Board.
- **Raoul Oudejans (VUA**): Raoul Oudejans is (Associate) Professor for Learning and Performing in Sports at the Department of Human Movement Sciences, Vrije Universiteit Amsterdam, and expert for training methods as well as perceiving and acting in high-pressure contexts.
- **Emma Jaspaert (KU LEUVEN**): As a criminologist in the juridical department of the KU Leuven, Emma Jaspaert is responsible for Ethics and Legal aspects in SHOTPROS.
- **Maaike van de Vorst (VESTA):** Maaike van de Vorst from Campus Vesta, the Trainings Facility for Emergency Management Training & Education, is the perfect representative of End-User Management in SHOTPROS.

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- **Christian Haarmeijer (RL):** Christian Haarmeijer as Managing Director from RE-liON is in close contact with the end users to advise on and define solutions tailored to their VR-training needs and will be involved in all technical SHOTPROS decisions.

The proposed executive board members have been selected with attention to gender balance and disciplines in the consortium. Procedure for operational decisions by the Executive Board: There is also a quorum required of three quarters (3/4) of its members are present or represented. Each member has one vote. Absent members are not entitled to vote but can authorise another member of this board to act as a representative. Decisions will be taken by a simple majority of the votes. The details of the decision-making procedures have been laid down in the Consortium Agreement.

3.4 Steering Committee

Procedure for strategic decisions by the Steering Committee: There is a quorum required of two-thirds (2/3) of its partners in total. Each partner has one vote. Absent partner members are not entitled to vote. Decisions will be taken by a simple majority of the votes.

3.5 End User Advisory Board

The consortium has formed an external End User Advisory Board of 5 experts from other law enforcement agencies that contribute their expertise to the project. The advisors are from the following organisations

- Israel national police & Ministry of public security
- Scottish Multi-Agency Resilience Training & Exercise Unit (SMARTEU)
- Zurich City Police
- Police Belgium
- Austrian Ministry of Interior

This ensures a broader pan-European multi-cultural and multi-national dimension when developing SHOTPROS. The advisory board will be invited to Consortium meetings (regular or online) and the final conference. In addition, they will be involved in the quality assurance of the project results by peer-reviewing the deliverables before submission.

The end user Advisory Board is led by VESTA and is a subtask of the end user management (WP1).

3.6 Work packages and WP-leader

Details see chapter Work packages, Schedule and Deliverables.

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Number	Title	Lead beneficiary
WP1	Project Management	USECON
WP2	Requirements Analysis and User Research	KU LEUVEN
WP3	Training Concepts & New Innovation Approach	VUA
WP4	Training Experience Assessment, Modelling and Scenario Development	AIT
WP5	Contextual VR Simulator-Toolkit	RL
WP6	Human Factor Studies & Experiments	AIT
WP7	Evaluation Phase with Field-Trials and Generation of Final Results & Impacts	VESTA
WP8	Dissemination, Exploitation & Communication	USECON
WP9	Ethics requirements	USECON

Table 1: Work packages and WP-Leader

4 Internal Communication

Communication between partners is predominantly by e-mail, Skype, the project's internal SharePoint, telephone, MS Word and MS Excel documents and PowerPoint presentations.

4.1 E-Mail

E-mails are the most common way to achieve efficient internal project communication. They are especially useful for bilateral conversations. The coordinator encourages the use of e-mails in the case of solving small specific issues. Furthermore, AIT provides a mailing list with all project partners that can be used for general updates, coordination issues and feedback requests.

There are two different lists:

shotpros_project@ait.ac.at: this list includes the contact persons for general project(-content) relevant matters including all participants that are actively involved in SHOTPROS

shotpros_admin@ait.ac.at: this list includes the contact persons for administrative and financial project matters

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The mailing list will be administered and updated by AIT in accordance with USECON.

Changes have to be communicated by the partners by e-mail to the Coordinator (e-mail: shotpros@usecon.com)

E-mails sent between partners have subject as follows

Subject: SHOTPROS – Topic

4.2 AIT SharePoint

A secure SharePoint for SHOTPROS is provided by AIT. All project partners have received an individual login and can upload / download documents, presentations, and pictures on the SharePoint.

4.3 Internal Newsletter

It has been decided to introduce an internal newsletter with updates about every work package in order to keep the consortium informed about the progress. Every WP-Leader is responsible to send 3 – 5 bullet points about the progress, issues and news of the work package every 2 weeks to USECON. The information is merged and sent out via e-mail every second Friday to all consortium members.

4.4 Internal WhatsApp Group

The internal WhatsApp group has been set up by the coordinator at the first Kick-off day to enable fast and easy communication within the partners. All members of the Consortium received an e-mail with an invitation link to the group. It was clarified that joining the group is not mandatory, still it might be helpful for fast updates.

4.5 Online Conferences

4.5.1 Individual

Typically, most of the collaborative alignment work within SHOTPROS is performed virtually via **video calls**. These are scheduled individually, depending on the needs of the project members, and must be completed by **meeting minutes**. The template is available on the project SharePoint and contains participants, content, decisions made and next steps. These minutes must be provided to the attending partners of the meeting and additionally to USE, who decides if the contained information must be spread to certain other partners or if any project challenges, or other issues have to be addressed. These meetings are organised from the WP leaders and respond to their operative planning.

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4.5.2 Periodically scheduled

To additionally ensure a closer **overall monitoring** of the actual work, USECON will arrange fixed 3-monthly online conferences with the WP leaders and the responsible Task leaders. The current **project status** of the WP and the corresponding tasks have to be presented via **slides** to the other attending partners. Besides the fact that all project partners are updated on the status, this presentation offers an opportunity to gain feedback from other partners on the work carried out and facilitates to address open issues and to discuss solutions. Additionally, to the WP overview, these meetings also cover the (internal) 3 monthly **effort reports** (see Internal Reports Procedure) and therefore will be scheduled after the reporting period to facilitate the project progress monitoring in terms of actual vs. planned person months. The timely reporting periods are visible within the project management tool (see chapter 5.4 SHOTPROS Project Management Tool**Fehler! Verweisquelle konnte nicht gefunden werden.**) on the internal SharePoint. The objective is, to close the loop of the ongoing and planned work packages.

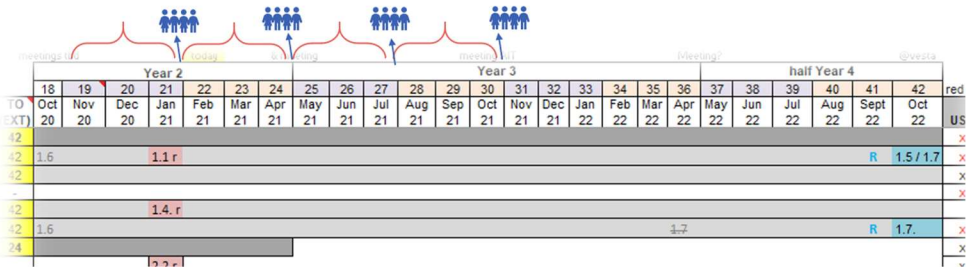

Figure 2: Reporting periods and 3-monthly online conferences visible in the SHOTPROS Project Management Tool

To evaluate the deviation of actual, planned, and open tasks and efforts attached to the work packages is the key goal of these meetings. Furthermore, they offer each participant an opportunity to address challenges occurred during the actual work concerning other partners and to ask for feedback or review. The common sense on the project objectives is strengthened by these measures. The goal is also to avoid work that has no impact on the project objectives and to focus the collaboration even with partners that do not contribute directly to a WP. This offers all partners an overview on the past, the present and the next steps of the project.

All online conferences will be followed-up by hand-outs and meeting minutes which will also be made available at the SHOTPROS SharePoint.

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4.6 Consortium Meetings

Ordinary consortium meetings: To facilitate the overall consortium meetings, USECON will organise the following meetings jointly with the host partner:

- USECON will organise the 6-monthly consortium meetings jointly with the host partner. All partners are expected to send at least one representative. They should be arranged timely together with the project reporting period and the periodic online conferences (see chapter 4.5.2 Periodically scheduled meetings and chapter 6.2 Internal Reports Procedure) to bundle resources.
- Additional meetings of the consortium or parts thereof if requested by the Executive Board.

An effort will be made to combine all meetings with other project activities such as the field trials in WP7 or networking meetings in WP8 and link them to some of the planned dissemination activities.

SHOTPROS has planned the following 7 consortium meeting over the 3 years:

	M1	M7	M13	M19	M24	M30	M36
Location	**Vienna**	**Leuven**	**Vienna***	**Selm***	**Amsterdam**	**Vienna**	**Ranst / Antwerp**
Organising partner	AIT/ USE	KUL	AIT/USE	LAFP NRW	VUA	AIT/USE	VESTA/ KUL
Date	May 19	Nov 19	May 20	Nov 20	Spring 21	Tbd	Tbd

*CM in M13 and M19 conducted online due to COVID-19

Table 2: Planned Consortium Meetings

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5 Project Management and Quality Assurance (QA)

As SHOTPROS is a long-term, multidisciplinary, innovative, and agile project, project management is a **key for successful accomplishment**. Therefore, project management and corresponding quality assurance have to be the base of SHOTPROS and available at any time to all partners. The following chapters provide a clear management plan concerning the procedures of the project, ensure compliance with the requirements set by the European Commission, minimise conflicts, and enable efficient and accurate work as well as a high-quality outcome.

5.1 Project Management

The following caption can be found at the very beginning of the DoA in the SHOTPROS GA[1]: "SHOTPROS Overall Vision: Innovation-driven by European LEAs needs".

Evidently, innovation and end user involvement are the foundation of this technology driven project and therefore, an agile development approach is suitable.

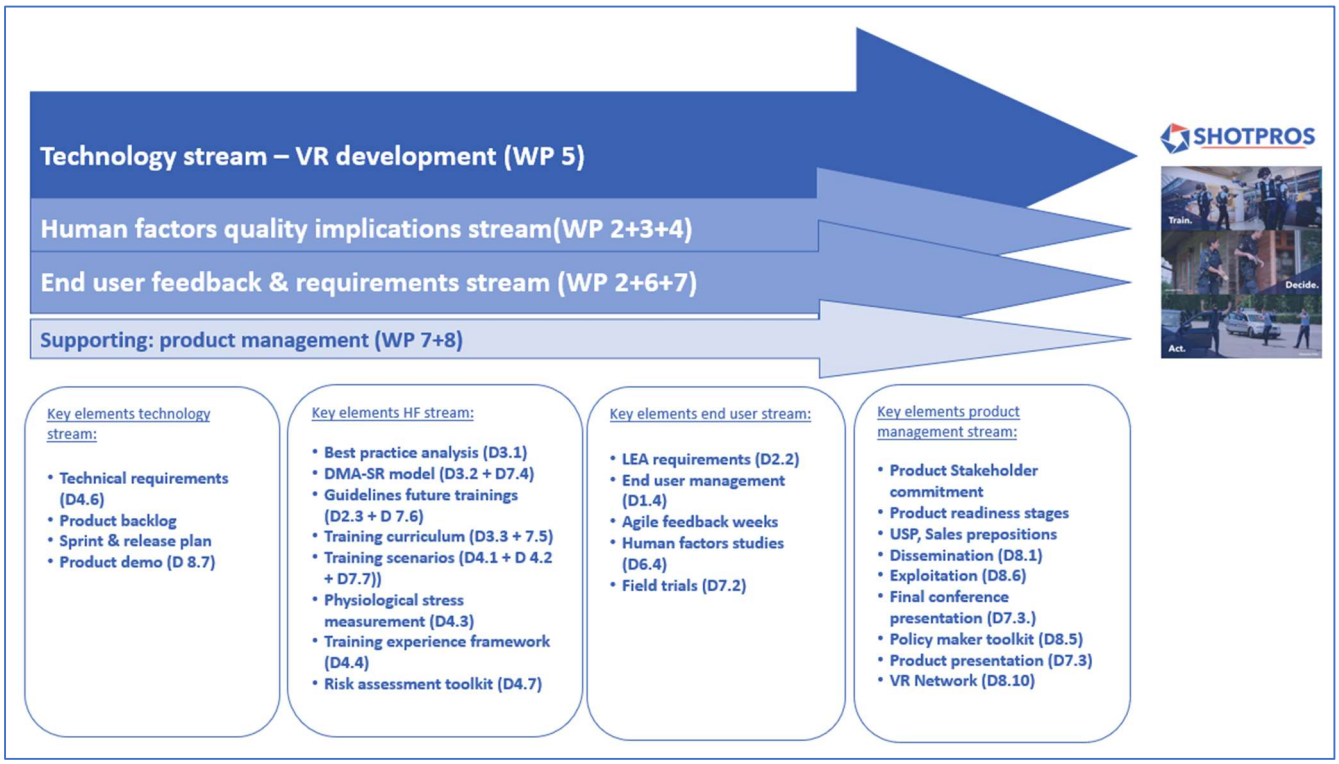

Figure 3 SHOTPROS main and supporting project streams

[1] SHOTPROS proposal – chapter Excellence *or* SHOTPROS GA – Annex 1- chapter Excellence

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SHOTPROS combines different project streams with different key elements and individual needs to a common objective. The streams (such as VR development, human factors quality implications, end user feedback & requirements and the supporting stream of product management) have to be managed according to their nature (such as: agility of software development; detailedness of scientific studies; research deliverables with the necessity for peer-reviewing, exploitability of results; necessity of end user feedback integration to develop user centred solutions etc.) and need to result in a joint project view. To ease this approach, an overall **project management tool** (see SHOTPROS Project Management Tool) is provided by the coordinator to secure a high agility of the interplay of the 4 above mentioned streams. This tool consists of different views regarding timing, deliverables, and agile technical development and enables the partners to manage their own tasks and the PC to manage the project in general.

The SHOTPROS project management approach consequently consists of **2 main aspects**:

- Continuous **agile development** management
- Project management for **deliverables** (strategic and operational)

5.2 Agile Development and Scrum Process

Reflecting the nature of SHOTPROS as a technology experience driven project, we need to be flexible, fast, and adaptable to the end user, stakeholder, and the technology needs. Scrum is an agile development method with a defined framework on how to deliver software. The idea is, to deliver software incrementally instead of at once to offer the opportunity of feedback.

This means: Many development cycles (= sprints) follow each other to a final product. After each sprint, a new piece of software is released and can be feedbacked. In business projects this often implies, you cannot actually sell the product after a few sprints – this might take longer - but you have one main advantage: You can easily involve the future customer at an early stage of the product and thereby strengthen the business success of a product.

Typically, within **agile software companies** there is a **product owner** (usually with business background and technical understanding – who decides on the business design of the product and the prioritisation of features) and the **development department** (coders, technical architects etc. - who decide on the technical design of the product) who form the agile team together with supporting roles like scrum master, testing department or others. To strengthen the decision-making of the product owner on features and their order in the implementation, the product is regularly made available to existing or potential customers for feedback to focus on the business success of the product.

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To better understand the framework behind agile and scrum as common software development methods, a factsheet was sent out to all SHOTPROS partners to spread know-how (see Annex IV – Scrum & Agile Factsheet).

Practice shows, the guidelines of this framework are typically adapted to the individual needs of a company or a project team. For **SHOTPROS** the following process will be implemented:

5.2.1 Roles

SHOTPROS development partner (RL) and the scientific coordinator (AIT) together with the project management partner (USE) and supported by representatives of the LEA organisations (end user view) form the **agile team**. Other partners contribute with **quality implications** (VUA, KUL, UHEI), their valuable knowledge as **end users** (RMIA-DGL, SPA, BP, NPN, LAFP NRW, ADCC IBZ) or organisational **infrastructure,** such as project management, end user management or coordinative functions (VESTA, USE, AIT). The agile development (implementation) as part of WP5, is owned by RL. The agile product management process is also part of WP5 and owned by USE and AIT. LEA partners account on the WP6 (HF studies & feedback weeks) and WP7 (field trials). Studies are accounted on the several study budgets (WP 6, 7) as planned in the DoA.

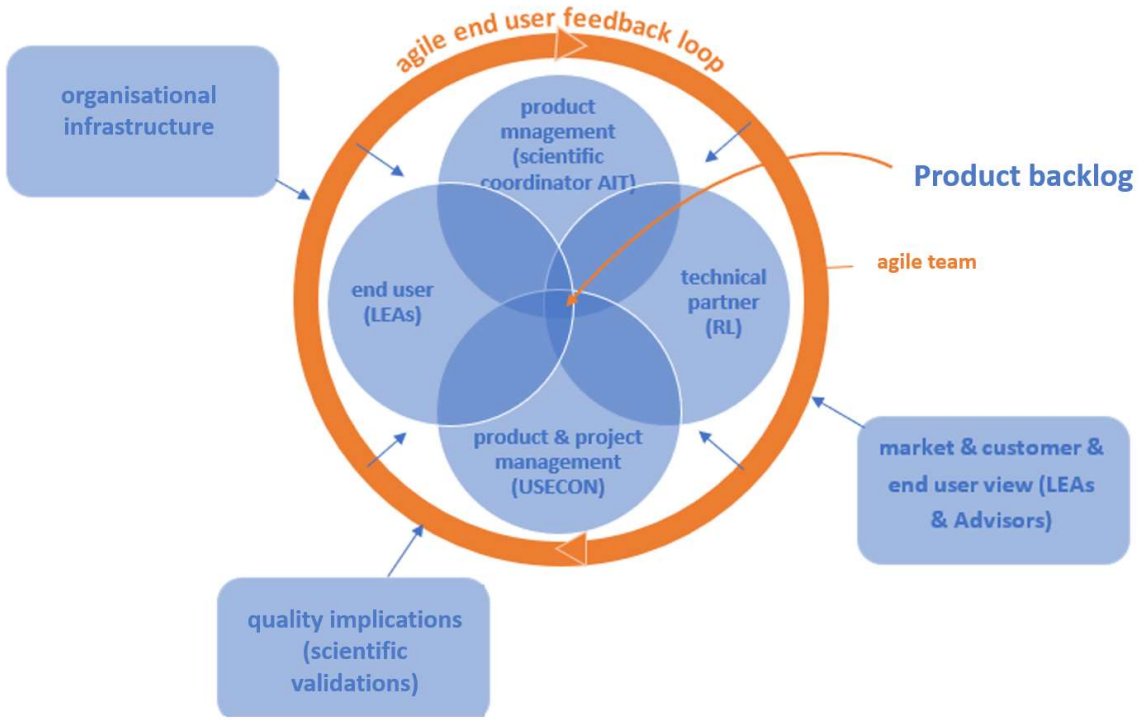

Figure 4: SHOTPROS - agile roles

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5.2.2 General Steps

The agile team consist of a developer representative (RL), a product owner (AIT) and a project manager (USE). The latter two are the **owner** of the **product backlog** (product owner), which combines all **estimated** and **prioritised requirements** (independent of the source) towards the SHOTPROS VR solution on a user story level (For details see 5.2.4 Requirements Process (Product Backlog, Prioritisation and Planning))

The development partner translates these requirements from the product backlog into **technical backlog** items (internal requirements tracker tool and tools like JIRA etc. by RL). Within the technical backlog, technical specifications can be added, and the actual software and hardware **implementation** can then be executed.

Which product backlog items are developed at what time, is defined in sprint planning and release planning meetings. After each sprint, the recently implemented **software and hardware increment** is **reviewed** by other roles than the developers themselves. During regular sprints, the review is done by the **product owner**, but if it is a sprint closing with a release, the new features are reviewed and feedbacked by the LEAs and Advisory partners (end user) in terms of a so-called **feedback week**.[2] This feedback is again incorporated as requirements into the product backlog and considered within the next release to be implemented in the software. For more details on the difference between sprint and release (see chapter 5.2.4.2 Sprint & Release planning).

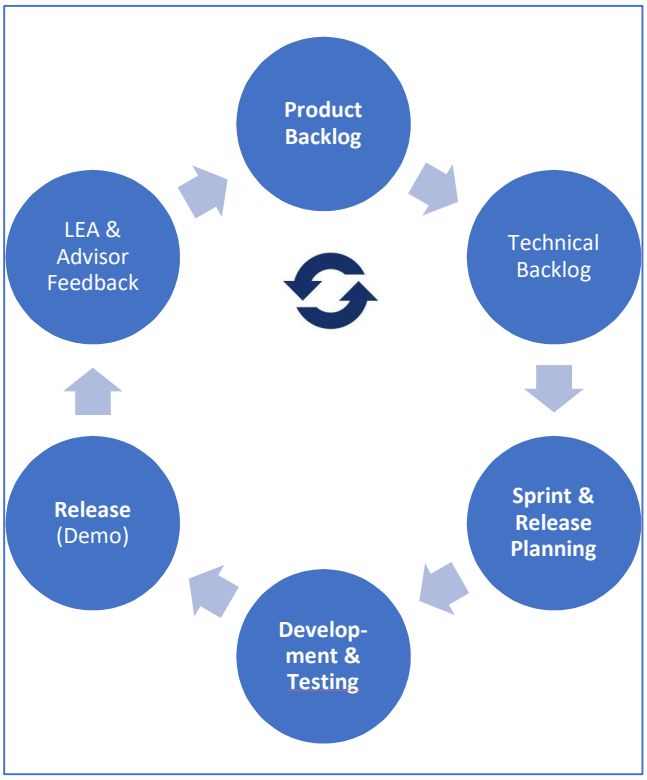

Figure 5: Single sprint cycle - SHOTPROS VR development

5.2.3 Timing & Releases

Releases	Sprints	Feedback weeks / end user involvement
7	25	6 + HF studies (WP6) + field trials (WP7)

Table 3: Overview on SHOTPROS agile events for RP2

[2] Which review type is applied, is marked in the Sprint Plan within the **Fehler! Verweisquelle konnte nicht gefunden werden.**.

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All concrete timings for the following process steps and framework are available in the SHOTPROS Project Management Tool on the project SharePoint for all partners.

SHOTPROS agile team decided (due to RL internal processes and practical application) to work with **sprints** with a **duration** of **3 weeks**. These sprints follow a certain process (see figure above in chapter 5.2.2) and each sprint iteratively follows this cycle. The sprints are strung together and after a defined number of sprints, an incremental software release is provided. SHOTPROS delivers **7 releases** until the end of the project when the final project solution will be available like defined in the DoA.

After each sprint, the product owner **reviews** the developed features according to the requirements defined for this sprint in the sprint planning meeting (see chapter 5.2.4.2). After a planned number of **sprints** (3-8 sprints[3]) a software **release** is provided. Each release delivers a **software increment** that is **exploitable by** end users. The information what is available for a user with this certain release, is communicated by release notes, that will be sent to all SHOTPROS partners. So, each release has to achieve an **overall readiness level** (O.R.L: - defined as ready to be tried out by a future customer or end user – no major bugs, interface working, connections available, etc.) and then can be presented to the **LEA** and Advisory partners for end user **feedback** within the so-called end user feedback weeks (see chapter 5.2.5 End user feedback). This feedback **again** represents a **source** of requirements for the product **backlog**.

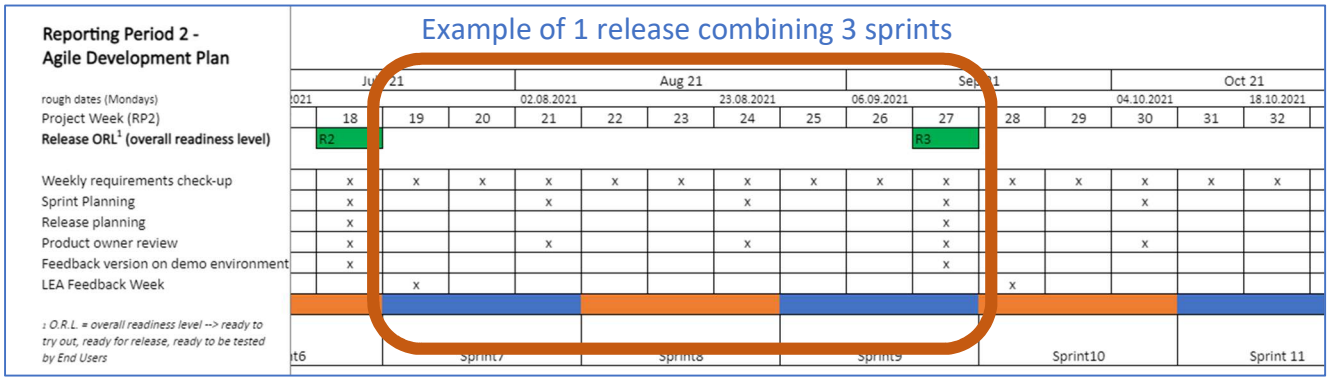

Figure 6: Screenshot of the SHOTPROS Sprint/Release sequence (SHOTPROS Management Tool)

[3] The long sequence of sprints for a release only occurs during the field trials (WP7 – final validation), where several intermediate demo releases are planned, but need to be released flexibly depending on the study set-up and the ad hoc needs and therefore can not follow the regular release cycles.

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The **development process** itself, also follows the scrum framework (such as transferring the items from the product backlog into the technical backlog, creating technical specifications, the development tool, coding, referencing, reviewing and defining and executing test cases, daily scrum meetings, sprint retrospective etc.) and is part of WP 5 and executed by RL. For this purpose, RL's internal company processes and tools are used to ease the integration of the project into the internal processes. To have a better overview on the status of the solution, the **result** (done and tested) is then transferred back into the SHOTPROS **product backlog.** Therefore, the SHOTPROS agile team agreed on unique **backlog item numbers** used for the product backlog and the technical backlog to be comparable.

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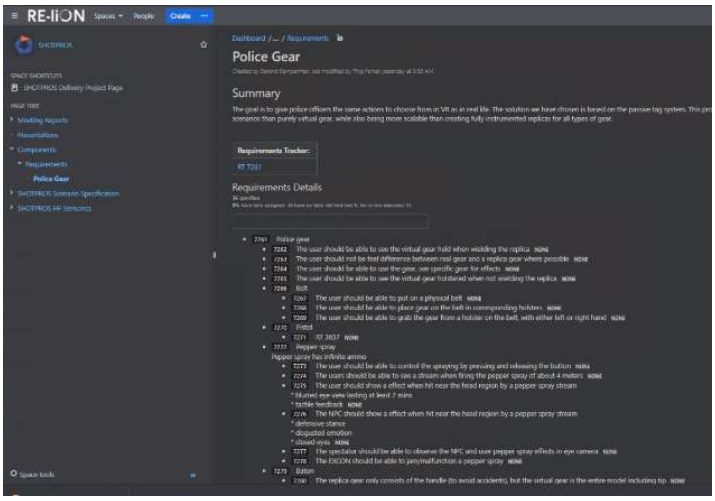

Figure 7: Screenshot RL internal technical requirements tool – user stories from product backlog transferred into items in the RL internal technical backlog

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5.2.4 Requirements Process (Product Backlog, Prioritisation and Planning)

To define the product backlog, the SHOTPROS agile team has **weekly requirements meetings** (Tuesdays) to **screen** new requirements, **decide** if and how they are transferred into the product backlog and to prioritise them.

Requirements regarding the SHOTPROS VR solution typically come from very different sources. The end user feedback and the scientific analyses, studies and quality implications (SHOTPROS WP2,3,4) are the **two main sources** (marked with orange outlines in the figure below).

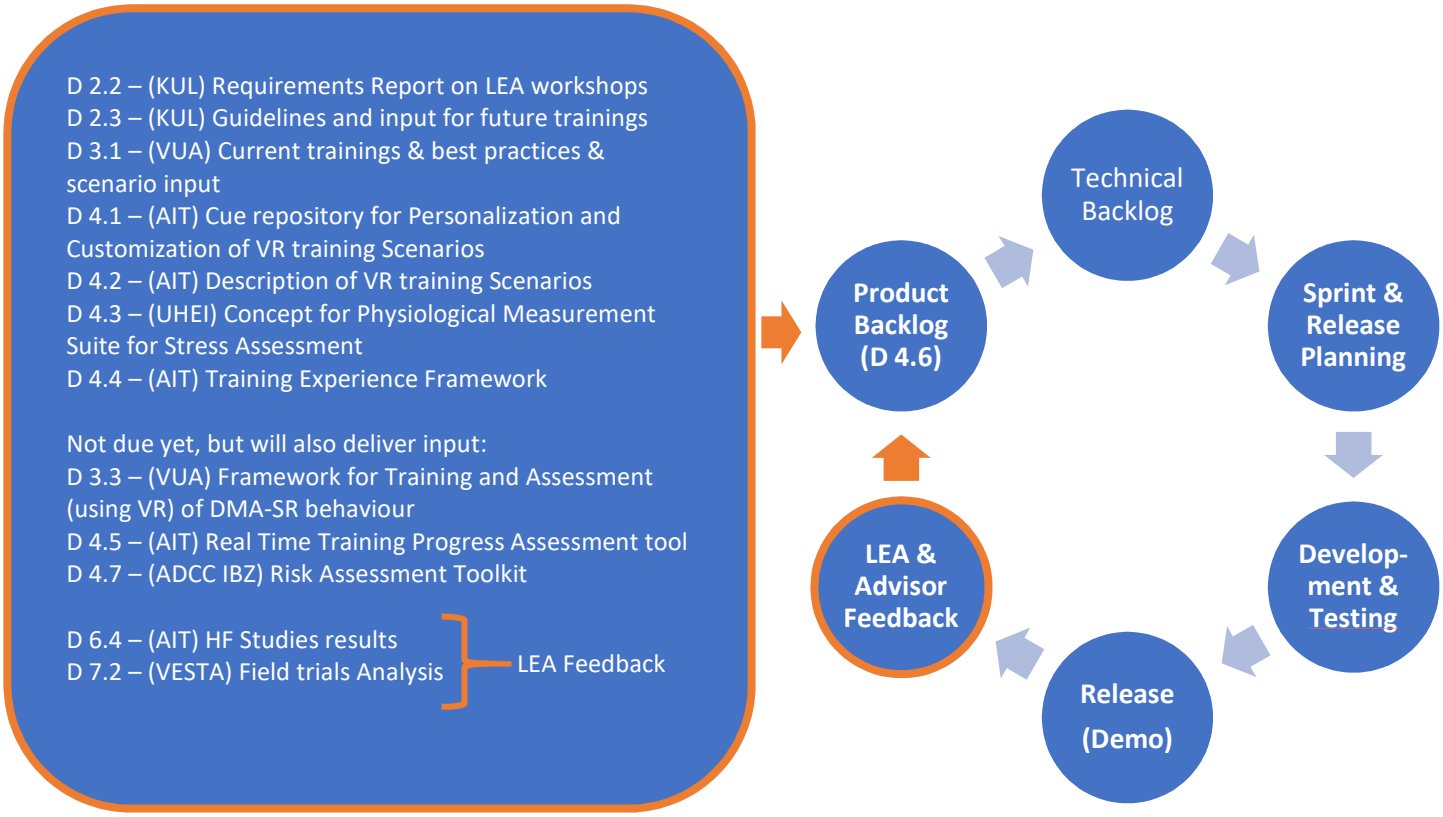

Figure 8: Main requirements sources (orange outlines) for SHOTPROS product backlog

One **source** is the end user feedback collected, for example, during requirement workshops, feedback weeks or directly sent to the agile team. This is combined and structured in an exploitable way (if not already done as part of a workshop or the feedback weeks) by AIT.

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The second source are scientific deliverables or other quality implications, where requirements regarding the VR system are defined by the SHOTPROS partners.

Requirements, independent of the source, are now **transformed** into **user stories** ("As a user I want to…"-descriptions) by AIT. This description reflects the needs of a user towards the technical solution and then can be entered as items into the **product backlog list**. Occasionally a product backlog item has to be enriched with a specification, user interface scribble design or flowcharts to show processes or details. These are stored separately (but linked to the list) on the project SharePoint to be available during technical specification and coding of the specific product backlog item.

The **items** (description/user story) are listed in the product backlog and **enhanced** with:

- a unique identification **number**
- the **source** (such as requirements workshop, deliverable, etc.)
- a rough **estimation** regarding development resources
- its **impact** to the final product (objectives)
- a development **status** (done, tested etc.)
- a **priority** (based on the mention frequency and the overall project objectives)
- a **release mapping** (when will it be implemented, as a result of the planning process)

This result (priority, feasibility and when is the requirement planned to be available) is communicated back to the LEAs by Release newsletter (see D1.4)

5.2.4.1 Prioritisation

To prioritise product backlog items, the end user prioritisation is the main source. This end user prioritisation comes from the structured feedback weeks or requirements workshops and form the base for the product backlog prioritisation. But other facts also need to be considered.

SHOTPROS product backlog prioritisation criteria:

- End user prioritisation as part of the feedback weeks or other end user meetings
- Frequency of mentions by end users
- Technical feasibility
- Efforts needed to achieve (ROI)
- Market compatibility regarding stakeholder needs
- Usage of the KANO Model for software product management, where expected customers' satisfaction is opposed to product function over time
- Experience of the agile team, supported by the project partners if needed

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This is done by the agile team, but the results are transferred back to the LEAs.

5.2.4.2 Sprint & Release planning

All applied **dates** for the planning can be viewed in the SHOTPROS Project Management Tool, tabs “agile release plan” and “detailed sprint plan” but typically take place one week ahead the start of a new sprint or additionally one week ahead of a new release.

Several sprints form a release. A release has a more “external” character, whereas a sprint is more an “internal” way to divide the workload into smaller pieces to better overview the work to be done to achieve the overall product goals.

After prioritisation, the product backlog entries are compared with the available development resources (person days or months) for the upcoming sprint and then marked in the product backlog with the according sprint which represents the scheduling for development. So, with each sprint planning, the development partner RL knows what to be done within the next cycle.

Release planning considers several iterative sprints, combined to an exploitable software package, which results in an end user feedback week. A release follows larger objectives than a single sprint. It also involves product management efforts like product objectives (exploitation), release notes in a marketing language (future customers – stakeholders like LEAs and Advisory partners but also policy makers should be addressed by the language used).

	Tuesday	20.04.2021		weekly dev/requirements
	Wednesday	21.04.2021		
6	Thursday	22.04.2021		
	Friday	23.04.2021		
	Saturday	24.04.2021		
	Sunday	25.04.2021		
	Monday	26.04.2021		
	Tuesday	27.04.2021		weekly dev/requirements
	Wednesday	28.04.2021		
7	Thursday	29.04.2021		
	Friday	30.04.2021		send out release notes
	Saturday	01.05.2021		
	Sunday	02.05.2021		
	Monday	03.05.2021	feature freeze	release note to be prepared
	Tuesday	04.05.2021	RELEASE planning	weekly dev/requirements
	Wednesday	05.05.2021		
8	Thursday	06.05.2021		
	Friday	07.05.2021	end of Sprint2	RELEASE 1 - ORL
	Saturday	08.05.2021		
	Sunday	09.05.2021		
	Monday	10.05.2021	Sprint 3 Start	Start RELEASE 2
	Tuesday	11.05.2021		weekly dev/requirements
	Wednesday	12.05.2021	End User	
9	Thursday	13.05.2021	feedback week	
	Friday	14.05.2021		

Figure 9: Screenshot - Detailed sprint and release Plan (timing) and regular meetings/events/todo’s

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5.2.5 End user feedback

The **feedback weeks** are always scheduled right after a new release is available on an overall readiness level (O.R.L.; see chapter 5.2.3). The dates are available within the end user management calendar (see D1.4).

In this stage of the process, LEAs try out the solution and give evaluation feedback from their view as actual users of the solution (on-premise of the technical partner and on-premise of the LEA partner to provide a higher personnel amount). During the feedback weeks, concrete feedback on the current development increment is obtained, new requirements are collected, and their need priority is defined (this represents the prioritisation in the product backlog). The methodological foundation and procedure for the feedback weeks are defined in advance and, due to the current pandemic situation, are always planned in two variants (on-site versus online). Thus, regular feedback is warranted, and hybrid planning is not impaired by the Covid-19 situation (see D1.4). In addition to the evaluation, the comparison of the original end user requirements and the current characteristics of the system is also collected (experience management gap analysis).

These valuable results again melt into the **product backlog as additional requirements or change requests** (item entries) and will be (after prioritisation and feasibility analysis) incorporated in the next sprint(s) – also see chapter 5.2.4 Requirements Process (Product Backlog, Prioritisation and Planning).

5.3 Deliverables project management

As SHOTPROS combines the world of technology with the scientific world, there is a high need to manage the different streams accordingly to their nature. Therefore, the process for the deliverables needs to be managed differently than the agile development process described above.

The deliverables process has been defined to ensure high quality and to foster collaboration between all relevant partners for the submission of deliverables. This procedure is mandatory and must be followed. To facilitate the process, USECON has developed a deliverable tracking document (see Annex I – Deliverables and due dates) that provides an overview of all deliverables, responsible and involved partner, dissemination level, submission, and internal review date. Also, information about delays or re-openings by the EC are indicated in this document.

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5.3.1 Deliverables creation and peer-review process

The partner responsible for a deliverable has to collaborate with all involved partners (involved partners are marked in the GANTT chart of the SHOTPROS Project Management Tool). The deliverable owner is responsible for the compilation of the document (or other form of submission) and has to collect all relevant materials. Regular meetings to synchronise activities of the partners are important to keep the exchange on the different perspectives alive. The gathered information is compiled by the responsible partner and every draft deliverable is reviewed by following the appointed peer-review process:

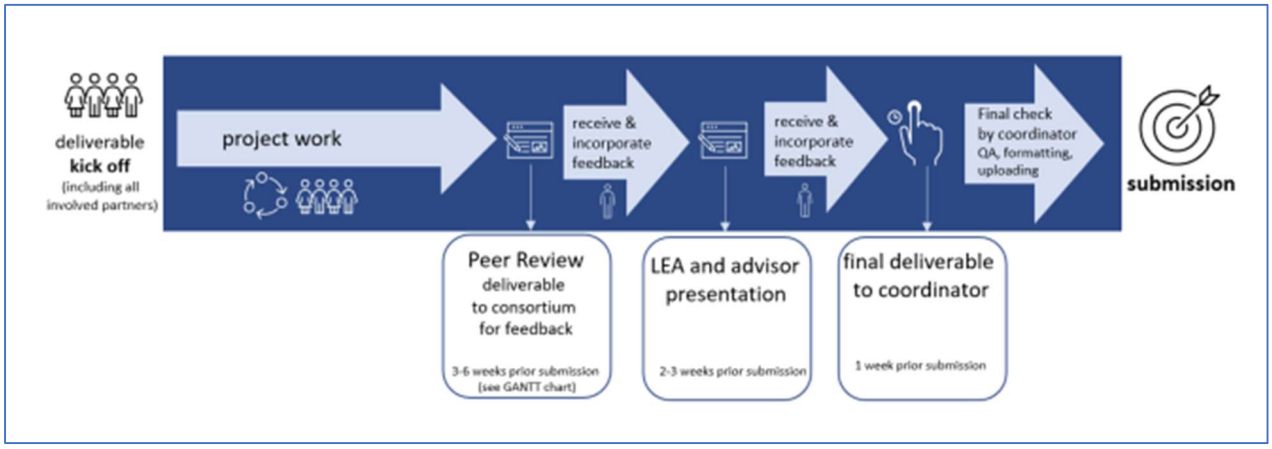

Figure 10: Work & peer review process for deliverables

1. **Working**: The process for a deliverable starts with a kick-off meeting for the WP and the tasks (including all collaborative partners on this deliverable). In this meeting the efforts, responsibilities, objectives and main content is set up together and strengthened via meeting minutes. The project management regarding timing is incumbent upon the task leader. To improve collaboration and interdisciplinary input, task leader may involve and / or gather input from other partners as planned in the DoA following an agile approach. Then the actual working phase continues.

Peer review & feedback: To deliver high-quality and beyond state-of-the-art solutions, the consortium decided to introduce a peer-review process. As soon as the draft deliverable is compiled and at least when the internal review process is due (see marked "R" in the GANTT chart in the SHOTPROS Project Management Tool or screenshot in

2. Annex II – GANTT view within the project management tool), the responsible partner must send it to the selected partner (defined in the tab deliverables list) for feedback that needs to be incorporated.

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The peer-reviewing partner needs to review according to the following criteria (template see Annex III):

- **Technical and scientific value** – Is the added value sufficient and scientific consistent?
- **Structure** – Is the structure of the deliverable logic and comprehensive?
- **Clarity of content** – Is the way how the results are elaborated clear for other readers even if they are not directly involved in the project? Is the content consistent and is the added value clear?
- **Relevance to objectives** – Is the result covering the SHOTPROS objectives?
- **Exploitability of results** – Can the results be exploited within the dependent deliverables and the technology stream of SHOTPROS?

This feedback needs to be commented within the deliverables text and needs to be answered by the deliverable's owner. This feedback needs to be kept available to the EC if requested and therefore must be stored separately to the document (one document with comments, one without for submission).

3. **LEA and advisor presentation**: Within two-three weeks before the deliverable is due, the **deliverable owner** must schedule an online meeting with the advisors and LEA partners (depending on availabilities) to present the key facts and content of the deliverable (as an executive summary slide deck) and gather feedback from practitioners. This feedback will be reviewed and accordingly integrated into the deliverable at least one week before submission. (Meeting minutes of this meeting need to be stored together with the peer review minutes).

4. **Final internal check**: After the re-iterations and corrections and at least one week before the submission, the document will be forwarded to the Project Coordinator for the final revision, formatting, version controlling and quality control.

5. **Submission**: Subsequently, the deliverable will be submitted as PDF to the European Commission in a timely manner by USE.

5.4 SHOTPROS Project Management Tool

The major goal of this tool is, to visualise the underlying agile methodology and to view the status of the overall project in real time to all project participants and therefore to enhance the agile collaboration and especially coordination between all WP participants including LEAs and external advisors.

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This tool offers an overview on the status of the project deliverables and software releases regarding **time**, **responsibilities**, **involvement,** and **efforts (person months) regarding the present, the past and the future.**

Different tabs in an MS Excel sheet allow this overview and deliver insights for all partners:

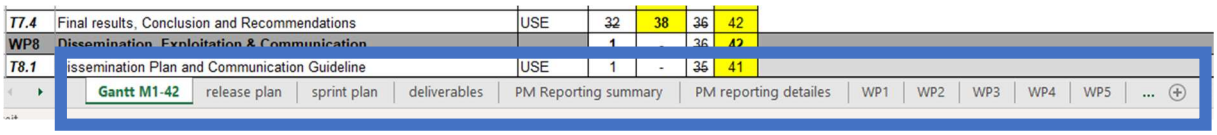

Figure 11 Tabs - SHOTPROS Project Management Tool

- **TAB 1 - GANTT view M1-M42** – *represents a general overview (combining the agile and the deliverables plan)*
  Within this view you see the listed WPs and corresponding tasks in line with the due dates of the dependent deliverables and software releases within a monthly timeline. The responsible executors and involved partners are visualised in a matrix to see who should be involved and has a planned budget for this task.
  This table supports the partners in getting a quick overview and considering the timing and dependencies of the different tasks and releases while accomplishing the project objectives.

- **Agile development plan**
  - **TAB 2 - Release Plan**
    This tab delivers a full view on the technology stream of SHOTPROS. You see the iterative sprints, combined to several releases during the project time. The valuable feedback weeks with end users, weekly requirement check-ups within the agile team, sprint and release planning meetings, internal technical walkthrough of software increments and the readiness level of a release are visible. Furthermore, the summary of a stakeholder roadmap of the releases is introduced, to make the single release objectives visible.
    This table supports the agile team in planning the efforts and features along the product roadmap.
  - **TAB 3 - Sprint Plan**
    This tab delivers a more detailed view on the technology stream of SHOTPROS and represents the detailed plan on a daily basis, which should provide the agile team members with a better overview of the weekly tasks.

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This table supports the agile team to plan their daily work.

- **TAB 4 - Deliverables List**
  Following the GA of SHOTPROS, this list shows all relevant deliverables, their nature, the responsible partners, who will review the deliverable internally, the status and the due dates (internal for reviewing and external for submission).
  This table supports the partners in the deliverable creation considering timing and status.

- **Effort reporting**
  - **TAB 5 - PM reporting summary**
    This locked table summarises the financial data reports of each partner (person months) in a general view summarised on plan vs. actual (up-to date data) entries.
    This table supports the partners to have an up-to-date view on used and planned efforts (person months) for all WPs

  - **TAB 6 - PM reporting details**
    This detailed view on the individual WPs regarding efforts (person months) is the heart of the project steering and risk management and delivers the data for the internal financial reports and represents the source for the external financial report. Regularly the partners enter their spent and planned efforts for each WP and herby see deviations and possible risks. This data is considered during the risk appointment during the regular online conferences representing the internal 3-monthly reporting periods.
    This supports the partners in visualising possible deviations from the plan and identifying risks regarding spent person months for the past periods but also for upcoming periods.

- **TABs 7ff - Individual WP plans**
  To support the partner in planning their WPs on a task level, the PC introduced these templates for individual WP planning. These planning is internal and not mandatory but can support the partner in task level steering.
  These tabs support the partners in their individual task planning

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5.5 Quality Assurance

Quality Assurance relates to the full range of SHOTPROS activities and is therefore an integral part of the SHOTPROS Project Management. It intends to ensure the quality of the entire project by setting goals and standards regarding the services and information, the description of the various processes and finally the measuring of the results against the goals set.

The following components of the project are monitored and controlled to assure high quality and standards. The implementation of the aforementioned objectives will continually be monitored and improved by the project coordinator wherever necessary. The project components that Quality Assurance procedures apply to are:

- Project and financial management
- Structured Feedback
- Records
- Documents & SharePoint

5.5.1 Project and financial management

5.5.1.1 Project Planning

The Steering Committee (SC) composed of senior representatives from all partners monitored by the Executive Board (Executive Board) ensures the reviews of the deliverables and the establishment and execution of the agile project plan:

- To ensure milestone and release dates are on target.
- For any changes in scope.
- For possible trouble spots.
- To ensure the project is not in jeopardy.
- To ensure high priority items are being resolved.

The DoA and the Project Management Handbook set the guidelines for project planning. All meetings are documented in minutes as a complementation to the DoA. The PC uses a project management tool (see SHOTPROS Project Management Tool) including a Gantt chart to monitor the status of all tasks of the project and the agile development of the SHOTPROS VR solution. This enables the PC to track the progress and to identify and prevent possible delays. Any changes in the project planning must be communicated to all partners by the coordinator.

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5.5.1.2 Project management

The following tasks are fulfilled by the coordinator USE and AIT:

- Revise and maintain all work plan streams of the project.
- Keep the work breakdown up to date, planning and track progress regularly.
- Ensure that project information is available and well known to partners working on the project.
- Maintain the internal project SharePoint where all project documents, templates and images will be kept, categorised, maintained and are made available to all project partners.
- Ensure frequent communication of progress among partners through e-mails and the other internal communication channels.

5.5.1.3 Technical stream with an agile framework

The technical part of SHOTPROS is strongly managed by an agile framework focussing the software implementation and considering end user and future customer needs. Fixed iterative sprints and combining releases ensure the flexibility within the given framework to achieve the technical goals.

5.5.1.4 Financial management

The PC reviews the budget for:

- Cost overrun potential
- Actual versus budgeted euros and efforts to date
- The PC and each partner will keep detailed accounts for the use of the funds of the project which will be available at all times (and up to 5 years after the end of the project) to be produced upon request of the Coordinator, the EC or any external auditors assigned by the EC.
- Each partner is responsible for the proper use of funds allocated to him and for the reporting of all expenses to the PC.

5.5.1.5 Financial Records

The following records are kept for financial control as specified above:

- **Timesheets:** All partners must fill in timesheets for each person working on SHOTPROS for each month. The originals will be kept in the partners' premises ready to be presented to the European Commission in case of a Second Level-Audit

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- **Financial statements:** Each partner must draw up financial statements periodically in accordance with the reporting principles laid down in chapter 6 Reporting & Monitoring
- **Transfer of funds:** The Coordinator will inform the partners of any payment received by the EC and send out a breakdown with an overview of the proportionate share based on the accepted costs by the EC. The PC will forward the proportional payment of the balance from the EC without delay (no later than 14 days upon reception) to the bank account of the beneficiaries indicated with the Financial Identification Form from each partner.

5.5.1.6 Risk assessment

To deal with risks within the project a risk assessment procedure was established. Risks are listed and assessed on a regular base. See details in chapter 6.3. known risks like the Covid-19 situation (travelling restrictions etc.) or a potential decrease in end user participation are already considered in the detailed end user management plan (see D1.4).

5.5.1.7 Regular Online Conferences

To sum up the project management and financial management quality assurance, 3-monthly online conferences take place to regularly ensure the reporting and the project know-how transfer within the partners and to detect challenges and potential risks regarding technical output and financial handling. See 4.5 Online Conferences.

5.5.1.8 Organisation and reporting of project meetings

The PC will be responsible for:

- Timely preparation of reports on progress, meetings and workshops (compiled by using input from the partners).
- Compiling the reports from the participants into Consortium reports to the Commission.
- Timely submission of Reports to the Commission.

Additionally, regarding the organisation of **consortium meetings,** the project coordinator will send out an agenda (in draft form) at least three weeks prior to the meeting by e-mail to all partners. The partners will have one week to propose contributions and add new specific subjects with the agreement of the project coordinator.

Travel/accommodation details will be circulated during the meeting preparation by USECON and should be provided by the host organisation at least 8 weeks in advance of the meeting to the Coordinator.

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Minutes will be issued by USECON within 2 weeks of each meeting and uploaded on the SHOTPROS SharePoint.

5.5.1.9 Periodic reports

As stated in chapter 6 Reporting & Monitoring, the partners have to submit internal and external reports on financial and technical status regularly to the PC, who revises them on potential risks and deviations.

5.5.1.10 Project reviews and Progress Reports

Reviews at work package level

The work package leaders will monitor the day-to-day work and will report to the Executive Board. Problems will be referred to the Executive Board, which will then decide on appropriate actions and consult with relevant members of the SC when necessary.

Each task leader should report regularly to the WP leader. These reports must contain current status against plan, progress made since last report, problems and plans for next period. The report should be sent by e-mail with a copy to the coordinator.

The work package leaders must report their progress every two weeks to the coordinator. The coordinator will comprise the information and send out an internal newsletter to all partners with the progress of each work package.

Reviews at project level

Each partner will keep monthly timesheets that will be kept in the partners' premises ready to be presented at the Commission's request.

Reviews at organisational level

Progress reports must be submitted by each partner in a timely manner to the coordinator.

5.5.2 Structured feedback

Feedback is a fundamental criterion to ensure high quality of a project. SHOTPROS contains 2 different feedback streams:

- End user feedback for the agile VR development (throughout different ways such as feedback weeks, direct feedback, field trials, human factors studies, etc). See chapter 5.2.5 End user feedback
- Peer review feedback within the deliverables process. See chapter 5.3. Deliverables project management

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Both feedback streams focus on defined aspects and are stored for later usage in the requirements process or eventual project adaptions.

5.5.3 Records

Records of all sorts should be kept for five years after the end of the project. Receipts and other documents must be stored in their original format – namely digitally formed receipts/documents must be kept in the original digital format, and paper receipts must be stored in their original.

Confidential information must be stored in a locked cabinet in a limited access room.

5.5.4 Documents & SharePoint

5.5.4.1 Document Name and Numbering Scheme

The task leader preparing the report document is responsible for the issuing of version numbers, which are incorporated in the file sent to the partner. USE is responsible for keeping all these documents as reference, properly archived including Title, Author, Version, Date, Security, Issued to and Status (e.g., draft, revised draft, final) in an appropriate log. Reports will then follow the document flow (as described above).

All deliverables must be named in the following scheme:

SHOTPROS_Deliverable Number_(short) Deliverable Name_Version

e.g. SHOTPROS_D1.1_Project_Manual_v0.1

The coordinator is responsible for the maintenance of all documents, properly named and archived, which are made available on the SharePoint.

5.5.4.2 Document Standard Format

All official project documents are produced in doc. format and the final version is converted into pdf. They are in A4 format and use Calibri English Font at 12-point size. The documents contain the following required fields that are already included in the template:

- **Cover page:** Project name and number, Title, Date of current version and the information if it is public or confidential
- **Page 2:** Version control (Version, Date, Author and Description) and the list of abbreviations
- **Page 3 (and 4):** Table of contents
- **Page 4 (or 5):** Table of figures
- **Page 5 (or 6):** Table of tables

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Page 6 (or 7): Executive summary. The Executive summary must be included in all deliverables and outline the key facts and findings, impacts, further use of results and a brief summary of the content of the deliverable. The objective is to simply indicate the impact of this deliverable.

- **The footer** of each document contains the EU emblem, the H2020 logo and the following sentence:

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6 Reporting & Monitoring

The following sub-chapters briefly describe the reporting procedures of SHOTPROS.

6.1 External Report Procedures

USECON will request the required input and each partner will have to report on the work carried out and results obtained and any related delays, as well as on the work planned for the following period.

The action is divided into two reporting periods:

- RP1 from month 1 to month 18
- RP2 from month 19 to the project end.

The following reports are scheduled as part of its **contractual obligation towards the EC** which the coordinator will submit on behalf of the consortium. A **periodic report** within 60 days following the end of each reporting period including a periodic technical report and a periodic financial report.

This is the specific procedure for the periodic reports (all steps in 60 days):

1. All partners receive a notification and log on to the Funding and Tenders Portal (day 0)
2. Partners share with USECON all expenses they claim and USECON checks and reviews the cost entries (day 0 – 30)
3. The beneficiaries complete their own Financial Statement and their contribution to the Technical Part of the Periodic Report. Beneficiaries e-sign and submit their Financial Statements to the Coordinator (day 31 – 35)

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4. USECON approves the elements of the Periodic Report and submits to the EC (day 35-60)
5. The EC reviews the submitted Periodic Report and accept or rejects it.

6.1.1 Periodic Technical Report

The **periodic technical report** contains:

- an explanation of the work carried out by the beneficiaries
- an overview of the progress towards the objectives of the action, including milestones and deliverables identified in Annex 1.
- a summary for publication by the Agency
- the answers to the "questionnaire", covering issues related to the action implementation and the economic and societal impact
- the description of potential deviations from the project plan and explanations for deviation reasons from the DoA
- an overview of used resources per partner, per WP which is showing the total person months spent for the period (and total spent from M1), the actual versus planned person months and an estimation of person months needed to complete the work (which will be provided separately with the plan for the second period)
- the identification and addressing of critical risks, the proposed mitigation measures and contingency plans

6.1.2 Periodic Financial Report

The **periodic financial report** contains

- an individual financial statement from each beneficiary, for the reporting period concerned
- an explanation of the use of resources from each beneficiary, for the reporting period concerned
- the total expenditure spent since M1, the potential deviations with justifications (referenced in the technical report) and the expenses needed to complete the work

6.1.3 Final Report

The **final report** which the coordinator will submit within 60 days following the end of the last reporting.

The **final technical report** with a summary for publication containing

- an overview of the results and their exploitation and dissemination

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- the conclusions on the action
- the socio-economic impact of the action

The **final financial report** containing

- a **final summary financial statement**
- a **certificate on the financial statements** for each beneficiary, if it requests a total contribution of EUR 325 000 or more, as reimbursement of actual costs

6.2 Internal Reports Procedure

To ensure a consistent project focus in between the external reporting periods, USECON introduces an additional internal reporting process.

This is based on:

- a 3-monthly internal technical progress, efforts report and efforts outlook and
- a 6-monthly internal technical progress, financial status report and budget outlook.

The objective of these internal reports is, to **closer monitor project expenditure**, **efforts** and technical **progress**, but also to have an insight of the **upcoming** efforts and budget needed. It will include a summary of the technical work completed as well as a brief explanation for any deviations (efforts, budget and content) from the DoA *(see EU GA: Annex 1)* or from adapted plans. Right after this report has been provided, an online meeting is scheduled to discuss the current status and possible deviations (see chapter 4.5).

6.2.1 3-monthly Progress Report

- Description of the **technical progress**, per work package: The WPL is responsible to gather all information about the technical progress in the WP from the attached task leaders and compile a WP report and send it to the coordinator. This report should demonstrate the agile and joint character of the collaboration on each WP and/or task. As this information is presented in an online meeting (see chapter 4.5) to the other partners, the additional compilation of a slide deck offers an opportunity to emphasis an executive and understandable view on the results, thoroughly revise the message that is transported, and more concretely refer to the added value of the work done and planned even better than in a written report only. This information represents a summarised and focused view on the tasks and therefore delivers the foundation of the executive summary for the deliverable.

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- Efforts report on the actual spent person months in the elapsed period per WP.
- Justifications regarding technical and effort deviations.
- Efforts report on the planned person months (estimation) to complete the work regarding this certain WP and justification for potential deviations.

All reports regarding efforts can be reported within the SHOTPROS Project Management Tool, available on the project SharePoint. The technical report template (for the detailed written report and the presentation) is also provided by the PC and is summarised in the following table:

Topic	What needs to be answered
Technical Progress	What did you work on the last 3 months?
Partner Involvement	Whom did you involve (research partners? LEAs? External? And what were the results?
Review	Is there something that needs to be reviewed by others?
Marketing Aspects	Is there something we can communicate externally (dissemination etc.)? What is especially innovative (regarding SHOTPROS objectives)?
Value Added (Innovation)	What is the added value of this WP (work done and planned to achieve)?
Challenges/Deviations/Risks and Solutions	Did any challenges arise & how can you/we solve it? What is the reason for the deviation and what are the next steps?
Forecast	What is planned for the next 3 months?

Table 4 Description of what should be covered in the technical report presentation.

6.2.2 6-monthly Progress Report

- All of the 3-monthly progress report (description of technical progress and efforts in person months elapsed and planned).
- And additionally, a financial status overview from each partner regarding expenses in the elapsed period and a view on expenses since M1 of the project (budget used to date)

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- Justification on deviations regarding the expenses.
- An estimation of the expenses needed to finish the work

The PC provides an excel template on the SharePoint with information needed for monitoring purposes and management reporting. This template will be filled out by all the consortium partners. The coordinator consolidates the provided information and uploads it on the SharePoint.

6.3 Continuous Risk management

As part of the internal quality assurance, a regular risk assessment will be carried out and reviewed during the 3-monthly online conferences with the WP leaders and the responsible task leaders which shall lead to corrective actions of the work plan.

SHOTPROS' risk management addresses issues that could potentially endanger the achievement of project objectives, deliverables, and outputs:

- financial risks (overspending and underspending)
- time risks (postponing of activities and/or deliverables)
- performance risks (quality of deliverables/outputs),
- sustainability and exploitability of the project results

In the GA of the SHOTPROS project, a set of foreseen risks associated to the work that will be implemented in each work package at technical, management and organisational level has been identified (GA ANNEX 1 section 1.3.5. "WT5 Critical Implementation risks and mitigation actions").

1.3.5. WT5 Critical Implementation risks and mitigation actions

Risk number	Description of risk	WP Number	Proposed risk-mitigation measures
1	Overestimation efforts	WP1	Further improve features and usability of the relevant WPs
2	Low participation in the final conference	WP8	The task leader, VESTA, has an excellent track record in organizing events and workshops for research and innovation projects; its team of marketing and communication experts has the knowledge and competencies to prepare a successful event. Moreover, the identification of potential and interested participants will be a continuous activity during the project (identification for the focus groups, for participation in the previous field trials, etc.)
3	Low use of the SHOTPROS website	WP8	In a world where virtual tools of communication are predominant, the success of the website might be compromised by the fact that too much information on too many websites is available. Special attention will be given to make the website attractive and focused. The traffic will be closely monitored for continuous improvement.
			Communication, planning. (WP1) Partners have

Figure 12: Screenshot SHOTPROS GA – excerpt list of risks and mitigation measures

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This list of identified risks and the related mitigation measures is enhanced with contingency plans (if mitigation is not possible) and is stored on the internal SharePoint. The following criteria are used:

- risk description (identification and analysis)
- risk exposure (assessment of likelihood and impact)
- related workpackage(s)
- risk owner(s)
- risk mitigation measures (corrective and/or preventive actions)
- contingency plan

In accordance with the 3-monthly reporting phases, the PC will monitor if any of these risks have materialised and if the proposed mitigation measures are still appropriate.

In addition to the reviews, the identification and assessment of new unforeseen risks is a joint responsibility of all project partners who have to communicate them to the PC, suggesting possible interventions and solutions, as soon as they get aware of those risks. Mitigation measures need to be defined and the status needs to be reported. If mitigation measures do not work out, a contingency plan has to be added by the risk owner in cooperation with the PC.

7 Resources to be committed

7.1 Financial Aspects

The Coordinator is responsible for the overall financial management and timely distribution of the EC contribution. Furthermore, USE will support the other partners by,

- Providing detailed information on the individual budgets and H2020 financial rules at the project kick-off.
- Advising all partners on financial matters according to the H2020 financial rules whenever requested.
- Monitoring expenses and efforts as part of the 3 and 6 monthly internal progress reports.

7.2 Resources and Staff Effort

SHOTPROS is planned for 36 months with an effort of 674 person-months and a maximum grant amount of € 5,059,843.75. The total personnel cost of the project amounts to € 3,565,381. Other direct costs of SHOTPROS amount to € 480,894 of which € 208,800 is allocated for travelling to the LEAs premises to conduct several end user based studies,

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workshops and field-trials. Additionally, travel expenses will occur for consortium and review meetings and for visiting the final SHOTPROS Conference. A total of 123,202 is dedicated to costs for equipment and large-scale infrastructure. Total other goods and services amount to € 148,892.

For the beneficiaries for whom the sum of the other direct costs exceeds 15% of the personnel costs a detailed justification is indicated in Part B of the GA.

The staff effort with an overview of the total budgeted person months, the planned and actual PMs for RP1 (M1-18) and the preliminary planned person months for RP2 (M19-end of the project[4]) by partner and by WP is shown in the table below:

	WP1	WP2	WP3	WP4	WP5	WP6	WP7	WP8	WP9	TOTAL
1 USECON - *total*	**29,5***	**7**	**7**	**9**	**5**	**11**	**15**	**22**	**0,5**	**106**
RP1 planned	14,5	6	4	7	1	3	0	12	0,5	**48**
RP1 actual	17,4	9,15	3,1	4,95	0,0	2,68	0,0	15,8	0,6	**53,68**
RP2 planned	15	1	3	2	4	8	15	10	0	**58**
2 AIT - TOTAL	**2**	**4**	**6**	**17**	**6**	**15**	**11**	**5**	**0**	**66**
RP1 planned	1	3	3	13	2	5	0	1	0	**28**
RP1 actual	1,26	4,14	3,15	10,36	0,0	3,23	0,0	0,64	1,45	**24,23**
RP2 planned	1	1	3	4	4	10	11	4	0	**38**
3K LEUVEN - *total*	**3***	**21**	**14**	**4**	**2**	**5**	**8**	**5**	**2**	**64**
PR1 planned	2	17	8	3	0	0	0	1	2	**33**
RP1 actual	1,75	16,33	0,0	1,95	0,0	0,0	0,0	1,11	2,0	**23,14**
RP2 planned	1	4	6	1	2	5	8	4	0	**31**
4 VUA - *total*	**1**	**8**	**24**	**6**	**2**	**8**	**14**	**2**	**0**	**65**
RP1 planned	0,5	6	18	5	1	3	0	0,5	0	**34**
RP1 actual	1,23	3,61	18,42	0,97	0,65	0,79	0,19	0,17	0,09	**26,12**
RP2 planned	0,5	2	6	1	1	5	14	1,5	0	**31**
5 VESTA - *total*	**4**	**2**	**2**	**2**	**0**	**4**	**16**	**6**	**0**	**36**
RP1 planned	3	1,5	1,5	1	0	1	0	2	0	**10**
RP1 actual	4,91	0,43	0,43	0,0	0,0	0,0	0,12	5,49	0,1	**11,48**
RP2 planned	1	0,5	0,5	1	0	3	16	4	0	**26**
6 RL	**1**	**6**	**6**	**12**	**42**	**16**	**14**	**7**	**0**	**104**
RP1 planned	0,5	5	4	7	26	3	0	1	0	**46,5**
RP1 actual	0,7	6,0	5,5	6,5	57,69	0,0	0,0	1,0	0,0	**77,39**
RP2 planned	0,5	1	2	5	16	13	14	6	0	**57,5**
7 RMIA_DGL - *total*	**1**	**7**	**2**	**1**	**0**	**14**	**10**	**1**	**0**	**36**
RP1 planned	0,5	5	1,5	0,5	0	3	0	0,5	0	**11**

[4] M36 as the originally planned end of the project on the basis of the DoA. But will be updated to M42 after accepted amendment for a proposed project extension by 6 months.

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RP1 actual	0,93	0,99	0,33	0,04	0,0	0,06	0,0	0,29	0,0	**2,64**
RP2 planned	0,5	2	0,5	0,5	0	11	10	0,5	0	**25**
8 SPA - *total*	**1**	**7**	**2**	**1**	**0**	**14**	**10**	**1**	**0**	**36**
RP1 planned	0,5	5	1,5	0,5	0	3	0	0,5	0	**11**
RP1 actual	0,51	10,82	3,78	0,5	0,17	1,56	0,0	0,51	0,17	**18,02**
RP2 planned	0,5	2	0,5	0,5	0	11	10	0,5	0	**25**
9 BP - *total*	**1**	**7**	**2**	**1**	**0**	**14**	**10**	**1**	**0**	**36**
RP1 planned	0,5	5	1,5	0,5	0	3	0	0,5	0	**11**
RP1 actual	1,3	3,93	0,32	0,03	0,01	2,25	0,0	0,12	0,0	**7,96**
RP2 planned	0,5	2	0,5	0,5	0	11	10	0,5	0	**25**
10 UHEI - *total*	**1**	**2**	**2**	**6**	**3**	**1**	**1**	**1**	**0**	**17**
RP1 planned	0,5	1	1	5	0	0,5	0	0,5	0	**8,5**
RP1 actual	1,2	0,2	0,2	6,2	0,0	4,5	0,0	1,3	0,1	**13,7**
RP2 planned	0,5	1	1	1	3	0,5	1	0,5	0	**8,5**
11 NPN - *total*	**1**	**7**	**2**	**1**	**0**	**14**	**10**	**1**	**0**	**36**
RP1 planned	0,5	5	1,5	0,5	0	3	0	0,5	0	**11**
RP1 actual	0,0	2,31	1,3	0,32	0,0	0,89	0,0	0,0	0,0	**4,82**
RP2 planned	0,5	2	0,5	0,5	0	11	10	0,5	0	**25**
12 ADCC IBZ - *total*	**1**	**3**	**2**	**10**	**2**	**3**	**9**	**6**	**0**	**36**
RP1 planned	0,5	2	1,5	9	1	1	0	2	0	**17**
RP1 actual	0,44	1,68	1,51	14,3	1,0	0,5	0,0	1,82	0,0	**21,25**
RP2 planned	0,5	1	0,5	1	1	2	9	4	0	**19**
13 LAFP NRW - *total*	**1**	**7**	**2**	**1**	**0**	**14**	**10**	**1**	**0**	**36**
RP1 planned	0,5	5	1,5	0,5	0	3	0	0,5	0	**11**
RP1 actual	0,92	5,05	2,79	0,28	0,0	2,44	0,0	0,63	0,0	**12,11**
RP2 planned	0,5	2	0,5	0,5	0	11	10	0,5	0	**25**
TOTAL PM	**47,5**	**88**	**73**	**71**	**62**	**133**	**138**	**59**	**2,5**	**674**
RP1 planned	25	66,5	48,5	52,5	31	31,5	0	22,5	2,5	**280**
RP1 actual	32,55	64,64	40,83	46,4	59,52	18,9	0,31	28,88	4,51	**296,54**
RP2 planned	22,5	21,5	24,5	18,5	31	101,5	138	36,5	0	**394**

Table 5: Staff effort

* Shift of staff effort since WP9 was added from the EC in the description of action

With the consent of the Steering Committee a re-distribution of person-months between partners and a budget transfer between beneficiaries may be considered. This re-distribution is allowed without requesting an amendment *(see EU GA: Article 55)* provided that it does not imply a substantial change to the action as described in the EU GA. Also a shift from one budget categories to another is possible unless it does not imply a significant change of work. All major re-allocations of budget items need to be discussed in order to decide whether they

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imply a change of work and therefore might prompt an application for an amendment to the EU GA.

8 Work packages, Schedule and Deliverables

The work plan of SHOTPROS is divided into 9 distinct work packages, all together lasting 36 months. Since the work is highly collaborative, several partners are involved in each of the work packages.

8.1 Work Packages

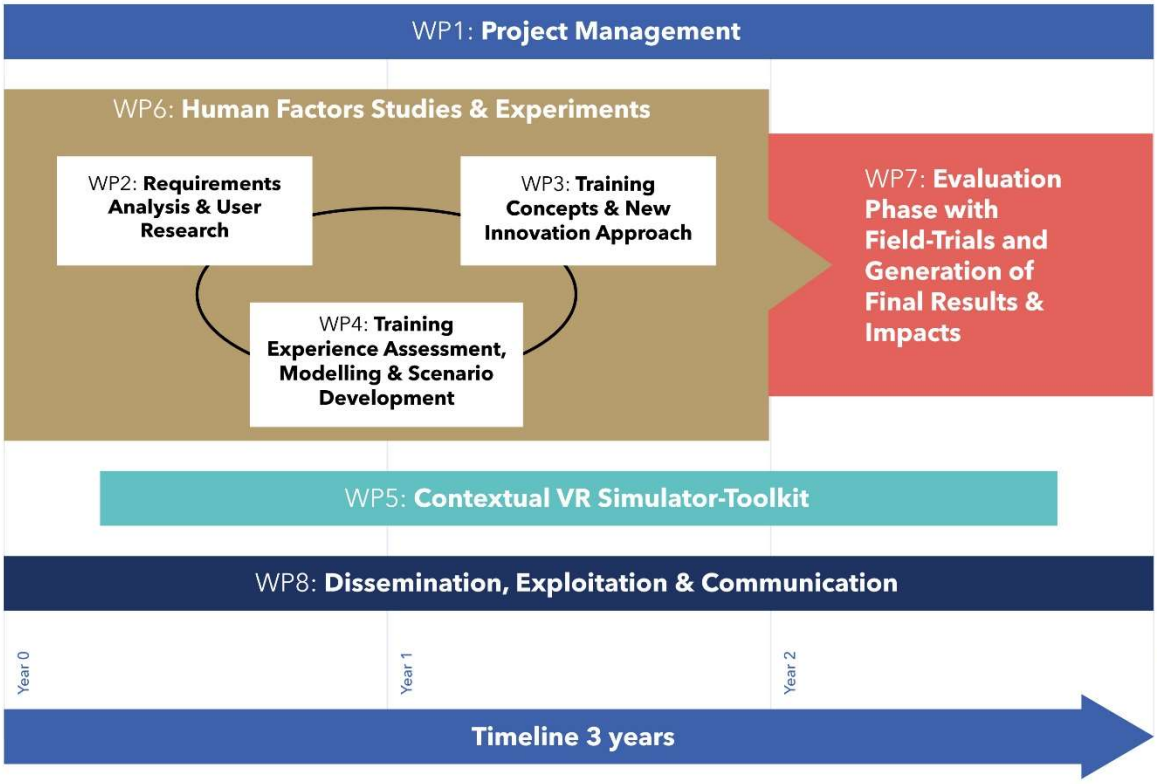

Figure 13: Interrelations of SHOTPROS WPs

Human Centred Research (HCR) as a Project Framework

The defined structure of the work packages follows a human-centred research (HCR) approach. HCR is an iterative process focusing on the end users (LEAs) and their needs in each phase of the project process. HCR calls for involving users throughout the process via a variety of research and design techniques to create highly usable and accessible products and services for them and to fulfil the defined objectives.

HCR considers the whole User Experience

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In HCR, researchers base their projects upon an explicit understanding of the users, tasks and environments. The process aims to capture and address the whole user experience; therefore, the research team must include professionals from across multiple disciplines (e.g., Human Factors researcher, ethnographers, psychologists, movement-scientists, software and hardware engineers, training experts, etc.), as well as domain experts, stakeholders and the users themselves.

Horizontal WPs

This group comprises WP1 (Project Management) and WP8 (Dissemination, Communication & Exploitation). These WPs will run throughout the entire duration of the project. They will ensure the project's successful execution and completion and maximise the project's impacts. Both WPs are led by USE.

Iterative WPs

WP2-4 will follow the Human Centred Research Approach. Every WP has its clear objectives and tasks but will get and deliver impacts to the others. This very agile approach guarantees an end user orientated thinking, because in every step the LEAs are involved. The research questions (WP2-4) will be examined and validated in WP6, which is framing the other WPs 2-4.

8.1.1 WP1 – Project Management (Lead: USECON)

This work package aims to ensure the successful execution and completion of the agile development project and to manage the project in a target-focused manner, ensuring all deliverables are submitted in time, milestones are met, and risks are minimised and mitigated if necessary. The coordination has to stimulate collaboration and collegiality among the consortium partners and to stimulate constructive relations with the EU project officer and set an effective structure for project management.

- To manage resources in such a way that the project is completed within the defined scope, time and cost limitations.
- To ascertain the ethical and legal conduct of the project and the fulfilling of the respective obligations.
- Manage the end user partners (LEAs) throughout the project duration to guarantee high involvement, to meet the requirements and establish a knowledge transfer between all partners.

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8.1.2 WP2 - Requirements Analysis & User Research (Lead: KU LEUVEN)

The first operational work package, WP2, focuses on analysing and uncovers the requirements from different stakeholders involved in police trainings (e.g. trainer, trainee, academy leads, etc.) and several perspectives (e.g. organisational, cultural, societal, etc.). It investigates the societal impact of police DMA on citizens' perspectives on police legitimacy and trust and will help at incorporating the needs of EU citizens in the project as well.

With several user centred methodologies and methods (e.g. stakeholder analysis, co-creation workshops, design thinking, interviews, etc.) the needs, wishes, concerns and restrictions of the mentioned stakeholders and perspectives will be uncovered, and concrete insights will be delivered. Furthermore, WP2 will conduct a largescale citizen study to integrate important aspects of European citizens. The insights of the WP2 are fundamental to setting up the groundwork for the tasks specified in WP3-WP7.

8.1.3 WP3 - Trainings Concepts & New Innovation Approach (Lead: VUA)

In WP3 a conceptual model of behaviour, including different contextual and human factors that influence perception, decision-making and acting in a potentially threatening situation will be created. WP3 will prepare a research agenda to validate (in WP6) the DMA-SR model and create the needed training concepts, methods and tools.

Furthermore, WP3 compiles an overview of best practices in Europe of training and assessment of (different aspects) decision-making and collect a comprehensive overview of current training and assessment methods in Europe. WP3 (and WP2) will deliver the fundament of the upcoming WPs.

8.1.4 WP4 - Training Experience Assessment, Modelling & Scenario Development (Lead: AIT)

Work in WP2-3 will be performed in parallel and will serve as input to WP4. The main objectives of WP4 are creation and validation of a psychological and physiological cue repository, prototyping the VR scenarios and the performance dashboard for trainers (WP5, WP7), develop a psychophysiological measurement suite and define the technical requirements for the VR Simulator Toolkit (for WP5). Furthermore, a risk assessment toolkit to identify high-risk situations will be developed.

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8.1.5 WP5 - Contextual VR Simulator-Toolkit (Lead: RL)

The objective of WP5 is to provide and develop the necessary VR infrastructure, VR technical knowledge and software components for conducting the human factors studies (WP6) and the end user field-trials (WP7).

The identified, summarised and defined requirements & prototypes (from WP4) are the fundament for creating the defined VR features. Innovation parts will be the developing of the VR Training Results Dashboard, the integration of the stress-cues and the possibilities for stress (psychological and physiological) measurement in the VR environment (defined and designed in W2-4).

8.1.6 WP6 - Human Factors Studies & Experiments (Lead: AIT)

The main objective of WP6 is the preparation (planning, measurement tools etc.) and execution of the human factor experiments and studies that have to be carried out in accordance with the research questions addressed in WP2-4. To achieve maximal ecological validity, these studies and experiments will be executed at the premises of the LEAs and recruiting test subjects among them. Furthermore, the large dataset will be utilised with machine learning in order to derive models of trainee behaviour in response to inserted cues in the VR environments.

WP6 will frame the WP2-4 and studies and experiments create the needed insights, validation and evidences for upcoming project steps.

8.1.7 WP7 - Evaluation Phase with Field-Trials and Creation of Final Results & Impacts (Lead: VESTA)

The results from the previous WPs will now be evaluated and improved from direct feedback of the LEAs (within the consortium and external LEAs). The results from WP 2-6 will be evaluated in field-trials at the different LEAs (on-site) and at the final SHOTPROS conference.

The feedback and insights from the evaluation phase will lead to the final results, concepts and impacts of SHOTPROS.

8.1.8 WP8 – Dissemination, Exploitation & Communication (Lead: USECON)

The objectives of this work package will be achieved by devising strategies for dissemination, exploitation, and communication of the project and its results amongst European target audiences. The work package leader, USECON, together with the other partners will execute this work package, and the industrial partners will contribute to the elements relevant to

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sustaining the impact of SHOTPROS beyond the project's duration, continued development of the training environment and marketing the platform.

8.1.9 WP9 – Ethic Requirements (Lead: USECON)

Ethical guidelines and procedures are established (see D1.2) and prepared for all consortium members to adhere to during the entire research and development and testing of the SHOTPROS System. These ethical guidelines focus on related consent and confidentiality procedures of the end users of the system as well as the protection of any collected data.

The task leader will monitor all activities within the project to make sure that they follow the ethical guidelines and procedures.

8.2 Deliverables and Schedules

Find a list of the Deliverables corresponding to the above listed WPs in Annex 1 of this document.

9 Innovation and Intellectual Property (IP) management

The Coordinator is responsible for the overall innovation and intellectual property management and will be assisted by the Executive Board. Within the project, knowledge will be created not only by various partners individually, but especially in collaborative effort. Therefore, a comprehensive and well drafted consortium agreement, based on the DESCA model, covers the management of all the main IP issues in the present and future, taking into consideration the specificities of the project and participants in question. This Consortium Agreement has been signed prior to the project start by all partners. As far as Intellectual Property Rights (IPR) are concerned, this consortium agreement covers issues related to dissemination, use and access rights, additional to the commitments under Annex II of the Grant Agreement.

When drafting the IP provisions, a flexible and efficient mechanism to support cooperation between partners is the key principle, in order to guarantee protection and maximum use of foreground as well as to ensure immediate dissemination thereof. Post-project provisions will also be drafted in view of the foreground exploitation after the project end, especially aimed to define the management of those IPRs which remain in force after the conclusion of the project.

The rules concerning management of knowledge and IPR can be outlined as internal and external IPR Management

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9.1 External IPR Management

It will be shared among partners based on the effort invested by each partner and on the cost sharing for the consequent industrial exploitation. The SHOTPROS Consortium Agreement will protect the legitimate intellectual property interests of all partners by limiting the rights to knowledge developed during the course of the project, when there is no need-to-know or need-to-use but will facilitate the consequent exploitation of the project results. Moreover, patent rights will be shared between all partners (industrial and academic) who contributed with their resources towards the related research activities.

9.2 Internal IPR Management

In order to carry out the projected work, the SHOTPROS partners develop and share know-how and technologies in many forms, such as algorithms, tools, software and hardware components, experiences and methodologies; that may include background knowledge as well. Therefore, the partners agreed on the principles for the management of their intellectual property, i.e. allowing all partners to carry out their project activities when this requires transferring knowledge from other partners, whether foreground or background knowledge. The detailed management of intellectual property and knowledge is part of the Consortium Agreement that has been signed by all consortium members.

In Section 8 of the CA, the ownership of results is outlined as follows:

- *Results are owned by the Party that generates them.*
- *Joint ownership is governed by Grant Agreement Article 26.2 with the following additions. Unless agreed otherwise*
    - *each of the joint owners shall be entitled to use their jointly owned Results for non-commercial research and educational activities on a royalty-free basis, and without requiring the prior consent of the other joint owner(s) but this always in compliance with the provisions regarding confidentiality and publications in this Consortium Agreement, and*
    - *each of the joint owners shall be entitled to otherwise Exploit the jointly owned Results and to grant non-exclusive licenses to third parties (without any right to sub-license), if the other joint owners are given:*
      (a) at least 45 calendar days advance notice; and
      (b) Fair and Reasonable compensation.
- *The joint owners shall agree on all protection measures and the division of related cost in advance.*

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9.2.1 IPR Management Plan IPR Management Plan

A knowledge and IPR management plan was established and is coordinated by USECON, based on the relevant agreements reached by the SHOTPROS partners in the Consortium Agreement (CA). The plan was implemented to promote the project innovation, and to protect and use the project knowledge in appropriate ways, while preserving the interest of the partners. The plan will record the ownership of the new results as they are being produced, and the corresponding access rights will be granted based on the need-to-know principle for carrying out the project and for the use of the project results. The plan further records the decisions on the protection, dissemination, and use of the knowledge in a verifiable form. It records the current partner dissemination and exploitation plans. These plans will be updated according to the knowledge produced and opportunities that are created.

9.2.2 IPR and Exploitation management tool

A strategic tool was developed by USE to keep track of the proposed plan and record all decisions and adaptions that are made by the consortium in terms of exploitation and related IPR issues. This tool is implemented as an Excel (SHOTPROS_Exploitation_IPR-Mgmt) document and compiles 3 sheets:

- **IPR Directory:** Each partner is obliged to inform the coordinator about results created during the project and the coordinator includes them in the list. This document can be requested by any partner at any time of the project. The IPR directory includes information about the owner of the results, background, type of IPR (e.g. Prototype, Algorithm, etc.), a brief description, implementation by (e.g. licencing, spin-off, etc.) and remarks.
- **Key exploitable results:** The key exploitable results including the planned exploitation, target group(s) and the respective deliverables as identified in the proposal are listed. Any changes from the initial plan are indicated in the document and will be reported detailed in D8.6 - Exploitation Plan, Innovation Management and Business Outlook
- **Exploitation goals per partner:** The exploitation goal(s) as outlined in the proposal are included and updated from the respective partner. Updates and changes are indicated in the document and will be reported in D8.6.

9.2.3 IPR and Exploitation processes

An initial exploitation workshop has been conducted at the 3rd Consortium Meeting in M13. The current status of the Exploitation and IPR Management Tool was presented to the consortium by USE and discussed with all partners. The focus of the workshop was on the

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refinement of the key exploitable results and identification of precise exploitation activities. Based on the workshop and further discussions within the partners and external meetings USE proposed the following main topics for concrete exploitation activities to the consortium:

- Creation of a certified DMA-Training for Police Training (also other domains e.g. CBRNe Training) and a "Train the trainer" education in DMA-Training
- VR Police Consultancy for topics in the field of technical implementation of VR training within LEA organisations, purchasing topics within the organisations (e.g. comparison of products and services, etc.) and settlement of a VR training
- VR Police Network and possibilities of business cases (membership fees, new funding possibilities, integration into existing networks, etc.)
- Exploit the results (and new issues) in follow-up research project(s)

Those possible exploitation activities were integrated into the IPR Directory sheet. Further measures for the exploitation of the aforementioned activities will be detailed outlined in D8.6 based on the canvas model and the planned investment from the partners.

An **example** for the further IPR and exploitation process was elaborated for the **certified DMA-Training:**

- One partner is the key lead of the DMA-Training exploitation; the decision will be made based on the plans for the second period of the project as outlined below
- A revenue stream model will be developed as well as a distribution key of the incomes resulting from the exploitation activity; both will be reported in D8.6
- The consortium will find an international training provider who offers then the certified DMA-Training
- IPR will be protected by a license, an internal agreement among the consortium and an external agreement with the training provider

In the second period of the project, the following actions will be taken with respect to IPR Management and Exploitation:

M22-M23: Further refinement of exploitation activities based on input from partners and initial evaluation of results (and related activities) that are claimed by each partner.

M25: An exploitation and IPR workshop will be conducted at the 5th Consortium Meeting to clarify IPR claims and joint ownership of results.

Quarterly Report: All partners have to report their progress (see Reporting section in this document) on a 3 monthly basis and must indicate the key results and exploitation of the

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reporting period. This information will be compiled by USE in the Exploitation and IPR Management tool and serve as input for the next workshop or online meeting.

Bi-annual workshops: Starting from M25, every Consortium Meeting will be accompanied by an exploitation and IPR workshop for a more focused forthcoming of these topics. The aim is, to systematically evaluate the SHOTPROS outcomes for exploitation potential and identify ways to make use of them on a scientific, societal and economic level. Also, the ownership of the evaluated outcomes will be discussed with respect to IPR management. If it is not possible to conduct the workshop during the Consortium Meeting, a dedicated (online-)workshop will be scheduled for this purpose.

In addition to that and whenever necessary, meetings will be set up by USE with all relevant partner.

M36: The final exploitation plan (see D8.6) with elaborated business cases and allocation of ownership of the results will be submitted as deliverable.

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Annex

Annex I – Deliverables and due dates[5]

To facilitate the view of the deliverables a compressed list of this document is shown here in the annex – Details and the updates are available on the project SharePoint:

WP No	Del. No.	Lead Beneficiary	delivery	internal review	reviewing partners	actual submission	Approval (by EC)
WP1	D1.1	USECON	31.08.2019	26.01.2021	all	31.08.2019	n/a
WP1	D1.2	KU LEUVEN	31.08.2019	-	-	31.08.2019	Dec 2020
WP1	D1.3	USECON	31.10.2019	-	-	31.10.2019	Dec 2020
WP1	D1.4	VESTA	31.08.2019	26.01.2021	LEA	31.08.2019	n/a
WP1	D1.5	USECON	30.04.2022	-	-	31.05.2019	Dec 2020
WP1	D1.6	USECON	31.10.2020	-	-	31.10.2019	Dec 2020
WP1	D1.7	USECON	30.04.2022	30.09.2022	all		
WP2	D2.1	KU LEUVEN	31.08.2019	-	-	30.08.2019	Dec 2020
WP2	D2.2	KU LEUVEN	31.12.2019	26.01.2021	all	31.12.2019	n/a
WP2	D2.3	KU LEUVEN	30.06.2020	-	-	30.06.2020	Dec 2020
WP2	D2.4	KU LEUVEN	30.04.2021	31.03.2021	all		

[5] Please note that both documents in the Annex are drafts and the presented timing reflects the project plan based on a requested extension of 6 months. However, changes might be made in accordance with the EC and the consortium partner in the weeks after re-submitting this deliverable. If that is the case, the documents will be updated and reported in the Project Progress Report Period 2 (see D1.7).

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WP3	D3.1	VUA	31.12. 2019	26.01.2021	USECON, KU LEUVEN	31.12.2019	n/a
WP3	D3.2	VUA	30.04.2020	26.01.2021	all	30.04.2020	n/a
WP3	D3.3	VUA	30.04.2021	30.06.2021	all		
WP4	D4.1	AIT	31.05.2020	26.01.2021	KU LEUVEN, VUA	31 May 2020	n/a
WP4	D4.2	AIT	31.10.2020	-	-	31 Oct 2020	Dec 2020
WP4	D4.3	UHEI	31.10.2020	-	-	31 Oct 2020	Dec 2020
WP4	D4.4	AIT	31.10.2020	-	-	30 Dec 2020	
WP4	D4.5	AIT	31.08.2021	30.06.2021	USECON, KU LEUVEN, VUA, UHEI		
WP4	D4.6	AIT	30.04.2021	31.08.2021	RL		
WP4	D4.7	ADCC IBZ	31.10.2020	28.02.2021	all	31 Oct 2020	Dec 2020
WP5	D5.1	RL	31.05.2021	30.09.2021	USECON, AIT		
WP5	D5.2	RL	30.04.2021	30.09.2021	UHEI		
WP5	D5.3	RL	31.08.2021	30.11.2021	AIT, KU LEUVEN, ADCC IBZ		
WP5	D5.4	RL	31.08.2021	30.11.2021	all		
WP6	D6.1	AIT	31.10.2020	-	-	30.11.2020	
WP6	D6.2	AIT	30.04.2021	31.03.2021	?		
WP6	D6.3	AIT	30.04.2021	30.09.2021	all		
WP6	D6.4	AIT	30.04.2021	31.10.2021	all		
WP7	D7.1	VESTA	31.08.2021	31.01.2022	all		
WP7	D7.2	VESTA	31.12.2021	31.05.2022	all		
WP7	D7.3	VESTA	30.11.2021	30.04.2022	all		
WP7	D7.4	VUA	31.03. 2022	31.08.2022	all		

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WP7	D7.5	VUA	31.03. 2022	31.08.2022	all		
WP7	D7.6	AIT	31.03. 2022	31.08.2022	all		
WP7	D7.7	RL	31.03. 2022	31.08.2022	all		
WP8	D8.1	USECON	31.08.2019	-	-	30.08.2019	Dec 2020
WP8	D8.2	USECON	31.08.2019	-	-	30.08.2019	Dec 2020
WP8	D8.3	USECON	31.08.2019	-	-	30.08.2019	Dec 2020
WP8	D8.4	USECON	31.03. 2022	31.08.2022	all		
WP8	D8.5	USECON	30.04.2022	31.08.2022	all		
WP8	D8.6	USECON	30.04.2022	30.09.2022	all		
WP8	D8.7	RL	31.08.2021	31.03.2022	all		
WP8	D8.8	USECON	30.09.2020	-	-	30.09.2020	Dec 2020
WP8	D8.9	USECON	31.03. 2022	31.08.2022	all		
WP8	D8.10	VESTA	31.12.2019	26.01.2021	all	31 Dec 2019	n/a
WP8	D8.11	VESTA	31.01.2022	31.08.2022	all		
WP9	D9.1	USECON	31.10.2019	-	-	31.10.2019	Dec 2020
WP9	D9.2	USECON	31.10.2019	-	-	31.10.2019	Dec 2020
WP9	D9.3	USECON	31.05.2019	-	-	31.05.2019	Dec 2020
WP9	D9.4	USECON	31.07.2019	-	-	31.07.2019	Dec 2020
WP9	D9.5	USECON	31.07.2019	-	-	31.07.2019	Dec 2020
WP9	D9.6	USECON	31.07.2019	-	-	31.07.2019	Dec 2020
WP9	D9.7	USECON	31.07.2019	-	-	31.07.2019	Dec 2020
WP9	D9.8	USECON	31.07.2019	-	-	31.07.2019	Dec 2020
WP9	D9.9	USECON	31.07.2019	-	-	31.07.2019	Dec 2020
WP9	D9.10	USECON	31.07.2019	-	-	31.07.2019	Dec 2020

Table 6: Deliverables and Due dates - Annex

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Annex II – GANTT view within the project management tool

This view is part of the project management tool and shows the duration of the single tasks. Details can be found on the internal SharePoint.

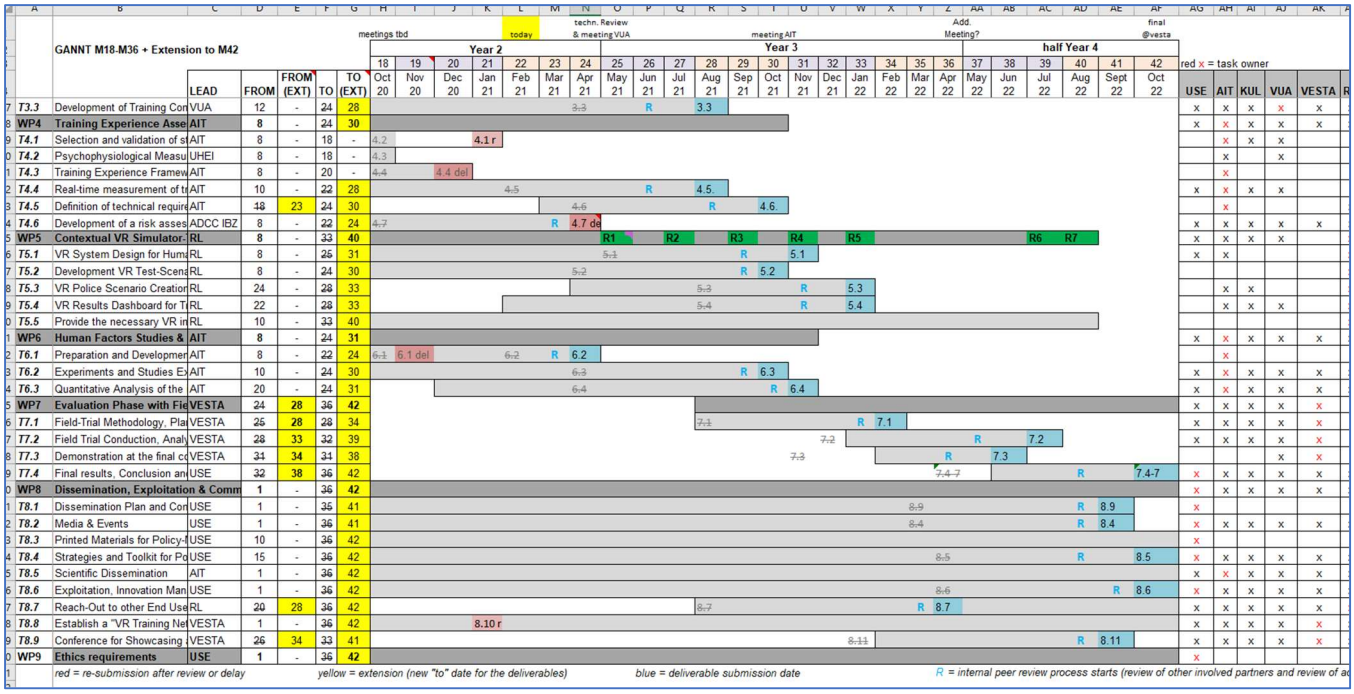

Figure 14: GANTT view in SHOTPROS project management tool

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Annex III – Peer Review Template

Peer-Review	**DX.X**
Deliverable Owner	
Reviewing Partner	
Review Date	
Deliverable due date	

This tables serves as **guide for consistent peer-reviewing** of all SHOTPROS deliverables. As reviewing partner, you are asked to revise the deliverable according to the criteria below and indicate if the topics are addressed appropriately. If so, indicate (Y) in the row next to the question. If not, indicate (N) and explain in the comment section your feedback and suggestions for improvement. Any additional comments that concern specific sections, wording, spelling can be included in the (draft) deliverable document.

Criteria	Y	N	Comment
Executive summary – Does it provide a summary of the deliverable including **the core messages and key findings / implications?**			
Technical and / or **scientific value – Is the added value sufficient?**			
Structure – Is the structure of the deliverable logic and comprehensive?			
Clarity of content – Is the way how the results are elaborated clear for other readers even if they are not directly involved in the project?			
Relevance to objectives – Is the result covering the SHOTPROS objectives?			
Exploitability of results – Can the results be exploited within the dependent deliverables and the technology stream of SHOTPROS?			

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Annex IV – Scrum & Agile Factsheet

SHOTPROS AGILE & SCRUM METHODOLOGY - Factsheet

FACTSHEET[1] on Agile Development & Scrum

When you face uncertainty, try something you think might work, get feedback, and adjust accordingly.[2]

AGILE

Agile is the ability to **create and respond to change.**[2] Scrum is one common software development framework that uses the agile approach as a fundament. Practice shows the principles are typically somewhat adapted to a teams' needs.

„In today's fast-paced, fiercely competitive world of commercial new product development, speed and flexibility are essential. Companies are increasingly realizing that the old, sequential approach to developing new products simply will not get the job done. Instead, companies are using a more holistic method" [3]

Figure 1: agile software delivering

SCRUM

Scrum is an **agile development method** with a defined framework how to deliver software to internally and to the customer. It involves certain steps and roles (e.g.: the product manager, developer, testing engineers etc.). The idea is, to deliver software **incrementally** instead of all at once. Typically, within older methods, the software was not visible to a customer/end user and sometimes even not to the product manager of the team until it was finally released (e.g. available for download) and could be bought. The idea of introducing sprints and providing software increments is that you see at least something before an official release, and you may even interact with this part of the software and get feedback from (potential) customers and users.

This means: **Many development cycles (= sprints) follow each other** iteratively to a final product which can be released to the public. After each sprint, a new piece of software (not the finished product) is released and can be feedbacked. In business projects this often means you cannot actually sell the product after a few sprints – this might take longer - but you have one main advantage: You can easily **involve the future customer** or **user** at an **early stage** of the product and thereby strengthen the business success of a product.

Especially within B2B products (like SHOTPROS would be) the distinction between the customer (who decides about the buying) and the user (who actually uses the product in his daily work) is important for prioritising the requirements and adapt the product to market needs.

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[1] This is a general factsheet on how these software development methodologies and the mindset behind "agile" are defined.
[2] https://www.agilealliance.org/agile101/
[3] Harvard Business Review, (The New New Product Development Game), online.

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Scrum Process:

- You have a **product backlog** (a list of requirements). This might be a mix of high-level ideas, detailed specifications, or smaller adaptions. They come from market research, customer feedbacks or other sources regarding product ideas.
- All backlog items need to be **estimated** (how much time is needed for the development).
- Furthermore, all items need to be **prioritised** (ranked by importance for the product goals). Practice shows, this is the trickiest part as this also means to dismiss some features to achieve the business goals.

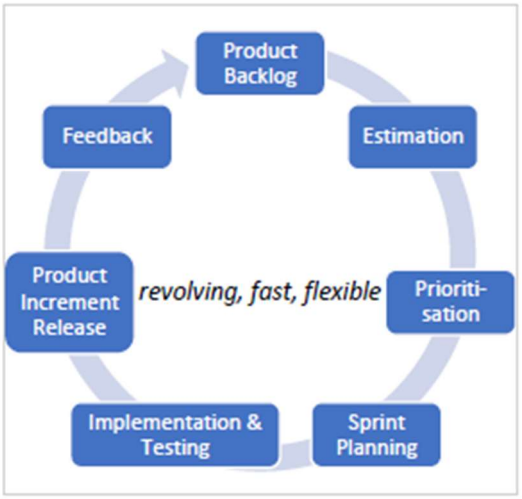

Figure 2: Scrum Process

- Then, the items are **planned** for the upcoming **sprint**: Which items should be developed and what are the intermediate goals for this product increment.
- Then the actual **implementation** (coding or hardware implementation) starts and afterwards needs to be **tested.**
- Then the features can be **released** as an increment of the product.
- Afterwards the product owner or customers (end users, decision-makers, etc.) can try it out in a demo environment and **give feedback.**
- After a few or many of theses sprints, a final product (or new version of the product) can be released (available for installation) and sold to the public.

ADVANTAGES	CHALLENGES
Users can give **feedback** on incremental software versions rather than waiting for a final product that maybe went into the wrong direction	Sometimes this means the **product is not finished** and parts do not work or are not available (yet) – you have to keep this in mind when feedbacking.
Developers and product owner get more insights on the **real user needs.**	Talking to customers is not always easy – therefore good **communication is key.**
Large projects are divides in **smaller, manageable parts.** You have sub-goals to go for and to be revised	Keep the overall vision of the product in mind. An Agile/Scrum approach **may not be** totally appropriate for projects that require a more plan-driven approach to achieve some level of **predictability**. However, there are ways to create a hybrid approach.[4]

[4] **https://managedagile.com/what-are-the-advantages-and-disadvantages-of-agile-scrum/**

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Annex V – Contribution of the SHOT-COVID study to SHOTPROS

Background of the SHOT-COVID Study

The following strategic considerations and objectives led to the planning and implementation of the SHOT-COVID Study:

Content level and (possible) effects on the project

Especially in the police sector, this topic was highly relevant, and questions were raised specifically in the following sub-areas:

How does the pandemic affect the current police situation and therefore the training? How do societal challenges such as the pandemic situation challenge future (VR) training within the police context? Are there factors which should be considered and influence people in such global crisis? Are there implications for the design of future training using VR (to be reported in D3.3 European Framework for Training and Assessment (using VR) of DMA-SR Behaviour of Professionals)?

- For example: The pandemic situation created new scenarios (such as the mask topic during demonstrations and possible escalation effects, etc.) which are difficult to integrate into existing real trainings. There a VR system has the power to react much faster to new scenarios.
- The SHOTCOVID study also contributes to the development of a training curriculum (D.3.3). Through the analyses of the qualitative reports, we could identify both best practices in police training that prepare even for unprecedented circumstances and novel work demands which currently lack corresponding training practices. Since officers are used to act under stable legal regulations, the requirement to act in legally uncertain, and dynamic circumstances resulted in an uncertainty in action, which stressed the officers. Clearly, this finding indicates that the current police training needs to be extended to enacting dynamic regulations which severely restrict personal freedom. As best practices, officers reported that scenario-based training fostering their decision-making, communication, empathy, and self-safety skills helped them to cope with this novel demand.

To what extent does the topic affect the overall topic of stress and high stress in SHOTPROS? For example, does the pandemic create other influencing factors that need to be taken into account as possible stressors (e.g. there have been cases where people have used "coughing" as aggression towards police officers which led to massive violence, etc.)?

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These questions will be part of the Human Factor Studies in WP6 and are also taken into account when conducting the LEA Feedback Weeks (as part of the agile development, see D1.1) and stressors (such as the mask topic, illness, etc.) were reported in D4.1 (stress cues, we added “People in the scene coughing, not wearing a mask and not keeping distance…”).

- In an agile feedback session (our so called “LEA Feedback Weeks”, see D1.1) was mentioned: The LEAs noted that the scenario "identify and stop persons without masks in a demonstration" is currently being practiced in the real training by means of role plays. Here the role players have to wear red and white masks and the red masks mean "no mask". This end user comment shows why VR has a strong meaning also in the field of role-playing - because in simulation the mask wearing can naturally fade out and thus create a much more real situation. (original wording in relation to the example of a police officer:"...currently we have very bizarre scenarios due to the role-playing games.... A VR system could make a significant contribution to the simulation of real scenarios and thus offer added value in training...".

Dissemination and communication

Due to the emergence of the pandemic in the first quarter of 2020, the COVID19 topic dominated global communication and pushed other topics off the agenda. The current pandemic situation affects all areas of life (contexts such as work, training, family, home, etc.) and thus also the police in their daily work. Therefore, considerations were made around the objectives such as network building, cultivating contacts or addressing media topics and how the crisis can be seen as an opportunity with a strong focus on the core topics of SHOTPROS.

Contribution to Dissemination & Communication

- The implementation of the study and the subsequent presentation of the results led to new police contacts and to an expansion of the SHOTPROS network activities (e.g. Mannheim Police, Austrian Ministry of the Interior, etc.)
- Presentation of results and link to the SHOTPROS core topics in two CEPOL Webinars to raise the awareness on our project and the relevance of VR enhanced DMA-SR police training in pandemic circumstances.
- Publication of the results in a peer-reviewed Journal (Journal of Criminal Justice)[6] to make the created knowledge available to the scientific community and other stakeholders to increase publicity of the project.

[6] Marie Ottilie Frenkel, Laura Giessing, Sebastian Egger-Lampl, Vana Hutter, Raoul R.D. Oudejans, Lisanne Kleygrewe, Emma Jaspaert, Henning Plessner, The impact of the COVID-19 pandemic on European police officers: Stress, demands, and coping resources, Journal of Criminal Justice, Volume 72, 2021, 101756, ISSN 0047-2352, https://doi.org/10.1016/j.jcrimjus.2020.101756.

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This means, that we saw the study as an opportunity to address the issue of stress in correlation to the pandemic, while referring to the core messages of SHOTPROS (such as VR Training and DMA).

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