



D8.9

Exploitation Plan and Business Outlook

Version 1

Version
V1.0

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1.0	26/11/2021	Markus Murtinger (AIT)	Final review and quality check

List of Acronyms and Abbreviations

Acronym/ Abbreviation	
AIT	Austrian Institute of Technology – MED1stMR Coordinator
EC	European Commission
HRB	Horizon Results Booster
I&E-tool	IPR & Exploitation management tool
IP	Intellectual property
IPR	Intellectual property rights
KER	Key exploitable result
MFR	Medical first responder
MR	Mixed reality
tbd	to be defined
USE	USECON – MED1stMR partner
VR	Virtual reality
WP	Work package

Relation to Objectives

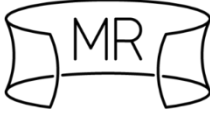
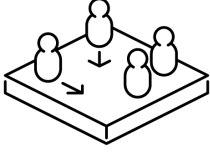
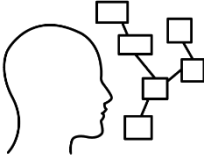
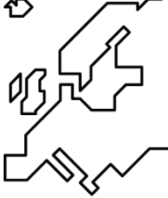
Objective	Description
	<p>Obj. 1: Pioneering MR training approach for enhanced realism</p> <p>To build a mixed reality (MR) solution is one of the main objectives of MED1stMR and therefore also represents one of the 3 main Key Exploitable Results (KERs) on which the exploitation plan is based on. A suitable exploitation strategy needs to be developed to be able to achieve objective 1.</p>
	<p>Obj. 2: Effective training scenarios and a training curriculum</p> <p>Objective 2 represents another KER of the project and therefore plays an important role for the exploitation plan of the project.</p>
	<p>Obj. 3: Physiological signal and trainee behaviour feedback loop and smart scenario control</p> <p>This objective represents an important part of the second main KER within the project. This KER is possible to achieve as an integration within objective 1 or as a stand-alone solution and therefore also represents an important factor for the exploitation strategy of MED1stMR. With the exploitation plan it is possible to achieve objective 3.</p>
	<p>Obj. 4: Position the pioneering MR training approach across Europe</p> <p>Positioning a solution or even raising awareness for a topic is not possible without an elaborated exploitation plan. Defining all the difficulties that future users of our potential products and services have with their current alternatives allows our project to find solutions to these issues.</p>

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Executive Summary

A suitable exploitation plan and business outlook for MED1stMR is essential to maximize the impact of the project and its results by generating a sustainable value. The exploitation plan, innovation management and a business outlook will be elaborated in WP8 by delivering four versions during the project and will in the end build a roadmap for actions after the end of the project.

This document at hand (version 1 of the exploitation plan) delivers a basic exploitation strategy and describes the three key exploitable results that will be elaborated in detail by the consortium throughout the course of the project. Furthermore, the relation of the exploitation plan and the IPR management (as part of WP8 task T8.6) is described as well as the intended procedures and tools. The results of the workshop with the European service agency “Horizon Results Booster” will also be covered in a first version and focus on the three main key exploitable results of MED1stMR.

Relation to other deliverables and tasks in MED1stMR

Table 1: The work and the document build on results from the following deliverables.

No.	Title	Information on which to build
-	Grant Agreement	First definitions and rules regarding exploitations
-	Consortium Agreement	First basic agreements on exploitation
D8.6	Knowledge and IPR management plan – Version 1	The general guidelines regarding IPR management defined in this document build the base for D8.9 and the other versions of the exploitation plan. (D8.10-8.12)
D1.1	Project Manual including Quality Assurance Guidelines	The basic project guidelines also apply for the definition of the exploitation plan within the project.

Table 2: The results of this work will be incorporated into following work and developments.

No.	Title	Basis for
D8.7, D8.8	Knowledge and IPR management plan – Version 2 & 3	IPR management and exploitation plans are dependent from each other respectively build on each other – therefore the common tool will be integrated in both deliverables.
D8.10 - D8.12	Exploitation Plan and Business Outlook - Version 2, 3, 4	Further versions of the deliverable at hand through the course of the project.
D8.14, D8.15	Dissemination Activities	As the exploitation covers a detailed description of planned results and is an ongoing process, the dissemination activities will be influenced by this in terms of description of the results and advantages of the solutions etc.

1 Introduction

Med1stMR aims to develop a user-friendly mixed reality (MR) **training solution** for **medical first responders** (MFRs) including performance measurement to combine medical simulators with virtual environments and smart scenario control options. A highly innovative integration of different technologies and the high number of consortium partners (19) from different disciplines need exploitation on different domains, markets and levels with ongoing planning. Even on an early stage of the project an exploitation plan and the understanding of the topic exploitation and impact as well as the expectation management regarding the outcomes is necessary to be guided within the consortium.

According to the European Commission¹, exploitation means the **use** (direct and indirect) **of results** in further **research activities** other than those covered by the action concerned, or in developing, creating, and marketing a **product** or **process**, or in creating and providing a **service**, or in **standardisation** activities. Without using project results after the end of the project, there will be no sustainable impact of the project. Therefore, exploitation is a key success factor of the project itself and beyond. The exploitation plan will, in its final version, be delivered together with a concrete business plan dealing with real activities where partners commit themselves to implement the solutions, having identified resources and first operative steps.

These facts claim for ongoing involvement, careful planning, and a close connection with the management of intellectual property rights (IPR).

2 Exploitation Strategy

2.1 General

The consortium will systematically and regularly evaluate the MED1stMR outcomes for exploitation potential and generate strategies to make use of the outcomes on a scientific, societal and economic level (see section 3.3 Exploitation procedures within MED1stMR). To achieve this, **four versions** of the “Exploitation Plan and Business Outlook” are planned as project deliverables starting with the D8.9 at hand in month 6 of the project, followed by D8.10 (M17), D8.11 (M26) and D8.12 (M36) as the final version. All versions build upon the prior version and will in the end provide a full overview of the planned and executed exploitation and business opportunities of MED1stMR. D8.9 - D8.12 all refer to the task T8.6 “IPR management, Exploitation and Business Innovation Opportunities” which is led by partner USE but is a collaborative task throughout the whole project consortium.

The final exploitation plan will review innovation opportunities for exploiting the findings of MED1stMR by entrepreneurial stakeholders and different kinds of MFR organisations and training

¹ Horizon Results Booster - www.horizonresultbooster.eu

institutions and will explore other entities such as local and regional governments responsible for legal set up of trainings for MFRs. A business plan for the finalisation of the MED1stMR developments and commercialisation of the product will be included in D8.12.

The exploitation plan is and will be based on:

- Grant Agreement
- Consortium Agreement
- Horizon Results Booster service provided by the European Commission
- Regular exploitation workshops (see section 3.3 Exploitation procedures within MED1stMR)
- IPR & exploitation management tool (I&E-tool)
- Prior versions of the IPR and Exploitation plan (D8.7 - D8.12)

2.2 Horizon Results Booster

During the MED1stMR project kick-off, the consortium was informed about the availability of the Horizon Results Booster (HRB - <https://www.horizonresultsbooster.eu/>) and decided to take advantage of the EC business planning service. After application, an internal preparation, and an overview on the **three most important key exploitable results (KERs)** and a preliminary report by the Horizon Results Booster agency, a kick-off with the MED1stMR consortium took place on November 2nd, 2021. This introduction of the topic was followed by a detailed full day Exploitation Strategy Seminar (ESS) workshop on November 9th, 2021. All three main KERs were elaborated and discussed in detail and will then be reported to the consortium by the service agency.² The consortium will discuss the HRB report in the next consortium meeting (currently scheduled for Dec 15-16th, 2021) and the results will be reported in the next version of the exploitation plan D8.10 (M17).

2.3 Exploitation criteria

For the elaboration of the exploitation options within MED1stMR, we will use the following criteria per KER:

- Problem
- Alternative Solution
- Unique Value Proposition (UVP)
- Description of the solution
- Target Market
- Early Adopters
- Competitors

² As the submission date of the deliverable D8.9 at hand is end of November 2021 (M6) and the results of the ESS are planned to be available after this date, the results of the full report are not included here

- Go-to-market Model
- Go-to-market Timing
- Go-to-market IPR Background
- Go-to-market IPR Foreground

During the project, all criteria need to be answered and defined. For the beginning of the project, we focus on the criteria we could already describe and will discuss them in detail on the first consortium meeting in M7. The focus is what are the current problems in MFR training, what alternatives do they currently use and based on this we can work on the unique value proposition of the targeted solution.

2.4 Exploitation Roadmap

To make sure that the project has an impact it is necessary to create an exploitation roadmap on all actions that need to be taken after the project ends. The exploitation roadmap will be listed in a tab in the IPR & Exploitation Management tool (see section 3.2 IPR & Exploitation management tool (I&E-tool) description).

2.5 Key Exploitable Results

To set an exploitation focus on the beginning of the project the MED1stMR consortium agreed on three main KERs within the GA and during the preparation for the Horizon Results Booster:

- KER 1 – MR training system
- KER 2 – Smart wearables (with bio signal sensors)
- KER 3 – Training framework & guidelines

2.6 Relation to project dissemination

During the elaboration of the exploitation topics and by describing the different criteria, a clear communication strategy regarding results, advantages, target groups etc. becomes clearer.

3 IPR & Exploitation management tool & procedures

3.1 Relation to IPR Management

As defined in D8.6, the IPR management approach for MED1stMR was established and follows the **three principles** of: **fairness, transparency, and persistence**. Although IPR and exploitation are reported in different deliverables over the duration of the project, both topics depend on each other and therefore need to be developed in coherence. IPR decisions are defined to be made jointly in a fair and transparent way and IPR issues are discussed on a regular basis (see D8.6). The same will be

valid for exploitation decisions, as the management of IPR is one influential factor of a sustainable exploitation of the project.

3.2 IPR & Exploitation management tool (I&E-tool) description

To keep an overview of IPR and exploitation management within MED1stMR, a tool was created as described in D8.6. This tool was enhanced with more exploitation related sheets since the first version (D8.6) and now covers the following sheets for both topics in a common view:

- **TAB 1 - IPR Directory (see Annex II):**

All partners must indicate the results created during the project in the IPR Directory. The IPR directory includes information about the owner, the type of IPR (e.g. prototype, algorithm, software, etc.), a brief description, the planned exploitation (e.g. licencing, spin-off, etc.) and remarks.

The following tabs derive from the Horizon results Booster and represent a detailed description of the three main KERs:

- **TAB 2 - KER 1 – MR training solution**
- **TAB 3 - KER 2 – Smart wearables**
- **TAB 4 - KER 3 – Training framework & guidelines**
- **TAB 5 – Problems per KER**

This represents the evolvment of the KERs during the course of the project. The first version has been added after the Horizon Results Booster seminar to focus on selected KERs. During the upcoming internal exploitation workshops (see section 3.3 Exploitation procedures within MED1stMR) the KERs will be discussed, enhanced and changes added here in the description of the KERs.

- **TAB 6 - Exploitation goals per partner (see Annex V):**

The exploitation goals as outlined in the Grant Agreement (GA) are included and updated from the respective partner.

- **TAB 7 - Overview KER from GA (see Annex III):**

The key exploitable results from the GA are listed and briefly described here. This list will remain stable – new additions will be added in the list on the next tab

In general, updates and changes are indicated in the document and will be reported in D8.7 and D8.8.

3.3 Exploitation procedures within MED1stMR

In accordance with the IPR action (see D8.6), the exploitation topics will be raised within the same procedures:

Table 3: IPR Management & Exploitation Actions - overview

IPR Management & Exploitation Actions - overview	
Bi-annual Report	All partners have to report their progress on a six-monthly basis and must indicate the key results and exploitation of the reporting period. This information serves as input for the next workshop or online meeting.
Bi-annual workshops:	Consortium meetings will be accompanied by an exploitation and IPR workshop for an efficient forthcoming of these topics. Results are reported in the tool described above and the corresponding versions of the deliverables in WP8, T8.6. If it is not possible to conduct the workshop during the General Assembly meeting, a dedicated (online-)workshop will be scheduled for this purpose.
Monthly Steering Committee Meetings	The IPR directory and the key exploitable results and the exploitation plans will be presented at each monthly meeting. The SC can permit a party to withdraw any of its background or result from the IPR directory.
Individual contribution	If a partner wants to add information to the IPR & Exploitation Management Tool, this can be done at any time as the tool is accessible on the MS-Teams channel of MED1stMR (changes will be tracked automatically by the system). The Coordinator and USE have to be informed by email about this contribution.

4 Exploitation MED1stMR – current status

4.1 Report on exploitation actions

The following Table 3 summarises the actions done for exploitation since the beginning of the project.

Table 4: List of exploitation actions done since beginning of project.

Action	Who	When	Status	Overview results
Establishing IPR tool	USE	July 2021	done	Excel tool established and first check by consortium
D8.6 – IPR plan	USE → all	August 2021	submitted	Revised by consortium & submitted
Horizon Booster ESS workshop	all	November 2021	done	Report will be created by EC and sent to us for further use
Establishing an adapted I&E-tool based on the IPR tool	USE	November 2021	done	Sent to partners for check
D8.9 first version of Exploitation plan	USE → all	November 2021	done	submitted

Send out request for bi-annual report on IPR and Exploitation issues to the consortium & check of current status of the tool	USE → all	November 2021	In progress	Additions made to the I&E-tool
Receive ESS report from Horizon results Booster	all	tbd	tbd	
Plan & execute workshop at Consortium meeting based on input from Horizon Results Booster	USE → all	December 2021	In progress	
D8.10 Exploitation plan V2	USE → all	October 2022	planned	
D8.11 Exploitation plan V3	USE → all	July 2023	planned	
D8.12 Exploitation plan final	USE → all	May 2024	planned	

4.2 Internal Exploitation workshop at the consortium meeting

The upcoming General Assembly meeting planned for December 15th-16th, 2021 in Zürich also covers a slot on exploitation of the project – the topics following in the next section will be discussed.

4.2.1 Topics that need to be discussed in the first internal workshop

(Competition) Alternative existing solutions on the market:

- Real-life trainings planned in different “sizes” depending on budget, time and objectives (with or without role players, with simulated manikins on different scales of realism, in realistic environments (e.g. including a burning car or just in a training hall etc.)
- VR solutions without the haptic integration and without the measurement of biosignals of the trainees

The advantages and disadvantages of them need to be elaborated and discussed. Additional alternatives might be added if suggested.

List of problems per KER and our planned UVP as an answer on that problem to the market:

This list will cover all problems end users currently face with MFR training in general and with the alternative solutions to the planned KERs. The entries need to be extended and discussed within the consortium. This list is part of the I&E-tool and only listed with first examples in Table 4.

Table 5: List of end user problems and planned UVPs per KER (first examples).

KER	Problem	UVP – how do we solve this problem better
MR training solution	Real-life MFR trainings are not realistic enough	Realism through VR environment, haptic and interaction
MR training solution	In real-life MFR trainings role-players typically have no detailed medical background and therefore do not know how to react correctly on right or false treatment of the trainee	Direct communication with role players by the trainer without interruption of the training and a trainee cannot hear it
MR training solution	Realistic wounds are time and money intensive (professional make-up) cannot be adapted to the treatment and do not change over time (e.g.: wounds get bigger if not treated)	Visualisation of wounds as "overlay" on manikins or avatars
Smart wearables	No (systematic) collection of trainee's biosignals during training	Tracking of scientifically validated data during training
Smart wearables	A lot of available sensors do not track validated, medical reliable data	Scientific validation during the project
Smart wearables	No understanding of the trainee's stress situation during a MFR training	Trainer gets informed about current mental load situation of the trainee within his trainer live view
Training Framework & Guidelines	No valid guidelines for medical VR/MR training - lack of standardisation	Guidelines according to the project results
Training Framework & Guidelines	No guidelines how to integrate with current trainings	Guidelines how to integrate with current trainings
Training Framework & Guidelines	Deciders do not have enough information about the training approach/framework of VR training in the MFR	Information for deciders on the training framework

4.3 Unique selling points of MED1stMR products – first drafts

In this section the competitive advantages and the innovative aspects of the KERs in MED1stMR are described. It is highlighted what the KERs will do better than alternative solutions and what distinguishes the KERs from the competition and current solutions.

4.3.1 KER 1 – MR training system

The MED1stMR training solution combines the technology of VR and enhanced VR enabled manikins combined with smart wearables to measure the biosignals of the trainees in a training framework including scenarios to train decision making and skills. Trainings can be modified according to the stress level of the trainees. It enables group training and adaptations to local conditions are easily possible. It can be restarted or adapted at any time so the time and money intensive investment like the re-building of dangerous situations like a tunnel or passing cars are not needed anymore. Trainee conditions regarding stress are monitored throughout the training and the training can be modified to this status (e.g. more or less stress inducing factors within a scenario or via the manikins). The role of the trainer gets enhanced with tools like the monitoring of stress and smart control options. The interpretation and coaching competencies of a trainer will raise and on the same time, the trainer get less involved with simple re-building tasks or similar tasks for real life training. Identifying real MFR user needs is a key factor of the project methodology – therefore the final product will meet the needs of European MFRs.

Main features and advantages of KER 1:

- MR training solution with improved realism by haptic rendering, scalable and configurable
- Flexibility
- Scenario selection
- Adjust environment and training objectives according to stress level and/or learning progress
- Real time feedback
- Cost efficiency, train more often at lower costs
- More trainings of large events/mass casualties
- Simulation manikins are typically missing emotions and the “behaviour”, or “status of injuries” is typically not changing during the scenario and quick verbal checks to clarify brain injuries cannot be made – this becomes possible by the integration of the manikin within the VR
- Create and change the environment (environment e.g. train station, city centre, tunnel, overcrowded ambulance; conditions like fog, smoke, add heating systems for fire environment, smells of fire, ...)
- Observers (like other trainers or trainees) can watch from any location (collaboration) to apply model learning
- Protocols are easy to record and analyse
- Biosignals help to identify causes of good and bad performance and can help improve resilience
- Empirically validated and scientifically tested effectiveness of our training system and scenarios including stress and performance measurements be able to show effectiveness by facts and data and support the exploitation of the solution

4.3.2 KER 2 – Smart wearables (with bio signal sensors)

The development of innovative and easily deployable smart wearable technology for medical first responders will allow for the monitoring of physiological data, supporting the training of MFRs. The usage of the correct sensors, the combination and the placement of these will be validated in several studies and then be integrated in the MED1stMR solution described above to provide monitoring and control options during and after the training for the trainer. Moreover, the smart wearables can be also introduced as a stand-alone solution to monitor stress as it is based on a scientific model. There could be a plug-in that allows other software providers to make use of the technology and the developed assessment model.

Main features and advantages of KER 2:

- Small & all in one wearable
- Easy to wear & easy to put on/off
- Feedback loop to the MR solution for adjustments (manually or AI based) or stand alone
- Easy to integrate into monitoring software (Via software APIs)
- Reliability (based on a scientific model) validated in clinical environment (comparison with gold standard) and on empirical ground (number of persons)
- Capability to measure stress and other physiological parameters
- Stress component is key, the collection of data and validation of our stress measuring approach will be important

4.3.3 KER 3 – Training framework & guidelines

The MED1stMR Training Framework & Guidelines will be scientifically evaluated and validated across at least 9 European countries. An Effective Performance in Medical Emergencies (EPME) model will be established and implemented in the framework. Based on this, the manipulation of influencing factors, selection of different scenarios appropriate to the training needs will be made available. The trainees will be turned into active users who engage physically and mentally. VR experiences stimulate tactile, visual, and auditory senses and therefore ensure to satisfy a range of different learning styles or types.

Main features and advantages of KER 2:

- Standardisation on a framework base
- Guidelines for implementing in existing training
- Co-creation within a European Consortium & based on best practices
- Elaboration based on the scientific model behind MED1stMR
- validation within 9 EU countries
- Presence of guidelines on scenarios

4.4 Business cases

To set up business cases for each KER, a first template was designed and will be elaborated throughout the project:

Table 6: Template for Business Cases with examples.

BC1	MR training solution
Business Model	<i>B2C, B2B, ...</i>
Service	<i>Selling training solutions, offering training as a service, ...</i>
Pricing model	<i>Purchase of the entire system, rental model, pay per use, ...</i>
Target client	<i>MRF organisations, trainer, ...</i>
Marketing channels	<i>(Scientific) dissemination on conferences and exhibitions, online media, interest groups, international networks, ...</i>
Sales Channels	<i>Partners, consultants, online, B2B-market places, ...</i>
Advantages for the client	<i>Scalable, configurable, flexible, cost efficient, ...</i>
Need to bring the service to the market	<i>high demand for the benefits, competitive advantage, new training opportunities, improved MCI training, ...</i>

5 Conclusion

All main objectives of the MED1stMR project comprise a product- and result-oriented solution or the positioning of these. Exploitation consequently is an important part of MED1stMR and needs to be considered throughout the whole project. The four versions of the exploitation and business plan which are further developed over the project period helps to achieve this as much as the regular involvement of all partners in workshops dedicated to the use of results after the project ends. With the involvement of the Horizon Results Booster the partner awareness regarding exploitation is already on a high level. The first major result is the agreement on the three KERs with all partners and the joint development of an initial exploitation strategy which now needs to be further developed regularly over the full duration of the project.