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# MIRROR

## Migration-Related Risks caused by misconceptions of Opportunities and Requirements

**Grant Agreement No. GA832921**

## Deliverable D1.3

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|---|---|
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| **Deliverable** | D1.3: Y1 MIRROR Progress and Planning Report |
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**List of Authors**

| Partner Acronym | Authors |
|---|---|
| **LUH** | Claudia Niederée |
| | Erick Elejalde |
| **CERTH** | Vasileios Mezaris |
| | Alexandros Pournaras |
| **UM** | Aitana Radu |
| **SAIL** | Katja Prinz |
| | Gerhard Backfried |
| **UNIVIE** | Hajo Boomgaarden |
| | Jakob-Moritz Eberl |
| **RUG** | Jeanne Pia Mifsud Bonnici |
| **EURIX** | Francesco Gallo |

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## Executive summary

In its first year, the MIRROR project has made major progress towards its goal of developing an integrated platform, a set of tools on top of this platform, as well as a systematic methodology for the comprehensive inter-media analysis of the perception of Europe (and individual countries in Europe), the detection of discrepancies between perception of and reality in Europe, and the creation of awareness for the impact of such misconceptions and potentially resulting threats.

In all areas of the project including technology development, understanding of legal and ethical framing, understanding of the requirements of the target groups, preparation of the field work and threat analysis work has been successfully started and important results have been achieved in the first year of the project following the work planning of the DoA.

This deliverable summarizes the progress of the MIRROR project in this first project year. It summarizes the overall progress and the results achieved in the individual work packages of the project. Furthermore, it describes the progress in terms of the KPIs, which the project has defined for itself. Finally, the deliverable also presents the results of a re-assessment of the risks identified for the project.

# 1 Introduction

## *1.1 Purpose of the deliverable*

In its first year, the MIRROR project has made major progress towards its goal of developing an integrated platform, a set of tools on top of this platform, as well as a systematic methodology for the comprehensive inter-media analysis of the perception of Europe (and individual countries in Europe), the detection of discrepancies between perception of and reality in Europe, and the creation of awareness for the impact of such misconceptions and potentially resulting threats.

This deliverable provides a compact summary of the results achieved in the MIRROR project in the first project year. It covers progress in all of its 12 Work packages. Furthermore, it also gives an idea of the major next steps planned in the individual WPs.

Thus the deliverable gives a good overview of the project status after one year of the project and can be used as a starting point for reading into the work done in the MIRROR project.

## *1.2 Structure of deliverable*

After the introduction in this first part of the deliverable, the deliverable is structured into three parts: The first part (Section 2) gives a compact overview of the progress in the project in Year 1. This is followed by a more detailed description of the progress in the individual WPs in the second part (Section 3 - Section 14) together with planning for next important steps. The deliverable closes with a re-assessment of the project risks in the final Section 15.

## *1.3 Relationship to other deliverables*

This deliverable is the first one of a series of yearly project progress reports and will be followed by D1.4 and D1.5 as progress reports for Year 2 and Year 3 of the MIRROR project.

The results produced by the project are only sketched in this report due to its compact nature. More detailed discussions of the project results can be found in the other deliverables of the project such as the series of technology deliverables D4.1, D5.1 and D6.1, the deliverables of WP3 on ethical and legal issues as well as the deliverables of WP7 on the MIRROR architecture and information model.

# 2 Overall Progress Overview

The project was successfully started in June 2019 with a Kickoff Meeting. In a series of Workshops with the application partners the requirements to the MIRROR system and the actionable insights were refined. A user driven approach was used for this purpose finally resulting in 13 personas and 21 user stories, which were transformed into functional requirement groups and additional constraints for the system. Furthermore, two further MIRROR scenarios were identified complementing the scenarios from the DoA.

A further important activity in the early phase of the project was in deepening the joint understanding of the MIRROR project and its domain. As part of this activity the Migration Related Semantic Concepts (MRSC) where developed, which provide an overview and ground definitions for migration-related factors and help in establishing a joint terminology for communication and content filtering.

Within the MIRROR project, special attention is given to sound ethical practices and respect to data protection and other fundamental rights. Raising awareness for this topics and has already started early in the Kickoff Meeting and accompanies all areas in the project including technology development. As part of these activities, the MIRROR Ethics principles and practices have been discussed and documented. Furthermore, a Human Rights check list has been developed for the project. For the planned work on societal acceptance, a mixed Societal Acceptance Task Force has been set up, in order to identify concrete ways how to address societal acceptance issues both during the lifetime of the project and when the MIRROR application is finalized. Work on ethical aspects has also considered the ethical requirements, which had been identified for the project such as establishing an MIRROR Ethics Board.

As an important pre-requisite for the technical work in MIRROR, a framework for giving access to (pre-annotated) media content from a large number of sources to the other partners has been established based on the SAIL's Media Mining System. This has been enriched with pre-processing and fundamental text analysis technology, which is tailored to the needs of the MIRROR project such as language recognition and the identification of migration related entities. Furthermore, methods have been developed for detecting EU-related topics and sentiment analysis methods have been extended to the needs of MIRROR focusing on the detection of hate speech. Finally, initial work on the identification of artificially generated content has been performed.

Work in the field of multimedia analysis focussed on methods for image/video annotation and on automatic speech recognition (ASR), which are driven by the identified user requirements. For image/video annotation methods have been developed and extended for generic visual concept detection, video captioning, and the detection of migration-related semantic concepts. Furthermore, work on sentiment analysis of visual content has been started, achieving already first promising results. In addition, a method for image and video summarization has been developed building upon a clustering approach and re-using parts of the results from the other image/video annotation methods. For ASR models were extended to meet the languages and terminology required for the MIRROR projects. Finally, the methods and components developed were also prepared for integration into the overall MIRROR system.

For Cross-Media Network Analysis, a component for this purpose has been designed and implemented, which will serve as a collector of annotations and findings extracted in text analysis, multimedia analysis and social network analysis. As a further achievement, a detailed analysis of the representation of Europe in the news across multiple geographical regions has been performed. This includes the evaluation of the

representation bias by exploring the differences in coverage not only in the general news context but also by focusing on specific topics. In addition, “silent” users in social networks have been investigated in the context of migration. This is in preparation of a method that can be used for predicting the opinion of such users, which otherwise might pass unseen, although they play an important role in perception. Finally, first results have also been achieved in automated bot detection by developing a first set of attributes to be used for the further development of an explanatory bot detection method.

For preparing the development of the MIRROR system, a system architecture was developed taking into consideration the identified requirements as well as legal and ethical aspects associated with data processed by the system. Furthermore, an integration approach and plan was agreed upon between the partners involved in the technical development. Complementing the work on the MIRROR prototype, a MIRROR information model was developed. A task force was created for this purpose. The MIRROR Information Model captures the project’s understanding of the core concepts relevant for the MIRROR project. For the actual implementation of the MIRROR prototype two types of activities were performed: a) the implementation of a basic analysis workflow and b) the implementation and step-wise refinement of a UI, which enabled early feedback from the application partners.

For preparing the field work foreseen in the MIRROR project, work has focussed on: a) a theoretical framework for migration process analysis, b) preparing processes and material for the field work and c) performing initial field word. The core of the developed theoretical framework is a new Migration-Communication-Model (MCM) that highlights the roles of migration networks, social capital, different types of feedback communication, as well as media and information literacy in contemporary migration processes. In preparation of the field work, interview guidelines as well as informed consent procedures and forms have been prepared and ethically approved. Furthermore, contacts have been established to persons and organizations relevant for the field work. As initial field work, interviews have been done with experts in the field of irregular migration, which informed the organization of the rest of the work.

Perception-driven risks and threats are a further important topic in MIRROR. In this area, work has started with an analysis of existing threat/risk analysis methods and tools with a special focus on security organizations in a border context. Based on this analysis, CIRAM - the risk assessment methodology employed by FRONTEX - has been selected as the basis for the MIRROR threat analysis approach. Currently, this threat analysis is extended in two main directions for employing it in the MIRROR context: a) by making it more OSINT-friendly and (b) by including the risks to migrants as well (in addition to the risks to the state).

Following the project plans, the preparation of the pilots in three countries is still in an early state. However, the planning has already started involving all application partners as well as the technical partners. As the most important result so far, a comprehensive checklist was developed which outlines the steps to be taken by all the partners involved in the piloting.

Preparations for disseminating project results were started early in the project. As a first step, a common communication, dissemination and exploitation strategy was developed. Furthermore, work was performed on the development of a common visual identity that reflects the project including a project logo, which were translated into a communication kit with templates and material for the project, such as templates for presentations and a poster. The project Web Page was launched and MIRROR social media accounts have been set up and are maintained. In addition, first scientific publications have already been

achieved based on MIRROR results and the project and its results have already been presented at different types of events and occasions.

Effective collaboration and progress in the project is enabled and fostered by the management procedures and the communication channels, which have been established as part of the management activities in the project. This includes effective methods for progress monitoring, quality control, refinement of planning and reporting.

Overall the first milestone MS1 (MIRROR Basics), which has been defined for month 6 of the project, has been achieved with important contributions such as the establishment of management procedures, the collection of user requirements, definition of the MIRROR architecture. Important contributions to MS 2 (MIRROR Major Release 1, due in month 14) are, furthermore achieved with the set of deliverables completed with the closing of Year 1 of the project such as the first version of the relevant technologies.

# 3 Progress in WP1

## 3.1 Overview of WP1 and its Goals

| WP Number | WP1 | WP Leader | LUH |
|---|---|---|---|
| WP Title | Project Management & Coordination | | |
| Involved Partners | All | | |
| Start Month | M1 | End Month | M36 |

**Goals of WP**

The project management encompasses contractual issues, technical, administrative, finance, communication and knowledge management inside the project, and external relationships between the project and the EC. WP1 has the following objectives:

- Ensure effective planning, implementation, coordination and achievement of the project activities, including timely production of deliverables and successful completion of the Tasks.
- Provide project structure and support to assist decision making, internal and external communications, encourage greater accountability and control, minimise risk, identify and address and exploit project related opportunities.
- Coordinate quality control for project output and help the consortium achieve their project objectives.

**Focus of Year 1**

The initial focus of Year 1 was on setting up the management structures and procedures as well as on establishing a good working environment for the MIRROR team including adequate communication channels. Subsequently, the focus was on project management, fostering of collaboration as well as on establishing quality control and reporting procedures.

## 3.2 WP1 Achievements & Results

### 3.2.1 Summary of WP Results in Y1

As the most important result of WP1 a productive working environment and a positive collaboration atmosphere has been established for the project activities. Furthermore, project planning has been refined and procedures for monitoring project progress towards its objectives have been established.

For easing communication and collaboration adequate channels have been set up. Following the project Kickoff in June 2019, further face-to-face as well as virtual meetings have been set up for fostering exchange, planning and the deepening of a joint understanding of the project activities and goals.

Furthermore, processes for quality control and reporting have been defined including a quality assessment preceding the submission of deliverables.

Management procedures, reporting practices, and established communication channels have been documented in a Project Handbook (deliverable D1.1). Furthermore, a data and knowledge management plan has been defined for the project and documented in deliverable D1.2.

### *3.2.2 Detailed Description of Achievements*

All four Tasks of WP 1 were active in the first year of the project.

**Achievements in Task 1.1 - Planning, Scheduling and Risk Management**

In year 1 of the project the understanding of the project has been deepened and the project plans, as they are outlined in the DoA have been refined leading to a more detailed scheduling of tasks and activities in the individual Work packages. Following the progress in the project and the experiences collected, the schedules and plans are regularly refined and adapted. During the last months it was, for example, decided to create smaller (cross-WP) task forces for selected topics to speed up progress in the respective area, while also bringing in multiple perspectives.

The work plan is monitored in collaboration with the WP leaders. Regular WP leader telcos have been established for this purpose. In addition, two face-to-face meetings (including the Kickoff Meeting) and one virtual meeting have been organized with the complete consortium for refining the project planning and discussing project progress (besides discussing other project issues such as project risks). This has been complemented by several multi-lateral meetings, e.g. for eliciting user requirements.

Furthermore, a data and knowledge management plan has been created and documented as deliverable D1.2. It describes data sets and data collection activities in the project and related aspects of data protection. In addition, it also contains a summary of knowledge management procedures and planned knowledge assets that are under creation in the MIRROR project.

**Achievements in Task 1.2 - General Project Management Activities**

In this Task, management procedures, as they are required for a large European project, as well as the required channels for communication and knowledge exchange have been agreed upon and implemented. Following the needs of the project 16 mailing lists have been set up for easing the communication in the project. Furthermore, a document repository with an associated Wiki has been set up for easing document and knowledge exchange in the project. This is used for collecting, managing and sharing documents that are relevant for the project such as presentations, (draft) deliverables, publications, templates, and working documents.

The management procedures have been documented in a Project Handbook (D1.1), which has been completed in month 3 of the project.

**Achievements in Task 1.3 - Quality Plan and Progress Monitoring**

For quality planning and monitoring a process for ensuring deliverable quality has been established under the lead of the Research Manager (CERTH). This includes assigning a quality assessor for every deliverable as well as a process and schedule for performing the quality control for the deliverables before submission.

Progress monitoring is established on two levels. Within WPs, the progress is monitored and discussed in WP telcos organized by the WP leaders. For project-level progress monitoring, WP leader telcos are

organized all 3-4 weeks, where each WP leader summarizes the progress in the respective WP. In addition, -as a further form of progress monitoring - progress is also presented and discussed at the project meetings.

**Achievements in Task 1.4 - Reporting**

A strategy for project reporting has been agreed upon. This includes the aforementioned WP leader telcos, which report on the progress in the WPs. Furthermore, an internal six-Monthly reporting procedure has been established for summarizing the achievements of the WP on a higher level of granularity also taking into consideration the KPIs defined in the DoA and the level of Task completion. Templates have been prepared for this purpose and distributed to the project partners.

### *3.2.3 Role of Partners in the WP*

The partner LUH as the WP leader has the lead in this workpackage and is also responsible for most of the Tasks. The project management activities are supported by the MIRROR management team – consisting of the Research Manager (CERTH), the Integration Manager (EURIX) and the Community Liaison Manager (SAIL) as well as by the WP Leaders. Furthermore, all partners are involved into planning and quality control activities in individual WPs.

CERTH as the Research manager is leading the Task T1.3 and is involved in Task T1.1. In more detail, In T1.1, CERTH participated in the overall planning of the project work, as Research Manager and WP5 leader, and organized a series of regular WP Leaders conference calls for monitoring the progress of the work. CERTH also contributed to the authoring of the data and knowledge management plan of the project (D1.2). In T1.3, CERTH organized the deliverables quality assurance procedure and assigned QA responsibilities for the project's first-year deliverables.

## *3.3 Contribution to KPIs*

There are no KPIs directly related to the management activities. However, the monitoring of the progress towards the KPIs defined in the DoA is a crucial management activity, which is also regularly followed up by the MIRROR management team.

## *3.4 Planned Next Steps*

Project management activities will be continued using the established processes and relationships. However, MIRROR management will also always try to still optimize the processes for achieving higher project effectiveness and efficiency. Furthermore, management processes will also be adapted to the changing needs in the project and according to the experience gathered during the project activities.

# 4 Progress in WP2

## 4.1 Overview of WP2 and its Goals

| WP Number | WP2 | WP Leader | LUH |
|---|---|---|---|
| WP Title | Demand Analysis & Forecasting for Border control Units and Policy makers | | |
| Involved Partners | LUH, MoDAT, MPF, NOA, EURIX, FOI, UM, FREUNDE | | |
| Start Month | M1 | End Month | M20 |

**Goals of WP**

The goal of this WP is to develop an improved and more detailed understanding of the demands and expectations of the target groups towards the planned MIRROR functionality and solutions. This embraces the technical solutions as well as the actionable insights to be produced by the project.

**Focus of Year 1**

WP2 has its main activities in Year 1 of the project, since the (main) requirements have to be elicited before the technical development starts. The focus in year 1 was, thus, in the interaction with the application partners for discussing scenarios and requirements. Furthermore, as a conceptualization of the relevant domain, the Migration-Related Semantic Concepts (MRSC) have been defined as a joint effort of the consortium.

## 4.2 WP2 Achievements & Results

### 4.2.1 Summary of WP Results in Y1

The elicitation of the needs of the target groups is a crucial foundation for the construction of the MIRROR system and the collection of useful actionable insights. Using a three-phase process, which is based on ideas from user-centered design, 13 relevant personas and 21 user stories have been collected. Furthermore, the user scenarios have been refined, also adding two new user scenarios for MIRROR. After prioritization of personas, this has resulted in 10 groups of functional requirements, which are used for the development of the MIRROR system. Complementing the requirements, 7 further constraints including multilinguality, transparency, involvement of experts, and legal compliance have been identified as part of the full process, which will also strongly influence the MIRROR system design. In a parallel activity, relevant MRSCs have been defined based on a literature review and on discussions in the consortium. This is a further building block for understanding the requirements, and an effort for better defining the domain relevant for the analysis of the project. For this purpose, MRSC were compiled, analyzed, and documented. These concepts will also play an essential role in establishing a common terminology and for providing a sound basis for content filtering activities (controlled vocabulary).

The collected personas, the refined user scenarios as well as the elicited requirements have been documented in deliverable D2.1. This deliverable also contains a description of the MRSC and their development.

### 4.2.2 Detailed Description of Achievements

In year 1 Tasks T2.1 and T2.2 have been active.

**Achievements in Task 2.1 – Scenarios and User Stories**

Following a user-centered design approach, a three phase approach for requirement elicitation has been selected for requirement collection in MIRROR. This includes: collection of first ideas via brainstorming (phase 1), scenario refinement (phase 2), and user story collection and prioritization (phase 3). In a series of workshops starting with a brain storming workshop at the Kickoff the user scenarios defined in the DoA have been refined. Furthermore, relevant personas and user stories have been collected during these workshops from the application partners in the project. This has resulted into 2 new scenarios, 13 personas and 21 user stories, which are all documented in deliverable D2.1.

For the MRSC, we created an overview and definitions for migration-related factors. These give us a common language (between application and technical partners) to work on the user's requirements. Categories are defined by sub-classes that, in turn, define more specific ideas. The MIRROR system needs to offer different levels of aggregation and analysis, depending on the information needs of different users. The hierarchical definition of the concepts gives us a natural solution to satisfy this requirement.

**Achievements in Task 2.2 – Requirement Analysis**

In this Task, the scenarios, personas, and user stories collected in Task T2.1 have been translated into requirements towards the MIRROR system. The first round of direct translation has resulted in 21 requirements for the system. Based on the prioritization of personas and a further round of grouping and revision, this list of requirements has been compiled into 10 groups of major functional requirements for the MIRROR system. Furthermore, 7 central constraints, such as the need for multilinguality and transparency, have been identified based on the results of Task T2.1. The results of Task T2.2 are also documented in deliverable D2.1.

### *4.2.3 Role of Partners in the WP*

Partner LUH leads the WP and is responsible for collecting requirements from the Austrian Partner MoDAT. UM is organizing the requirement collection from partner MPF, and FOI the requirements collection from partner NOA. EURIX participates in the work package as the representative of the technical development in the project. FREUNDE ensures that the migrant perspective is also considered in the documented requirements.

## *4.3 Contribution to KPIs*

WP2 lays the foundation for KPI12 (Percentage of collected requirements fulfilled), since it collects the requirements for checking KPI12 in the middle of the project. Furthermore, WP2 also creates the foundation for KPI15 (Level of user satisfaction with developed MIRROR system): a good understanding of the needs of the target group is an important precondition for user satisfaction with the implemented system.

## *4.4 Planned Next Steps*

The next steps in the WP are a) monitoring, that the collected requirements are also taken into consideration in the mockups and implementation of the MIRROR system and tools, b) a revisiting of the requirements in the second year of the project, for dealing with the typically evolving understanding of the system and the needs of the target community.

# 5 Progress in WP3

## 5.1 Overview of WP3 and its Goals

| WP Number | WP3 | WP Leader | RUG |
|---|---|---|---|
| WP Title | Legal Compliance, Societal Acceptance & Ethical Framework | | |
| Involved Partners | RUG, UM, K&I, FREUNDE, AGENFOR | | |
| Start Month | M1 | End Month | M36 |

**Goals of WP**

MIRROR is built on strong respect for the rule of law and fundamental rights, in particular rights to privacy, data protection and expression. Moreover, MIRROR will be implemented taking in account the features of a complex phenomenon, i.e. migration processes, and in alignment with social expectations of the involved actors. Therefore, the three main objectives for this WP are:

- To ensure that solutions developed and exploited by the consortium, its partners and stakeholders are compliant with ethical principles, applicable data protection legislation and other legal frameworks.
- To ensure that the solutions developed are acceptable to the different social groups affected by them and by society at large.
- To ensure that the solutions developed consider all the societal issues related to the migration processes towards Europe.

**Focus of Year 1**

There are three main foci this Work Package has focused on during Year 1: (a) ensuring awareness and adherence to ethical sound research practices; (b) an analysis of the key ethical issues that can arise from the project's research and findings; and (c) an analysis of human rights implications of sentiment analysis models for use in border security.

## 5.2 WP3 Achievements & Results

### 5.2.1 Summary of WP Results in Y1

The primary achievements of this WP are:

a. Awareness of sound ethical practices and respect to data protection and other fundamental rights during the project lifetime: this process of awareness started during the Kick-off meeting, continued in all project meetings and in frequent communication with other partners working in other work packages. In different telcos we have discussed alternative ways to carry out tasks which are more respectful of e.g. data protection rights.

b. Setting up of ethics advisory board: in collaboration with WP12, an Ethics Advisory Board has been set up to review and comment on ethical issues the arise during the project.

c. Review of consent forms and information sheets to be used in interviews in WP8: in collaboration with WP8, the team in WP3 assisted in the preparation and review of consent forms and information sheets to be used in the field research of WP8.

d. Report of MIRROR Ethical Principles and Practices: this report (Deliverable 3.1) documents ethical concerns MIRROR can come across during the lifetime of the project and the way that these concerns can be dealt with.

e. Human Rights Implications checklist: an advanced draft of the human rights implications of the design, implementation and further use of the MIRROR application has been worked on during this period.

f. Setting up of Societal Acceptance Task Force: under the lead of K&I a task force made up of members in different work packages was set up to identify concrete ways how to address societal acceptance issues both during the lifetime of the project and when the MIRROR application is finalized.

g. Identification of factors influencing societal acceptance: a thorough literature review has been carried out during this period.

### *5.2.2 Detailed Description of Achievements*

In year 1 of the project, mainly the taks T3.1, T3.2, and T3.3 were active. Work was also started in Tasks T3.4 and T3.5.

**Achievements in Task 3.1 - Adhere to Good Ethical Practices**

Task T3.1.1 has worked closely with WP12 to understand which ethical review committees are applicable for the research carried out by the different partners; assisted in the setting up of an Ethics Advisory Board (reported on in WP12); assisted with the preparation of consent and information forms needed for the field work to be carried out as part of WP8; and worked on a report on measures to prevent misuse of research findings.

Task T3.1.2 has identified and assessed the ethical issues arising from the project. A traffic light system has been used to define the severity level of the potential risks of ethical and legal breaches that the MIRROR project may pose. Severity level green means that the relevant ethical value suffers no influence and that the development of the project is not concerned by potential breach of the same value. Severity level yellow means that the relevant ethical value may suffer an indirect influence from the MIRROR activities. Severity level red means that the relevant ethical value can potentially be jeopardized by the activities of the project. The findings of this Task were discussed with the whole consortium during the March 2020 Project Meeting. Deliverable D3.1 is completed.

**Achievements in Task 3.2** - **Human Rights Implications of Building a Sentiment Analysis Model for Border Security**

In this Task, the team has been working on a broad human rights analysis of the potential effects from a human rights perspective of using sentiment analysis techniques. The work is slightly delayed, but an advanced draft of the human rights checklist has been prepared. Deliverable D3.2 is in preparation.

**Achievements in Task 3.3 – Privacy and Data Protection Impact Assessment**

The work on this Task is on-going. At this stage of the project the Task is assisting the technical partners in WP4, 5, 6 and 7 to include data protection principles in the design of the MIRROR application. This includes regular discussions on how to take a data minimisation approach, considerations on tools to separately store identifiable data from other data; anonymisation and pseudonymisation, security of storage, built-in data deletion tools etc. In the next stage of this Task we will report on the impact assessment process we have followed in this Task. Deliverable D3.3 is in preparation.

**Achievements in Task 3.4 – Factors Influencing Societal Acceptance**

An elaborate literature review on factors influencing societal acceptance has been carried out. This literature review covers: major trends in migration; theoretical issues including classifications of migrants and types of migrants, the role of social networks and social media and the dynamics of integration; and narratives on migration. Based on the literature review, a number of critical issues for MIRROR that affect social acceptance have been identified. These critical issues include reflections on the levels of disclosure of MIRROR technologies; the communication on MIRROR technologies and the role and scope of social acceptance in the design and implementation of MIRROR. To help the further reflection on these critical issues a project-wide Task Force on Social Acceptance has been set up. Deliverable D3.4 is in preparation

**Achievements in Task 3.5 – Societal Issues of Migration**

Work in Task T3.5 is closely related to the work in Task T3.4. The work in the two Tasks inform each other. In the literature review referred to in Task T3.4, the following aspects of Task T3.5 were also covered: dynamics of integration of migrants in EU countries; the reception ability (and reception willingness) of migrants in EU countries; difficulties, challenges and risks connected to the migratory process (more specifically if irregular) and reflections on the cost of the migration process. This Task is working closely with WP8.

### *5.2.3 Role of Partners in the WP*

RUG is the work package leader and the lead partner in Tasks T3.1, T3.2 and T3.3. K&I is the lead partner for Task T3.4 and T3.5. FREUNDE contributes to the work in Tasks T3.4 and T3.5. UM and Agenfor contribute to all the Tasks.

## *5.3 Contribution to KPIs*

Having a strong ethical and legal compliance framework is key to the achievement of all KPIs. There are no KPIs specifically linked to this WP.

## *5.4 Planned Next Steps*

The major goals for the next months are to:

a) Finalise the human rights checklist (D3.2)
b) Continue with the close cooperation with WP4, 5, 6 and 7 on data protection and privacy issues and conclude the privacy and data protection impact assessment
c) Proceed with the work of the Task Force on Social Acceptance and further the work in Tasks T3.4 and T3.5.

# 6 Progress in WP4

## *6.1 Overview of WP4 and its Goals*

| WP Number | WP4 | WP Leader | SAIL |
|---|---|---|---|
| WP Title | Text Analysis Methods for Social and Traditional Media | | |
| Involved Partners | SAIL, LUH, EURIX, CERTH, FOI, K&I | | |
| Start Month | M1 | End Month | M36 |

**Goals of WP**

This WP will develop and adapt a set of text-analysis technologies for the enrichment of information collected from traditional and social media. It will address the often informal nature of communication (i.e. the different registers employed by communicating parties) and the target languages and dialects found to be relevant within the scope of the project. Enrichment technologies will focus on migration-related topics and concepts as well as sentiment/affective categories and links to the results of the threat analysis will be created.

Technologies to be developed and adapted include (a) language identification: from a variety of texts from traditional and social media, taking into account that documents may contain mixed-text sections, (b) cleaning, tokenization and extraction of relevant sections of text, eliminating superfluous and irrelevant sections, (c) annotation with named entities and concepts including creation and adaptation of migration-related ontologies and annotation of these concepts in input texts (in a multi-lingual manner, in order to be able to annotate/detect them consistently across languages and media), (d) Sentiment/polarity analysis: annotation of emotionally-charged content with particular focus on social media contents (e) Clustering of documents according to content, building upon the above technologies and a model of word-embedding of migration specific terminology.

The technologies and models were planned to be reused where available and adapted/extended to the domain of migration. Technologies which did not exist previously are to be developed.

Methods and technologies are informed by the requirements identified in WP2. The resulting components will be integrated into the MIRROR framework and workflow(s) developed in WP7. The information model developed by WP7 will be reflected in the outputs produced by components of WP4.

**Focus of Year 1**

In the first year of WP4 the focus was on enabling the partners in WP4 an in the other WPs to access the data sources that are required for the MIRROR related research work, including preprocessing steps such as language assignment. Furthermore, work has started on topic detection, sentiment detection and named entity recognition, building upon existing work and extending it for the needs of the MIRROR project.

## 6.2 WP4 Achievements & Results

### 6.2.1 Summary of WP Results in Y1

As an important pre-requisite for the work in the other WPs, a framework for giving access to (pre-annotated) media content from a large number of sources to the other partners based on the SAIL's Media Mining System has been established. Furthermore a scheme for the assignment of (country-level) origin and language has been developed and applied for several thousand news sources. This assignment is an absolute prerequisite for aligning statements/perceptions with localities.

A further achievement is the extension of named entity recognition to cover migration related entities based on the observation of current migration related events. In the field of topic and concept detection progress has been made in identifying migration related concepts and especially in the field of MRSC (see WP2) and several datasets that are large and diverse (with respect to channels, content, topics) have been collected, which enables a more comprehensive evaluation of the topic models. Furthermore, methods have been developed for identifying EU-related news as an important step for analyzing the perception of such News.

Deliverable D4.1 describing the first release of text-analysis technologies and models has been completed. Furthermore, a first MIRROR related scientific publication has been achieved.

### 6.2.2 Detailed Description of Achievements

Within the first year of the project all WP Tasks have been active.

**Achievements in Task 4.1 Text-extraction and Pre-processing**

A framework for continuous content collection and access for MIRROR to data from the Media Mining System (via API) has been set up. Furthermore, work has been performed on an architecture for continuous collection of content, assignment of origin and language for all Internet sources, allowing for targeted filtering/querying of information and for assignment of statements to locations (essential for COO, COT and COD based analysis of information and perceptions reflected in the media). For this purpose, targeted adaptations and extensions have been performed within the SAIL LABS Media Mining System (MMS) with the goal of providing data processed within the MMS to MIRROR. The API has been extended and work has been carried out in connection with WP7 on how to connect to the MMS and use it in a DaaS manner. Furthermore, as an important preprocessing step, a country of origin has been assigned to about 7000 news-sources being processed within the MMS. Whereas these sources had been assigned a language (of content) previously, this assignment makes the localization of the origin of news possible and thus allows to link news with countries- of-origin (COO), countries-of-transit (COT) and countries-of-destination (COD).

**Achievements in Task 4.2 Named Entity and Concept Detection**

NER has been extended by several classes and instances concerning areas of relevance to the detection/perception of Migration Related Semantic Concepts (MRSCs). This work has been carried out guided by the work of WP2 (in particular the definition of MRSCs) and by monitoring of events linked to migration (e.g. the situation in refugee camps on Greek Islands, the Turkish threats to open borders to the EU, changes in the situation in Syria, ...).

**Achievements in Task 4.3 Sentiment/Polarity/Stance Detection**

The sentiment component and models have been extended by terminology and expressions employed within the scope of migration. Initial models targeting the detection of hate-speech have been developed and are foreseen to provide a basis for extension of the current sentiment models.

**Achievements in Task 4.4 Early Topic Detection and Topic**

A first approach for the identification of EU-related news as a topic has been proposed. This entities-based method tries to identify events where either the action or the actors are associated with one of the member states or one of the EU institutions (e.g., European Commission, EU parliament, etc.). Furthermore, entity-embedding has been used as a semi-supervised method for the study of EU-subtopics such as crime, health, or migration. News media topic identification has been approached using supervised models. We expect to exploit the more structured and formal language used by news outlets to classify documents within the Migration Related Semantic Concepts taxonomy defined in WP2. For more informal channels such as social networks (e.g., Twitter), we are investigating unsupervised novel models that can incorporate background knowledge about words to uncover topics. We expect a deep generative probabilistic model to perform well in our domain as they can leverage both the high performance of deep neural networks while enjoying the high interpretability of probabilistic models.

**Achievements in Task 4.5 Impact of Editorial Information and Perceived Information Quality**

Studies and experiments related to language models (e.g., GPT-2, Grover, CTRL, PPLM) used to generate realistic texts/comments on user-defined themes have been conducted, informing research work on building models which can learn to distinguish between authentic and automatically generated migration related comments on editorial material. In addition, a literature survey related to detection of automatically generated text focusing on migration has been conducted. Furthermore, deep learning language models for generation of text have been examined in order to investigate how and to what extent these models can be used for generation of large amounts of comments and news articles intended to influence the perception of migration related matters by malicious actors.

### *6.2.3 Role of Partners in the WP*

SAIL has been focusing on the preparation and provision of data to the MIRROR project (origins and languages for media sources, extension of the NER component to migration-relevant classes and extensions to Sentiment Analysis model). LUH has contributed to the evaluation and extension of several models for topic detection and topic evolution. CERTH participated in the discussion on how to combine the WP5-generated video captions within the WP4 text analysis pipeline, for the purpose of effecting sentiment analysis using these auto-generated texts. FOI has (i) conducted a pre-study related to recently developed language models used to generate realistic texts/comments based on user-defined themes, (ii) conducted preparatory technical work related to construction of machine learning models to be used to distinguish between authentic and automatically generated migration related text snippets, and (iii) prepared a research paper describing early work related to detection of deceptive text content.

## *6.3 Contribution to KPIs*

**KPI1 Number of relevant languages covered:** Through access to content from the Media Mining System, content is made available to the project in more than 30 languages. Not all of these are relevant to the

project, but languages spoken in COOs in the Middle East (e.g. Arabic or Turkish) and Central Asia (e.g. Farsi or Pashto) and COTs (e.g. Turkish or Greek) as well as CODs (e.g. German, Italian or Swedish) as well as English are well-covered.

**KPI3 - Number of different types of media channels covered:** The available set of media sources comprises TV, Radio, IP-radio, news-feeds as well as content from Social Media platforms such as Twitter and Youtube. These sources will be refined according to use-cases and policies mandated by the platforms themselves (which change almost on a monthly basis).

**KPI4 - Number of different media channels/sources covered:** The number of media channels (in the sense of categories) supported by the Media Mining System and accessible to the MIRROR system is currently: TV, radio, IP-radio, Newsfeeds (RSS and ATOM), web-pages, Twitter, FB, YouTube and VKontakte. Except for TV and radio which require specific hardware (digital SAT), we plan to provide support for the ingestion also within the MIRROR framework (i.e. provide the respective source as a dockerized component for data collection and extraction within MIRROR). The number of individual sources available to MIRROR via API-access to the Media Mining System exceeds 7000. Only a small portion of these is envisioned to be within the focus of use-cases and directly relevant to the project. However, the current set provides a sound basis for further work.

## *6.4 Planned Next Steps*

As a first important next step, WP4 will complete the integration of the first set of text analysis technology into the first MIRROR prototype. Furthermore, in the next months, it is planned to extend and refine the models language identification and sentiment model extension and refinement, to link all models and technologies to the MIRROR framework in terms of processing (workflows) and to the elements of the Information Model (CIM), and to establish a test-set for evaluation of NER and sentiment within the migration domain. In addition, work on topic detection will be refined by implementing some state of the art algorithms for topic modeling to be tested as benchmark over the collected datasets, the evaluation of different architectures in our deep learning models for the identification of news media topics, and by performing features importance analysis for determining the relevance of entities and keywords in identification of topics. In addition, several ML-based methods have been investigated for the detection of hate-speech. These will serve as the basis for future work. Finally, work on the construction of machine learning models to be used to distinguish between authentic and automatically generated migration related text snippets will be performed.

# 7 Progress in WP5

## 7.1 Overview of WP5 and its Goals

| WP Number | WP5 | WP Leader | CERTH |
|---|---|---|---|
| WP Title | Multimedia Analysis Methods for Social and Traditional Media | | |
| Involved Partners | CERTH, LUH, SAIL, EURIX, K&I | | |
| Start Month | M1 | End Month | M36 |

**Goals of WP**

WP5 aims to develop a set of multimedia analysis technologies for the annotation and summarization of social and traditional media – images, videos, and audio data. Images and videos will be labelled with a set of migration-related semantic concepts (MRSC) (as defined in WP2) as well as with generic visual concepts and with sentiment labels. Multimodal media summarization techniques that exploit the above annotations, among other inputs, will be developed for selecting the most appropriate media items, and creating compact representations of large media collections. New deep learning architectures will be developed in this WP and used for enabling the annotation and summarization of media collections. Furthermore, Automatic Speech Recognition (ASR), covering several languages of interest to the project, will also be developed and adapted to the relevant migration-related domains, with the aim of transcribing and annotating the audio data collected within the project.

**Focus of Year 1**

In Year 1 of MIRROR, we initially focused on establishing working baselines for multimedia analysis, i.e. methods and their implementations for the primary tasks of annotation of audio-visual content. We then continued the work in three directions: i) improving these baselines; ii) extending the reach of multimedia analysis to tasks that are unique to MIRROR, most notably MRSCs detection; and iii) the packaging of the software implementations of these methods in components that can be readily integrated in the MIRROR system, in accordance with the architecture that has been specified for the latter. The focus of work on automatic speech recognition was on adaptation of ASR models for the MIRROR domain and on the creation of an environment which allows to perform this adaptation in a semi-automatic manner. This environment forms the basis of and facilitates future work.

## 7.2 WP5 Achievements & Results

### 7.2.1 Summary of WP Results in Y1

The achievements of WP5 in the first year include the development of new methods for audio-visual analysis; the adaptation of previously-developed methods to the needs of MIRROR; the software implementation of MIRROR-architecture-compliant implementations of these methods; and the delivery of D5.1. Newly-developed methods include a visual concept detection method that combines a NetVlad layer and a Mixture of Experts layer within a new deep-network (DCNN) architecture; this leads to more accurate annotation. We also developed a new MRSCs annotation method, by adapting a two-stream deep network previously used for addressing the ad-hoc video search problem. Taking advantage of developments in

video annotation, we extended them to the task of sentiment analysis of visual content, e.g. using for this the YT8M extractor together with a SoA deep network architecture developed for generic classification, and also to a baseline approach for image/video collection summarization. In terms of ASR, a semi-automatic vocabulary and language model building environment reflecting the terminology and domain specific vocabulary related to MIRROR was set up, and MIRROR-domain specific models were introduced, resulting in improved transcription of migration related terminology. Most of these technologies were packaged in a Visual Media Annotation and Sentiment component (MAS) and an Automatic Speech Recognition (ASR) component, both ready for use by the MIRROR system. These developments are reported in D5.1, due at the end of Year 1, which was delivered on time and, as specified in the DoA, "describes the first version of the developed approach for migration-domain multimedia content annotation, automatic speech recognition, and provides a preliminary version for the visual sentiment analysis approach".

### *7.2.2 Detailed Description of Achievements*

In the first year of MIRROR all WP5 Task were active: T5.1 and T5.4 started in M1 and will continue to run until M24, while T5.2 and T5.3 started in M7 and will continue to run until the end of the project.

**Achievements in Task 5.1 – Migration-domain Multimedia Content Annotation**

In this Task we worked on three types of image/video annotation methods, addressing three different annotation sub-problems: generic visual concept detection, video captioning, and the detection of migration-related semantic concepts. For generic visual concept detection in video, we started from a SoA deep-learning method (published in early 2020) that we had previously developed, and we extended it by introducing a NetVlad layer in the input of the network (so that multiple video frames, instead of one frame at a time, can be effectively represented), and a Mixture of Experts layer in the output of the network. Experiments in the large-scale YT8M video dataset (6.1 million videos; 3862 classes; 3 labels per video, on average) showed that these extensions increased the Global Average Precision at 20 (GAP@20) of our method from 82.2% to 85.1%. For video captioning, we experimented with the HACA model, published in 2018, and following several experiments we optimized the initial implementation that was eventually adopted in MIRROR. For Migration-Related Semantic Concept (MRSC) detection, driven by the lack of ground-truth MRSC -annotated image/video corpora, we formulated the problem as a zero-shot learning / Ad-hoc Video Search (AVS) problem, and adapted to this end a SoA method that we previously developed for AVS. We tested this method in MIRROR on a couple of generic-concept benchmark datasets so as to quantitatively assess and document the sensibility of re-purposing an AVS method for concept detection, and experimented with retrieving videos that are associated with specified MRSCs that were defined in MIRROR. In addition to the above experiments and algorithmic developments, a Visual Media Annotation and Sentiment component (MAS) was implemented. This is a REST service component that realizes in software the above three annotation methods, and is hosted in a dedicated CERTH server; it brings the generic visual concept detection, video captioning, and MRSC detection functionalities to the MIRROR system.

**Achievements in Task 5.2 – Visual Sentiment Analysis**

In this Task we worked on the sentiment analysis of visual content. We started with a literature review, and by adopting, for training our algorithms and for experimentation, the large scale SentiBank dataset (>1

million images, and 3295 Adjective-Noun Pairs (ANP) that comprise a visual sentiment ontology). For representing the image/video content, we employed the "inception" neural network architecture, pre-trained on the YT8M video dataset, so as to produce 2048-element vector representations. On top of these representations, we trained two networks to perform classification to 1) polarity (a one-dimensional sentiment indicator ranging from positive to negative), and 2) adjective noun pairs (ANPs). As network architecture, we used a simplified version of the one that we also used as our starting point in Task T5.1, i.e. a version of that network that does not consider sub-classes partitioning for effecting classification. Our first results indicate that in term of accuracy in ANP classification, under the usual protocol of considering the top-1200 ANPs, we already have a small increase in accuracy, from 14.36% to 14.60%, compared to the best previously-reported result (which was also based on using deep learning); translating these ANP results to a binary polarity classification gives us 63.8% accuracy.

**Achievements in Task 5.3 – Media Collection Summarization**

In Task T5.3 we reviewed the latest literature in image/video collection summarization. We established a baseline approach that uses the YT8M extractor to represent the images in a vector space; this is a SoA representation that is also used in Tasks T5.1 and T5.2 for generating the generic visual concept annotations and the sentiment analysis results, respectively, thus minimizing the computational overhead of summarizing collections of media items that have gone through these earlier analysis steps. The vector representations within a media collection are clustered using a k-means algorithm, which had been successfully used in the past in combination with older image/video representations and was shown to have advantages over other clustering algorithms such as DBSCAN / HDBSCAN. Representative images/videos are selected from each cluster, based on minimal distance from the cluster's center. Early qualitative results of this baseline look promising; the more formal assessment of them is work in progress.

**Achievements in Task 5.4 – Automatic Speech Recognition (ASR)**

In this Task work focused on the extension/adaptation of (previously existing) models for ASR for languages relevant to MIRROR. This comprises the setting up of a semi-automatic vocabulary and language model building environment reflecting the terminology and domain-specific vocabulary related to MIRROR, in particular to the MRSC's as well as the building of such models themselves. Models in 5 languages are built and deployed automatically on the Media Mining System at SAIL LABS – which serves as one of the data-sources for MIRROR (and as *the* data source regarding content from TV) in a continuous manner. The use of such MIRROR-domain specific models results in improved transcription of migration related terminology. Previously and without this work, this specific terminology was not transcribed and thus could not be processed within MIRROR. In connection with WP7, the ASR component was wrapped into a docker container and ASR-output is being produced in a format according to WP7.

### *7.2.3 Role of Partners in the WP*

CERTH, being the partner expert in image/video analysis and deep learning, performed the work associated with Tasks T5.1, T5.2 and T5.3, as described above. SAIL, being the partner expert in ASR, performed the work described above for Task T5.4.

## *7.3 Contribution to KPIs*

The WP5 work contributes primarily to the following KPIs, as listed in the DoA:

**KPI1: Number of relevant languages covered:** The ASR models built using the newly devised method in T5.4 cover 5 languages of interest to MIRROR: English, German, French, Italian and Spanish. The aim of T5.4 is to extend this set to further languages relevant to migration: Arabic, Turkish, Greek (and possibly beyond).

**KPI2: Amount of effort required to extend solution to new languages and analysis methods:** The workload related to the setup of the (semi-automatic) processing scheme for the generation of ASR models for migration specific matters has been reduced substantially. Whereas before, interactive work was required, the current scheme allows for (mostly) automatic processing of several steps in the building of ASR models. The addition of further languages to this scheme (see KPI1 above) will further reduce the amount of effort required for migration-domain specific model building.

**KPI8: Efficient annotation and summarization of migration-domain multimedia content:** We established working implementations of three types of image/video annotation techniques; one of them represents a new method developed in MIRROR, increasing the GAP@20 from 82.2% (compared to our starting-point SoA method) to 85.1%; another new method developed in MIRROR offers a project-specific functionality that was not available before MIRROR (MRSCs annotation).

**KPI9: Accurate sentiment detection from visual data:** We developed a deep-learning based method for Adjective-Noun Pairs (ANP) classification that already shows a small increase in accuracy, from 14.36% to 14.60%, compared to the best previously-reported result; and, a very initial approach to translating these ANP results to a binary polarity sentiment classification gave us 63.8% accuracy.

## *7.4 Planned Next Steps*

As concerns image/video annotation, we will consider the use of semi-supervised learning techniques in order to effectively exploit additional training data (unlabeled video sequences) in order to improve the accuracy of annotation. We will also investigate the use of “attributes”, i.e. automatically detectible semantically-meaningful parts such as objects, for effecting improved image/video captioning. For MRSCs detection, further extensions of our two-stream deep learning architecture together with richer textual descriptions of each MRSC, and way for automatically generating such descriptions, will be investigated. These will result in a second major release of the MAS component, integrating the above developments.

Concerning visual sentiment analysis, training direct polarity classifiers on appropriate datasets, instead of translating ANP results to a binary polarity classification, is part of the planned future work. Applying techniques to de-noise the training data (to minimize the effect of the noisy annotations that are present in the training set that has been used thus far) will also be investigated, together with experimenting with other datasets. We plan to integrate our image/video sentiment analysis method to the MIRROR system in the future, via integrating it in the MAS component.

Work on image/video collection summarization will focus on the experimental assessment of our initial method, and then the further improvement of it, leveraging additional metadata that can lead to better clustering of similar media items, most notably the visual and MSRCs annotations that are extracted. The first release of the visual media collection summarization component (MCS), implementing and exposing the image/video collection summarization functionality to the MIRROR system, will also be developed.

Work on ASR in the next months will focus on the further extension of the devised methods to further languages, allowing for a broader spread of coverage in languages and media channels. The method to adapt vocabularies and language models and in particular the integration of MRSC-related terminology will be coupled with advances in WP4 and automated as much as possible to allow for application to further languages. The deployment and use of ASR within the MIRROR system will be addressed within WP7. Improvement of ASR core technology will include work on segmentation of audio, which is deemed important especially for discussion-like content.

# 8 Progress in WP6

## 8.1 Overview of WP6 and its Goals

| WP Number | WP6 | WP Leader | LUH |
|---|---|---|---|
| WP Title | Methods for Cross-Media Network Analysis | | |
| Involved Partners | LUH, FOI, SAIL, EURIX, UNIVIE, CERTH, K&I | | |
| Start Month | M1 | End Month | M36 |

**Goals of WP**

The goal of WP6 is to explore, examine, adapt, and develop analysis methods for migration-related social networks collected from available sources. These methods will provide to the users (such as border control agencies) the tools and frameworks for exploring and understanding the possible sources of misperceptions that can result in threats. Additionally, it will provide methods for analysis of the misperception evolution across the geographical areas of interest as well as along the migration paths. Data bias, information manipulation and temporal monitoring of network communities are of particular interest in the analysis.

**Focus of Year 1**

The focus in Year 1 of the project has been on the design and development of the Cross-media Network component (CNC) following the use cases identified in WP2 during the end-users' requirements analysis. Furthermore, focus was on understanding the formation of migrants' perception through the lens of mass media and their framing of EU-related topics and events. In this context, WP6 also identified and characterized several relevant communities for the study of migrants' perception, and worked on methods for predicting the opinions of users who are "silent" in social networks like Twitter. Furthermore, work has been performed in the field of bot detection methodology, for the purpose of better understanding automated communication about migration.

## 8.2 WP6 Achievements & Results

### 8.2.1 Summary of WP Results in Y1

As an important achievement of Y1, the Cross-Media Network component (CNC) been designed following the use cases identified in WP2 during the end-users' requirements analysis. The design of the CNC also considers the analysis made about the Migration Related Semantic Concepts (MRSC). Furthermore, CNC has been implemented as a web service. Following the microservice architecture of the MIRROR system, these components are isolated and attached to the whole system via Docker containers.

As a further achievement, a detailed analysis of the representation of Europe in the news across multiple geographical regions has been performed. This includes the evaluation of the representation bias by exploring the differences in coverage not only in the general news context but also by focusing on specific topics.

In addition, initial work was performed for predicting the opinions of the users who are “silent” in social networks like Twitter. Although silent users rarely post on social media, they still have relevant opinions towards different topics, which have to be considered, when analysing perception. If we do not take their hidden views into account, our content based predictions could be poorly representative of real-world trends.

Finally, first results have also been achieved in automated bot detection by developing a first set of attributes to be used for the further development of an explanatory bot detection method. The targeted bot detection mechanism will be specifically tailored to detection of automated communication related to migration.

### *8.2.2 Detailed Description of Achievements*

In year 1 of the project Tasks T6.1, T6.2 and T6.3 of WP6 have been active. Work in Task T6.4 has also already been started.

**Achievements in Task 6.1 Cross-media Network Construction**

We designed and implemented our Cross-media Network component (CNC). Based on scenarios identified in WP2, we recognize the following three groups of sources: news media, social media, and an additional group of miscellaneous sources, which do not fit in the first two categories. Besides sources of data, for each scenario, we identify the most important entities, which are subjects of interest. We use a multigraph as the underlying structure for the representation of the unifying graph. By applying filters on the nodes and edges, we can retrieve subgraphs, and through aggregation and network analysis, we generate knowledge according to the user needs. The cross-media network component is implemented as a web service with four main subsystems: CNC-parser, CNC-gate, CNC-analyser, and CNC-gui. The CNC-parser and the CNC-gate components are written around Janusgraph. Following the microservice architecture of the MIRROR system, these components are isolated and attached to the whole system via Docker containers. The communication within the system is done via the REST API.

**Achievements in Task 6.2 Bias Detection and Reduction**

Our perception of the situation in a country or a region is strongly influenced by the reflection of this situation in mass and social media channels. With this in mind, we performed a detailed analysis of the representation of Europe in the news across multiple geographical regions. For a deeper understanding of coverage, we also analyzed the news, which are directly adopted from the European news sources (i.e., overlapping of content with the EU internal media). We carry out our evaluation by exploring the differences and possible bias not only in the general news context but also by focusing on specific topics. In particular, we are interested in subjects that contribute to creating an image of Europe and may act as pull and push factors according to migration-related literature. This study is an essential first step towards better understanding the external perception of Europe by audiences across the globe.

**Achievements in Task 6.3 Evolution of Networks and Communities**

In this task we are studying how migration related communities evolve over time. The methods being developed incorporate and leverage results and findings of textual and multimedia analysis so as to better profile the communities using multi-modal data. We have focused on the identification and characterization of several relevant communities (such as refugee and silent users) for the study of

migrants' perception. First, we addressed the absence of comprehensive datasets that contain both social networks among Twitter users who are interested in refugee and immigration topics as well as their content and interaction regarding the topics. These collected datasets would enable us to conduct extensive empirical analysis from multiple perspectives, including social communities, topics, and affective factors. One particularly relevant subgroup of Twitter users is that of less active accounts, which often do not directly express their opinions online. Analyses that relied exclusively on the side of active participation and content production may fail to generalize to real-world populations, or even to less active users. In MIRROR, we are developing a methodology to predict the opinions of the users who are "silent" in social networks like Twitter. We implemented the Coupled Sparse Matrix Factorization (CSMF) Model to be used as a base-line for the evaluation of users opinion prediction.

**Achievements in T6.4 Information Diffusion and Manipulation**

In Task T6.4, initial work has focused on bot detection. Existing approaches in this field have been analysed, in order to identify suitable approaches for the project. Furthermore, first steps towards developing an explanatory bot detection methodology have been performed for the purpose of better understanding automated communication about migration. In more detail, a first set of attributes to be used for the further development of an explanatory bot detection method has been identified.

### *8.2.3 Role of Partners in the WP*

LUH has been focusing in the design and implementation of the Cross-Media Network Component. Also, it has contributed to the design and implementation of experiments to evaluate representation bias in the mass-media. Finally, LUH has contributed to the evaluation of social media users modeling and communities identification. SAIL has been focusing on the preparation and provision of data. Also it has contributed in the analysis of textual content. EURIX has participated in the integration and testing of the CNC within the MIRROR framework. UNIVIE has contributed in the analysis of mass media data and providing relevant background knowledge and bibliography. FOI has studied the use of bots for propagating migration-related information (and misinformation), and commenced the development of a novel bot detection method specifically tailored to detection of automated communication related to migration.

## *8.3 Contribution to KPIs*

The WP6 work contributes primarily to the following KPIs, as listed in the DoA:

**KPI1 - Number of relevant languages covered:** The methods developed for the analysis of mass-media coverage are language agnostic. They support all the languages included in the datasets.

**KPI3 - Number of different types of media channels covered:** The work produced in year 1 from WP6 cover types of media channels such as Social Media platforms, news-feeds. We plan to evaluate and improve our models with other types of media channels.

**KPI4 - Number of different media channels/sources covered:** Our analysis covers multiple media channels. For example, this year we investigated users and communities in Twitter. We also studied the mass media coverage of EU related events with data from media outlets websites and RSS-feeds.

**KPI10 - Accurate methods for network analysis and evolution, information diffusion, and bias detection and management:** We have designed a cross-media network that will allow us to represent the

information coming from all the sources covered in MIRROR. Also, we have improved our understanding of the mechanism of information diffusion and possible sources of bias in the mass media in different regions. Furthermore, we have evaluated and implemented state of the art models to be used as base-line for our next steps.

## *8.4 Planned Next Steps*

Following, we will continue with the implementation of the CNC component. Methods developed for the multi-modal analysis of networks will be continuously integrated and validated for performance and relevance with technical and application partners.

We will extend our analysis to integrate all the data sources considered in MIRROR. We will also check the differences between regional and English channels of a specific region. One is mostly used to reach global audiences, while local audiences usually consume information posted in their native languages. Hence, it is essential to analyze such representation gaps, if any. We also intend to extend and refine the topical coverage of our analysis. Likewise, so far, we have considered regions that cover large geographical areas, but they might internally follow different patterns of information consumption. We will investigate the optimal level of aggregation for different dimensions and the rate of information loss as an additional input for end-users.

We will employ text-based technologies and information about sources and origins of content items (both provided by WP4) for investigating potential biasing related to MRSC topics. For this purpose, we will rely on the paradigm of framing.

The next steps in community analysis involve the development of methods to improve our understanding of how these identified communities evolve or react to specific events.

For further developing the methodology for explanatory detection of migration bots, the next steps to be taken involve to investigate different kinds of bot accounts. At the same time, we will further investigate the attributes identified during the first year of the project. The aim is to be able to distinguish between different kinds of well-known bot types (spambots, pornbots, etc.), and make use of this knowledge to in the end be able to single out migration bots.

# 9 Progress in WP7

## 9.1 Overview of WP7 and its Goals

| WP Number | WP7 | WP Leader | EURIX |
|---|---|---|---|
| WP Title | MIRROR Architecture and Information Model | | |
| Involved Partners | EURIX, LUH, SAIL, CERTH, UM | | |
| Start Month | M1 | End Month | M36 |

**Goals of WP**

The goals of WP7 are the design of the architecture of the MIRROR system, the development of an environment for continuous integration of the analysis methods developed in WP4, WP5 and WP6, and the definition of an information model and a framework, targeting a comprehensive system that provides a wide range of functionalities implementing these methods into a core platform through a user friendly interface.

**Focus of Year 1**

The focus of WP7 during Year 1 was first of all on the architecture of the MIRROR framework, the identification of all technical tools and other components used to build the system and of the most suitable integration approach, taking into account the results from other technical WPs and the requirements and scenarios identified in WP2. Then the WP7 effort was devoted to the definition of the initial version of the information model. The two tasks mentioned above resulted in D7.1 at M6 and D7.2 at M12.

The development activities were conducted in parallel, with the selection of technologies for the continuous environment and for the middleware components, with the configuration of a server for the prototype, and finally with the integration and test in a preliminary analysis workflow of the technical tools from the other WPs. Finally, due to the relevance of the UI to deliver the value generated by the project to the users, based on the feedback from all partners, part of the effort was devoted to the design of the UI mock-up and to the prioritization of the required functionalities.

## 9.2 WP7 Achievements & Results

### 9.2.1 Summary of WP Results in Y1

Three main results have been achieved in WP7 during the first year.

The first result was the design of the MIRROR architecture, which provided a better understanding of the expected results from all technical WPs and of the requirements of the overall system to fulfill the requirements in WP2, also taking into account the input from WP3 about legal and ethical aspects associated with data processed by the system (security by design, pseudonymization and data retention, just to name a few). In addition to this, the MIRROR system was conceived as a framework to integrate the different components in a loosely coupled way, taking into account the actual development and availability of the technical tools during the whole project. The backbone of the system, thus, is provided by a message oriented middleware (Message Handler) and an API Gateway (used to translate the inner technical APIs

into user-oriented APIs, to implement authentication and authorization and for logging and monitoring tasks).

The second result was the definition of the initial version of an information model. The Conceptual Information Model (CIM) captures the project's understanding of the core concepts relevant for the MIRROR project: the migration-related perceptions and misperceptions of Europe by migration actors and the resulting threats are the main subjects of analyses. The definition of the CIM improves the shared understanding of the concepts within the interdisciplinary team and clarifies the conceptual understanding (and terminology) of the project for external readers as a basis for better understanding other parts of the project. The model also includes a preliminary description of the core processes and workflows involving the core elements of the model.

The third result is related to the development of the framework and the integration of the components. This is described in more detail in the following. We have implemented a basic analysis workflow as a proof of concept of the interplay of the different components. In parallel, we have set up a dedicated server for the prototype, we configured an environment and tools for the continuous integration and started to plan for system deployment (targeting the pilots). Furthermore, some preliminary tests of integration with the components from other WPs through a message oriented middleware were performed. Finally, the effort was devoted to the creation of a mock-up of the UI, since the beginning of the project the need for a user friendly UI was identified as a priority to deliver the value generated from the project to the users. The mock-up has been iteratively improved, capturing the feedback from all partners, mainly from the application partners for ensuring a demand-driven approach.

### *9.2.2 Detailed Description of Achievements*

During the Year 1 of the project all WP7 Tasks were active: Task T7.1 , Task T7.2 and Task T7.3. Task T7.1 was completed at M6 according to the plan, with the delivery of D7.1.

**Achievements in Task 7.1 - MIRROR Architecture and Integration Approach**

Task T7.1 was active from M1 to M6, the effort from all contributing partners was mainly focused on (1) the design of the MIRROR Framework architecture, (2) the definition of the most convenient approach for the integration of all the components developed within the technical WPs, (3) the identification of the other components spanning across the different layers, from data collection through the middleware, up to the client applications. The architecture of the MIRROR system includes the following layers: data management (raw data collection, pseudonymization and other privacy and security policies, such as data retention, storage), media analysis layer (technical tools for text, audio, image and video analysis and cross-media analysis), integration layer (message handler, supporting databases, API Gateway) and client applications.

The architecture emerged from the contribution of all partners: the work started from the identification of the requirements in WP2 (preliminary interviews, discussion with users in the consortium, identification of main personas and of the prioritized scenarios), which highlighted the crucial role of the UI and the challenges with data sources, their analysis and the secure storage and access (retention policy, pseudonymization, etc); then a fruitful discussion among all partners, lead by WP3, was conducted, about the relevance of privacy and security by design in conceiving the system from the grounds; all technical partners were provided with a form to associate the expected results of each WP to a number of components with a name, role, deployment mechanism, technologies and other requirements; in parallel

an approach based on message-based integration and (micro)services was identified and the data management layer was refined.

The resulting architecture and the components were discussed and represented using a top down approach, based on the C4 model (Context, Containers, Components, Code): this enabled the discussion at the different levels of detail and favoured the discussion among technical and non-technical partners.

Task T7.1 was completed at M6 with the delivery of D7.1.

**Achievements in Task 7.2 - MIRROR Information Model**

The work in Task T7.2 resulted in the definition of the initial version of the Information Model in D7.2. The proposed Conceptual Information Model (CIM) is made up of two parts: a static model where the core elements have been identified along with their relationships, and a dynamic part with a number of core processes.

In a nutshell, MIRROR collects and analysis Media Elements (Digital representations of partially biased migration related information). The application of different types of media analysis methods leads to Annotations, which link Media Elements to further information items. In addition Media Elements are summarized to ease digestion (Summary). Further processing and aggregation steps lead to higher-level perception related Findings. The types of findings considered (e.g. Information Campaigns) are tailored to the goals of the MIRROR project, namely the analysis of Perception and the identification of possible Threats triggered by migration-related perceptions and especially misperceptions. The End User perceives the MIRROR results in terms of Observed Contexts/Situations, which combine and select Media Elements, Summaries, Annotations and Findings according to the users preferences. In addition to the set of Core Elements already shown above, the MIRROR CIM contains a number of other relevant elements, which are linked to the Core Elements and refine and contextualize them. Moreover, a number of core processes have been identified: Data Collection, Media Analysis Linking, Summarization, Pseudonymisation, Deletion, Verification and Threat Linkage. It is worth mentioning that since this is the initial version of the model, the main purpose was not a comprehensive and detailed definition of all process, but rather the need for framing the different ideas in the project and support the awareness of the big picture, targeting the final version of the model expected at M27.

**Achievements in Task 7.3 - MIRROR Framework**

The effort of all contributing partners in Task T7.3 was focused on the implementation of the MIRROR Framework and on the preliminary integration of the components. The activities were performed in parallel first with the design of the architecture till M6 and then with the development activities within the technical WPs. Different tools were evaluated for the middleware implementation, RabbitMQ was chosen due to its flexibility, widespread use and support of all the main requirements. A message-based analysis workflow was configured, using a few available components, such as a preliminary version of the visual analysis services by CERTH and a demo version of the Media Mining System by SAIL, which provides a query-based access to a very large amount of media content from an extensive list of public sources. An extensive discussion among all partners was conducted to improve and extend the analysis workflow, but also to better clarify the role of each component in the system in compliance with the main scenarios. The development activities are still in progress, targeting the first prototype. A working version of the integrated analysis workflow was demoed and discussed during the last project meeting.

Part of the effort was also devoted to the design of the UI, starting from scratch (from brainstorming during the kick-off meeting) and collecting iteratively new requirements and feedback from all partners. A UI mock-up has been created and disseminated in the whole consortium. The UI will provide a dashboard, a search page, a reporting section and an admin area. Each part has been improved in the mock-up by collecting feedback in periodic calls where all partners were invited, in order to focus on the UI and identify a prioritized list of features and functionalities to be implemented. Finally, the contribution of all technical tools to the UI was reviewed from a user perspective and integrated in the mock-up. Concerning the other framework components, candidate solutions are under testing for other shared components, such as the Indexer, the API Gateway, and the different storage components.

In addition to the activities described above, part of the effort was allocated on the configuration of the environment for the continuous integration and deployment of the MIRROR prototype. Two technologies have been identified: Ansible, a DevOps tool for configuration management, and Docker, an automation tool for delivering software applications in containers. The components in the framework are integrated either as remote REST services or, whenever possible, using Docker containers, in order to simplify the deployment in different environments for the pilots. Ansible is used to define recipes for automating the installation and configuration of all components, also those who are not deployed as containers. Other tools such as Jenkins are used to define automated pipelines and to continuously deliver software components from Docker images or to build and deliver the source code versioned on GitLab.

The WP7 development and integration tasks will result in the first prototype implementation in D7.3.

### *9.2.3 Role of Partners in the WP*

EURIX, as WP Leader, coordinated the activities for the three WP7 tasks, led the preparation of D7.1 and D7.2 and organized periodic WP7 calls (weekly or biweekly). Furthermore EURIX contributed to Tasks T7.1-T7.3.CERTH participated in the discussions and specification of the basic architecture of the MIRROR platform, contributed to deliverable D7.1 and also contributed to T7.2. SAIL has been actively contributing to Task T7.2 as well as to Task T7.3 by participating in the design of information model as well as the selection of technologies which are going to be used within the MIRROR framework. LUH participated in the design of the Information Model (Task T7.2) and in Task T7.3. Furthermore, LUH contributed to the configuration of the servers and tools that will be used for the integration tasks.

## *9.3 Contribution to KPIs*

The two main results delivered by WP7 during the first year, namely the architecture and the information model, are related to several KPIs, although none of them is strictly tied to WP7 deliverables. More specifically, the results produced by WP7 during the first year contributed to the following KPIs:

- **KPI2, KPI3, KPI4**: the architecture of the MIRROR framework is flexible and scalable and provides the required loose coupling among the components and the framework backend so that the different media types and sources can be used and included in the analysis workflow over time and the integration mechanism with the technical components allows for their continuous development without breaking the overall system.
- **KPI12**: the architecture of the MIRROR framework has been designed in accordance with the requirements collected in WP2, taking into account the same scenarios and following the same prioritization criteria; the design of the UI has been done using a mock-up approach, collecting

feedback from both technical and non technical partners with periodic updates and open discussions among all interested partners; the information model is based on the core concepts and ideas developed so far in the project.

## *9.4 Planned Next Steps*

The main goal for the next months is the delivery of the first MIRROR prototype (D7.3) at M14. This prototype is being built according to the architecture defined in D7.1, integrates the first release of the technical components delivered by WP4, WP5 and WP6 and provides a proof of concept of the MIRROR approach implementing the main scenarios described in D2.1. The UI is based on the feedback collected so far and on the current understanding and awareness of the project goals.

After the release of the first prototype and the Y1 review, the second year of the project will be devoted to the completion of the Information Model and to major software development and engineering activities for the implementation of the MIRROR framework, raising the overall TRL level, targeting the setup and run of the pilots (WP10). This will result in deliverables D7.4 (final version of the Information Model) at month 27 and D7.2 (second prototype release) at M30.

# 10 Progress in WP8

## *10.1 Overview of WP8 and its Goals*

| WP Number | WP8 | WP Leader | UNIVIE |
|---|---|---|---|
| WP Title | Analysis & Field Studies for EU Perception and Media Impact | | |
| Involved Partners | UNIVIE, FREUNDE, AGENFOR, UM | | |
| Start Month | M1 | End Month | M36 |

**Goals of WP**

Three main objectives are guiding the work in WP8:

The first relates to the role of media, communication, and information before and during the process of irregular migration. Here the WP seeks to garner a deeper understanding of the relevance of mobile media communication for guiding decisions before and during the migration process.

The second major objective is an assessment of the (mis-)perceptions of the EU as receiving area, living conditions in different EU member states, and knowledge about and perceptions of migration routes, and EU policies on migration, asylum and border control.

Finally, the WP brings together the two objectives outlined above by an assessment of whether knowledge about and (mis-)perceptions of the EU and the migration process are influenced by means of digital communication, and at what point during the migration process knowledge and perceptions have been shaped due to incoming information.

The research involves three main steps: a comprehensive literature review, as well as a number of individual interviews with irregular migrants and experts at different locations that are key to irregular migration processes.

**Focus of Year 1**

The overall focus of the WP in Year 1 lay on the T8.1 “Literature Review and Expert Interviews Informing the Subsequent Field Work” as well as preparatory work for T8.2 “Field Work.”

## *10.2 WP8 Achievements & Results*

### *10.2.1 Summary of WP Results in Y1*

During the first year of the project, we submitted two deliverables D8.1 and D8.2.

D8.1 is a working paper that presents a theoretical framework for migration process analysis that should guide the work within the MIRROR project. The deliverable connects leading strains of theory from the field of migration studies to relevant insights from the field of information and (political) communication and brings together existing research on perceptions of irregular migrants and the role of media for perceptions and migration decisions. At the heart of this deliverable is a new Migration-Communication-Model (MCM), presented by the authors, that highlights the roles of migration networks, social capital, different types of

feedback communication, as well as media and information literacy in contemporary migration processes. This model adds to the previous literature and aims at a better understanding of the driving factors behind irregular migration as well as the role of social media and ICTs in these processes.

D8.2 are the interview guidelines for the fieldwork with irregular migrants. This deliverable aims to present and discuss the ethical ground rules within the work package, the only work package within the MIRROR project that directly talks to and deliberates with irregular migrants. In particular, the following pages will present ethical considerations and a self-assessment concerning the fieldwork with irregular migrants. The interview guide itself has been attached as an Annex to this document. It focuses on questions about the role of mobile devices in the daily life of irregular migrants, their perceptions of Europe, their information seeking routines, and the process of sharing gathered information with other potential migrants. The informed consent form, which will be used, has been submitted as deliverable D12.1 in all languages relevant for our fieldwork.

### *10.2.2 Detailed Description of Achievements*

During the first year of the project, T8.1 and T8.2 were the only active Tasks.

**Achievements in Task 8.1 – Literature Review and Expert Interviews Informing the Subsequent Field Work**

We have successfully conducted initial interviews with experts in the field of irregular migration that helped inform our literature review as well as the preparation of T8.2, such as the identification of interview partners for the different subsequent activities (individual interviews, focus groups, etc.) as well as the development of guidelines for comparative and semi-structured interviews with irregular migrants and experts at key locations.

We have succeeded in screening a large part of the relevant literature and consolidated different strands of research into one framework for the fieldwork. The framework serves as a cornerstone for the project in that it deepens our understanding of the interplay between irregular migrants' (mis-)perceptions as well as their media use at different stages of the process of irregular migration.

**Achievements in Task 8.2 – Field Work**

We have prepared a comprehensive guideline for the fieldwork with irregular migrants, clearly presenting and discussing the ethical ground rules within this work package. We also prepared the actual guide (the questionnaire) and the informed consent form for the interviews. These documents were reviewed and approved by the Ethics Committee of the University of Vienna as well as by the MIRROR Ethics Board.

We furthermore made contact with several persons of interest in the relevant locations. Some have already confirmed that access will be granted, and interviews can be done within the respective reception centres. However, the COVID outbreak has put further planning in this regard on hold, for now.

### *10.2.3 Role of Partners in the WP*

UNIVIE had the lead on the literature review and on the development of the interview guide for initial expert interviews. As work package leader, it was also in charge of the coordination within the Work Package and between this Work Package and others. UNIVIE was furthermore involved in the planning of the fieldwork. FREUNDE was involved in the development of the interview guide for initial expert

interviews. It had the lead in conducting and transcribing the initial expert interviews. FREUNDE was furthermore involved in the planning of the fieldwork. The partner also gave indispensable feedback to all other Tasks and deliverables produced within this WP. AGENFOR was involved in the development of the interview guide for initial expert interviews. AGENFOR was furthermore essential in the planning of the fieldwork in non-EU locations. The partner also gave indispensable feedback to all other Tasks and deliverables produced within this WP.

## *10.3 Contribution to KPIs*

The work thus far has contributed to **KPI11** "Number of interviews performed in field studies", since initial expert interviews have already been conducted, and the groundwork (guidelines, interview guide, contacts) for the interviews in reception camps has been laid.

## *10.4 Planned Next Steps*

We are preparing the working paper D8.1 for submission to an international peer-reviewed journal.

We are evaluating different tools in the realm of automated transcription and translation to maximize efficiency at later stages of the project.

The COVID-19 outbreak has put our efforts into conducting first interviews with irregular migrants in May and June on hold. While we are currently observing and constantly reassessing the situation in the different locations, an immediate start of the respective fieldwork does not seem reasonable. We are, instead, on the lookout for alternatives to face-to-face interviews, such as online interviews. We are scanning the respective research in the field and evaluating pros and cons of changing the mode of interview.

# 11 Progress in WP9

## 11.1 Overview of WP9 and its Goals

| WP Number | WP9 | WP Leader | UM |
|---|---|---|---|
| WP Title | Threat Analysis & Actionable Insights | | |
| Involved Partners | UM, LUH, MoDAT, MPF, NOA, RUG, FREUNDE, AGENFOR | | |
| Start Month | M3 | End Month | M36 |

**Goals of WP**

The aim of this WP is (a) to analyse threats related to the misperception of Europe, heavily relying on existing threat analysis results (b) to integrate results created in the MIRROR project into threat analysis and risk assessment methodologies used by border control across Europe and (c) provide border control & foreign policy bodies with a set of legal, ethical, technological, organizational etc. actionable insights, best practices and recommendations with respect to the use of social media in addressing security challenges generated by migration flows.

**Focus of Year 1**

In Year 1 the work in WP9 has focused in the following directions:

a. Collect information on the threat methodologies and OSINT products used for threat analysis by border guard organizations (especially those organizations who are part of the MIRROR project). This has been achieved through both desktop research and online meetings with relevant partners.
b. Build an inventory of security threats derived from perceptions. For this desktop research was carried out on the information collection patterns of migrants and refugees.

## 11.2 WP9 Achievements & Results

### 11.2.1 Summary of WP Results in Y1

During Year 1 of the project only the work on threat analysis, which connects threat analysis in MIRROR to existing work, was active. Here, we focused on identifying the main risk assessment methodologies currently employed. In a next step, we have started to identify ways to improve them. However, in order to aid the partners involved in the development MIRROR system we have also carried some preliminary work in Task 9.2 by working with practitioner partners to better understand their practices, needs and challenges in the area of OSINT and risk analysis.

### 11.2.2 Detailed Description of Achievements

In Year 1, according to the work plan only Task T9.1 was active. However, there was also some first work in Task T9.2 for better supporting other project activities.

**Achievement in Task *T9.1 Threat Analysis Connecting to Existing Work***

We have carried out desktop research and have identified the main methodologies employed by security organizations for threat/risk analysis (especially in a border context). After building an inventory of such methodologies we then proceeded to explore the advantages and limitations of each one. Based on our preliminary findings and following discussions with practitioners we have decided to focus mainly on CIRAM (the risk assessment methodology employed by FRONTEX) and we sought to find ways to design a MIRROR methodology that would be an improvement to CIRAM: (a) by being more OSINT-friendly and (b) by including the risks to migrants as well (in addition to the risks to the state).

**Achievement in Task *T9.2 Provide Recommendations Based on MIRROR Results***

We engaged with the border control organizations who are partners in MIRROR to better understand (a) the type of risk assessment methodologies and (b) the type of OSINT products they are using, so as then to be able to advise the tech partners on the design of the MIRROR system outputs.

### *11.2.3 Role of Partners in the WP*

The main work in WP9 has been carried out by UM who was directly involved in collecting and analyzing the information for Task 9.1 and T9.2. MPF has also contributed to WP9 by sharing information on their internal processes and methodologies for risk assessment. NOA has contributed to WP9 to both T9.1 and T9.2 by sharing information on their OSINT processes, the type of OSINT products they currently deliver and the structure of their risk assessment methodologies. RUG has also assisted in carrying out a preliminary review of the index of perception-based threats.

## *11.3 Contribution to KPIs*

The preliminary work carried out in Task 9.2 is assisting in the achievement of **KPI14 - Number of Threat Linkage.** The creation of an index of perception-based threats based on the information collection patterns and validating this index with practitioners will increase the effectiveness of the MIRROR system.

Also the work carried out in Tasks T9.1 and T9.2 and especially the continuous engagement with the practitioner partners on their OSINT and risk assessment needs will also contribute to the achievement of **KPI15** - **Level of user satisfaction with developed MIRROR system.** What WP9 is trying to ensure is that the outputs of the MIRROR system can be easily integrated in the type of OSINT products currently being used by practitioners and that the MIRROR risk assessment methodology is an improved version of the methodologies they are already using as part of their FRONTEX commitments.

## *11.4 Planned Next Steps*

The main goal is to finalize the MIRROR Threat Analysis Methodology and the index of perception-based threats and circulate them to WP4, 5, 6 and 7 partners, for them to integrate in the system design.

# 12 Progress in WP10

## 12.1 Overview of WP10 and its Goals

| WP Number | WP10 | WP Leader | UM |
|---|---|---|---|
| WP Title | Pilots, Evaluation and Validation | | |
| Involved Partners | UM, LUH, MoDAT, MPF, NOA, SAIL, EURIX, RUG, CERTH, and FOI | | |
| Start Month | M1 | End Month | M35 |

**Goals of WP**

The aim of Work Package 10 is to test and validate the MIRROR system developed in Work Packages 4-7 in Sweden, Austria and Malta, using the scenarios prepared in WP2. The results of each pilot will be closely monitored and fed to the technical team, thus allowing the system to be improved from one pilot to the next. The goal of the pilots is the validation of the MIRROR approach and the technical solutions developed based on this approach through the target communities of border agencies and policy makers and to assess to which degree the developed solution meet the expectations of the target communities. The activities of WP10 include the time planning, technical and organizational preparation of the pilots, setup of pilot systems, conducting the pilot studies and analysing the results of the pilots.

**Focus of Year 1**

During Year 1 the focus has been on the preliminary activities required for the preparation of the pilots in each country. To this end, a checklist including a description of the steps to be taken ahead of the pilots and precise guidance was developed and circulated across partners for feedback.

## 12.2 WP10 Achievements & Results

### 12.2.1 Summary of WP Results in Y1

In Year 1, WP10 has focused on Task 10.1 – Preparation for the Pilot Runs in 3 countries. A checklist was developed which outlines the steps to be taken by all the partners involved in the piloting. These steps include the obtainment of the required internal permissions to implement the pilot in the end-user partners' organizations, the recruitment of the personnel required for the pilots, the identification of infrastructure, as well as the development of guidelines for the use of the MIRROR system, among other steps. Partners reviewed and approved the checklist.

### 12.2.2 Detailed Description of Achievements

In year 1 of the project only Task 10.1 was active.

**Achievements in Task 10.1 - Preparation for the Pilot Runs in 3 Countries**

As part of Tasks 10.1, both technical and end-users partners discussed and agreed on the requirements for the implementation of the pilot in Sweden, Austria and Malta. A checklist was developed outlining the necessary steps to be taken in each of these countries.

### *12.2.3 Role of Partners in the WP*

UM, as the WP10 leader, identified the preliminary activities to take place ahead of the pilots and developed the checklist to be distributed to partners.LUH, MoDAT, MPF, NOA, SAIL, EURIX, RUG, CERTH, and FOI provided feedback on the checklist and on the preliminary activities they would be involved in.

## *12.3 Contribution to KPIs*

The work carried out in WP10 is contributing to the achievement of **KPI15 – Level of user satisfaction with developed MIRROR system.**

The pilots with aim to evaluate and validate the MIRROR system and will therefore provide insight in the level of user satisfaction with the system through the use of benchmark tools for user satisfaction. The activities undertaken during Year 1 in WP10 provide the basis for the implementation of the piloting and therefore the measurement of user satisfaction and the achievement of KPI15.

## *12.4 Planned Next Steps*

In the upcoming months, the partners involved in WP10 will start to implement the preliminary activities for the preparation of the MIRROR system pilots as described in the checklist.

# 13 Progress in WP11

## *13.1 Overview of WP11 and its Goals*

| WP Number | WP11 | WP Leader | SAIL |
|---|---|---|---|
| WP Title | Dissemination, Communication and Exploitation | | |
| Involved Partners | ALL | | |
| Start Month | M1 | End Month | M36 |

**Goals of WP**

The role of this work package is to ensure that target audiences receive information about the project which will support the maximum exploitation of its results.

The main objectives of WP 11 are:

- Disseminating knowledge about the project especially to the target groups defined.
- Establishing and carrying out the dissemination and communication activities based on the set strategies which are closely linked to the excellence and impacts of the project.
- Developing a dissemination strategy, which is based on cross-fertilisation of consortium partners. This means close cooperation and ongoing feedback-enriched communication with lead-users, academic partners, civil-society organizations and industrial partners which are represented in the consortium.
- Addressing the needs of target groups by efficient dissemination activities and to convince end-user's key decision makers to make use of the project's results
- Creating and implementing an exploitation strategy, especially together with relevant stakeholders, end-users, civil society organizations and industrial partners, ensuring sustainability for MIRROR during and after the projects' life.
- Promoting the project identity, creating the project's website and targeted promotional material.

**Focus of Year 1**

During the first year the main focus was set on spreading the word about the project and its progress. The first step for WP11 was to establish the overall strategy for communication, dissemination and exploitation along with the project identity. With this master plan, the main target groups were defined, communication channels were selected, and the main messages were crafted. Thus, the main communication and dissemination goal was to first establish trust within the created communication networks. Three main channels were prioritized in year one: the MIRROR website, selected social media accounts and the partners' own networks (intra-company networks, partner websites and intranet, partners' mailing lists).

It should be noted that growing and maintaining networks entails a step-by-step relationship and trust-building process and is considered as an ongoing, project accompanying task, which will continue to be important for years two and three and beyond.

## 13.2 WP11 Achievements & Results

### 13.2.1 Summary of WP Results in Y1

WP11 achieved the following results:

- Development of the common communication, dissemination and exploitation strategy to disseminate knowledge about of the project, its progress and results.
- Launch of the project website.
- Set up and maintenance of the MIRROR social media accounts (Twitter and LinkedIn).
- Creation of trust and establishing and maintenance of communication networks.
- Development of a common visual identity that reflects the project.
- Production of the communication kit containing PowerPoint presentations, promotional material, newsletter and poster.
- Submission of publications.
- Participation at events.
- Preparatory work for the MIRROR video.

It should be noted that the COVID-19 pandemic led to a delay in many of the planned communication, dissemination and exploitation activities and related milestones which were originally planned for in the communication timeline (communication about first results, field studies, events, newsletter, video production, etc.).

### 13.2.2 Detailed Description of Achievements

The following section details a description of achievements per Task. During Year 1 Tasks T11.1-T11.4 have been active in WP11.

**Achievements in Task 11.1 - Project Dissemination and Communication Strategy**

This Task includes the development of the overall project's dissemination and communication strategy in close cooperation with all partners. It includes all communicative activities planned during the runtime of the project and beyond with the aim to disseminate knowledge about of the project and its progress. This common strategy was then integrated in and reflected by the dissemination and communication plan.

To be able to include all possible audiences from the very beginning, the social media accounts for MIRROR on Twitter and LinkedIn were established in June 2019.

**Achievements in Task 11.2 - Development of the MIRROR Dissemination and Communication Plan**

The work done within this Task is the foundation for all future communication, dissemination and exploitation activities of MIRROR. The first deliverable D11.1 ("Communications Plan") was concerned with defining the following key aspects: communication goals, identification and segmentation of target audiences, design of key messages, definition of communication channels and appropriate formats and the timing of activities ("communication timeline").

In August 2019, the projects' identity was developed to reflect the main ideas and personality of MIRROR as a brand (represented by a combination of color schemes, branding activities, designs and typographies).

As the main visual representation, the project logo was developed and published on all formats. The project identity is summarized in D11.2 ("Project Identity Report").

**Achievements in Task 11.3 - Dissemination and Communication Activities**

The first crucial step of this Task was the establishment of the online presence for MIRROR: the launch of the project website at the earliest possible time (month 3), was key for broad communication to reach all interested parties from the general public to specified experts or stakeholders. The whole visual design concept was aligned according to the project identity developed in D11.2.

In parallel, the "communication kit" containing the MIRROR flyer and poster was created to enable the project partners to communicate and disseminate information to the best possible extent.

In addition, a common deck for MIRROR PowerPoint shows was developed and made available for all consortium partners (at the shared drive) to optimally support their dissemination and exploitation activities. Following, the MIRROR newsletter was designed and the content was prepared together with all partners. It was disseminated in April 2020 with more than 5000 recipients through various partners' channels.

This Task (T11.3) also included the story telling around the project. The MIRROR team has crafted and refined the main story ("narrative") around MIRROR, matching with the target audiences which should guide and promote all future communication activities and public relations.

As further achievements in the dissemination of project results, there are already first publication created based on project results:

- Going Beyond Content Richness: Verified Information Aware Summarization of Crisis-Related Microblogs (LUH at CIKM 2019)
- Veracity assessment of online data (Journal of Decision Support Systems, FOI)
- Identifying Deceptive Reviews: Feature Exploration, Model Transferability and Classification Attack (EISIC 2019, FOI)
- Extracting Account Attributes for Analyzing Influence on Twitter (EISIC 2019, FOI)
- Automated Text Analysis for Intelligence Purposes: A Psychological Operations Case Study (Book chapter in Open Source Intelligence and Security Informatics, Springer Lecture Notes in Social Networks, FOI)
- "How to stitch lacunas in Open Source Intelligence – Using ethics to fill up legal gaps" (RUG, Jean Monnet NOVA-EU workshop)
- Exploring the Missing Link – The Role of Media and Communication Theory in Migration Decision-Making" (accepted at IMISCOE Annual Conference, UNIVIE)

Furthermore, the following table lists of successful and foreseen event participations:

| ***Event*** | ***Date*** | ***Location*** | ***Participation by Partner…*** | ***Additional Information, Status, Action*** |
|---|---|---|---|---|
| *ERA event Annual Conference on EU Criminal Justice 2019* | 14 November 2019 – 15 November 2019 | Lisbon | Agenfor | Participation and flyer distribution by partner |

| | | | | |
|---|---|---|---|---|
| *ESSENTIALs of Security Conference* | 14-15 November 2019 | The Hague, The Netherlands | RUG/UoM | Synergy and cross-dissemination (EC-event organized by partner) |
| *DISKOW & 9Conversations* | 19-20 November | Rome | LUH | Multiplier Event (event co-organized by partner) |
| *Milipol Paris 2019* | 19-22 Nov. 2019 | Paris | Agenfor | Participation by partner (dissemination and future exploitation) |
| *European Intelligence and Security Informatics Conference (EISIC) 2019* | November 26-27, 2019 | University of Oulu, Oulu, Finland | SAIL, FOI | Participation (SAIL) and presentation of paper (FOI) |
| *National European Migration Network Conference 2019* | 3. Dec. 2019, | Vienna | Univie, FREUNDE | Migration & communication - Information campaigns in countries of origin and transit: Participation by partner |
| Digitalisation, Ethics and EU Fundamental Rights | Jan, 2020 | Maastricht | RUG | Paper presented: "*How to stitch lacunas in Open Source Intelligence – Using ethics to fill up legal gaps"* |
| IMISCOE Annual Conference | July 2020 | probably virtual | UNIVIE | Paper: "*Exploring the Missing Link – The Role of Media and Communication Theory in Migration Decision-Making"* |

**Achievements in Task 11.4 - Project Exploitation**

The Task includes the elaboration and implementation of the overall and individual dissemination and exploitation strategies, open access and IPR rights culminating in the Deliverable D11.3 (Dissemination and Exploitation Plan). This plan was developed together with all consortium partners and includes target groups for exploitation, dissemination and exploitation channels, exploitable assets and the timeline of exploitation activities.

### *13.2.3 Role of Partners in the WP*

All MIRROR partners are actively involved in the WP contributing to the dissemination, communication and exploitation tasks:

SAIL - as the leader of WP11 - has done active communication work via the different channels. In addition, SAIL participated at the European Intelligence and Security Informatics Conference (EISIC) 2019. Furthermore, various tweets and newsletter were published via the SAIL communication channels (Posts on the company website and social media channels (https://www.sail-labs.com/category/projects/, https://twitter.com/saillabs), Press release (FIBEP https://www.fibepcongress.com/single-post/2019/07/31/MIRROR-Project); Corporate Newsletter in June News & Updates (Issue 32); July Newsletter (Issue 33), August (Issue 34), September News & Updates (Issue 35), November News & Updates (Issue 37) and in April 2020 and a two-staged dissemination of the MIRROR newsletter.

LUH created a project's profile page within the L3S website (https://www.l3s.de/de/projects/mirror) and presented the work "Going Beyond Content Richness: Verified Information Aware Summarization of Crisis-Related Microblogs" was presented at the CIKM '19. In addition, flyers of the MIRROR project were

distributed in the DISKOW Multiplier Event in November 2019 (https://www.diskow.eu/?page_id=262). The event was held simultaneously in two locations (Rome and Valverde, Italy). The event gathered a broad audience consisting of relevant stakeholders and other organizations, such as migrants in Valverde, relevant industry stakeholders, representatives of related projects, and the associated partner FSOP (Fondazione per lo Sviluppo dell´Oltrepó Pavese).

MoDat disseminated project information and MIRROR flyers at the Austrian Disaster Research Days 2019 (TU Graz and within the Austrian Armed Forces Command) and distributed the project newsletter to targeted departments.

MPF disseminated information via its Twitter account @MaltaPolice.

NOA created an internal Mirror website ("Police Intranet"). In addition, personal communication to RIFA group for intelligence (IT-and experts working with developments for the intelligence units in Sweden), to national and regional chiefs of intelligence units in Sweden, the expert group concerning business rules developments within Sweden for the implementation of the new Interoperability EU regulations (EES,ETIAS, VIS) including border system experts took place. Furthermore, the project was presented to audiences responsible for programme planning 2021-2024 (Border Management and EU Security funds).

EURIX disseminated information about MIRROR via their own social media channels on Twitter and LinkedIn.

RUG disseminated information about MIRROR at the ESSENTIALs of Security Conference Synergy and cross-dissemination (EC-event organized by RUG) and presented paper "How to stitch lacunas in Open Source Intelligence – Using ethics to fill up legal gaps" successfully. Furthermore, STeP Twitter re-tweeted newsletter and promoted newsletter via LinkedIn.

CERTH contributed to establishing the project's dissemination and exploitation strategy. In addition, made contributions to the contents of the MIRROR website and newsletter. Moreover, the newsletter was disseminated via CERTH's Linkedin account (>5.000 followers) and CERTH's Twitter account (>1.700 followers).

FOI presented the project at the EISIC (European Intelligence and Security Informatics Conference 2019) and several successful publications (see above).

UNIVIE has a paper accepted at the IMISCOE Annual Conference "Exploring the Missing Link – The Role of Media and Communication Theory in Migration Decision-Making", furthermore it has several re-tweets of MIRROR disseminated information.

UM (together with RUG) organized the ESSENTIALs of Security Conference Synergy. Newsletter disseminated and post created via own university website.

K&I created a dedicated communication and dissemination section on the website http://www.knowledge-innovation.org/en/ki-srls/mirror/ with information and news about the project. The MIRROR newsletter was disseminated and post created.

FREUNDE reviewed the Communication Plan (D11.1), the Dissemination and Exploitation Plan (D11.3) and disseminated project information via related posts on FREUNDESocial Media Accounts. In addition, the newsletter was disseminated to LinkedIn contacts.

Moreover, the main MIRROR narrative was crafting together with SAIL, UM and LUH.

AGENFOR participated at the ERA event Annual Conference on EU Criminal Justice 2019 and the Milipol (commercial event) and disseminated information via flyers (see Table 1). In addition, the MIRROR newsletter was disseminated to the AGENFOR contacts (more than 5000 recipients)

## *13.3 Contribution to KPIs*

The WP11 work contributes to a number of KPIs. The most important ones are listed below:

**KPI18 - Visits to website:** More than 200 monthly unique visits (based on statistics for April 2020 and May 2020)

**KPI20 - Presence in social media:** Mirror has attracted 159 twitter followers (average of 1-to 2 Tweets per week) and has 21 posts on LinkedIn.

**KPI21 - Media Presence:** One press releases was published by FIBEP (https://www.fibepcongress.com/post/2019/07/31/mirror-project)

**KPI24- Publications & events:** Mirror has published 6 articles and publications.

**KPI26 - Workshops, demonstrations and expert groups:** Mirror has participated in more than 5 events (see list with more than 100 key target audience participants. Furthermore, interviews with experts have been performed as part of the work in WP8.

## *13.4 Planned Next Steps*

The communication and dissemination strategy was set up to not only highlight the project and its partners but also major progresses, events and milestones achieved. As mentioned before, due to COVID-19 some of MIRROR activities were either postponed (field studies, conferences postponed to 2021 or later) and re-organized or re-defined (face-to-face versus virtual conferences or events).

Thus, the next steps include a re-shaping of our communication strategy with regards to these new “COVID-19 communication realities”. We will therefore also consider new types of (remote) events, other forms of maintaining our (virtual) communication networks and creation of virtual trust.

Closely linked to the results and main achievements of the project is the creation of a video for MIRROR. In the course of this year we have developed and refined the main narrative which serves as a foundation for the storyboard of this video. The focus is set on explaining the importance and main purpose of MIRROR. With the completion of the video, the MIRROR YouTube channel will be opened and maintained – the next important step in the communication, dissemination and exploitation strategy of the project.

# 14 Progress in WP12

## 14.1 Overview of WP12 and its Goals

| WP Number | WP12 | WP Leader | LUH |
|---|---|---|---|
| WP Title | Ethics requirements | | |
| Involved Partners | ALL | | |
| Start Month | M1 | End Month | M36 |

**Goals of WP**

The goal of this WP is to act upon the ethical requirements formulated as part of the ethical review performed on the MIRROR project proposal. Work will be performed in close collaboration with WP3, which is responsible for legal and ethical issues in the MIRROR project.

**Focus of Year 1**

The focus of Year 1 is on the required deliverables scheduled for Year 1. This includes data protection issues, issues related to informed consent and ethical approval of field work as well as the formation of an MIRROR Ethics board and the interaction with this board.

## 14.2 WP12 Achievements & Results

### 14.2.1 Summary of WP Results in Y1

The MIRROR Ethics board has been established and has taken up its work. This mainly consisted in reviewing ethically relevant deliverables and giving ethical advice to the consortium.

Furthermore, the further requirements raised during the proposal review and summarized in the Ethics Summary Report have been considered for the MIRROR project work. Activities related to these requirements have been documented in the deliverables of this WP.

### 14.2.2 Detailed Description of Achievements

WP12 has no task-based structure. Its structuring is given by the deliverable schedule, which has been defined for the WP.

In the first month of the project the ethics Deliverable D12.3 answering to requirement POPD – Requirement No.5 (Data Protection Officers) has been prepared and submitted.

The MIRROR Ethics board has been established and has taken up its work. A plan for collaboration with the Ethics board has been established and has been documented in Deliverable D12.7. As an important contribution to the project, the Ethics Board has reviewed ethically relevant deliverables. A first report on the work of the Ethics Board has been submitted (D12.8).

For the field work, an approval for the procedures has been received by the ethics board of the University of Vienna (leading the field work). This approval has been submitted as Deliverable D12.2. Furthermore, the informed consent procedures for the field work (D12.1) and the Interview Guidelines for Migration

Process Analysis (D8.2) both have been approved by the Ethics board of the University of Vienna and reviewed by the MIRROR Ethics board. D12.1 and D8.2 have been submitted after taking into considerations the comments of the MIRROR Ethics Board.

#### *14.2.3 Role of Partners in the WP*

LUH as the coordinator is leading the WP. RUG as the leading partner in Legal and Ethical Issues is also strongly involved in the WP. In the context of the issues and deliverables related to the field work UNIVIE also played an important role in the WP activities.

### *14.3 Contribution to KPIs*

There is no KPI directly related to WP12 activities.

### *14.4 Planned Next Steps*

The collaboration with the Ethics Board will be continued. Currently the next deliverables and the second report of the Ethics Board are under preparation.

Keeping a close eye on the ethical aspects will remain an important activity in the project.

## 15 Updated Risk Assessment

As part of preparing the MIRROR project proposal and the DoA we have already defined a set of critical risks for the MIRROR project. Those risks are monitored as part of the normal project management process and issues related to such risks are discussed with the MIRROR management team and in the regular WP leader phone conferences, whenever necessary.

As part of the closing of the first project year a more in depth analysis of possible risks has been performed. This includes a re-assessment of the already identified risks as well as the possible identification of new risks, which have surfaced in the first project year.

### *15.1 Re-assessment of Identified Risks*

The following project risks have been identified before the start of the project (as listed in DoA):

1. Unforeseen technical problems may not be resolved with the assigned resources
2. The planned field studies require more effort than expected and planned
3. Technology planned in MIRROR becomes available from a third party
4. Lack of consensus within consortium
5. Project partner leaves the consortium
6. Loss of access to data sets/Media Channels
7. Under-estimation of development time
8. Technology developed by different partners cannot be integrated
9. The developed system does not meet the needs or expectation of the target groups
10. Previous projects that MIRROR build upon fail to deliver

The following table summarizes the results of the risk re-assessment for the 10 aforementioned risks.

| No | Identified Risk | Re-assessment |
|---|---|---|
| **1** | Unforeseen technical problems may not be resolved with the assigned resources | So far no unforeseen technical problems have been identified during the research and development activities in MIRROR. In addition a good working atmosphere has been established between the partners involved in technology development easing the joint solution of technical issues.<br><br>This has lowered the likelihood of this risk to low-medium. The mitigation plans remain unchanged. |
| **2** | The planned field studies require more effort than expected and planned | The field studies have not yet been started, but have been carefully prepared. So far there are no evidences that the field studies will require more effort than expected. There are, however, two risks related to the field studies, which had not been included in the original list. They are discussed in the next section (15.2).<br><br>Due to the challenging character of field studies outside Europe, the risk of field studies requiring more effort remains a risk with medium likelihood. The mitigation plans remain unchanged. |
| **3** | Technology planned in MIRROR becomes available from a third party | The individual teams perform regular technology watch activities as in their different areas of expertise as part of their research activities. So far technology planned in MIRROR has not become available from a third party.<br><br>Due to the duration of the project this risk remains a risk with medium likelihood. |
| **4** | Lack of consensus within consortium | A good collaboration climate has been esablished. Upcoming issues within the work of a WP are discussed within WP telcos, which are organized by WP leaders. Project wide issues are discussed in the regular WP leader telcos and/or in the face-to-face (and virtual) project meetings. So far it was possible to resolve all upcoming issues (and conflicts) in this way, in spite of the multidisciplinary composition of the consortium.<br><br>Lack of consensus, thus, remains a risk with low likelihood. |
| **5** | Project partner leaves the consortium | The overall climate of collaboration is very good in spite of the currently difficult working situation for many of the partners due to the Corona Pandemia. The research and the company partners are all still committed to the project goals. Therefore, there is no increased risk of a partner leaving the consortium.<br><br>This, remains a risk with low likelihood. |
| **6** | Loss of access to data sets/Media Channels | So far no further restrictions in the data sets relevant for the project have occurred. The situation is, however, closely observed, especially |

| | | |
|---|---|---|
| | | by partner SAIL.<br><br>Loss of acess to part of the data remains a risk with low-medium likekelihood, since it cannot be excluded that media channels accessible so far might become more restrictive with respect to access. |
| **7** | Under-estimation of development time | So far development progresses as planned. However, due to the complexity of the system delays in the development are still possible for the future.<br><br>The risk remains a risk with medium likelihood. The mitigation plans remain unchanged. |
| **8** | Technology developed by different partners cannot be integrated | Within WP7 and under the lead of its WP leader EURIX, all partners developing technology have agreed upon an integration plan and flexible integration technology to be employed. Furthermore, early discussion of integration issues and a continuous integration approach with a first prototype in Month 14 also helped in preventing issues with integration.<br><br>Problems with technology integration, thus, remains a risk with low likelihood. |
| **9** | The developed system does not meet the needs or expectation of the target groups | A careful requirements analysis based on persons and user stories has been performed, in order to capture the expectations of the target groups especially the border agencies.<br><br>Furthermore, the MIRROR team has chosen an agile development approach. UI Mockups (and sub-sequentially also early prototypes) are regularly discussed with the target groups, in order to collect and incorporate early feedback.<br><br>Furthermore, the risk of non-acceptance is also covered from another complementing angle by starting a task force on societal acceptance, which will also influence technology development.<br><br>Not meeting the target group expectations, thus, remains a risk with low likelihood. |
| **10** | Previous projects that MIRROR build upon fail to deliver | All but one of the projects listed for this purpose have meanwhile finished and delivered their technology for MIRROR to build upon.<br><br>Problems with delivery of results from previous projects, thus, remains a risk with low likelihood. |

## *15.2 Newly identified Risks*

During the first project year, two new risks have been identified.

11. Influence of political developments on field work

In some of the countries, for which the field work has been originally planned, the political situation has changed considerably, since the time of writing the proposal. This made re-assessment of the plans for the field work necessary. However, meanwhile good new plans for countries of the field work have been established ensuring the achievement of the planned project results in this area.

12. Delay of project work due to CoVid 19 Pandemia

As for all other projects the CoVid 19 pandemia also had an impact on the MIRROR project. This especially refers to the inability to travel to project meetings and conferences. Furthermore, for most partners the employees had to switch to home-office on relatively short notice. However, due to good equipment, decent network connectivity from home and the already established collaboration relationships, it was possible to keep working on the project quite effectively.

Since the pandemia is still an ongoing development, a final assessment of its impact on the project and its progress is not yet possible.