D4.1 – Training Methodology and Curricula - 1st Release

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Quality Review by: ED

Official Submission Date: 2023-10-31

Actual Submission Date: 2023-10-31

Dissemination Level: Public

This project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement No 101074048

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Executive Summary

This deliverable outlines the work conducted under Task 4.1 on Training Methodology and 4.2 on Training Curricula. Both tasks are interconnected, while they also receive input from other Work Packages (WP3, WP5, WP6) and inform the work of other tasks (T4.4).

Developing training activities requires structured learning packages and plans, which must be based on a sound training methodology. By conducting desk research and field research on the training needs and objectives of LEA personnel, ensuring focus on TENACITy topics (particularly relevant to the field research), IANUS developed the TENACITy Training Methodology, which constitutes the guiding basis for the training curricula, which are being created by KEMEA. The field research was conducted with the dissemination of a Training Needs and Objectives Survey (ANNEX I: TENACITy Survey on trainee needs and objectives) and determined several gaps in the training of the TENACITy target audience (particularly PIUs). Though the desk research, the learning objectives of the trainees were also illustrated, complementing the objectives set out by the project's GA. Needs, objectives and background elements on the trainees (e.g., years of experience) constitute the trainee profile.

In particular, the **specific training objectives** of the TENACITy Training are:

1. To use both synchronous and asynchronous training activities, via a variety of means, to convey the knowledge required by LEAs to use the TENACITy Tools.
2. To engage LEAs in self-directed, self-paced training activities, with opportunities for interaction among learners and between learners and instructors
3. To connect the trainees' learning process with real-life scenarios and applications
4. To train the participants focusing on AI, Blockchain, OSINT and digital technologies
5. To cultivate the skills highlighted by the target trainees and required at their job, such as analytical thinking, decision-making, problem-solving, attention to detail, data analytics and interpreting the results of the TENACITy Tools.

More on the trainee profile, needs and objectives are outlined in Sections 2.2 & 2.3.
Once the trainee profile was defined, the desk research conducted could be filtered to find the most fitting learning methodology, theory and strategies for the purposes of TENACITy. The training will be based on Kolb's Experiential Learning Theory, incorporating several elements of the theory of andragogy and problem-based learning (Section 3).

The training curricula were developed with the methodology in mind, also using input from partners involved in WP3, 5 and 6, which contributed to better defining and structuring the curricula by tailoring it on both the methodology and content they are based on. Three curricula phases have been identified (Section 4.1). Namely, the curricula phases are: First Curriculum – Training Structure and Methodologies (M1 – M14), Second Curriculum – Understanding The Tenacity Framework (M15 – M27) and Third Curriculum – Applying The Travel Intelligence Tools (M28-M33).

Some of the training Modules that will be included in the training platform have already been identified and described in a preliminary level in this deliverable. These are:

[1] Pattern Identification Tool
[2] Risk Management
[3] OSINT/Web Crawling tool
[4] Hyperledger Fabric-based blockchain
[5] AI-based Criminal Organisation Persona tool

In the months that follow, the partners will keep working closely to fully realize the objectives of the training methodology and curricula of TENACITy, developing the appropriate material and activities, finalizing the training platform and reviewing the existing work under the lens of user/trainee feedback.

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List of Abbreviations

Term	Description
AI	Artificial Intelligence
API	Advance Passenger Information
GA	Grant Agreement
IT	Information Technology
LMS	Learning Management System
OSINT	Open-Source Intelligence
PBL	Problem based learning
PIU	Passenger Information Unit
PNR	Passenger Name Record

1 Introduction to the deliverable

Work Package 4 on Training Methodology and Curricula of the TENACITy Project aims at developing training curricula on the use of travel intelligence against serious crime, based on a well-researched training methodology. The methodology and curricula shall be tailored to the training needs and objectives of LEA personnel involved in travel intelligence, namely PIU officers, as well as representatives from Customs and Border Security[1]. This Deliverable is the first release of D4.1 "TENACITy training methodology and curricula" and contains the account of the work conducted by M14 under task 4.1 on training methodology and task 4.2 on Training Curricula, led by IANUS and KEMEA respectively.

1.1 Description of Activities

In order to provide a comprehensive and innovative approach to training, that is aligned with the objectives of the project, but also takes into consideration European training objectives, resources and guidelines, the training methodology was developed following a twofold methodology, based on the CEPOL Methodology for the Strategic Training Needs Assessment[2]. First, we conducted desk research, which was then supported by direct input from the prospective trainees, namely officers of PIUs across Europe and the TENACITy end-users. The desk research scanned various reports, articles and books on current needs, objectives and best practices for the training of law enforcement. The input from trainees was gathered via a survey (see section 2.2 for more details), aiming to collect direct and synchronous input on the training needs and objectives. Further feedback from trainees will be accumulated during the next months of the project, through activities of WP4 and WP7, and incorporated in the next version of the deliverable.

The training curricula, having taken into consideration the training methodology were developed in accordance with the GA and the training needs and objectives outlined in this deliverable. After the definition of the three phases of the training curricula, the training modules were developed at a preliminary level, pending further analysis and detailed structure.

[1] Since TENACITy strives to develop comprehensive solutions that bridge the gaps between the aforementioned authorities and among EU Member States, the training components of the projects are aimed towards all end-users involved in it.

[2] (CEPOL - European Union Agency for Law Enforcement Training, 2021)

1.2 Structure of the Deliverable

The deliverable follows the structure of the workflow of the tasks thus far. First, the training profile is described, analyzing the training needs and objectives as they derived from the TENACITy Survey on trainee needs and objectives (Section 2). Following this section, the training methodology is described, comprising of the learning theory and strategies proposed for the training activities. In Section 4, the deliverable discusses the Training Framework and organisation, outlining the curricula phases, their content, justification and proposed activities. Section 5 describes the Training Modules and Section 6 concerns the Evaluation of training activities. Lastly, there is a chapter devoted to the description of the living labs (Section 7), as they are also a part of the training activities.

1.3 Relationship With Other Deliverables and Tasks

The work of WP4 is correlated with WP3 and WP5. In particular, WP3 will provide the material and foundation for the modules on the Risk Management Framework (Task 3.1) and the Regulatory/Legal Framework (Task 3.2 and 7.5). WP5 will produce user manuals on the technology solutions developed under TENACITy, on the basis of which the modules on using advanced technology for travel intelligence will be developed. According to the DoA, project outcomes with a focus on standards, policies and information sharing will be also part of training activities. Training material and activities will be developed taking into consideration WP3, 5 and 6, while informing the proceedings of Task 4.4 on the training platform.

1.4 Glossary

The glossary of baseline terminology included in this section can provide some clarifications, if needed, making the content of the deliverable, particularly the methodology, easier to conceptualize.

Table 1 - Glossary of key terms

Term	Description
Learning Strategy	Rules, principles, and procedures used to facilitate learning, frequently applicable to a variety of specific learning tasks.
Learning Theory	A learning theory is a systematic framework or set of principles that seeks to explain how learning occurs. Learning theories aim to understand the cognitive, emotional, and social processes that underlie the acquisition of knowledge, skills, or behaviours. These theories help educators and

	researchers make sense of the learning process, and they often inform teaching methods and educational practices.
Trainee Profile	A training profile typically refers to a structured document or record that outlines the specific training and development experiences, qualifications, skills, and competencies of an individual, particularly in a professional or educational context.
Adult Learning	Adult learning, often referred to as "andragogy," is a term that describes the process of adults acquiring new knowledge, skills, or competencies. It encompasses education and training activities designed to meet the specific needs and characteristics of adult learners. Adult learning is distinct from traditional pedagogy, which is designed for children and adolescents. Characteristics of adult learning include problem-solving oriented, prior experience, self-directed and paced, flexibility and relevancy to current occupation.
Problem based learning	A distinct educational method aimed at giving the learner effective skills in problem solving, self-directed learning as a life-time habit and teamwork, all while acquiring an integrated body of knowledge from many different subject areas or disciplines.
Blended learning	Blended learning is a training method that combines traditional in-class, instructor-led teaching with eLearning content to create a more flexible learning experience. By blending these methods, learners can benefit from the guidance and interaction of an in-class experience while having access to dynamic and flexible learning opportunities outside the classroom.
Traditional learning	Traditional learning, also known as "conventional learning" or "classroom-based learning," refers to the established and widely recognized method of acquiring knowledge and skills through in-person, face-to-face instruction
Synchronous learning	Synchronous learning, within the realm of education, denotes an instructional modality in which learners and instructors engage in real-time, simultaneous interactions through various communication technologies. Synchronous learning is emblematic of structured, time-bound events, such as live webinars, video conferences, or virtual classrooms, wherein learners actively engage in discussions, pose queries, and receive immediate responses from their instructors or peers.
Asynchronous learning	This pedagogical approach enables learners to engage with learning materials and educational content at their own discretion, unburdened by real-time constraints. Asynchronous learning is typified by the availability of pre-recorded lectures, discussion boards, e-learning modules, and digital repositories, which students can access at a time and pace aligning with their individual schedules. This modality prioritizes learner autonomy and flexibility, affording the opportunity for reflection, in-depth exploration, and self-directed learning.
Training Module	A training module is an online learning element that specializes in a particular goal. Therefore, it is aimed at teaching a particular subject. Thus, every module is like a chapter that leads to another. Training modules, once viewed as a whole, comprise an extra layer of expertise and tell a full story.

	A complicated course may be divided into modules, and each module may hold a lot of lessons or learning objects.
Training Session	A specific timeframe allocated to training, on certain learning objectives and learning items.

2 Introduction to the TENACITy training curricula

2.1 Purpose of the curricula

The training methodology and curricula aim at maximizing the impacts of the technology tools and frameworks developed within the scope of TENACITy. Training curricula for LEAs need to blend with technology tools and provide a holistic approach to travel intelligence, covering aspects such as border management and counter terrorism. TENACITy training envisions of sensitizing all relevant stakeholders (PIUs, Ministries, Government Departments, airlines etc.) and familiarizing them with the appropriate usage of new technologies for the purpose of travel intelligence and the fight against serious crime and terrorism.

2.2 Target Audience Analysis

One of the most important steps in the development of the training methodology has been to define a trainee profile, which allows for a better understanding of the target audience and by extension facilitates the process of creating tailor-made curricula. Defining the trainee profile helps mitigate potential faults in the training methodology and curricula, by clearly assessing the trainees needs and preferences in receiving training, as well as analyze the profile to extract objectives, potential constraints and existing capabilities[3]. This section of the deliverable aims at analyzing the results of the trainee questionnaire, which will be referenced throughout the document, as a major influence on the training methodology and curricula.

TENACITy is a project with a niche target audience. Despite the variation of its end-users and stakeholders[4], it is still relevant mostly to people and organizations fighting serious crime and terrorism using travel intelligence. In order to define the trainee profile for such a particularly themed set of training, IANUS conducted a survey which was disseminated to end-users of the consortium (HP, GRC, GPI[5]) and PIUs outside of the consortium, to achieve better geographic coverage and a wider range of results, reflecting the differences among trainees needs and objectives. The PIUs were contacted via email, after formally requesting and receiving the Contact

[3] Capabilities relevant to the offered training.

[4] A stakeholder analysis shall be included in the Annexes

[5] MPS is also a consortium partner and end user. Their responses have not yet been received, due to internal consortium rearrangements.

list by the HP. The Survey was developed in cooperation with WP4 partners, namely KEMEA, ED and HSE, and was distributed to all respondents via email, using the EU Survey and a secure password.

When seeking to define the learners' profile, 2 pillars are mostly emphasized: demographic characteristics, training preferences and evaluation. In adult trainees, demographic characteristics consist of:

- Country of origin
- Organisation of work
- Organisation type (specify)
- Position in the organisation
- Title
- Years of experience
- Interest and relation to the training material

These are important factors to understand the background of the training recipient and therefore provide better training. This derives from the theory of andragogy (further elaborated in section 3.1), which basically reminds us that adults learn in a different manner than underage students, vastly due to their previous experience and more focused interest on specific topics regarding their work. Therefore, years of experience and position in their respective work environment are essential elements of their profile.

Training preferences and evaluation are also important factors to take into consideration when designing adult-oriented training curricula, as adult-learning should be more student-centered and guided by the interest of the trainees[6]. These two pillars of the trainee profile cover aspects relevant to expectations from the curricula, current challenges or gaps in the topic at hand, interest in and level of understanding of the topic etc.

The TENACITy Survey on trainee needs and objectives is included in ANNEX I: TENACITy Survey on trainee needs and objectives. It has received 15 replies[7] from a diverse set of countries and roles.

[6] (Birzer, 2003)

[7] So far, meaning that by the end of the deliverable's timeline, we will update the questionnaire results and tables included in this deliverable.

2.2.1 Questionnaire Analysis.

2.2.1.1 Demographic Characteristics.

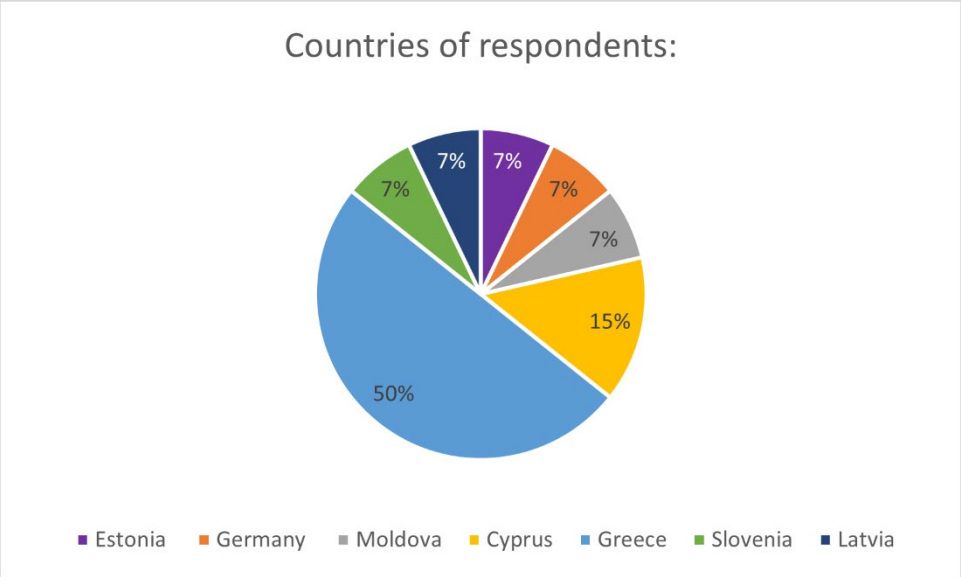

Figure 1 - Countries in which respondents are based

Firstly, participants were asked to indicate the country in which they are currently based and occupied. As seen in Figure 1, the survey received replies from 7 different countries, most of which came from participants in Greece, as the Greek PIU is a Consortium Partner, with entrenched participation and relevance to the project.

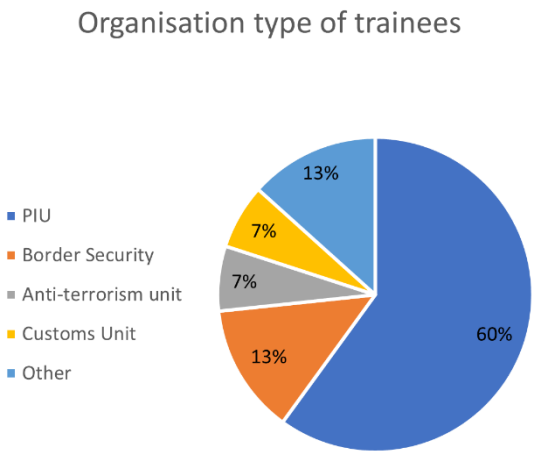

Figure 2 - Organisations of trainees

In the next question, participants were asked to note their organisation of occupation. Most trainees work in PIUs, while *Border Security* and *Other* were also highly chosen replies. In *Other*, participants wrote: Hellenic Police and Hellenic S.I.Re.N.E. Bureau. A visual representation of the replies is Figure 2.

When asked on their years of experience within their respective organizations, most of the participants seem to have more than 5 years of experience, which indicates that potentially a lot of them were involved in their respective units from the trailhead of the establishment of PIUs[8]. If this estimation is correct, it means that the target audience is highly equipped with the experience needed to identify at first hand and at an early stage the challenges and objectives of their respective organisation, with regards to PNR/API data usage and travel intelligence. Therefore, the trainee profile contains valuable information on how these experienced respondents view their perspective TENACITy training.

Figure 3- Years of experience within the organisation stated above

The subsequent questions were aimed at understanding the kind of work the survey respondents are occupied with, by getting to know their role, their involvement in investigations and the phase of investigation in which they participate.

When asked to define their role in the organisation, participants were free to use their own wording, in an open-ended question. Below, you can see Table 2 with their replies, as well as a word cloud (Figure 4), summarizing the frequency with which the words used in the replies appeared.

Table 2 - Respondents' role in their respective organisations

Organisation Type	Title
Hellenic Police	Employee at the Greek Police headquarters
Hellenic S.I.Re.N.E Bureau	Head of the Unit's Back office
Border Security	Schengen Information System Administrator
PIU	PIU Analyst, Operational Analyst, Senior Officer, Supervisor, PIU Analyst, PNR/API Analyst, PNR Data Engineer, Analyst, Head of PNR Topics

[8] Considering that the PNR Directive (Directive EU 2016/681) was issued in 2016, approximately 7 years ago.

Customs Unit	Customs Officer
Anti-terrorism Unit	Main officer of investigations

As indicated by the size of the word, *analyst* was used most often to describe the work conducted by the respondents in their roles. This gives us an indication of the workflow of the respondents, the skills and competences required, as well as their potential relation to the TENACITy Tools, and by extension their training objectives.

Figure 4 - Word Cloud Analyzing the roles of respondents

Next, the survey participants had to reply to the following questions: "In what kind of investigations are you involved?" and "In which investigative phase are you involved?". The replies to these questions are summarized by *Figure 5*- Investigations in which participants are involved and *Figure 6* - Investigative phase in which participants are involved.

Figure 5- Investigations in which participants are involved

The results portrayed in Figure 6 - Investigative phase in which participants are involved correlate with the aforementioned replies concerning the respondents' role in the organisation, since intelligence and analysis often require a similar skillset[9], such as critical and analytical thinking, problem-solving, decision-making, attention to detail and research skills.

Figure 6 - Investigative phase in which participants are involved

2.2.1.2 Training and Evaluation Preference

After having replied to several questions that helped define the demographic aspects of the trainees' profile, the survey participants were required to continue with questions targeting their preferences regarding the training activities, as well as the evaluation thereof.

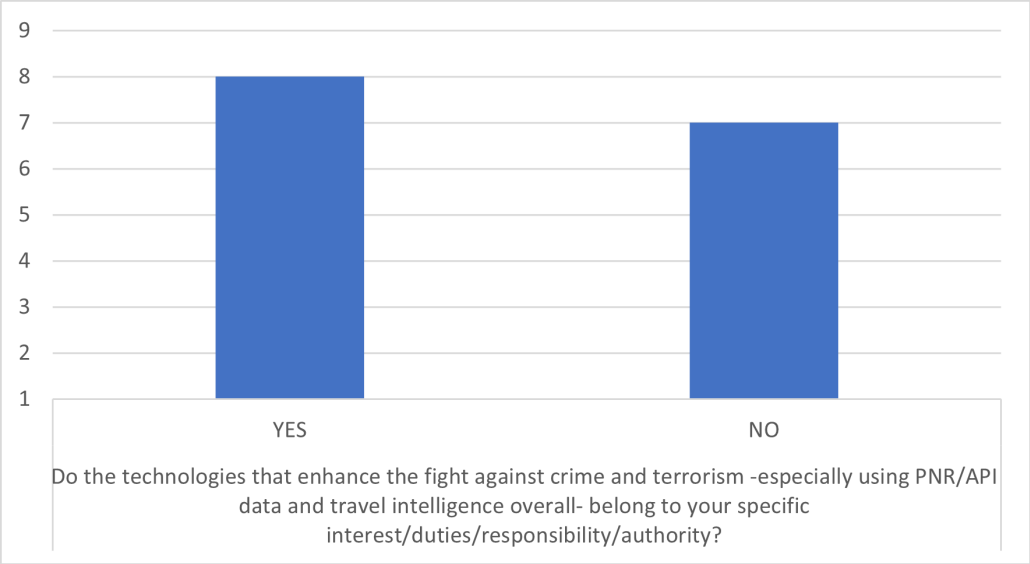

Figure 7- Interest/Authority regarding technologies pertinent to TENACITy

[9] https://online.norwich.edu/academic-programs/resources/how-to-become-intelligence-analyst

The respondents first had to state their opinion on whether technologies that enhance the fight against crime and terrorism, particularly using PNR/API data and travel intelligence was in their interest/duty/responsibilities/authority (Figure 7). The replies gathered do not facilitate a distinct and clear degree of interest, which might be due to the complexity of the question. Since the phrasing referred to interest and responsibility, it is possible that these do not overlap for the participants. Therefore, this could be further examined in the future months of the project, during the implementation of the training curricula, and also through follow-up evaluation questions.

The next question focused on the various characteristics training activities can have in order to attract and retain the interest of the trainees. The participants were asked to classify their preference for each of these presented factors, on a scale from 1 to 5, 1 being the least important factor and 5 being the most important factor. From the replies, we can understand that emphasis is given on the ability to choose the pace and schedule of the training (study at your own time), ability to choose the level of the training material, adapting to one's own needs and prior knowledge, as well as having downloadable material, to revisit and expand one's knowledge. Less importance is given on opportunity for interaction, either between trainees and instructor or among trainees, on being part of a group taking the same course at the same time, or on having the training adjusted for particular educational needs (i.e., dyslexia).

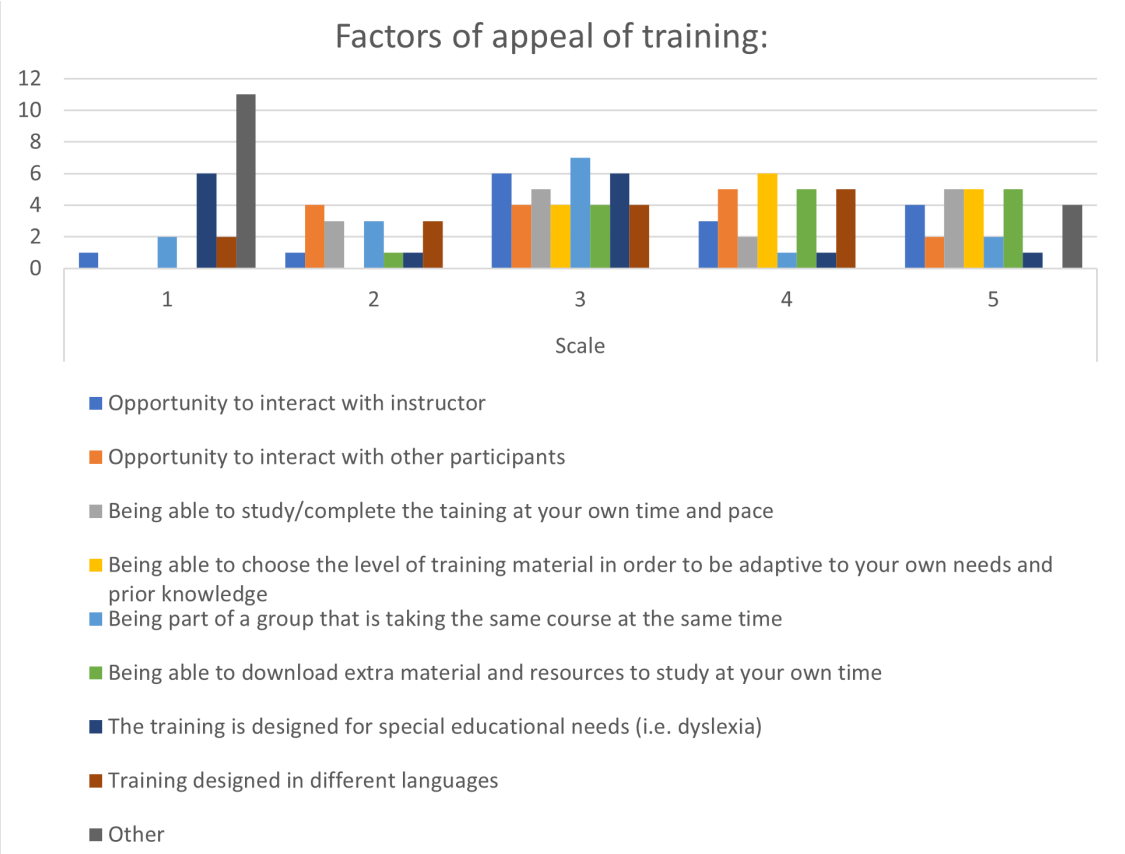

Figure 8- Factors for an appealing training

As far as previous training on the project-related topics[10] is concerned, when presented with several relevant topics, participants are almost equally split between *having* and *not having* had any training before, for most of the topics mentioned, as showcased in Figure 9.

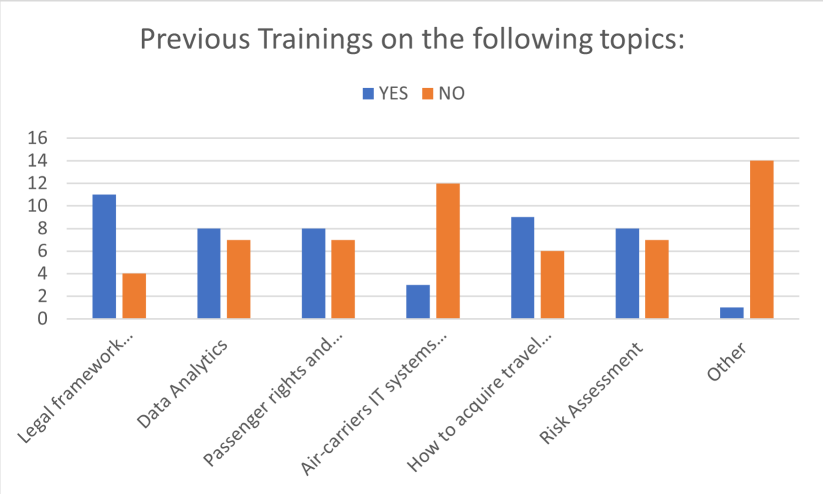

Figure 9 - Previous training on relevant topics

When asked about the required skills for officers working in LEAs relevant to travel intelligence (PIUs, Borders, Customs), most participants put emphasis on attention to detail, ability to interpret and comply with the legal framework for data protection and advanced data analytics capacity. More detail on the replies[11] can be found in Figure 10 - Required skills for officers in travel intelligence roles.

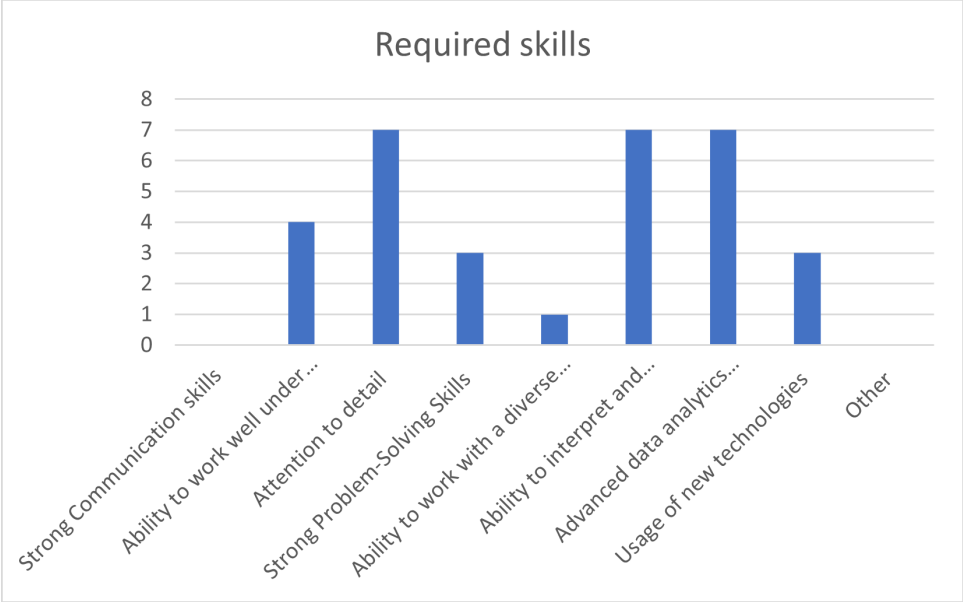

Figure 10 - Required skills for officers in travel intelligence roles

[10] Legal framework around PNR, Data Analytics, Passenger rights and responsibilities, Air-carriers IT systems and practices, How to acquire travel intelligence, Risk Assessment.

[11] Strong Communication skills, Ability to work well under pressure, Attention to detail, Strong Problem-Solving Skills, Ability to work with a diverse range of people, Ability to interpret and comply with the legal framework for data protection, Advanced data analytics capacity, Usage of new technologies, Other

Participants were also asked to grade their confidence regarding their knowledge of specific topics relevant to TENACITy, as listed in Figure 11 - Confidence in knowledge of specific topics.

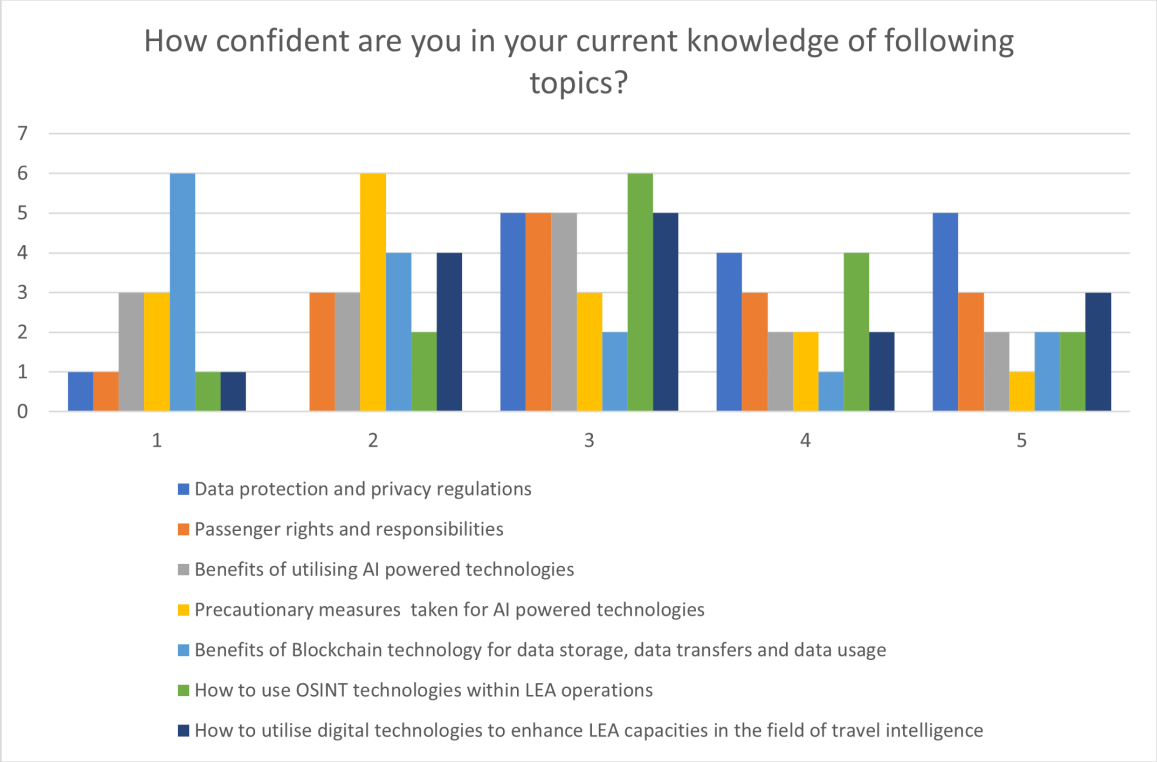

Figure 11 - Confidence in knowledge of specific topics

With 5 indicating the highest grade of confidence, we can safely deduce that data protection and privacy regulations is a topic with which the participants feel quite familiar. When it comes to various topics on technology, a generic phrase on digital technologies in the field of travel intelligence got an average amount of *highly confident* replies, along with passengers right and responsibilities. Yet, when it comes to AI, Blockchain and OSINT, most replies range between the grades 1 to 3. This question can indicate where the focus should be placed, concerning the material and modules of the TENACITy training.

In the following Figure 12 - Preference on topics to receive training upon, we can see the replies concerning the preference of participants on the training they wish to receive. They emphasize digital technologies, OSINT, AI-powered technologies and Blockchain, over the other suggested topics. This reply enhances the previous reply's conclusion on which topics should be prioritized for the TENACITy training.

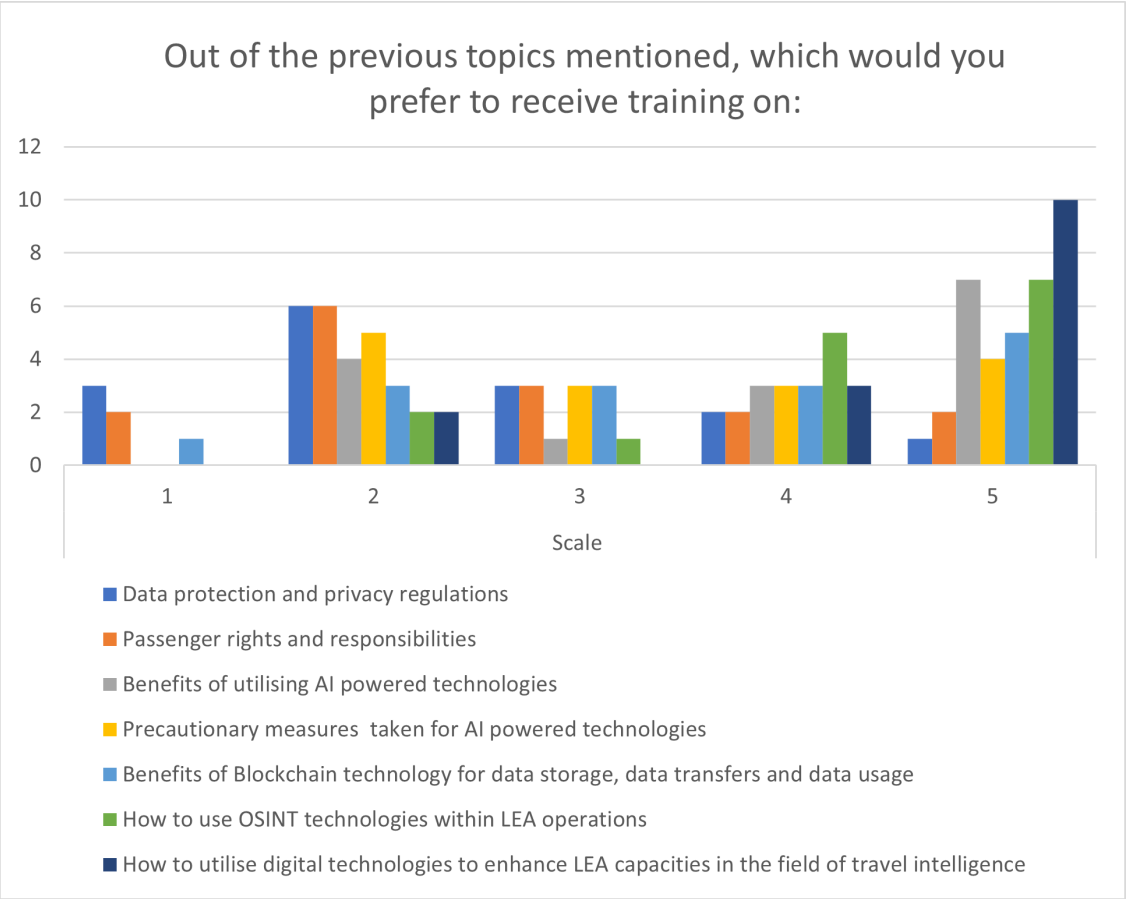

Figure 12 - Preference on topics to receive training upon

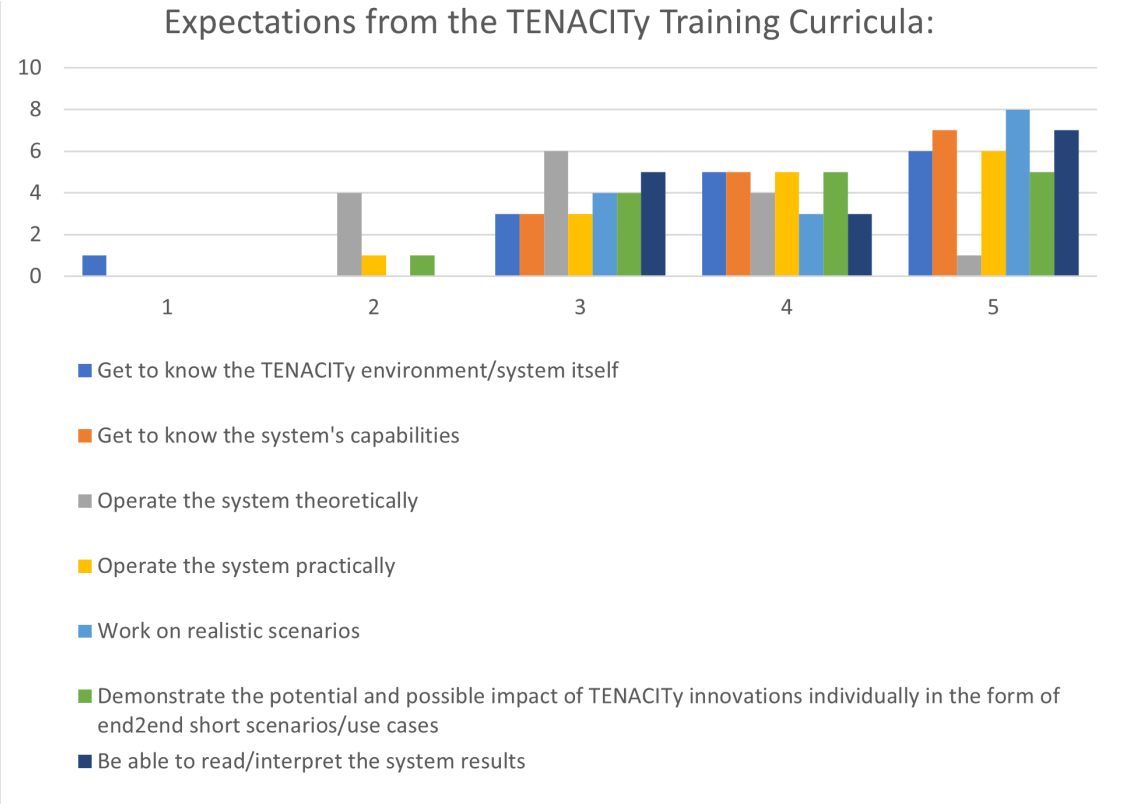

Figure 13. Expectations from TENACITy training Curricula

Figure 13 describes the participants' expectation from the TENACITy training Curricula. As distinctly noticed from the graph, the replies[12] put emphasis on practical and hands-on knowledge of the TENACITy, based on realistic, end2end scenarios and use cases. This adds a new dimension to the training to-be-provided, in comparison to the next figure (Figure 14), which showcases the preference of the respondents regarding the format of the training. Most of the replies indicate that the survey respondents lean towards online formats of training, with less opting for e-learning[13]. Workshop events and the combination of e-learning and classroom training also received a significant number of responses.

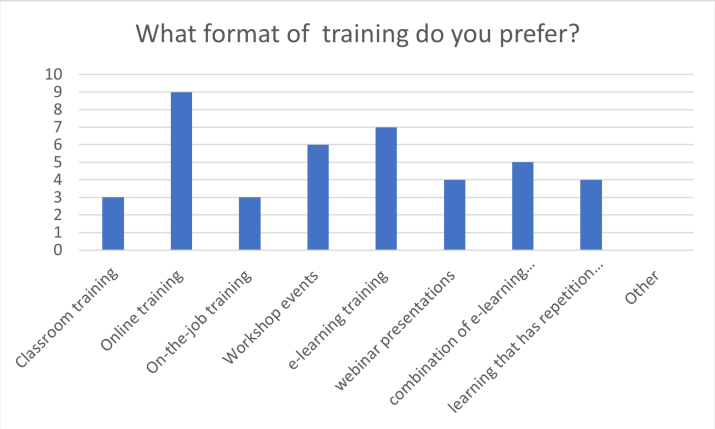

Figure 14. Preferred format of Training

[12] Classroom training, Online training, On-the-job training, Workshop events, e-learning training, webinar, presentations, combination of e-learning and classroom training, learning that has repetition versions, Other

[13] https://insights.fuseclassroom.com/elearning-vs-online-learning-whats-the-difference/

The last two closed-ended questions of the questionnaire concerned the frequency of training participants wish to receive, as well as the methods they prefer to measure the training effectiveness. Figure 15 shows that most participants would want training activities to occur on a semi-annual basis, while several of them also opted for annual trainings. Concerning the training effectiveness, major emphasis was placed on *evaluations on-the-job*, while *feedback surveys* were also quite accepted (Figure 16 - Means of measuring training effectiveness

Figure 15 - Frequency of training

Figure 16 - Means of measuring training effectiveness

Taking all the replies into consideration, the survey on training needs and objectives provided significant input, illustrating how to develop the TENACITy training methodology and curricula. Participants have opted for a diverse format of training, while demonstrating an interest in more practical approaches building concrete experience, specific to the technological components of the project. The replies of the questionnaire will be further exploited to dictate the training methodology. This input will also be used to cross-check the delivered training with the input of the trainees, when conducting the training evaluation.

2.3 Training objectives

In order to achieve the goals of this work package, the **general objectives** of the TENACITy Training are:

(i) to train LEAs (specifically PIUs) on the appropriate use of the technological products developed,
(ii) to engage police officers and representatives in R&D initiatives, by training them on how to best exploit the technology solutions under development and utilizing their feedback to further ameliorate said solutions,
(iii) to improve the knowledge of technological aspects through gaining experience while using them,
(iv) to collect updated end-user feedback in order to create the best possible innovative solutions, which will be achieved through evaluation forms during the living lab activities and the curricula, and
(v) to improve the skills and capabilities of police officers in the field of acquiring intelligence from the processing of PNR data.

The **specific training objectives** of the TENACITy Training are:

6. To use both synchronous and asynchronous training activities, via a variety of means, to convey the knowledge required by LEAs to use the TENACITy Tools.
7. To engage LEAs in self-directed, self-paced training activities, with opportunities for interaction among learners and between learners and instructors
8. To connect the trainees' learning process with real-life scenarios and applications
9. To train the participants focusing on AI, Blockchain, OSINT and digital technologies
10. To cultivate the skills highlighted by the target trainees and required at their job, such as analytical thinking, decision-making, problem-solving, attention to detail, data analytics and interpreting the results of the TENACITy Tools.

3 Training Methodology

Taking into consideration the previous chapter of this deliverable, and in particular section 2.2.1, the learning theory of choice for the TENACITy training should comply with a few standards set by the trainees through their replies to the questionnaire. In this chapter, the TENACITy training methodology is developed and tied to the replies of the survey participants, as well as to several findings of desk research, that led to the composition and triage of the various different options available regarding the learning theory and learning strategies.

The training methodology comprises of several integrated pillars, which put together a solid foundation for the development of training activities. An assessment of the training needs and objectives leads to the definition of training aims and goals, which then are framed by a learning theory and how to apply it, which is the learning strategy.

To provide more context, a learning theory is the narrative of how learning occurs, which factors influence it and which learning principles should be applied in a specific educational context[14]. The learning strategy on the other hand describes the rules, principles and procedures of how the learning theory is to be applied in practice[15].

3.1 Learning Theory

The TENACITy training has a very distinct target audience and aims at conveying knowledge on particular, niche topics. In instances where adult education is concerned, we cannot apply the same principles as with underaged students. Another layer of specificity for the TENACITy training is added by the fact that the target audience of trainees is occupied in law enforcement agencies. Therefore, the aim was to choose a learning theory and compose a methodology that would address very unique learning styles, environments and requirements.

When designing training modules for adults, one has to take into consideration the experience factor. Adults do not join training activities with a tabula rasa stance. They have acquired experience through their professional occupation, their daily lives and previous training and educational activities. Especially when the suggested training, as is TENACITy training curricula, concerns their field of profession, previous experience is a major factor on how they learn and how they apply the knowledge received by each training activity. Therefore, the Learning Theory for TENACITy is founded upon a blend of the principles of the theory of Andragogy, by Malcolm Knowles, and the Experiential Learning Theory (ELT), by David Kolb. Besides, due to its correlation with pre-acquired

[14] (Schunk , 2012)

[15] https://learningportal.iiep.unesco.org/en/glossary/learning-strategy

experience, problem-solving and reflection, ELT has been associated with adult-learning and life-ling learning[16]. Therefore, the two chosen theories are highly integrated.

Developed in the 1970s, the Experiential Learning Theory (ELT) of David Kolb is a holistic approach to learning that suggests individuals acquire knowledge and develop skills through experience. ELT offers a different view of the learning process compared to behavioral theories of learning and takes its name by emphasizing the essential role of an individual's experience in the learning process. However, experiential learning theory does not oppose behavioral and cognitive learning theories but aims at presenting a holistic and integrative perspective on learning, by combining experience, perception, cognition and behavior. In order to better understand ELT, one must re-frame their concept of knowledge and learning. According to Kolb, "*Learning is the process whereby knowledge is created through the transformation of experience. This definition of learning puts emphasis on the process of adaptation and learning as opposed to content and outcomes*"[17].

Experiential learning is an engaged learning process whereby students "learn by doing" and by reflecting on the experience. Learning is a four-stage process (Figure 17)) that involves concrete experiences, reflective observation, abstract conceptualization, and active experimentation. The learning process begins with a concrete experience, which is followed by reflection on the experience to identify key concepts and ideas. These concepts are then transformed into abstract ideas or concepts through the process of conceptualization. Finally, these abstract concepts are tested through active experimentation, which leads to new experiences and further learning.

Figure 17- The Experiential Learning Cycle

The experiential learning cycle can be further elaborated as follows:

- Concrete experience (awakening): This refers to learning through hands-on experiences and direct observation.

[16] (Smith , 2023)
[17] (Kolb, 1984)

- Reflective observation (observing): This involves observing and reflecting on experiences from different perspectives.
- Abstract conceptualization (practicing): This involves the creation of concepts and theories based on observations and experiences.
- Active experimentation (applying): This refers to testing and applying theories through experimentation and problem-solving.

Kolb's theory has been widely applied in different settings, including education, professional development, and training. It is often used to design learning experiences that cater to different learning styles and to help individuals develop skills and knowledge in specific areas.

In terms of education, Kolb's theory has been used to design experiential learning activities such as internships, service-learning projects, and simulations, where students can apply their knowledge in real-world contexts. In professional development and training, Kolb's theory has been used to design training programs that cater to different learning styles and provide opportunities for hands-on practice, reflection, and experimentation.

As far as law enforcement training is concerned, the ELT is applied through the principles of andragogy and problem-based learning (PBL)[18]. Andragogy, as developed by Malcolm Knowles, is a theory which is vastly in contrast with the traditional pedagogical model, and it advocates both the self-directed learning concept and the teacher as the facilitator of learning. Adults are motivated to learn something when they perceive that it will help them perform tasks or deal with problems they confront in their life – in TENACITy's case, professional – situations. The learning process is more effective when the trainees' knowledge, understandings, skills, values, and attitudes are framed in the context of real-life applications.

Andragogy defines three specific needs of adult learners:

1. In a classroom training situation, it is important that the environment be comfortable, both physically and psychologically;
2. Trainers must understand the participants' expectations of the course because the self-concepts of the participants are involved; and
3. By serving as a facilitator or orchestrator, the effective instructor can manage the classroom by allowing participants to share their experiences and knowledge, can integrate new knowledge, and can provide strategies that will allow transfer of learning back to the job.

Although it is recognized that specific learning materials are to be taught in lectures, or passive-learning style, like most traditional trainings for adults, it is essential for police-training to emphasize

[18] (Werth, 2009), (Birzer, 2003)

the experiences of the learner, not only their past experiences but also with the use of experiential learning activities[19]. Overall, the learning theory of andragogy:

- emphasizes the skills of analysis and decision making through a series of job-related cases or problems;
- establishes a learning approach rather than a teaching approach by a series of planned, structured activities enabling the learner to acquire the appropriate knowledge; and
- is a practical, job-based approach which keeps the learners constantly aware of the value of the training program to them and their work

Problem-based learning takes a deeper dive into the practical aspects of andragogical teaching techniques. As an educational method, PBL is more effective at producing individuals prepared for the rigors of real-world work than traditional lecture-based methodology, possibly due to integrating teaching techniques such as learner-cantered activities, personalizing instruction, and material relating to the past experience of learners[20].

Both of these educational theories advocate for a more student-centered approach, that emphasized the process of learning, instead of the outcome, as well as allowing a self-directed training on behalf of the trainees. Andragogy and PBL also encourage students to use their life experience and apply their previous and newly acquired knowledge in real-world cases, focusing on immediately applying the knowledge-gains to examples and cases pertinent to the trainees' current experience (at the time of learning).

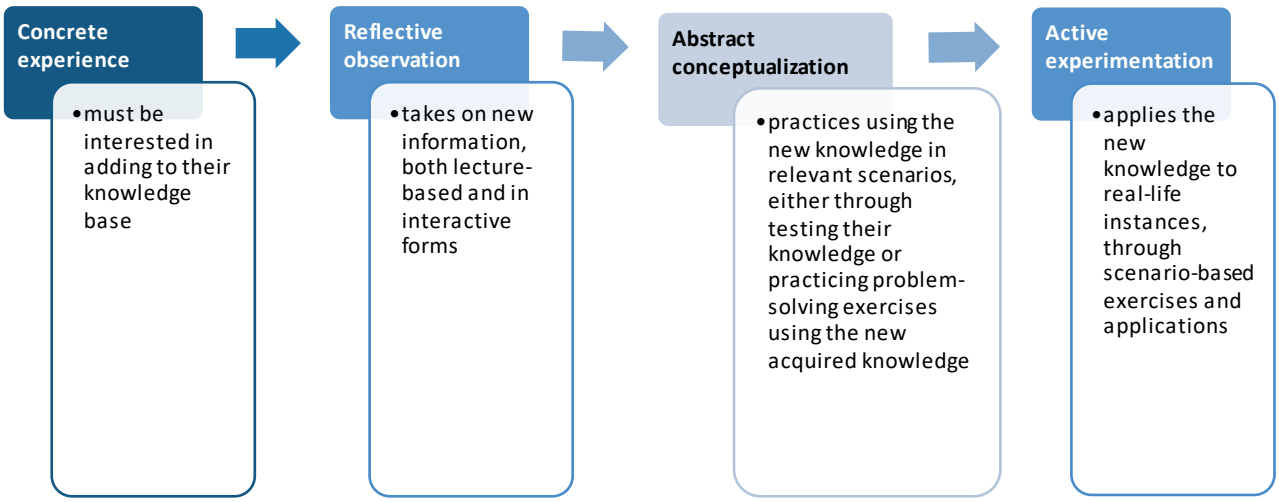

Figure 18 - ELT learning stages in correlation with andragogy and PBL

[19] (Birzer, 2003)
[20] (Werth, 2009)

3.2 Learning Strategies

The TENACITY learning theory prompts a variety of techniques to implement, requiring self-directed learning, that focuses more on practical implementation of the acquired knowledge and less on passive, instructor-focused learning. Therefore, TENACITy will be implemented Blended Learning techniques[21], which combine characteristics of traditional classroom learning and online instruction into an integrated model. The learning strategies that TENACITy will put emphasis on are presented below:

Collaboration: Collaboration between learners and instructors can be encouraged to facilitate the sharing of knowledge and perspectives.

Problem-based or Scenario-based exercises are a type of learning activity that is designed to simulate real-world situations. Learners are presented with a scenario or problem, and they are required to use their knowledge and skills to solve it. By providing a realistic context, learners are encouraged to apply their knowledge in a practical way. This helps to reinforce their understanding of the topic and allows them to see the relevance of what they are learning to real-world situations. These exercises can take many forms, such as case studies, simulations, role-plays, or problem-solving activities.

Reflection: Learners should be given time to reflect on their experiences and to analyse and evaluate their own learning process.

Feedback: Frequent and constructive feedback should be provided to learners, so that they can learn from their mistakes and improve their performance.

Feedback and *reflection* strategies are going to be available through interactive elements of the TENACITy Training Platform, such as a discussion board, chat-box or forum for the trainees and the instructors.

Multimedia Elements: this includes video, audio, text, infographics, interactive presentations, and visualizations, to enhance comprehension and retention of information. Also, providing learning content in various formats will allow the trainees to absorb knowledge through different means, according to their own learning styles.

Bite-sized material: Most of the TENACITy training content is going to be concise and provided in small parts, to render the knowledge more digestible and facilitate self-directed learning. This strategy also encourages learners to schedule their training, knowing it will not strain their time.

[21] (Milheim , 2006), (Dr. Belur, Dr. Bentall, Dr. Glasspoole-Bird, & Laufs, 2021)

4 Training Framework

It contains the training program broken down into modules, the training objectives they satisfy, the different training methods that will be applied for each module and the sequence in which their training sessions will take place.

4.1 Training Organisation

The TENACITy Training composes of three curricula each corresponding to a development phase of the project.

4.1.1 FIRST CURRICULUM – Training structure and methodologies (M1 – M14)

The first curriculum is included in this document and contains the training methodology (Section 3) developed based on the end-users' training needs analysis (Section 2.2). In particular, the first curriculum includes the specific training objectives to be achieved via the TENACITy Training, the methodology and the training theories to apply, as well as the assessment and the evaluation strategy.

4.1.2 SECOND CURRICULUM – Understanding the TENACITy framework (M15 – M27)

a) Justification and aim. The expected outcome of this training activity is to allow participants to understand the meaningfulness and usefulness of the TENACITy solution to their daily work in comparison with the existing tools and practices, while ensuring that it is compatible with fundamental rights.

The second curriculum is designed to incorporate a holistic theoretical approach to crime prevention, ensuring that the proposed digital technologies will support the identification of the modus operandi of criminal and terrorism organizations, examining how the new tools will provide new capabilities to shape the existing EU and national travel intelligence regulations.

Being learner-centered, the training activity following this curriculum aims a) to provide the participants with a sound understanding of the TENACITy solution future application to their daily work, including the legal and regulatory aspects, and b) to familiarize them with the TENACITy tools and their respective functioning in building travel intelligence to prevent crime, including the

decision-making process in applying each tool. This curriculum will correspond to beneficiaries' expressed training needs for understanding risk management procedures, the regulatory and legal framework and the benefits of utilizing AI-powered technologies, blockchain technology for data storage, data transfers and data usage, etc. The target group will be formulated from within the consortium law enforcement members based on work indicators (i.e., years of experience, type of duties) and other criteria relating to their individual skills (i.e., competence in the use of the English language).

b) Structure, learning strategy and training methods. The learning outcomes will be constructed according to the notion of the S.M.A.R.T. (Specific, Measurable, Attainable, Results-Focused, Time-Focused) principle, following Bloom's taxonomy, and covering all aspects and goals that need to be achieved. All learning outcomes will be linked to specific topics and subtopics, where they are designed to be achieved.

The trainers will be selected from within the consortium members based on pre-defined criteria, on the basis of their expertise and training skills.

The training activity shall consist of one Module – in accordance with the CEPOL quality standards – be structured in three stages, namely a pre-course stage (asynchronous training), an implementation stage (synchronous training), and a post-course stage (asynchronous training). The pre-course stage shall aim to provide participants with the foundations they need to obtain a comprehensive understanding of the various aspects of the course. Participants will receive training materials, tasks, links to recorded webinars and videos, as well as assignments to complete during the various course stages. The implementation stage will develop in a synchronous manner by consortium experts supported by KEMEA trainers.

c) Training methods. The trainers will apply interactive lectures, group discussions, practical exercises, and online platform discussions (in writing) to enhance the learning experience and achieve learning outcomes. Modern online educational tools will be used in this regard.

As a post-course activity, the participants will be encouraged to upload on the LMS, the cascading method that they will use to disseminate the knowledge that they have gained to their colleagues in their respective organizations. Moreover, we will upload all presentations, manuals and recordings of the trainers' presentations during the synchronous session to motivate the participants to revisit the platform on the one hand, and to enhance cascading of knowledge on the other hand.

d) Content. Content-wise, the curriculum takes into account several sources such as: D3.1 Deliverable, which comprises the 1st release of the work on the various Governance Framework components; ongoing developments of the WP5 tools; as well as existing training products developed in this knowledge area, including the United Nations Office on Drugs and Crime (UNODC)/Terrorism Prevention Branch (TPB) publication on training curricula that assesses international legal framework in the context of the fight against terrorism[22]. The citizens' perceptions of cross-border security processes and requirements to engender engagement and

[22] https://www.unodc.org/pdf/terrorism/CTLTC_CT_in_the_Intl_Law_Context_1_Advance_copy.pdf

trust (D2.3) will be briefly demonstrated to the participants as well. During the synchronous stage, the consortium experts will display and explain the functionalities of each tool they develop and, in cooperation with the KEMEA experts, will conduct practical exercises and simulations based on pre-defined scenarios, regarding the decision-making process to use the tool, thus demonstrating their added value to law enforcement practice compared to the currently used tools and the existing practices. Particular attention will be paid to how the TENACITy framework ensures legal compliance and even enhances the protection of fundamental human rights. Experiential exercises, including the themes of the three scenarios that will be developed in the pilot workshops (WP7) will consist of the link between this training phase, the pilot testing phase and the third training phase described in length below.

e) Assessment strategy. We will primarily apply formative assessment during this course to ensure a high-level understanding of the Travel Intelligence Governance Framework, which this project relies on. Participants will be provided with feedback by tutors and peers throughout the course, namely during the implementation and the post-course stage. A summative assessment will lead to receiving a certificate of completion.

4.1.3 THIRD CURRICULUM – Applying the Travel Intelligence Tools (M28-M33)

a) Justification and aim. The expected outcome of this training activity is to allow participants to apply the TENACITy solution in practice and utilize the functionalities of its components.

The TENACITy project will develop five tools to support the LEAs work in combatting crime and terrorism using flight travel routes, namely i) a Pattern identification tool, b) a Risk Management tool for crime prediction, iii) an OSINT/ Web crawling tool, iv) an Ethereum-based blockchain/ IPFS, and v) an AI-based Criminal Organization Persona tool. While technical partners will develop these tools, LEA participants need to validate the development in virtual environments, in the "Living labs". Validating will be the first step of an experiential process leading to a self-reflection step where participants consider areas of possible application of the tools in the daily practice, and to feedback to the developers on areas of improvement, thus benefiting work by WP5 and WP7.

b) Structure, learning strategy and training methods. Modules will be developed based on the tools to be trained on, namely the Pattern Identification Tool, the Risk Management Tools, the OSINT/ Web crawling tool, the Blockchain-based tool for data misuse avoidance and encrypted/trusted communication, and the AI-based Criminal Organization persona tool. The learning outcomes will be constructed similarly with the Second Curriculum process, while all of them will be linked to specific topics and subtopics where they are designed to be achieved.

The trainers will be selected mostly from within the consortium members participating in the WP5 tasks based on pre-defined criteria, on the basis of their expertise and training skills.

The course will be structured in three (3) stages, namely a pre-course stage (asynchronous training), an implementation stage (synchronous training), and a post-course stage (asynchronous training). Same as with the second curriculum, the pre-course stage will provide participants with the foundations they need to use the tools relying on the TENACITy Framework, while the post-course stage will focus on drafting a curriculum to implement the tools at the national level adjusting to each national authority's needs.

c) Training methods. We will employ practical exercises and scenario simulations within the Living Labs as well as group discussions as training methods to enhance experiential learning according to Kolb's learning cycle. Hackathons conducted and led by each technical partner to support the development of the tools will enhance the learning experience providing the context for practical exercises.

d) Content. The manuals to be provided by each technical partner will constitute the foundation for the training materials to be developed by KEMEA and the technical partners. The training materials will be presentations, sets of questions, and answers for debate and reflection, practical exercise scenarios, reports on the outcomes of discussions, etc. Techniques developed under WP6 regarding pseudonymization, quality assurance, etc. will also be part of the training content.

e) Assessment strategy. The summative assessment will be the primary one in this curriculum. Participants will be asked to participate and complete scenarios using the tools. They will be graded according to pre-defined metrics based on the successfully acting upon the different tasks in the scenarios. In addition, tutors will provide participants with feedback throughout the course.

5 Training Modules content

This section provides a short description of the content to be included in the training modules related to the theoretical and practical content of knowledge and operations of TENACITy platform All modules will be thoughtfully designed to provide participants with an in-depth and well-rounded understanding of the subject(s) matter. To achieve this, they will draw from a diverse array of references, including both theoretical and practical sources. These sources serve to enrich the learning experience and ensure that participants are well-prepared to navigate the complexities of cross-border security and governance frameworks.

5.1 Theoretical training on Travel Intelligence

One of the foundational sources contributing to the curriculum's depth is the D3.1 Deliverable. This deliverable represents the initial release of work on various components within the Governance Framework. It serves as a comprehensive reference point that offers valuable insights into the intricate mechanisms and principles that govern cross-border security and cooperation. Through this deliverable, exercises and information sheets will be designed for the participants to gain access to a wealth of knowledge, including the legal structures and regulations that underpin cross-border security measures and in particular the tools developed under TENACITy. This insight is critical for law enforcement professionals as it provides them with a solid legal foundation for their work in an international context. A significant and critical emphasis within the curriculum is placed on the legal aspects of the TENACITy framework. While the tools are undeniably powerful and transformative, their usage must always be within the bounds of the law. The curriculum goes beyond mere instruction on tool operation and delves into the ethical and legal implications of their use. Participants will gain a deep understanding of how these tools can be employed while ensuring strict legal compliance. This aspect is crucial, as adherence to the law not only safeguards the rights of individuals but also ensures that cross-border security efforts are conducted in an accountable and transparent manner.

In addition to the legal and structural aspects of cross-border security, the curriculum also pays close attention to the human dimension. This is where the citizens' perspectives, as outlined in D2.3, come into play. Understanding how ordinary citizens perceive and engage with cross-border security processes is vital for law enforcement professionals. It sheds light on the social, cultural, and ethical considerations that underpin these operations. The theoretical training offers participants the opportunity to delve briefly into these perspectives, fostering an awareness of the human element in security operations. It underscores the importance of community engagement and trust-building, which are essential for effective cross-border security endeavors.

Furthermore, the training activity maintains its relevance by staying current with ongoing developments in the WP5 tools. The dynamic nature of law enforcement and security operations necessitates a curriculum that evolves with the tools used in the field. To further enrich the curriculum and offer a broader perspective on the international legal framework, it draws from existing training products in the field. A notable resource in this context is the publication of the United Nations Office on Drugs and Crime (UNODC) Terrorism Prevention Branch (TPB). This publication provides a comprehensive exploration of the international legal framework as it pertains to the fight against terrorism. Participants will benefit from this deep dive into the legal aspects of international security efforts, gaining insights into the legal protocols and regulations that govern such operations.

The first workshop to take place during the Living Labs (7.3.1) shall provide the grounds for demonstration of the first wave of the TENACITy tools and an opportunity for learners to test and provide preliminary feedback on their functionality and usability, as well as to reflect on their potential impact to their daily work. Some of the tools' functionalities available at the time may be included in practical exercises to aid their execution and enhance the learning experience.

In conclusion, the training activity not only offers theoretical foundations but also emphasizes the practical and legal dimensions of these complex operations. By combining legal compliance, ethical considerations, ongoing tool developments, and established international legal frameworks, the curriculum ensures that participants are well-prepared to navigate the intricacies of cross-border security in an informed and responsible manner.

5.2 TENACITY Suite of Tools

The third curriculum will include modules that cover the Travel Intelligence Overview and are based on the TENACITy Travel Intelligence Tools. In this chapter, a brief overview of each tool is included.

5.2.1 Pattern identification tool

There are two basic forms of requests dependent on the use-case:

- Identification of known people (Watchlist/RFI/Associate Detection)
- Identification of unknown people (Targeting)

In some cases (Watchlist/Targeting) the request will be applied to current/future PNR/API instances, in others (RFI/Associate Detection) requests will be applied to historic PNR/API instances.

To aid in the investigation process for these use cases the Pattern Identification tool provides three main functionalities:

Similarity Search – This will employ metrics to determine similarity of individuals as complex objects, i.e., considering all known data, rather than the classical search based on matching of key features (e.g., name, date of birth, etc.). This will facilitate the identification of individuals whose identity is accidentally or deliberately obfuscated, e.g., due to missing or incorrect data, or using false documentation.

Outlier/Anomaly Detection – Provides identification of anomalous patterns representing abnormal behaviors, in terms of differences between an individual and population behaviors, and an individual's historic behavior, i.e., behavioral change.

Associate detection – provides a measure of the likelihood of potential relationships between two individuals, and groups or networks of individuals based on their spatiotemporal patterns.

The responses from these components are also dependent on the use-case:

- Watchlist/Targeting
  - Responses will be an ordered set of passengers, defined by a PNR/API instance.
- RFI/Associate Detection
  - Responses will be an ordered set of people, defined by their set of PNR/API instances.

5.2.1.1 Similarity Search

The component will consume a query, constructed from a subset of variables contained in the PNR/API data. These queries can represent a known individual, either on the Watchlist or being investigated as a Request for Information (RFI), or an unknown (set of) individual(s) represented in the Targeting Rules. The component will be able to utilize all the information known about the individual or target contained in the query and return an ordered set of PNR/API data that most closely match the query. Note that the nature of similarity search means that individual variable values in the returned data may not match those in the query.

Responses for Watchlist/Targeting/RFI will include a similarity score indicating how similar the PNR/API or person is to the request. Responses will also include an explanation providing an indication of how the score was derived.

5.2.1.2 Anomaly Detection

Identification of anomalous patterns representing abnormal behaviors, in terms of differences between an individual and population behaviors, and an individual's historic behavior, i.e., behavioral change. The latter necessitates that the individual has sufficient travel history to provide a comparative pattern.

Anomaly detection will not provide definitive identification of POI, rather it will be used to filter/rank the set of instances returned from Watchlist/Targeting. Responses for both similarity search and associate detection will also include an anomaly score (indicating the degree or abnormality) and anomaly explanation (providing a reason the response may be considered abnormal. For example, of the instances that match the target, this component would identify those who exhibited anomalous behaviors, e.g., low amounts of baggage, very early booking, use of many different booking agents, etc.

5.2.1.3 Associate detection

Associate identification is a key feature of criminal investigation. This component will take a known POI and return the other individuals significantly associated with them, including the reasons for that association, both in terms of the quantification of interaction time and the location significance.

The response to an associate detection query will include an overall associate score to rank the responses. Also there will be an associate explanation to how the score was determined, including the locations (specific flights, airports, destinations) where the potential interactions took place and the date/time and duration of those interactions.

5.2.2 Risk Management

The Risk Management Tool (RMT) is a sophisticated platform designed for comprehensive risk assessment of passengers. Here's a breakdown of its functionalities and interactions:

Data Aggregation: The RMT acts as a hub, drawing in information from a variety of external data points. This holistic approach ensures that decisions are made based on comprehensive data like the following:

- PNR (Passenger Name Record) data: This includes specifics of a passenger's travel details, such as ticket information, flight details, and travel itinerary.
- API (Advanced Passenger Information) data: These are the basic biographical details of a passenger, which can include name, date of birth, gender, and nationality.
- Police databases: Information sourced from law enforcement, which can include criminal records or any watchlist details.
- Other relevant databases: Can be any other third-party data sources relevant to assessing passenger risk, like immigration or customs databases.

Rule Creation & Application: The power of RMT lies in its flexibility. PIU officers can design rules that cater to current threat scenarios. By using logical operators like AND, OR, NOT, PIU officers can set conditions for alerts. For example, a PIU officer might set a rule to highlight passengers with a certain

travel pattern AND who appear in a police database. The Evaluation Engine of the RMT is processing live data against set rules. It's fast, efficient, and reduces the manual workload on PIU officers.

Risk Assessments: The ability to run risk assessments means PIU officers can actively query the data based on current needs or concerns. Different situations might require different rules. For instance, if there's a specific threat from a certain country, PIU officers can run assessments focusing on passengers from that region. The results aren't just a list of names; they come with contextual data, which helps officers understand why someone might be a potential threat.

In addition, the risk assessment capability of the RMT is enhanced by the TENACITy Risk Management Framework (RMF). The RMF has identified, systematized, and operationalized an array of risk indicators pertaining to different domains (e.g., sociodemographic information, travel habits). The synthesis of these risk indicators allows the computation of a risk score associated with each passenger informing them about potentially anomalous behaviors that may be linked to their involvement in some criminal activities. Together with the passenger-level risk scores, PIUs are also provided with extensive explanations of the factors associated with the increased risk for certain passengers. The information supplied by the RMF serves as an additional asset for PIUs, helping them gather extra details about potential POIs and prioritize security checks accordingly.

Database Checks: Cross-referencing is vital. Just because a passenger isn't flagged in one database doesn't mean they aren't a person of interest in another. This automatic cross-referencing enhances the ability to identify POIs.

Integration with OSINT Tool: Open-Source Intelligence (OSINT) tools gather publicly available information. This can include social media posts, news articles, or any public records. The RMT's integration with OSINT means that officers can get a fuller picture of a POI, beyond just their travel details or police records.

Pattern Identification Tool Interaction: This tool looks for patterns in the data. If several seemingly unrelated passengers all follow a similar unusual travel pattern, this tool can flag that pattern. PIU officers can select the identified POIs or created rules to feed the Pattern Identification Tool to get enhanced results, along with explanations, which helps in understanding the context and deciding the next course of action.

Criminal Organisation Persona Tool Integration: The actions of the PIU officers in the RMT are evaluated by the Pattern Organisation Persona Tool, which provides a second layer of oversight. Potential threats that are missed by the already set rules can be identified and shown to the PIU officers in the RMT.

By integrating all these functionalities, the RMT provides a comprehensive platform that ensures passengers are assessed holistically, efficiently, and based on the most up-to-date and comprehensive information available.

5.2.3 OSINT/ Web crawling tool

The Open-Source Intelligence (OSINT) tool will be used for collecting information about a subject from the publicly accessible internet (Clearnet), the social media (Facebook, Instagram, LinkedIn, Twitter – X), Darknet Forums, where members can freely discuss illicit activity, and Darknet Markets, where illicit goods and services are traded for cryptocurrency. The collected information will support Passenger Information Units (PIUs) in their investigation into a subject of interest.

An OSINT investigation will be initiated by the PIU officer after the Risk Management Tool (RMT) has conducted its own risk assessment and has an indication that the subject might be involved in illicit activities. The information collected by the OSINT tool will assist the PIU officers to make their final decision.

The PIU officer will trigger the OSINT investigation via the RMT tool by sending the available Passenger Name Record (PNR) and Advance Passenger Information (API) of the subject to the OSINT tool. The PNR and API data required by the OSINT tool are the following:

- first name
- surname
- date of birth
- gender
- home address
- email address
- phone number
- travel agency name

Not all the above data will always be available. Apart from first name and surname, which are mandatory, at least date of birth, gender and home address should be provided for higher accuracy of the OSINT investigation. Using this data, the OSINT tool will search for associated Social Media profiles. If the travel agency name is also given, it can also search for Facebook groups associated with the given travel agency. The latter is considered when the scope of the investigation is to identify suspicious travel patterns that might lead to trafficking, illegal migration or relevant illegal activities.

Using the acquired social media profiles along with the original PNR and API data, the OSINT tool will then run a risk search in Clearnet, social media and Darknet, looking for risk terms associated with the social media profiles and the PNR / API data of the subject. The risk terms will cover the following crime topics:

- Illicit trafficking in narcotic drugs and psychotropic substances
- trafficking in human beings
- terrorism

The purpose of the OSINT investigation is to make a risk assessment on whether the subject exhibits illicit activity on the Web. The assessment will comprise of a binary risk value (zero or one), indicating whether the subject poses a threat, and a confidence level value from zero to one indicating the certainty of the risk value. To enhance the risk assessment, the OSINT tool will also conduct a search for connections of the subject with other subjects known for their illicit activities.

The OSINT tool will return its brief risk assessment results to the RMT tool for display. Additionally, the end-user will be able to connect to the OSINT tool's user interface, in order to see the reference data of the assessment. More specifically the end-user will be able to see the following details:

- Social Media profiles of the subject with details per profile like name, URL, photo, gender, date of birth, connections count, location, education and employment, whichever is available.
- Crime topics associated with the subject (e.g., human trafficking), risk value with confidence level per topic, the sources of the risk assessment (e.g., posts, URLs) from Clearnet, social media and Darknet, as well as the associated risk terms found.
- Connections of the subject to other known subjects of interest. This information will come from social media and Clearnet searches.
- Facebook groups associated with the travel agency (if provided) investigated for human trafficking, along with a risk value and confidence level as well as the sources of the risk (e.g., posts, URLs) and the related risk terms.
- Possible contact details (email addresses associated with the subject). This information will come from Clearnet searches.

In order to respect the restrictions for personal data usage, imposed by social media platforms and GDPR, the above details will not be permanently stored at the OSINT tool's database, but will only be available for the duration of the investigation. Only the risk and confidence values will be stored in the OSINT databases. Those will be considered in future investigations into the same subject of interest. More specifically, if a future investigation for the same subject of interest does not retrieve any OSINT data, the historical risk values will be considered in the new assessment. Risk and confidence value per topic will be stored permanently or for as long as it is indicated by national legislation.

Finally, it is highlighted that personal/sensitive data that may be collected during OSINT investigations will be pseudonymized and only privileged users will have access to their original form.

The following diagram displays the data flow from the RMT to the OSINT tool and backwards:

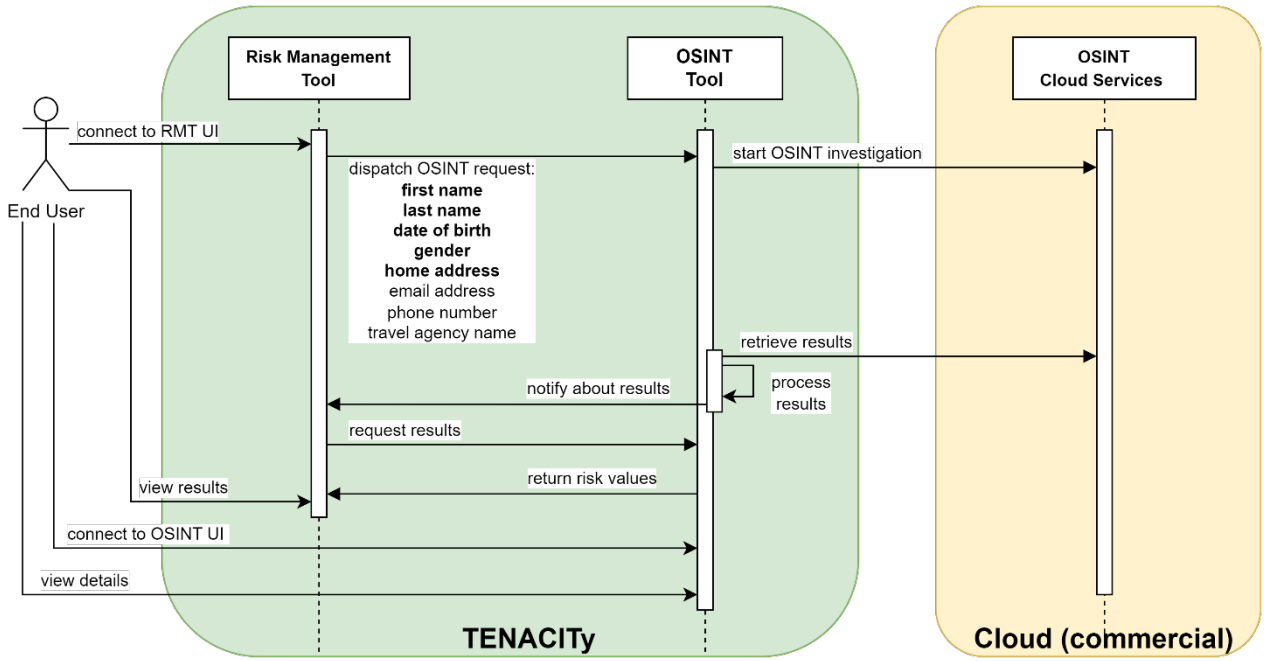

Figure 19 - Data flow between RMT and OSINT tools

5.2.4 Hyperledger Fabric-based blockchain

The blockchain subsystem will facilitate confidential and auditable exchange of PNR data between different PIUs to help with investigation. Its main purpose is to serve as a data exchange channel supplying data for other tools of the TENACITy platform.

A PIU officer can request specific PNR data from a different PIU using the Risk Management tool. The RM tool communicates with the blockchain using an API (Application Programming Interface) server which translates the application requests to blockchain RPC (Remote Procedure Call). This creates a request that is recorded in the blockchain.

A PIU officer belonging to the unit the data is being requested from will be able to see this pending request in the RM tool and respond by either approving or rejecting the request. This response is also recorded in the blockchain.

In the case of approval, the PNR data is sent from the RM to the blockchain. The blockchain itself does not understand the format of the data and treats it as an opaque blob. The RM on the other side retrieves the provided data from the blockchain.

The actual access control policy will be implemented as a pluggable module (chain code) able to be independently updated during the blockchain's lifetime.

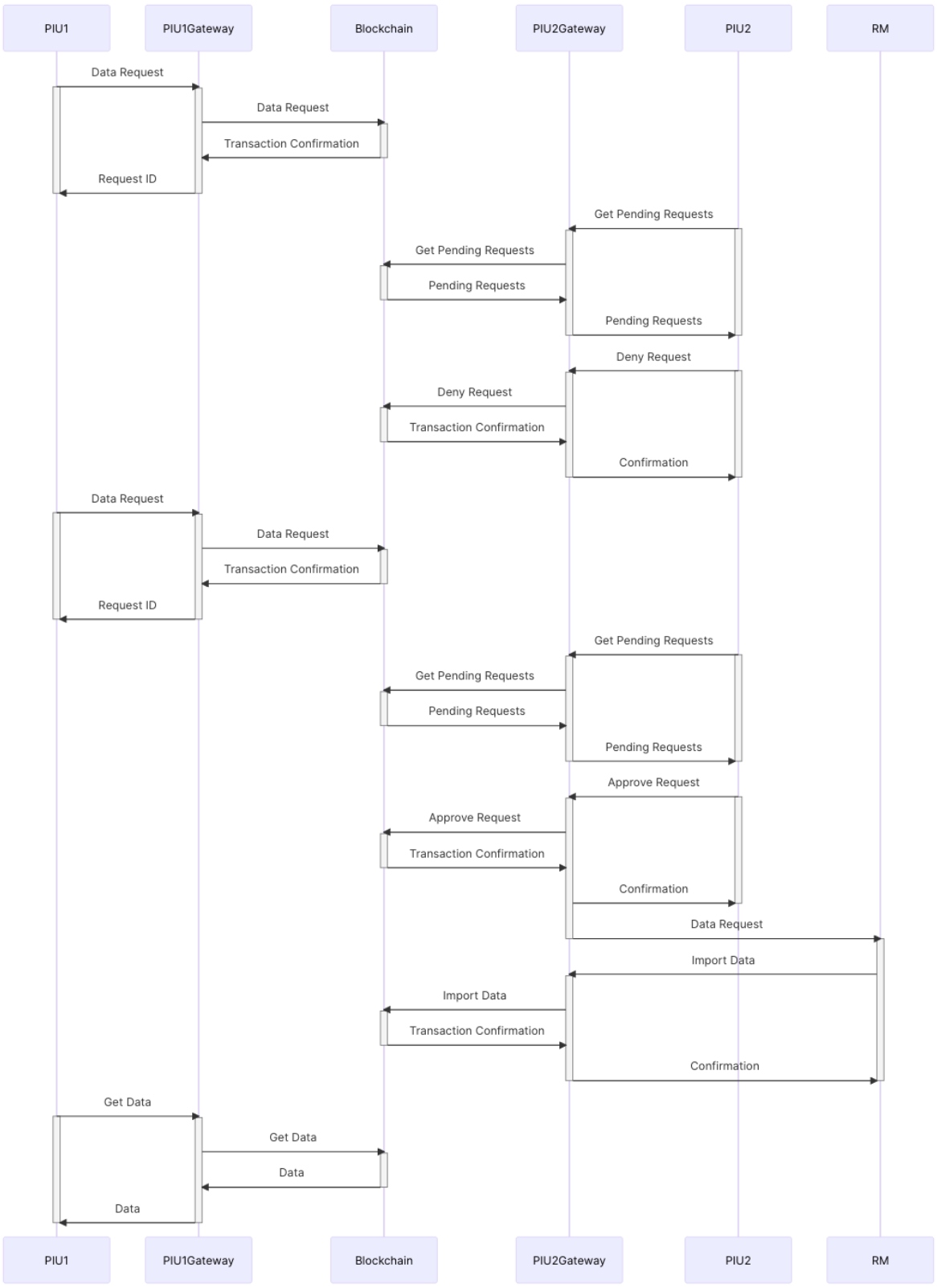

Figure 20 - Blockchain Diagram

5.2.5 AI-based Criminal Organisation Persona tool.

The main objective of the AI-based Criminal Organisation Persona Tool (AICOPT) is to provide support to PIU users during the management, through TENACITy, of cases about Organised Crime Groups (OCGs). AICOPT enhances the RMT's tools user interface providing additional functionalities in terms of:

- Provision of alerts in real-time in the form of simple and effective alerts on suspicious travelers based on their personal information and travel history and the component's internal watchlists.
- Managing enhanced case search criteria by allowing users to define extra patterns to look for in OCG related cases in a format compatible with the one used in the RMT and enabling the suggestion of search criteria and the creation of the internal watchlists including sets of search criteria.
- Provision of alerts from off-line analysis by creating models than can potentially assist PIUs to understand the travelling patterns and motives of OCGs by suggesting at SOI that PIU officers should take a closer look at.

The basic information flows from and to the AICOPT is depicted in Figure 21.

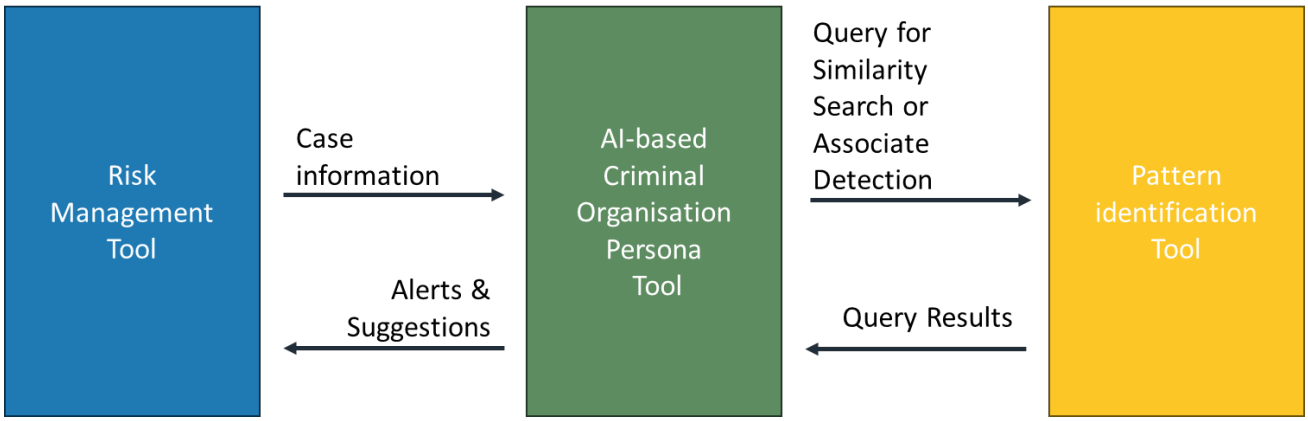

Figure 21- High Level Information Workflow between AICOPT and Relate Components

6 Evaluation

When education takes place, there is always a need for evaluation. It serves as a tool for measuring not only the trainees' performance, but also the fulfilment of the learning objectives and the effectiveness of the learning procedure. An evaluation plan will be developed to measure the effectiveness of the training program. This will involve pre- and post-assessments, performance evaluations, and feedback from participants to ensure that the training program is meeting its objectives and making a positive impact.

In this training activity, we will apply an evaluation system covering the first three levels of the Kirkpatrick Model[23], namely the Reaction, in terms of finding the degree that the training is favorable and relevant to one's work, the Learning, in terms of acquiring the intended skills by the training, and the Behavior, in terms of applying what they learned to their work (partial assessment).

This system will include measuring a) the satisfaction with the activity via satisfaction questionnaires, b) the knowledge obtained via entry and final quizzes, and c) the detailed benefits of the training activity on a personal level, via a post-activity self-reflection report by the trainee.

The fourth level of the Kirkpatrick Model (Results, in terms of observing targeted outcomes as a result of the training) cannot be assessed due to the nature of the project and the facts that the tools will not be put into operation by the relevant police units before the conclusion of the project.

[23] Smidt, Andy & Balandin, Susan & Sigafoos, Jeff & Reed, Vicki. (2009). The Kirkpatrick model: A useful tool for evaluating training outcomes. Journal of intellectual & developmental disability. 34. 266-74. 10.1080/13668250903093125.

7 Living Labs

7.1 Introduction

The general overview of our living lab involves three key goals aimed at fostering collaboration and knowledge sharing within the project. Firstly, it entails the establishment of a continuous interaction and data collection process to bring together the technology providers, Law Enforcement Agencies (LEAs), and relevant authorities. Secondly, it focuses on facilitating stakeholder engagement by providing access to data, best practices, and technology demonstrations, thereby creating an environment conducive to mutual learning. Lastly, the task aims to enhance stakeholders' awareness, encourage the exchange of experiences and best practices, and deliver impartial technical advice to ensure the project's success. Together, these components form a comprehensive approach to promote cooperation, knowledge sharing, and effective implementation of project objectives.

7.1.1 Objectives

The objectives of our living lab encompass several key facets vital to the success of our project. First and foremost, we aim to showcase the technologies we have developed and elucidate the power of the data. Additionally, we plan to foster a deeper understanding among practitioners through a series of organized exercises and events, including hackathons, workshops, and study visits, both in virtual and in-person settings. It should be noted that the living labs are considered part of the hand-on training which will familiarize (train) end-users with the TENACITy Suite of Tools. These initiatives are designed to fortify practitioners' knowledge and proficiency in utilizing the technologies we offer. Moreover, we are committed to mitigating risks associated with inadequate feedback during pilot evaluations, ensuring that our project remains on a path of continuous improvement. Lastly, we are eager to explore the vast potential of the digital processes and the environment within the TENACITy Living-Lab as a Key Enabling Resource (KER), emphasizing its significance in our journey towards achieving our project's goals.

7.1.2 Stakeholders

Stakeholders in the proposed living lab project represent a diverse group of entities and individuals with vested interests and roles crucial to its success. At the core are technology providers, law enforcement agencies (LEAs), and relevant authorities, forming the foundation for collaborative innovation. Practitioners, including workshop participants and attendees of study visits, actively engage in knowledge-building exercises, fostering a deeper understanding of project technologies.

Project organizers and managers shoulder the responsibility of planning and executing the living lab, while end users stand to benefit from the technologies developed. Entities involved in data collection, those providing technical advice, and partners contributing premises, such as the Centre for Security Studies (KEMEA), all play integral roles. Lastly, collaborative partners and organizations interested in exploring digital processes within the living lab underscore the multi-faceted nature of stakeholders, collectively contributing to the project's overarching goals of cooperation, knowledge sharing, and effective implementation.

7.1.3 Approach

The comprehensive approach to our Living Lab initiative encompasses early steps and three pivotal phases. In the early steps, our strategy begins with a holistic understanding of the ecosystem, taking into account viewpoints from all stakeholders. Following this, we define key issues and objectives that will be the focal points during the Living Labs. The groundwork continues with the planning and organization of the first workshop, strategically designed to address these identified key issues and objectives. Moving into Phase 1, our efforts concentrate on creating a shared understanding of Living Labs, constructing a preliminary plan, and formulating an overarching concept that encapsulates key activities, required data, thematic sections, and related scenarios. Phase 2 involves rigorous testing and debugging of scenarios on the initial wave of the TENACITy Platform, coupled with collaborative refinements of concepts and scenarios. This iterative process leads us to Phase 3, where we emphasize continuous validation, evaluation, and exploration of scenarios through simulated real-life demonstrations. Additionally, we validate concepts through specialized Red-Blue Team adversarial concept hackathons and workshops, ensuring the robustness and dynamism of our Living Lab framework.

7.2 Infrastructure

7.2.1 Physical Location

A highly secure and well-protected location is poised to become the ultimate home for cutting-edge living labs. These state-of-the-art facilities will boast an array of stringent safety measures, emphasizing interdisciplinary collaboration, meticulously controlled experimentation, and uncompromising data security. Within these innovative spaces, researchers, entrepreneurs, and local residents will join forces to explore and develop solutions for a multitude of real-world challenges, all while prioritizing the paramount safety and privacy of all participants.

Furthermore, a dynamic Living Lab will be established as a versatile virtual forum, acting as a nexus for practitioners to convene, offering invaluable training opportunities, fostering knowledge-sharing, and serving as a platform for live demonstrations. Although, one of our partners, the Centre

for Security Studies (KEMEA), already has these premises available, the precise location of the Living Lab will be thoughtfully determined through collaboration among the responsible partners, ensuring its accessibility and convenience for all stakeholders involved.

7.2.2 Technical Resources

The Living Lab, upon its establishment, will be outfitted with a cutting-edge infrastructure that includes a minimum of four dedicated computers (purchased by the Hellenic Police), to seamlessly execute the innovative tools crafted by collaborative teams. These high-performance machines are finely tuned to accommodate the multifaceted needs of researchers, enabling them to develop, test, and refine their solutions with utmost efficiency.

Complementing this technological arsenal, the location will feature an advanced networking environment, characterized by a robust and high-speed Wi-Fi connection. This network infrastructure is meticulously designed to offer not only uninterrupted connectivity but also an expansive bandwidth, ensuring that researchers and innovators can readily access the vast array of online resources, engage in real-time communication, and share data without hindrance. This integrated technological environment is strategically orchestrated to promote the exchange of knowledge and ideas, thereby exponentially enhancing the productivity and overall success of the living lab initiatives.

7.3 Living Lab Plan

7.3.1 Key Activities

- M18: Workshop for PIU officers / Airline Security Officers to test and provide preliminary feedback on functionality and usability that technical partners want to expose before the pilot deployment.
- M24-26: Workshop for PIU officers to use the system on specific scenarios based on the project's use cases designed to gather data of users using the system. The outcome of the workshop will be used to schedule additional virtual workshop on synthetic data to run additional scenarios by PIU officers especially from PIUs external to the project between M26-30.
- M32-33 Final workshop to showcase the full functionality of the TENACITy platform to all relevant stakeholders. The scenarios included will be finalized in the next version of the deliverable.

7.3.2 Required Data

7.3.2.1 Synthetic PNR/API Data

Synthetic Passenger Name Record (PNR) and Application Programming Interface (API) data play a pivotal role in the living lab's preliminary plan. Passenger name record refers to data that passengers provide to their air carriers for commercial and operational purposes such as reservation and check-in processes. Advance passenger information is another set of data that air carriers capture at check-in or boarding. API consists of biographical data about passengers, plus information concerning the flight involved. Further clarification regarding PNR/API Data will be provided within the D3.1 § 2.1 Main Sources of Travel Intelligence Data for TENACITy, within the architecture we will assess the functionality and align it with the workflow of the use cases for comparison.

7.3.2.2 Documentation of Tool Functionality

Documentation of tool functionality stands as a cornerstone in the preliminary living lab plan. Comprehensive and accessible documentation serves as a guide for practitioners, providing insights into the intricacies of the developed technologies. This documentation details the functionalities, features, and potential applications of the tools, empowering end-users and stakeholders to make informed decisions. Clear and concise documentation aids in knowledge transfer, enabling effective use of the technologies within the living lab. By ensuring that the documentation is up-to-date and user-friendly, the living lab maximizes the understanding and proficiency of practitioners, fostering a collaborative environment where stakeholders can leverage the full potential of the innovative tools at their disposal.

7.3.2.3 Use Case Descriptions

For designing meaningful living labs exercises and scenarios, it is important to have a comprehensive understanding of the sequence of steps in the project's use cases (UCs) developed in WP2[24]:

- "Identification of Movement Patterns of a Lone Terrorist in Europe using TENACITy"
- "Human Trafficking Detection"
- "Enhancing the reliability of PNR data to track a known criminal in Europe"
- "THB by individuals of origins in the Levant and frequent movements in the EU"

Living lab activities will include the monitoring of the potential elaboration or refinement of the Use Cases in WP3 in the context of the final version of the architecture.

[24] TENACITy D2.1

7.3.3 Thematic Sections and Related Scenarios

The TENACITy Living Labs will be comprised of 3 thematic sections and X respective scenarios. The thematic sections are listed below:

1. Synthetic Data Validation and Pre-Pilot Functionality Assessment
2. Stakeholder Engagement and Training
3. Innovation Diffusion

7.3.3.1 Thematic Section 1: Synthetic Data Validation and Pre-Pilot Functionality Assessment

7.3.3.1.1 Scenario 1: Synthetic Data Validation

In Living Lab Scenario 1 (LLS1) there are two main envisioned approaches. It should be noted that synthetic data validation can only be performed by specialized scientific teams.

In the first approach, teams from the domain stakeholders will be asked to review the TENACITy synthetic data and validate them in any way they deem fit. In the ideal case, they will compare the TENACITy synthetic data with real data and report on the findings of their analysis.

In the second approach, teams from the domain stakeholders will be provided the synthetic data and assigned with subsets of the synthetic data labels (annotations) using a random split and will be asked to search for elements in the data similar to the labelled ones. In an extension of his approach, teams could be asked to identify the potential sources of bias in the synthetic data. This can be done by considering the data generation process and the data annotation process. In this case, a small set of types of biases of concern will be provided and teams will be asked to identify (in any method they see fit, including “manual review”) in the synthetic data these types of biases.

The incentive for involved practitioners would be the creation of an additional tool in the form of a quality dataset in the security-for-civilians domain to support the fight of crime and terrorism. In case the GA and the practices of Horizon Europe projects allow it, additional, more tangible, incentives will be examined to be offered. It should be noted that, even LLS1 is considered of considerable value to the consortium, its execution involves the participation of particular practitioners, mainly in the law enforcement section, which may be difficult to attract into participating for various reasons.

7.3.3.1.2 Scenario 2: Pre-Pilot Functionality Assessment

The purpose of Living Lab Scenario 2 (LLS2) is to ensure that the software meets the needs and expectations of end users, identify any potential issues or shortcomings, and gather feedback for further refinement before rolling it out to a wider audience.

To execute LLS2 the scope of the assessment needs to be defined including the specific features and functionalities to be tested. Ideally, a diverse group of end users and stakeholders, who will participate in the pre-pilot assessment will be assembled and a dedicated testing environment will be set up. Practitioners from key stakeholders, mainly PIUs and airlines, will be asked to participate and execute scenarios dictated by the technical partners as per the scope defined. Specific testing teams may be asked to intentionally defy the "script" and try to produce unwanted behavior. At the end of the exercise all participants will be required to provide feedback through a survey. Volunteers will be asked to give an interview on camera for dissemination and communication purposes.

7.3.3.2 Thematic Section 2: Stakeholder Engagement and Training

7.3.3.2.1 Scenario 3: Workshop on Tool Functionality

Under Living Lab Scenario 3 (LLS3), the living lab organizes a workshop to engage practitioners and stakeholders. Documentation of tool functionality is presented comprehensively, providing practitioners with a hands-on understanding of how to use and integrate the technologies in their daily operations. Through interactive sessions, practitioners can explore various features and functionalities, fostering a deeper understanding of the tools at their disposal.

7.3.3.2.2 Scenario 4: Continuous Improvement through Feedback

In Living LAB Scenario 4 (LLS4) the living lab establishes mechanisms for continuous improvement based on feedback. Practitioners provide feedback on tool functionality, and the living lab utilizes this data to iteratively enhance the technologies. The related documentation will include guidelines on providing effective feedback, ensuring a collaborative feedback loop that contributes to the ongoing refinement of the tools.

7.3.3.2.3 Scenario 5: Cross-PIU Collaboration

This Living Lab Scenario 5 (LLS5) involves collaboration between PIUs. The living lab simulates specialized cooperation circumstances and exercises are executed focusing on the exchange of information between PIUs. The objective is to assess how well the technologies facilitate information sharing and collaboration between European PIUs emphasizing the interoperability and effectiveness of the tools.

7.3.3.3 Thematic Section 3: Digital Processes and Innovation

7.3.3.3.1 Scenario 6: Integration of Digital Processes in Law Enforcement

Living Lab Scenario 6 (LLS6) explores the integration of TENACITy digital processes within European PIUs operations. The living lab assesses how well the technologies align with digital transformation and state-of-the-art technology uptake goals within PIUs, emphasizing the tools' role as a Key Exploitable Result (KER).

7.3.3.3.2 Scenario 7: Knowledge-Sharing Hackathon

In Living Lab Scenario 7 (LLS7), the living lab hosts a knowledge-sharing hackathon where practitioner mixed teams (each participating organization's members are divided among different teams) collaborate to solve simulated security challenges using the developed technologies. The event aims to enhance practitioners' proficiency, encouraging collaborative problem-solving and the exchange of best practices. The documentation serves as a reference guide during the hackathon, ensuring participants can effectively leverage the functionalities of the tools.

8 Conclusions and future work

Designing a set of curricula for the training of LEA personnel requires a sound methodology, concrete objectives and a particular focus. Adult learning is highly characterised by the prior experience of adults, the need for self-directed learning and the need for a high relevance of the training to the adults' occupation. These are just a few of the qualities of andragogy that make it more appealing and distinctive than regular training. As far as the TEANCITY Training Methodology and Curricula are concerned, the scope of work revolves around experiential learning and the use of problem-based exercises, inspired by real-life world scenarios.

In this deliverable we have accounted the method of developing the training methodology, the desk research and field research behind it. Based on the survey of the needs and objectives of trainees, we have developed a training methodology and devised a set of training strategies that would accommodate the set of requirements, as well as the set of objectives that were set by both the TENACITy GA and the survey on trainee needs and objectives. Based on the training methodology of experiential learning theory, in which we have included elements of andragogy, police-oriented training and PBL, the training curricula were developed.

The training will take both forms of asynchronous and synchronous learning, also utilizing the training platform developed under Task 4.4.

The activities that occurred for Task 4.1 and 4.2 on the methodology and curricula will continue to unfold. In the future, until the conclusion of the two tasks (M33 and M30 respectively), the methodology and curricula will be ameliorated by incorporating any feedback that comes directly from trainees, during the course of the activities. The training curricula will be further developed, acquiring more structure and detail, depending on the material and results produced in the rest of the work packages connected to the training activities (WP3, WP5, WP6). Task 4.2 will further inform task 4.4 and the development of the training platform, which will host the training material developed.

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ANNEX I: TENACITy Survey on trainee needs and objectives

TENACITy

TENACITy Survey on trainee needs and objectives

Fields marked with * are mandatory.

A Welcome

Information for survey participants

Dear participant,

You are invited to take part in an Online Survey carried out as part of the Travelling Intelligence Against Crime and Terrorism (TENACITy) (101074048) project, a 3-year HORIZON EUROPE funded project, which started on 1 September 2022.
The following Survey aims at gathering input by law enforcement practitioners operating within units relevant to travel intelligence and PNR/API data usage, of the TENACITy Framework, concerning the various tools and solutions TENACITy envisions to develop, in order to identify and define trainee needs and objectives, necessary to develop a training methodology and a set of curricula and modules on the TENACITy tools and topics of concern.

More specifically, the survey aims at the identification of:
i) what is the current knowledge of LEAs on TENACITy relevant topics, namely AI, Blockchain, OSINT, Pattern Identification, Risk Assessment, travel intelligence, data analytics and protection;
ii) what needs and objectives do LEA practitioners have from training curricula developed on the aforementioned topics;
iii) what kind of training methods and activities do the prospective TENACITy trainees expect or prefer to participate in.
The outcomes of the survey will be taken into account for the design and execution of training activities on the usage of the TENACITy Tools and how they can better enhance LEAs capacities.

The training activities will also provide the opportunity for the TENACITy tools to be tested, thus providing with feedback on how to ameliorate the tools to better assist the work of LEA Officers.

Before you decide to provide us with your replies please, be informed of the following details and, if you wish, consent to your participation by clicking the respective boxes in the EU Survey platform.

What is TENACITy about?
Exploiting travel intelligence for security brings a broad range of different professional disciplines closer together, transferring knowledge between many competences: Border control including EES, ETIAS & API;

Visa/migration authorities; Police cooperation; Counter-terrorism/Internal Security; Criminal investigation, Passenger Information Units (PIUs); Customs; Carriers and airlines; law enforcement officials, etc., to meet the challenges of the dynamic threat environment. This large scale of actors dictates common tools and approaches. TENACITy will work beyond the current state of play, to propose an open architecture, applicable at European level. TENACITy's vision of strengthening security authorities in fighting serious cross-border crimes, is as follows:

i. To provide for modern and effective tools for exploitation of travel intelligence data by security authorities: TENACITy proposes an interoperable open architecture for the integration and analysis of multiple transactional, historical, and behavioural data from a variety of sources, by exploiting game changing digital technologies;

ii. To train the LEAs (Law Enforcement Agencies)' personnel: TENACITy envisions the design of a "living lab" to be established to organise hackathons, workshops for all relevant stakeholders who would benefit from the use of passenger data and digital technologies proposed;

iii. To implement a holistic approach to crime prevention: TENACITy vision is to implement and demonstrate a Travel Intelligence Governance Framework that will incorporate a holistic approach to crime prevention, will ensure that the proposed digital technologies will support the identification of the modus operandi of criminal and terrorism organizations and will include policy makers in the governance process, examining how the new tools will provide new capabilities to shape the regulations.

The Consortium of this project is consisted of: European Dynamics Luxembourg SA LU (ED), European Dynamics Advanced Information Technology and Telecommunication Systems SA (EDAT), Hellenic Police (HP), Gottfried Wilhelm Leibniz Universitaet Hannover (LUH), Ianus Consulting Ltd (IANUS), Kentro Meleton Asfaleias (KEMEA), Vysoke Uceni Technicke V Brne (BRNO), Inspectoratul General Al Politiei (IGP), Universita Cattolica Del Sacro Cuore (UCSC-TC), Space Hellas Anonymi Etaireia Systimata Kai Ypiresies Tilepikoinonionpliroforikis Asfaleias - Idiotiki Epicheirisi Parochis Yperision, Asfa (SPH), ICCS Institute Of Communication and Computer Systems Hardware and Software Engineering Epe (ICCS), Aegean Airlines Ae (AEGAIR), Nutcracker Research Malta Ltd (NMT), Generalni Reditelstvi Cel (GRC), Office for Policing and Crime (MPS), The University Of Sheffield (USFD).

What will you need to do?

For the purposes of the current research activity, the TENACITy partners have prepared a questionnaire which you are asked to complete. In particular, - You are called to answer a set of questions. Please be specific and short as possible.

- Please take into consideration that during the analysis of the results all personal information will be anonymised.
- If some information is confidential, please mention that in your reply.

There are two ways in which you can complete this questionnaire. Either by completing the online EU Survey OR by sending us the questionnaire by post, only if you consider that the replies contain EU RESTRICTED information. Please read the relevant document: "HOW TO SEND EU RESTRICTED INFO".

Who is the contact person?

For more information on this survey, you should contact Georgia Anagnostaki, Researcher at IANUS Consulting, g.anagnostaki@ianus-consulting.com, +30 607 692 9911.

A.1 Download the document on how to send EU Restricted Information

How_to_send_EU_Restricted_Information.pdf

2

B Survey Information and Consent Form

B.1 Information Sheet concerning the participation to this Survey
TENACITY_Training_Methodology_Survey_Information_Notice.pdf

Giving my consent, I undersign that:
a. I have carefully read and understood the attached Information Sheet.
b. I am fully aware of all my rights and especially my right to withdraw this consent, at any time, without consequences, by sending an e-mail to the Data Protection Officer of IANUS,

B.2 Hereby I, freely and voluntarily consent to participate in the questionnaire distributed via EU Survey under the conditions set out in the Information Sheet.

- ○ YES
- ○ NO

C TENACITy Trainee Profile and Objectives

* C.1 In which country are you based?

* C.2 From the following list, choose the organisation you are working for:

- ○ PIU
- ○ Border Security
- ○ Anti-Terrorism Unit
- ○ Customs Unit
- ○ Other (please specify)

* C.3 If you chose 'Other' in the previous question, please specify:

* C.4 Please, define your role in the organisation:

* C.5 How long have you been working for your organisation?

- ☐ Less than 1 year
- ☐ 1-3 years
- ☐ 3-5 years
- ☐ Longer than 5 years

* C.6 In what kind of investigations are you involved? (select all that apply)
at least 1 choice(s)

3

- [ ] Border Security
- [ ] Immigrant/refugee smuggling
- [ ] Counter Terrorism
- [ ] Cybercrime
- [ ] Drug trafficking
- [ ] Environmental Crime
- [ ] (Electoral) inference / influence
- [ ] Financial crime
- [ ] Human trafficking
- [ ] Public safety
- [ ] Extortion
- [ ] Not involved in any investigations
- [ ] All the above
- [ ] Other (please specify below)

* C.7 If you chose 'Other' in the previous question, please specify:

* C.8 In which investigative phase are you involved? (select all that apply)

- [ ] Evidence analysis
- [ ] Intelligence
- [ ] Prosecution
- [ ] Strategic analysis
- [ ] Not involved in any investigations
- [ ] Other (please specify below)

* C.9 If you chose 'Other' in the previous question, please specify:

* C.10 Do the technologies that enhance the fight against crime and terrorism -especially using PNR/API data and travel intelligence overall- belong to your specific interest/duties/responsibility/authority?

- ( ) YES
- ( ) NO

* C.11 If "Yes", could you briefly describe the interest, duties, responsibilities and authorities delegated?

C.12 Which of the following factors make the training procedure more appealing to you? (1: least important factor, 5: most important factor)

4

	1	2	3	4	5
* Opportunity to interact with instructor					
* Opportunity to interact with other participants					
* Being able to study/complete the training at your own time and pace					
* Being able to choose the level of the training material in order to be adaptive to your own needs and prior knowledge					
* Being part of a group that is taking the same course at the same time					
* Being able to download extra material and resources to study at your own time					
* The training is designed for special educational needs (i.e. dyslexia)					
* Training designed in different languages					
* Other (please specify below)					

* C.13 If you chose 'Other' in the previous question, please specify:

* C.14 Have you received any previous training related to the TENACITy learning topics as briefly described in the beginning of this survey? Please, describe and specify your previous training.

C.15 Have you received any previous training on the following topics:

	Yes	No
* Legal framework around PNR		
* Data analytics		
* Passenger rights and responsibilities		
* Air-carriers IT systems and practices		
* How to acquire travel intelligence		
* Risk Assessment		
* Other (please specify below)		

* C.16 If you chose 'Other' in the previous question, please specify:

*

5

C.17 What do you believe are the most important skills required for police officers working in LEAs relevant to travel intelligence (PIUs, Borders, Customs Units)? (Choose up to 3 choices)

at most 3 choice(s)

- ☐ Strong communication skills
- ☐ Ability to work well under pressure
- ☐ Attention to detail
- ☐ Strong problem-solving skills
- ☐ Ability to work with a diverse range of people
- ☐ Ability to interpret and comply with the legal framework for data protection
- ☐ Advanced data analytics capacity
- ☐ Usage of new technologies
- ☐ Other (please specify below)

* C.18 If you chose 'Other' in the previous question, please specify:

C.19 How confident are you in your current knowledge of the following topics? (1: least important factor, 5: most important factor)

	1	2	3	4	5
* Data protection and privacy regulations:	○	○	○	○	○
* Passenger rights and responsibilities:	○	○	○	○	○
* Benefits of utilising AI powered technologies	○	○	○	○	○
* Precautionary measures taken for using AI powered technologies	○	○	○	○	○
* Benefits of Blockchain technology for data storage, data transfers and data usage.	○	○	○	○	○
* How to use OSINT technologies within LEA operations	○	○	○	○	○
* How to utilise digital technologies to enhance LEA capacities in the field of travel intelligence	○	○	○	○	○

C.20 Out of the previous topics mentioned, which topics would you prefer to receive training on? (1: least important factor, 5: most important factor)

	1	2	3	4	5
* Data protection and privacy regulations:	○	○	○	○	○
* Passenger rights and responsibilities:	○	○	○	○	○
* Benefits of utilising AI powered technologies	○	○	○	○	○
* Precautionary measures taken for using AI powered technologies	○	○	○	○	○
* Benefits of Blockchain technology for data storage, data transfers and data usage.	○	○	○	○	○

* How to use OSINT technologies within LEA operations					
* How to utilise digital technologies to enhance LEA capacities in the field of travel intelligence					
* Other (please specify below)					

* C.21 If you chose 'Other' in the previous question, please specify:

* C.22 What format of training do you prefer?

- Classroom training
- Online training
- On-the-job training
- Workshop events
- e-learning training
- webinar presentations
- combination of e-learning and classroom training
- Learning that has repetition versions
- Other (please specify):

* C.23 If you chose 'Other' in the previous question, please specify:

* C.24 How often do you believe training should be conducted?

- Every 6 months
- Annually
- Every 2 years
- Other (please specify below)

* C.25 If you chose 'Other' in the previous question, please specify:

* C.26 How do you believe training effectiveness should be measured?

- End-of-course assessments
- Feedback surveys
- On-the-job evaluations
- Other (please specify below)

* C.27 If you chose 'Other' in the previous question, please specify:

7

C.28 What do you expect to learn from the TENACITy Training Curricula? (1: least important factor, 5: most important factor)

	1	2	3	4	5
* Get to know the TENACITy environment/ system itself	○	○	○	○	○
* Get to know the system's capabilities	○	○	○	○	○
* Get to know where the system can be applied	○	○	○	○	○
* Operate the system theoretically	○	○	○	○	○
* Operate the system practically	○	○	○	○	○
* Work on realistic scenarios	○	○	○	○	○
* Demonstrate the potential and possible impact of TENACITy innovations individually in the form of end2end short scenarios/use cases	○	○	○	○	○
* Be able to read/interpret the system results	○	○	○	○	○

* C.29 Is there anything else you would like to share about your training needs and objectives as an LEA officer?

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Travelling Intelligence Against Crime and Terrorism