AHEAD

Toward sustainable foresight capabilities for increased civil security

D4.1 – Report assessing the foresight methods used for the first foresight exercise

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1 Executive Summary

In this deliverable, we present our method to finalize a new methodology for predicting and preparing law enforcement agencies (LEAs) to respond to future crime trends.

Based on the choices argued by the deliverables of WP2 - D2.1 and D2.2, we present an alpha version of the AHEAD framework.

This version is intended to be flexible and modular and will be adapted in the light of the feedback received from LEAs as well as supplemented in the light of the 5 foresight topics that will be addressed throughout the AHEAD project.

The framework is being designed by LEAs for LEAs. We are aware that there are differences between countries. Therefore, while the framework is being developed collectively and collaboratively, its final version is meant to be put into practice individually with each LEA. The framework has consequently been designed to be modular and to take account of pre-existing tools, methods and processes. It is then to be tested locally by each LEA and a roadshow will be organised to that purpose.

The evaluation of this alpha version will be based on the clarity of the link it establishes between potential future crimes and the proactive development of the police force's capacity to deal with them. On this basis, the AHEAD framework is anticipated to help LEAs transform their organisation in alignment with their evolving missions as to be ready to deal with new forms of crime.

The detailed outcomes for the first foresight exercise are detailed in the deliverable D4.2

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List of Acronyms

Abbreviation / Acronym	Description
AI	Artificial Intelligence
BRL	Business Readiness Level
EBN	European Business Network
EU	European Union
IT	Information Technology
LEA	Law Enforcement Agency
NESTA	National Endowment for Science, Technology and the Arts
POSTEDFIT	Military architecture framework that covers People, Organisation, Support, Training, Equipment, Doctrine, Facilities, Information, Technology
SME	Small and Mid-sized Enterprises
STEEPL	Social, Technological, Environmental, Economical, Political, Legal analysis method
TRL	Technology Readiness Level

2 Introduction

The difficulty to predict the future in the LEAs context

In addressing the complexities of predicting future crime trends within law enforcement, it is imperative to consider several academic insights that highlight the challenges inherent in this field.

Firstly, the methodologies employed in crime prediction, whilst essential for proactive law enforcement, face intrinsic limitations in accurately forecasting crime opportunities. This limitation significantly affects the strategic deployment of law enforcement resources and their overall effectiveness in crime prevention [1].

In addition, the increasing volume and complexity of crime data presents a significant challenge. Effective and accurate analysis of this data is essential to generate a reliable picture, but the scale and diversity of this information is often beyond the current analytical capabilities of many local authorities [2].

The use of predictive policing tools, which rely on data-driven knowledge, further complicates the situation. These tools rely on assumptions about the accuracy and relevance of data, which can unintentionally lead to biased policing strategies and outcomes, raising ethical and legal issues [3][4].

Furthermore, the temporal resolution of the predictive analysis plays a crucial role. The time period over which data is considered can significantly influence the accuracy of crime predictions. This factor underlines the need for nuanced, context-sensitive models [5].

Finally, the application of big data analysis to crime prediction, while offering significant potential, faces a number of challenges. The complexity of crime data, characterised by its heterogeneity, requires a range of analytical techniques, each with its own strengths and limitations. This diversity requires careful selection of methodologies to ensure effective crime prediction and prevention strategies [6].

While predictive methods hold great promise for the future analysis of crime trends within LEAs, their effectiveness is limited by the challenges associated with the accuracy and specificity of crime location predictions, the management of large-scale and complex crime data, the biases inherent in predictive policing tools, the impact of temporal resolution on prediction accuracy and the multifaceted nature of big data analysis. These challenges require a comprehensive and multidimensional approach to crime prediction in the context of law enforcement. What's more, it's important to bear in mind that the missions of the forces of law and order are restricted and that they cannot, for example, carry out pre-emptive strikes. As a result, these missions are characterised by: prevention, protection, investigation and enforcement.

Once these considerations have been taken into account, the question arises as to how these complex methodologies can be adopted within a purely operational and pragmatic framework. This is why the AHEAD methodology seeks above all to be a framework designed by LEAs for LEAs. This framework is intended to be simple enough to be implemented by LEAs in their foresight bodies and open enough to be able, over time,

to integrate processes, methods and tools capable of bringing greater accuracy to the forecasting of criminal trends and the ability of LEAs to deploy countermeasures.

Thus, the whole process underpinning the framework follows 3 stages as explained in the initial proposal.

- Stage 1: Analyse connecting data to Topic
    - Format: Online or in-person expert meeting
- Stage 2: Interpretation
    - Format: In-person workshop with LEAs' experts
- Stage 3: Prospection & Roadmap
    - Format: Online workshop with some experts and LEAs

The whole process may be synthetized as below:

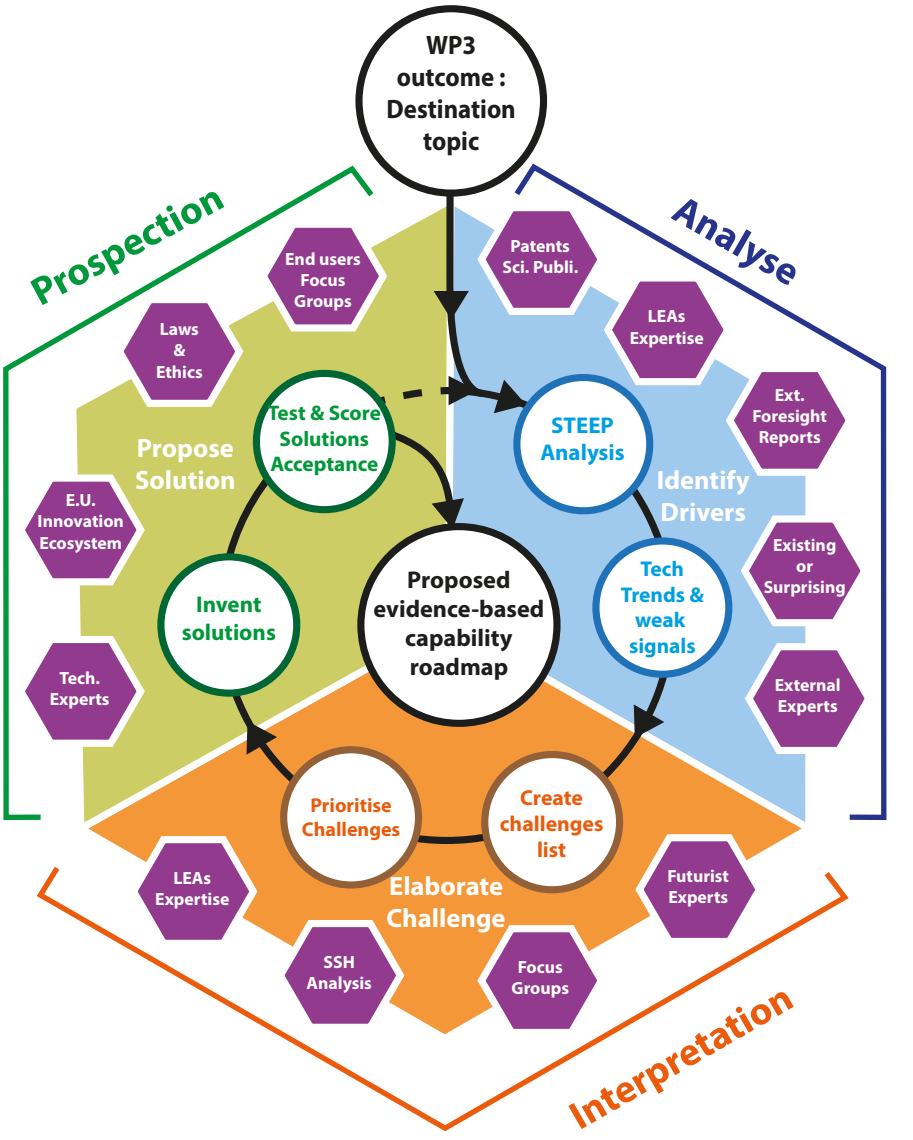


Figure 1: The three stages of the methodology

3 PROCEDURE FOR THE FIRST FORESIGHT EXERCISE

It is important to notice that AHEAD procedure is divided into steps meant to be modular. This is because foresight capacity is not the same for every LEA in every country. Within the AHEAD consortium, some countries such as Sweden and the Netherlands, for example, have already implemented capability frameworks. But this is not the case in all countries. The modular aspect of the AHEAD framework will make it possible to propose an end-to-end methodology for LEAs which are lacking foresight frameworks while enabling others to consider only the missing building blocks in their foresight process.

Building on this first exercise, a roadshow will be organised with LEAs who wish to test the framework in their local context and validate the interactions with the building blocks already in their possession.

The **alpha version** of this detailed practical process for the foresight exercise complies with the three stages proposed in our framework as depicted in the figure below.

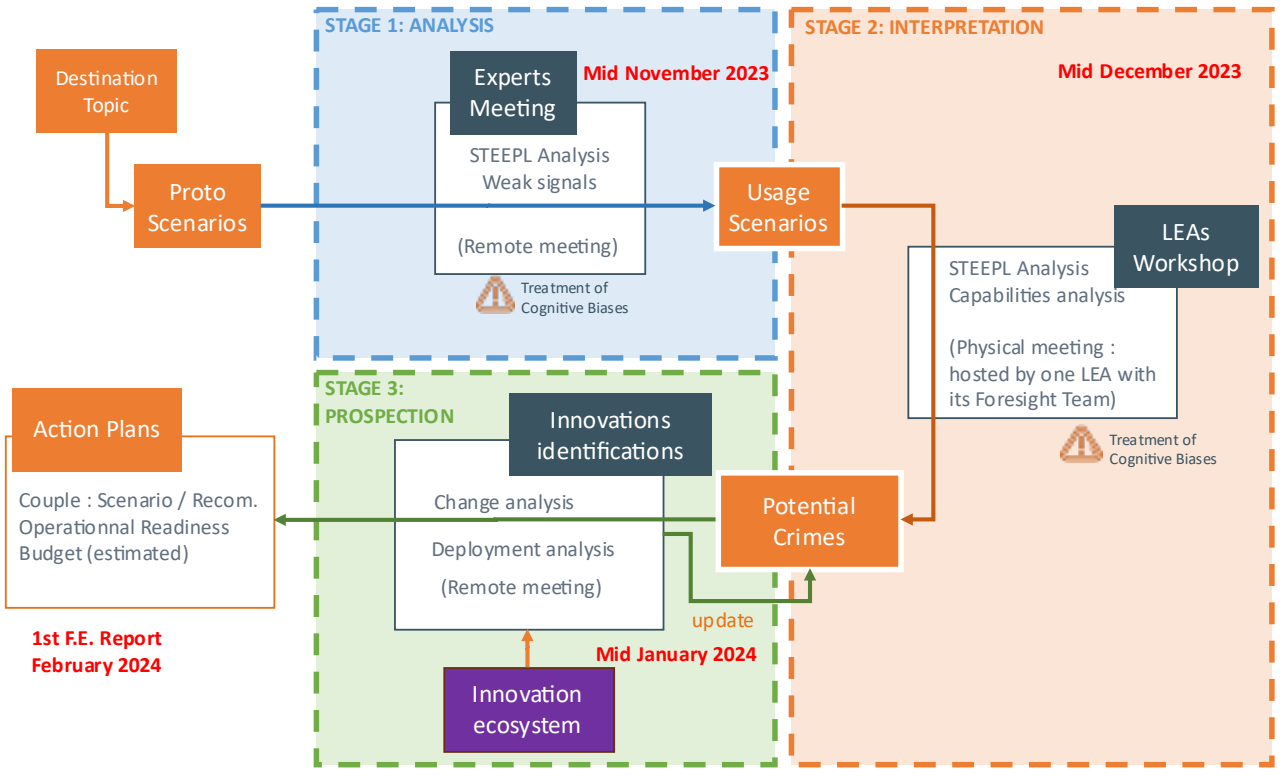


Figure 2: Detailed process put in place for the first foresight exercise.

3.1 STAGE 0: FROM MEGATRENDS TO PROTO SCENARIOS

For the first foresight exercise, the destination chosen was: “Online presence”. To define this term, we considered that “Online” refers to “Cyberspace” that was defined by Andrew Colman [7] as : “a notional environment that enables people and systems to communicate over interconnected networks”. To match with the LEAs context, we considered that “Cyberspace” is a new territory, recently discovered, that has no to “few regulation”.

For LEAs, the "Online presence" trend should therefore be interpreted as "Being present in this specific digital territory".

The philosophy behind the AHEAD framework is to consider usage rather than technology as the entry point.

Technology in itself is neither good, bad, legal nor illegal. It's the way people use it that can be good or bad, legal or illegal[1].

Going from mega trends to scenarios required an additional step to study the evolution of online usage.

Due to time constraints, the first exercise had to manage the design of the process as well as the setting up of the other work packages while running the exercise itself. We therefore decided to use the assistance of artificial intelligence to "rough out" proto-scenarios representing likely changes in usage.

The proto-scenarios were created on the basis of data collected from scientific publications and reports, and contributions of three artificial intelligence (AI) source (perfectly in line with the aim of identifying futuristic uses): ChatGPT 4.0 (private A.I.), Llama-2 7B (opensource A.I.) and Consensus.app (private A.I.).

The first two AIs provided content generation based on their learning corpora, while the third provided scientifically proven information and exact references. [2]

We applied the C-K method [8] to develop the proto-scenarios. In our case, the knowledge space included the generative artificial intelligence algorithms, the artificial intelligence algorithm for analysing published scientific data and all the knowledge accessible to the work package team.

The process begins with the conceptualisation of the queries to be submitted to the A.I. and the existing databases.

The search in the knowledge space reveals all online human activity and criminal motives.

At this stage, the consistency of the data is validated by human intervention in criminology and emerging technologies. The data is then cross-referenced and specific research is carried out to assess the market addressed in order to validate criminal motives in the context of the mega-trend.

In order to validate a time window for the foresight exercise, the chronology of adoption is assessed.

The following figure shows the process of creating these proto-scenarios.

[1] When Nobel invented dynamite, it was to relieve the suffering of miners, not to kill his fellow human beings on a massive scale

[2] To date, neither ChatGPT nor Llama-2 are able to cite their sources.

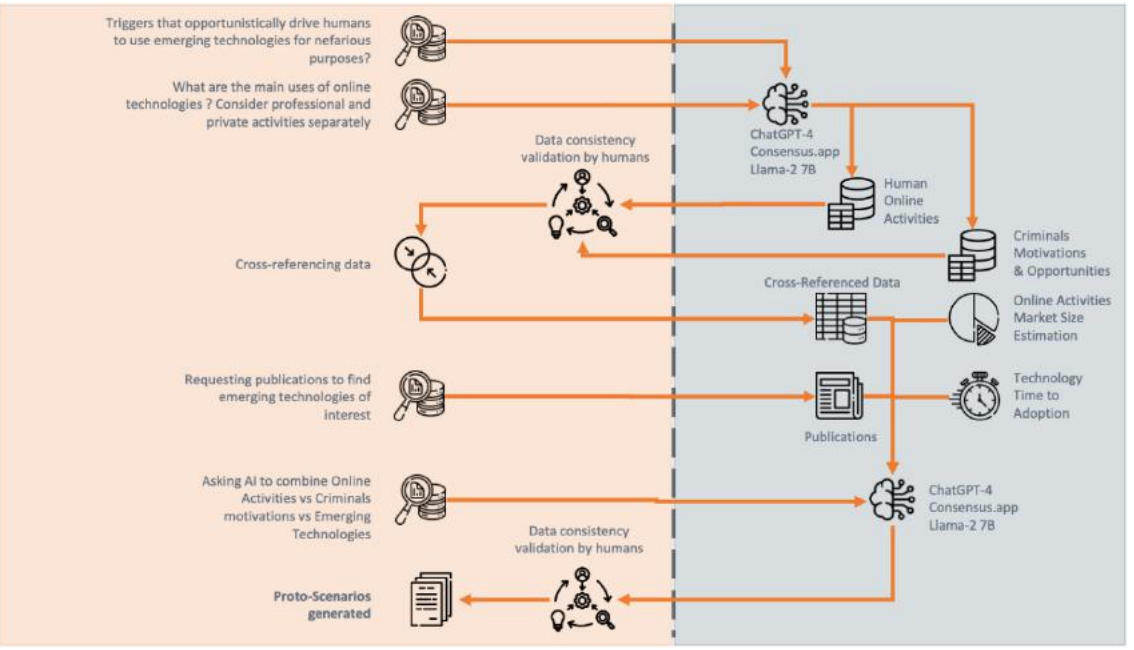


Figure 3: A.I. based process for creating proto-scenarios using C-K method

Using this process, we obtained four proto-scenarios (the list and contents of which are discussed in Deliverable D4.2).

3.2 STAGE 1 – ANALYSIS: NON-LEAs EXPERT MEETING – FROM PROTO-SCENARIOS TO SCENARIOS

The four proto-scenarios were submitted to the critical scrutiny of the group of non-LEA experts representing the STEEPL components (Sociology, Technology, Environment, Economy, Politics and Legal) through collaborative online sessions using klaxoon boards.

For the first foresight exercise, we recruited the following experts:

For Economics:

- Pr Jacques Crémer, Professor of Economics, Toulouse School of Economics (Toulouse – France);

For Sociology:

- Dr Yann Ferguson, Inria Scientific Director of LaborIA (Toulouse – France);

For Legal:

- Dr Anne Boubal, Lawyer (Toulouse – France);

For Technology:

- Mr Laurent Bardi, IT CISO CNRS (Toulouse – France);
- Kurt Callewaert, Valorisation Manager Digital Transformation - HOWEST UNIVERSITY of APPLIED SCIENCES (Bruges – Belgium)
- Michael Tandecki, Senior Consultant – AE company (Leuven – Belgium)

These experts worked on the proto-scenarios to obtain finalised scenarios as shown on hereafter figure.

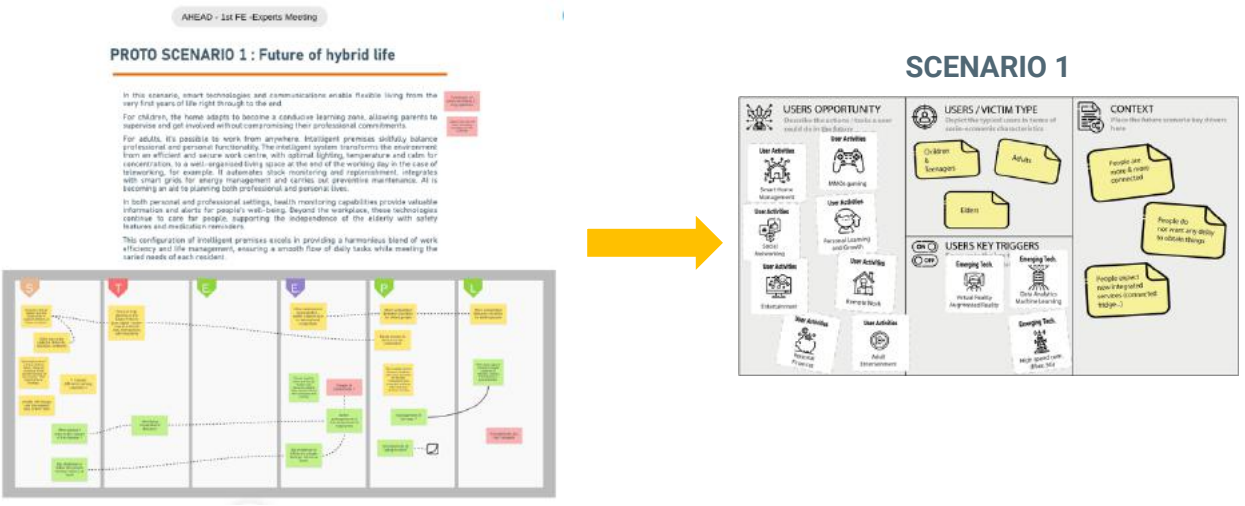


Figure 4: STEEPL Experts workflow – from proto-scenario to validated scenario

It is important to notice that the invited experts were not coming from LEAs. They represented, as far as we can, the different components of the STEEPL analysis.

The experts proposed to merge scenarios 1 and 2, validated the resulting three proto scenarios and clarified their plausibility. On this basis, three scenarios were created and detailed according to the following criteria:

- the general future context;

- the type of user and potential victim;

- future opportunities in terms of activities/usages for users;

- the key factors enabling new opportunities to be realised, in particular through access to emerging technologies.

Then the scenarios were developed in order to fit into the board game.

3.3 STAGE 2 - INTERPRETATION: LEAs' WORKSHOP – FROM SCENARIOS TO NEW CRIME OPPORTUNITIES

Once the scenarios have been detailed and validated by the STEEPL experts, then formatted, they were presented to the LEAs' experts in a serious game workshop (see D2.2. for the detailed justification of this choice). As a reminder, a serious game is a game used not to entertain people but to train them and to allow them to acquire new skills. In Europe, it has its origins in the Prussian Kriegsspiel, an essential training tool for the Prussian army, which was developed by Georg Leopold von Reiswitz (1812) and Georg Heinrich von Reisswitz (1824). These innovators did not make an ordinary game, but a veritable school of war [9].

The aim of this stage (and therefore of the workshop) was for the LEAs to use their knowledge of crime to imagine and propose the most plausible future crimes associated with these new uses, on the basis of probable uses and user typologies.

This stage therefore was designed to elicit thought and prompt responses to the following questions:

- what are the most plausible future criminal opportunities, taking into account the types of criminals and access to emerging technologies?
- how LEAs' missions will need to adapt to these new crime opportunities, but also to new uses by users;
- what capabilities will need to be deployed to adapt these missions to this new context.

To help LEAs get involved in the serious game, it included assets serving as benchmarks, challenge topics and basic elements to describe the potential uses or activities, emerging technologies and potential crimes motivations.

3.3.1 The Board Game

The gaming session was organised around a board that allowed the LEAs to gain a “big picture” concerning the scenario under scrutiny (see D2.2 for a detailed presentation of the session).

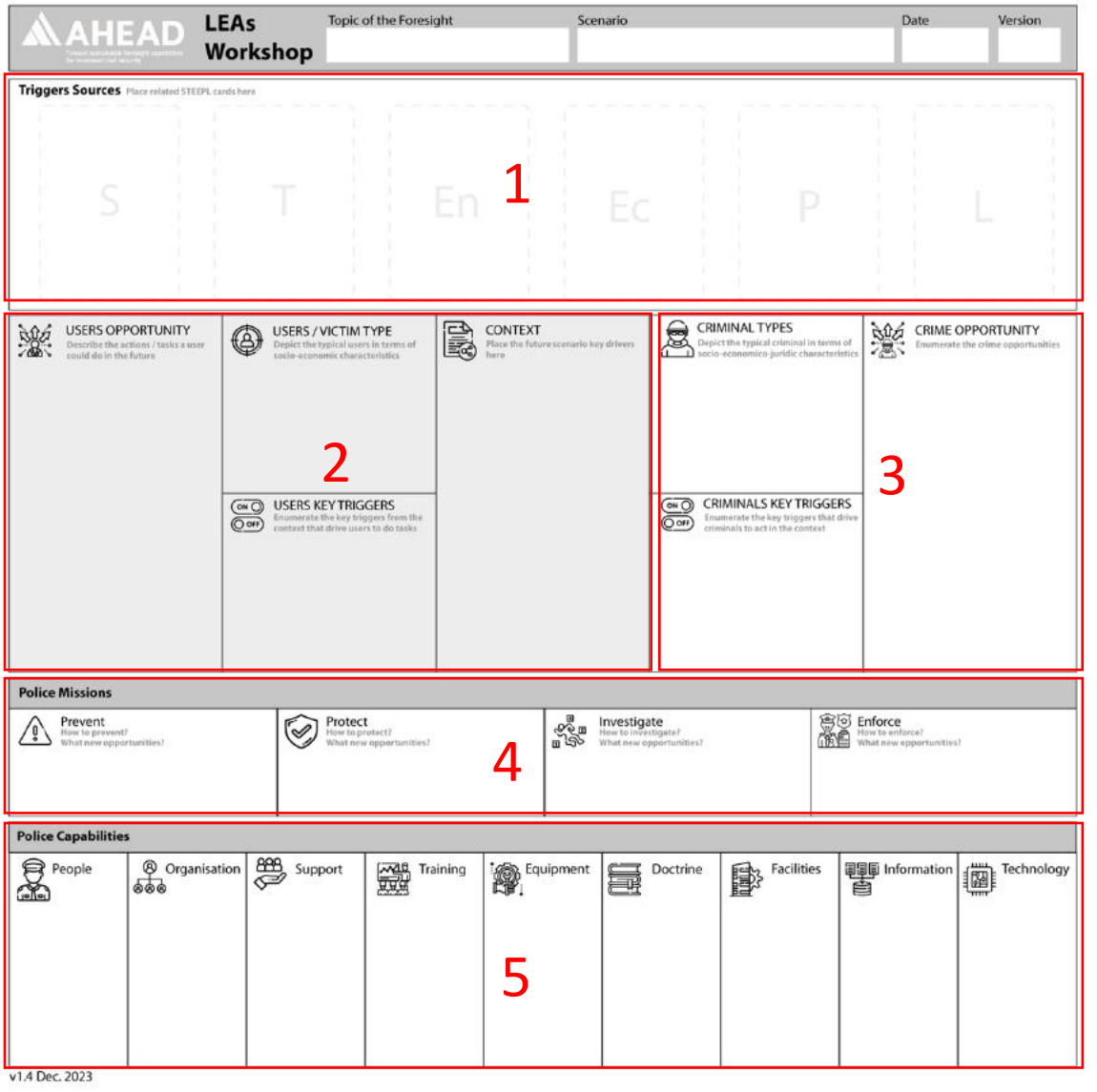


Figure 5: Canvas used to create the board game for the LEAs Workshop session

The game board is divided into 5 areas:

Area 1: placeholder for the STEEPL trigger cards;

Area 2: the transcription of the scenario to be studied;

Area 3: the criminal opportunities to come;

Area 4: the police mission's components;

Area 5: the capabilities needed to propose countermeasures to criminal opportunities using the POSTEDFIT framework.

POSTEDFIT was proposed by Oosthuizen et al. (2008) [10] for a military context (South African Department of Defence). It does not focus on IT, but rather all the components of an organization, including People, Organisation, Sustainment, Training, Equipment, Doctrine, Facilities, Information and Technology [11]. It is generic enough to fit the needs and the context of European LEAs. Moreover POSTEDFIT optimizes and takes in account the local versions like the Swedish Capabilities framework (see Figure 6)

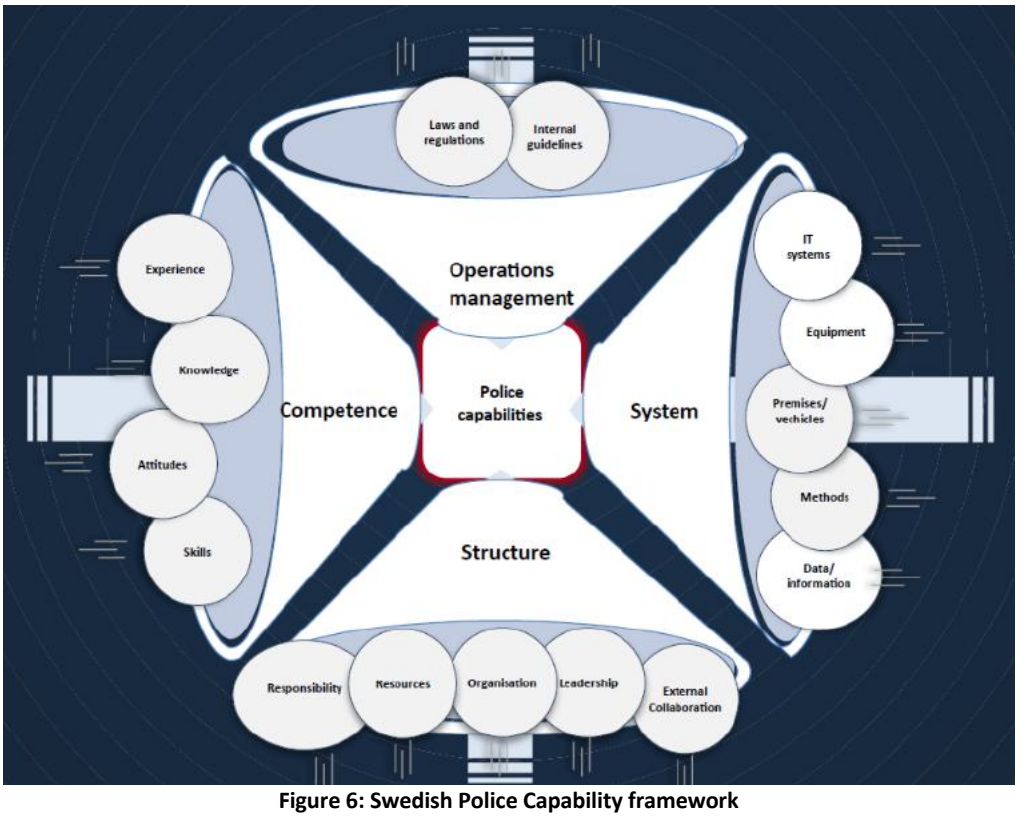


Figure 6: Swedish Police Capability framework

3.3.2 Introducing the scenarios into the serious game

The first stage of our framework allows to scan the horizon of uses. It is elaborated with non-LEAs' experts including sociologists, technologists, economists and legalists). As highlighted in a previous section, it defines the main context of uses, the users' types, the main triggers (essentially technologies) and the new opportunities of uses.

The figure below shows how it can be filled in the context of a future scenario related to "online presence", dealing with the hypothesis of "more connected people".

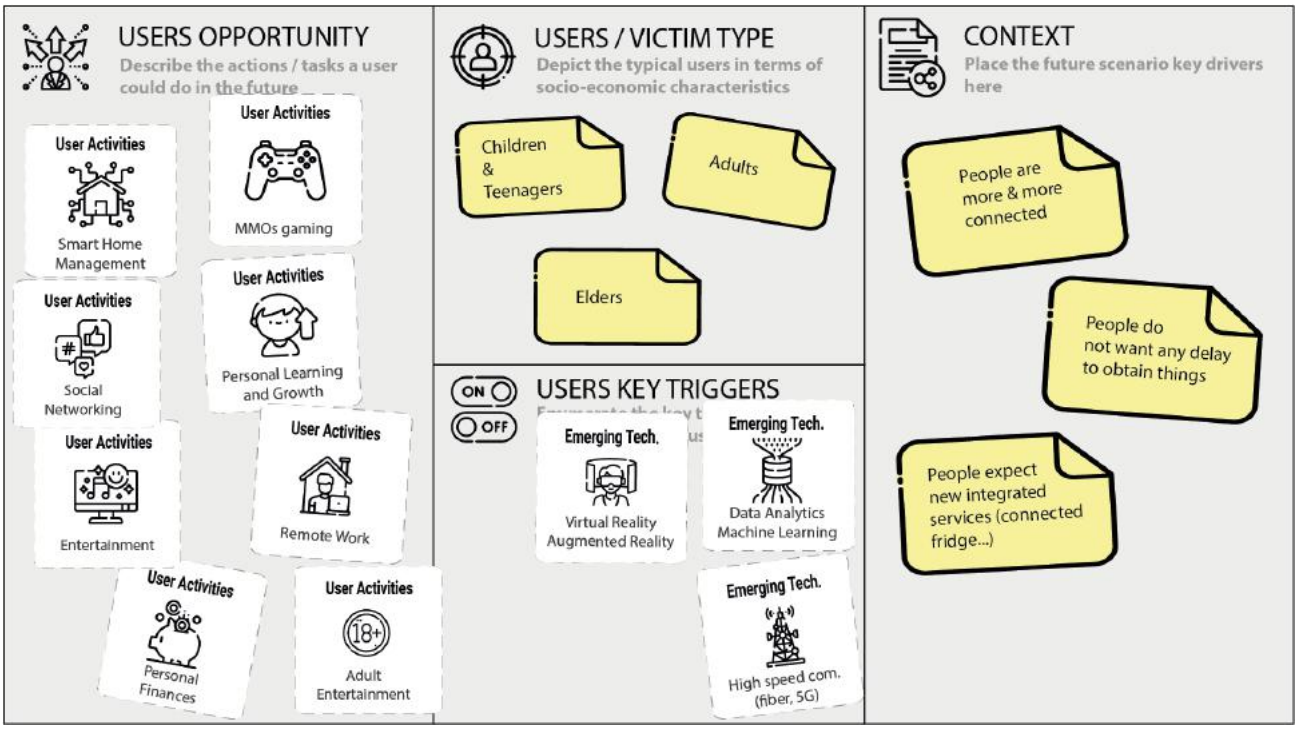


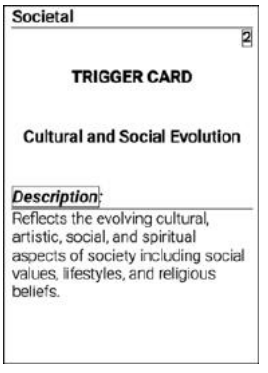
Figure 7: Usage scenario transcribed into the framework canvas

3.3.3 The Drivers and Triggers

As to embrace a holistic view taking into account contextual elements, this 360° approach being a key feature of the AHEAD methodology, we have based event management on a STEEPL analysis. The main objective was to ensure that not only technological considerations but also social, environmental, economic, political and legal implications were accounted for. To this end, we designed and created six decks of cards, each presenting ten aspects to be considered.

These cards describe situations representative of each of the STEEPL components. They are written in a neutral way (i.e. neither positive nor negative) to be used in different phases of the game. They can be used as inspiration, if the group is at an impasse, or simply as a challenge to compare the participants' proposals.

The figure below shows an example of such card.



The card category with its order in the deck

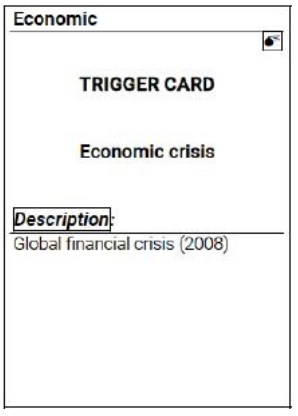
The card's title

A short description that details the topic of the card

Figure 8: STEEPL Card example

Working within a foresight framework, we felt it essential to add “non-predictable events” to these components. Those were materialized in a card deck called “Uncertainty” and included pandemics, popular uprisings or sudden geopolitical crises. Our list is based on a number of cases that have already happened in the past.

The figure below shows an example of such unexpected event card.



The card category with its order in the deck

The card’s title

A short description that details the topic of the card

Figure 9: Uncertainty card example

3.3.4 User Activities tokens

A non-exhaustive list of potential user activities, which may be expanded over time, was drawn up. It considers both personal and professional activities.

The figure below gives an example of the possible activities for the subject of online activities.

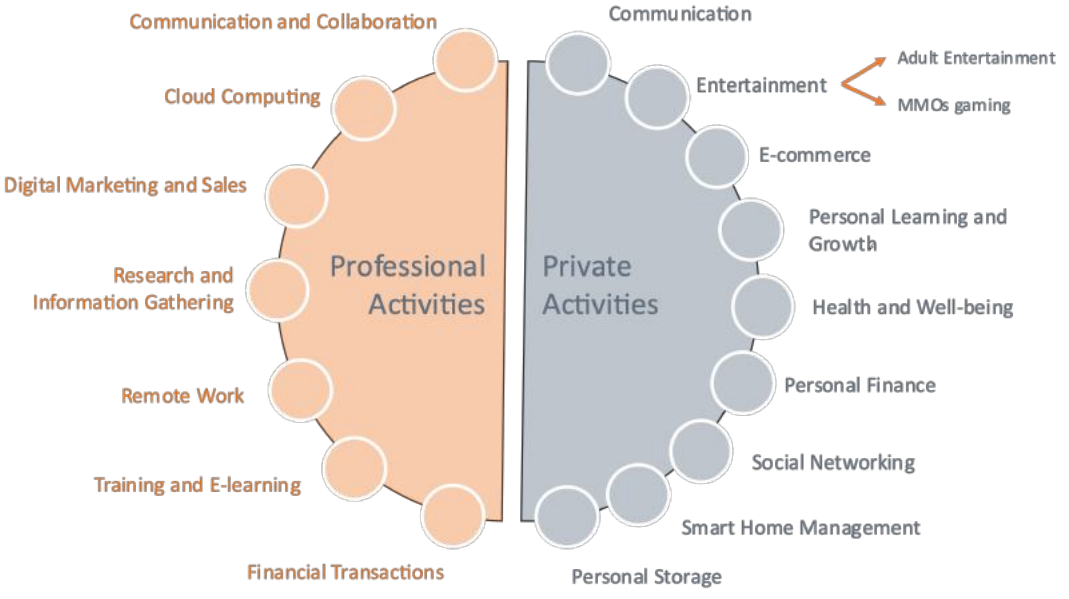


Figure 10: List of potential activities by users. On-line activities example.

The token format makes them easy to place on the play mat. Each token is prepared on the same model as shown in the figure below.

A title

An Icon that illustrates the activity

A short description that details the activity

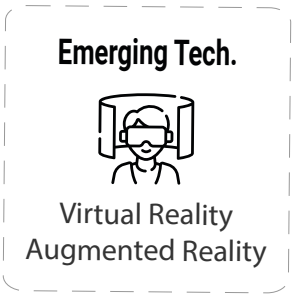
Figure 11: User Activity token presentation

3.3.5 About the emerging technologies

A comprehensive list of emerging technologies has been established based on desk-studies, with reports like Gartner Hype Cycle and tech blogs and websites like Medium, TechCrunch, Engaged or Wired being reviewed. This analysis led to the identification of the following technologies:

Generative-AI
Computing Power
Smart Devices
Datafication
Artificial Intelligence (AI) and Machine Learning
Extended Reality
Digital Trust
3D Printing (including 3D Bioprinting)
Genomics
New Energy Solutions
Robotic Process Automation (RPA)
Edge Computing
Quantum Computing
Virtual Reality and Augmented Reality
Blockchain
Internet of Things (IoT)
5G
All kind of unmanned vehicles
Cyberphysiological devices

This list has been tokenized to be added into the serious game. The figure below presents an example of token.



A title

An Icon that illustrates the activity

A short description that presents the emerging technology

Figure 12: Emerging Technologies token presentation

3.3.6 About the crime opportunity

When designing the serious game, one of our guiding questions was what tomorrow's crimes would be. Our experience in innovation demonstrated that people find it easier to evolve existing technologies, meaning that fewer disruptive innovations are being generated. So, a literature review was conducted to see if the same could apply for criminal activities.

The research indicates that many new forms of crime are essentially advancements of traditional crime types, with limited disruptive innovation. In that sense, the crime remains the same, only the means are evolving:

- Enhancements of Traditional Crime: Leong (2016) discusses how new crimes like money laundering and terrorist financing are primarily enhancements of traditional crime types with limited disruptive innovation [12]. Similarly, Xie Yi-cheng (2007) notes that internet crime represents a new form of traditional crime combined with the internet, enhancing its technology, speciality, concealment, and spreading quickly [13].

- Technological Influence on Crime: Savona and Mignone (2002) argue that new technologies reshape criminal typologies, dynamics, and trends, offering valuable means for both criminals and crime-fighting institutions [14]. Clarke (2004) highlights how technology creates a new environment for traditional crimes like fraud, identity theft, and child pornography to take new forms and prosper, while also providing new ways to control crime [15].

- Virtual Organized Crime: McCusker (2006) observes that technological advances in crime have led to a new wave of traditional, but virtual, organized crime [16].

In conclusion, while new technologies and mediums have introduced different dimensions to crime, they primarily represent the evolution and enhancement of traditional crime types rather than a complete disruption or creation of entirely novel criminal activities. Based on these findings, a list of motivations for crime was proposed (see below for detailed motivations).

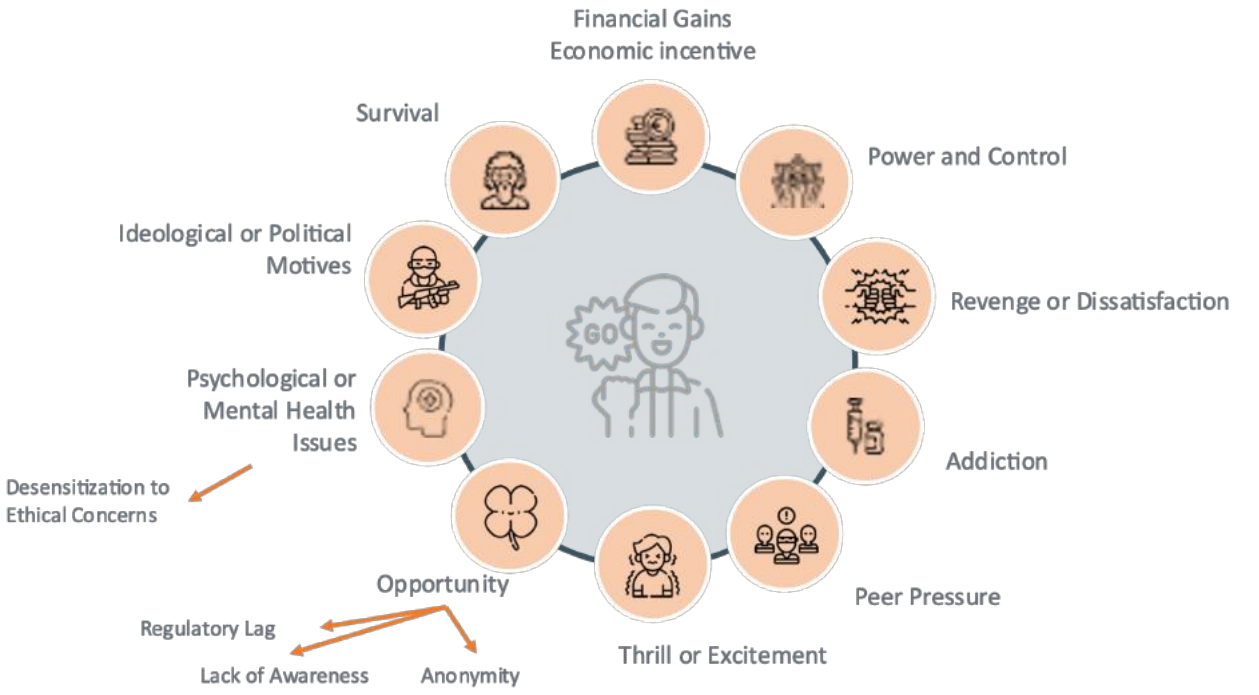


Figure 13: Criminal motivations. List of the main motivation for criminals to commit crimes in the whole criminal history.

Adopting a similar layout as for the other sets, a set of tokens depicting the different motivations was created.

A title

An Icon that illustrates the activity

A short description that presents the emerging technology

Figure 14: Criminal motivation token example

3.3.7 Typical work session with the serious game

Typical procedure for a game session with LEA practitioners requires at least one facilitator and between 4 and 6 participants.

The facilitator sets up the game which is composed of:

- the game mat,
- the "User Activities", "Emerging Technologies" and "Crime motivations" tokens.
- the STEEPL cards in dedicated slots, the "Uncertainties" cards remaining with the facilitator.

He presents the scenario that will be debated by the participants and fills in the grey boxes concerning the new opportunities for use by users as defined by the scenario.

He begins the first phase of the game, which consists of asking the LEAs, on the basis of their experience and the elements of the scenario, to propose new crime opportunities.

To do this, the participants will have to search the STEEPL tokens and cards for all the elements that will enable them to put together a criminal behaviour that would take advantage of the new uses as well as external STEEPL elements.

The facilitator can challenge the participants at any time using the STEEPL cards and the specific deck for "Uncertainties".

Once the participants have agreed on the potential crimes, the facilitator suggests moving on to the next stage: how the LEAs' missions are impacted.

The participants must then fill in the corresponding boxes on the game mat. They place post'its on which they write their new needs to ensure their various missions.

Once the participants have decided that they have completed everything they were required to do, they take the proposals they have just made for their missions and translate them into operational capabilities by analysing the POSTEDFIT components.

These results will serve as inputs for the third phase of the exercise: the drafting of recommendations and the action plan.

The facilitator’s manual – a short document of 2 pages – has been attached as an annex to this report. It details in a more practical and detailed way the full session.

3.3.8 The trap of cognitive biases

Based on NESTA works about the Collective Intelligence playbook , we decide to take into account the cognitive biases that could occur in such a workshop [17]. We listed the most common biases and how to mitigate them in the table below to support facilitators when engaging with participants.

We also recommend to have a specific selection of attendees for the workshop. Indeed, it is not so simple for LEAs to think like criminals. We propose to mix, Operational LEAs, Technologists and criminologists.

POTENTIAL BIAS		TACTICS TO OVERCOME BIAS
Conformity Bias	When people suppress opinions or dissent to go along with group consensus. Also known as group think.	• Allocate someone in the group to play devil's advocate • Gain everyone's personal perspective first (e.g. through a silent brainstorm)
Confirmation Bias	Interpreting all new evidence as confirmation of existing belief/theories, or rejecting information that doesn't confirm existing views.	• Actively seek out evidence that contradicts the group's theory/world view • Ensure you have a diverse group • Use techniques like 'six hat' thinking
Authority Bias	The opinions of those with the highest social status, or greatest seniority get prioritised. This can also occur if there is a very dominant or confident individual in the group.	• Level the field by removing hierarchies among participants where possible • Introduce turn-taking and prevent interruptions or collect input anonymously • Ensure the leader doesn't state their opinion too early
Shared Information Bias	The tendency for group members to spend more time and energy discussing information that all members are already familiar with (i.e., shared information), and less time and energy discussing information that only some members are aware of (i.e. unshared information).	• Avoid time pressure or other constraints that might dissuade group members from sharing more information • Listen out for the minority view for hidden insights
Anchoring Bias	A tendency to jump to conclusions by basing decisions on information or an idea gained early on in the decision-making process. Also known as first-impression bias.	• Allow time for group deliberation, reasoning and checking of logic
In-Group Out-Group Bias	A pattern of favoring members of one's in-group over out-group members. This can be expressed in being more positive and helpful towards one's in-group, at the expense of others.	• Look for commonalities between opposing groups • Encourage empathy - asking people to put themselves in another person's shoes
Optimism Bias	Overestimating the probability of positive events or effects and underestimating the probability of negative events or effects.	• Undertake a 'pre-mortem', asking the group to imagine that their solution or project has gone very badly wrong and describe how this happened. • This will help people think ahead.

Figure 15: Potential biases and tactics to overcome them for the use of the facilitators

These biases are included into the facilitator manual, to be sure he/she will pay attention to this during the workshop.

3.4 STAGE 3 – PROSPECTION: ELABORATING RECOMMENDATIONS AND ACTION PLANS

The third and final part of the foresight exercise consists of formulating recommendations for one or more action plans in response to the opportunities for criminal threats created by new uses.

To that end, we propose to start again from the POSTEDTIF analysis previously carried out. We will also add the LEAs' specifications to the analysis

The first meeting provides an opportunity to summarise progress on the subject (in our case, "online presence") and to list the outcomes of the workshop with the LEAs in Stockholm.

At this meeting, the initial recommendations relating to the development of the missions in the above-mentioned context were summarised and more in-depth work was carried out on the basis of the POSTEDFIT architecture framework.

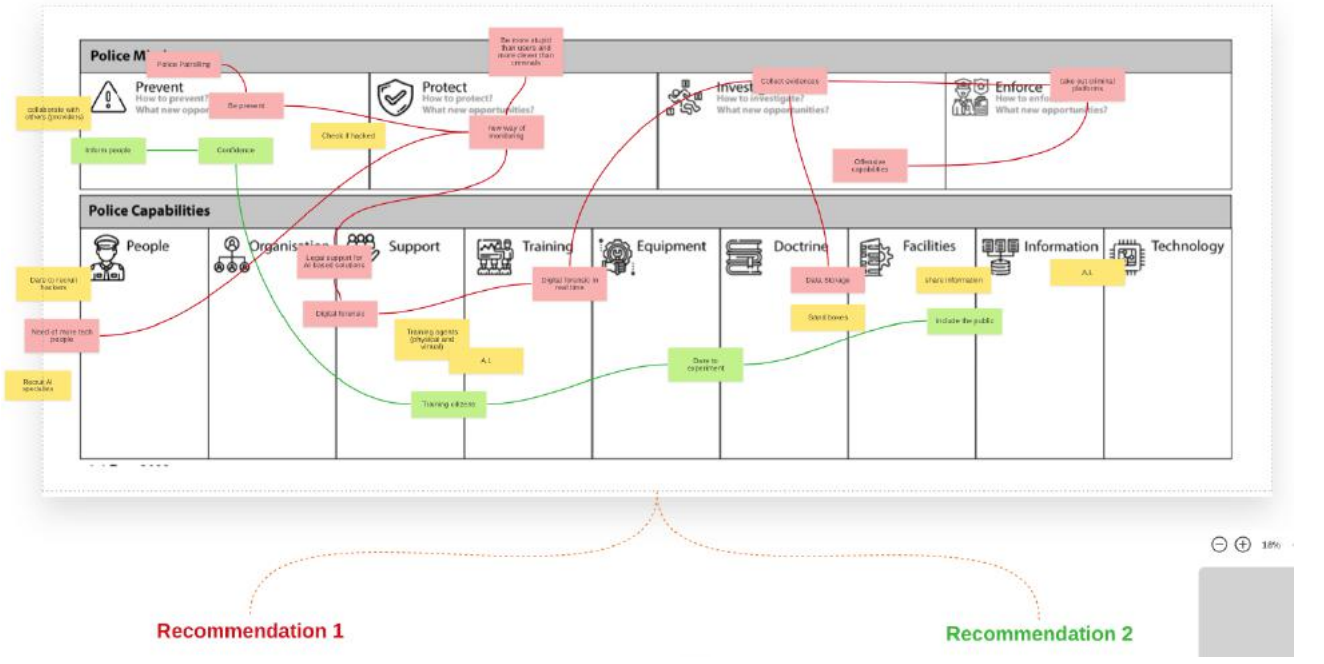


Figure 16: Synthesis of the POSTEDFIT findings from the Stockholm session

This stage involves an online collaborative board. For the first foresight exercise, the stage 3 session was carried out on 17 January 2024 using a Klaxoon board.

The findings from the criminal opportunities section were synthetized considering three main components: the criminal motivations & opportunities, the "channels used" (technologies or process), and the criminal targets. The figure below shows the typical findings:

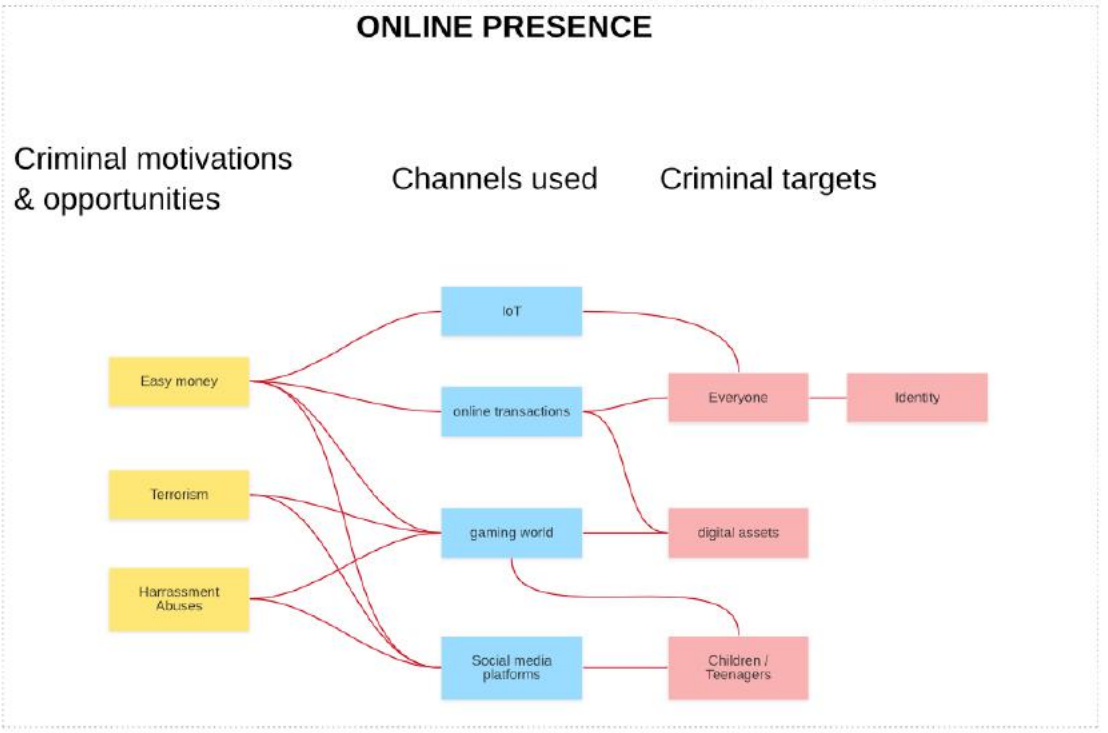


Figure 17: Synthesis of the crimes' opportunities emphasised during the LEAs' Workshop session

In preparation for the collaborative session, the elements indicated in the POSTEDFIT part of the table were transferred to the Klaxoon board, respecting the scenario to which they belong. This led to the emergence of two recommendations as shown in figure 18.

The working session involved the same LEAs who took part in the Stockholm workshop. On the basis of the elements reported from the game board, the aim of the session was to specify the recommendations/hypothetical solutions that would need to be put in place to combat a new criminal opportunity.

To do this, participants were invited to an online collaborative session using the C-K method. This method, described by Le Masson et al [8], is used to devise innovations.

As shown in the Figure , the table is divided into two parts. The left-hand side represents the concept space (C) and the right-hand side the knowledge space (K).

By taking the elements from the POSTEDFIT table, it is possible to validate each of them against the knowledge and experience of the LEAs (column K) (see deliverable 4.2 for a detailed presentation of results).

The exercise was repeated for the other scenarios.

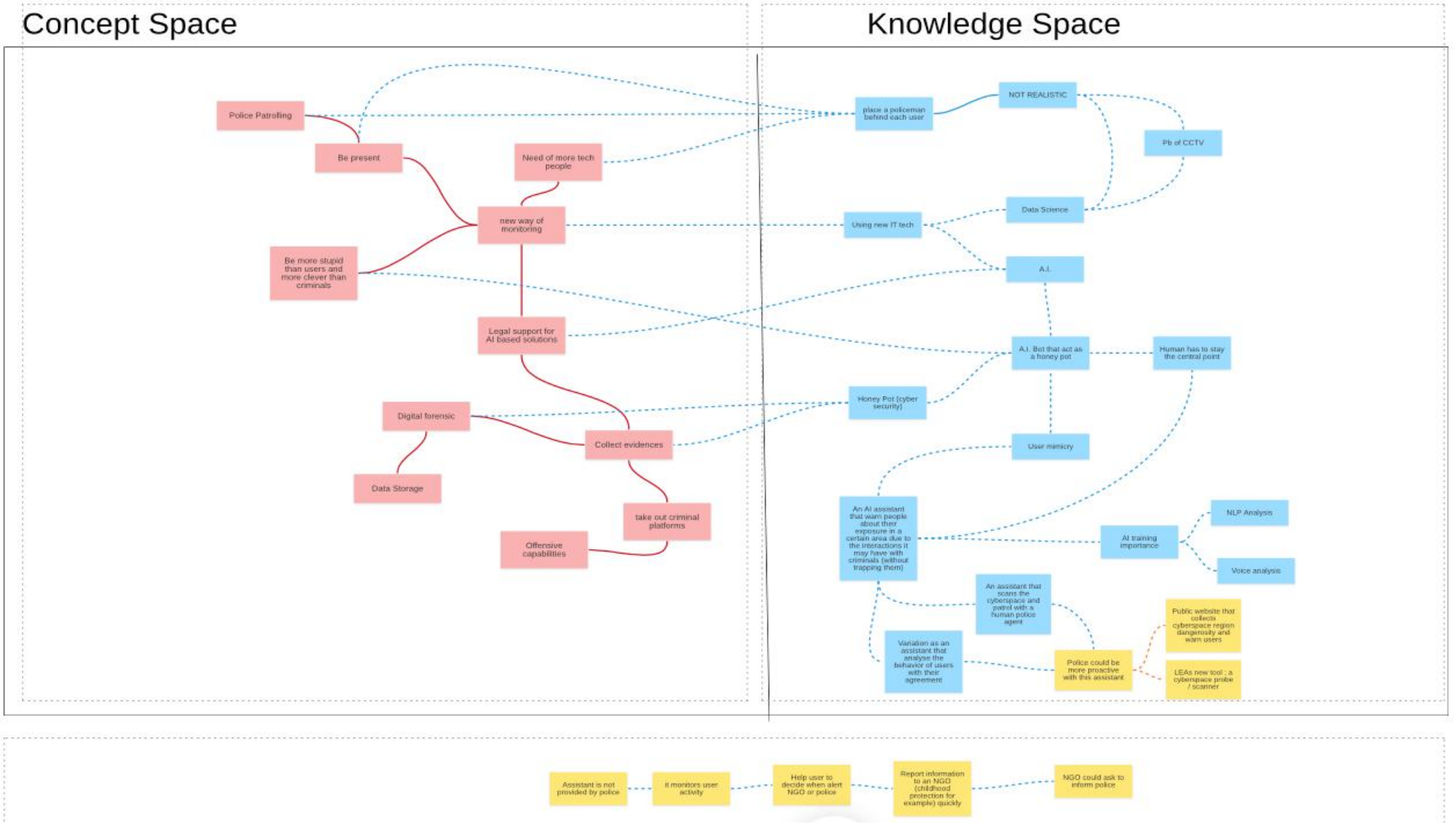


Figure 18: C-K board used to precise the recommendation 1

This first two-hours session enabled to validate the recommendations/solutions that the LEAs would be needing to support them in the evolution of their missions in the light of changing uses and criminal opportunities.

The next step was about drafting the action plan recommendations. However, as it was still difficult to assess the impact of these results on LEAs' organisation and operations, a second online session was planned on 24th January 2024to tackle this point.

In order to evaluate the impact of the change generated by the proposed recommendations, it is important to begin by summarising the starting point (AS IS) and the end point of the proposed transformation (TO BE).

To do this, the session leader presented these elements at the beginning of the session (see figure below for an extract of these elements).

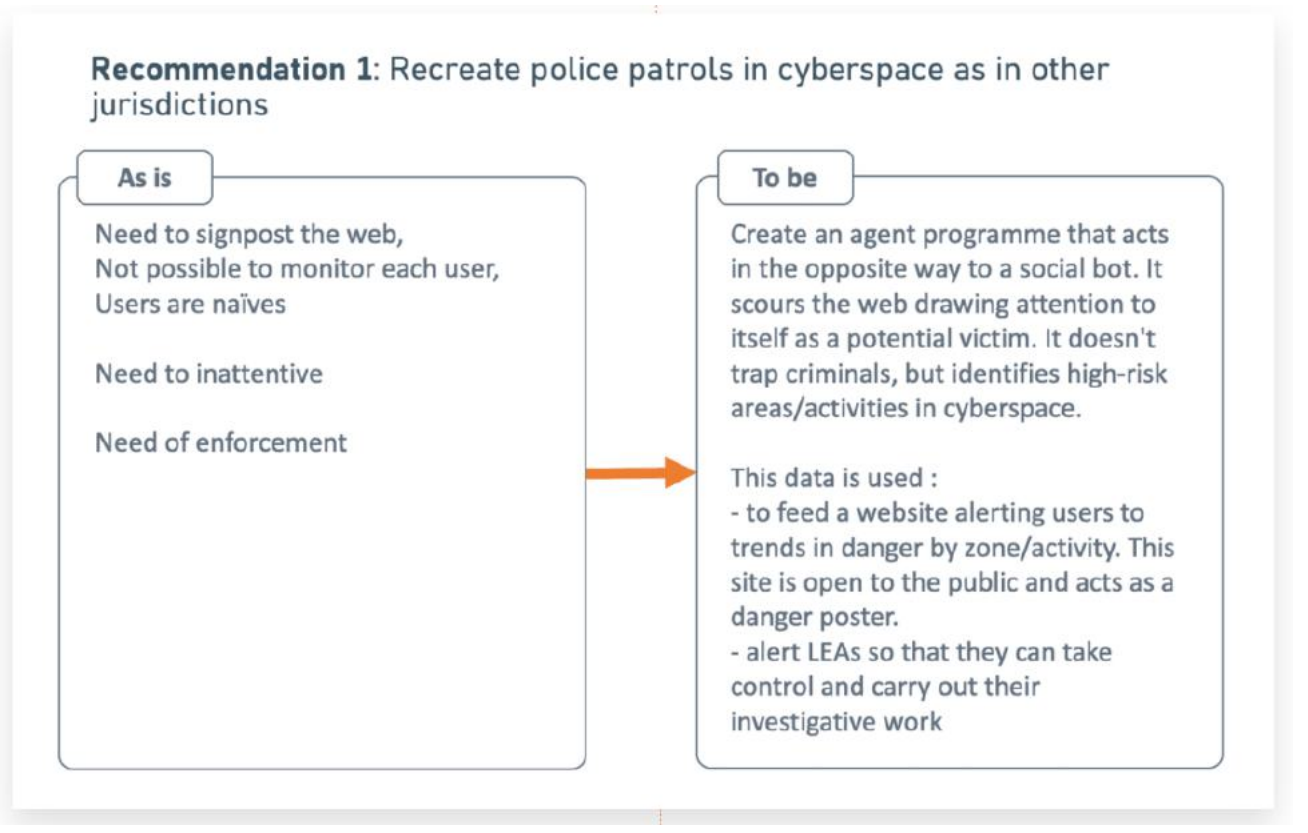


Figure 19: Example of "As Is" -> "To Be" elements presented during the online session

Participants were then asked to compare this future vision (TO BE) against the main stakeholders.

In the 1st Foresight exercise, we considered that there were four stakeholders: citizens, businesses, government and civil society players. Given the rather short duration of the session, we decided to use a specific framework for a collaborative working session. The Figure gives an example of what was obtained for recommendation 1.

As shown on the Figure , for each stakeholder, attendees were asked to consider their expectations, their challenges and to figure out how the proposed recommendation can overcome the stakeholder's challenge.

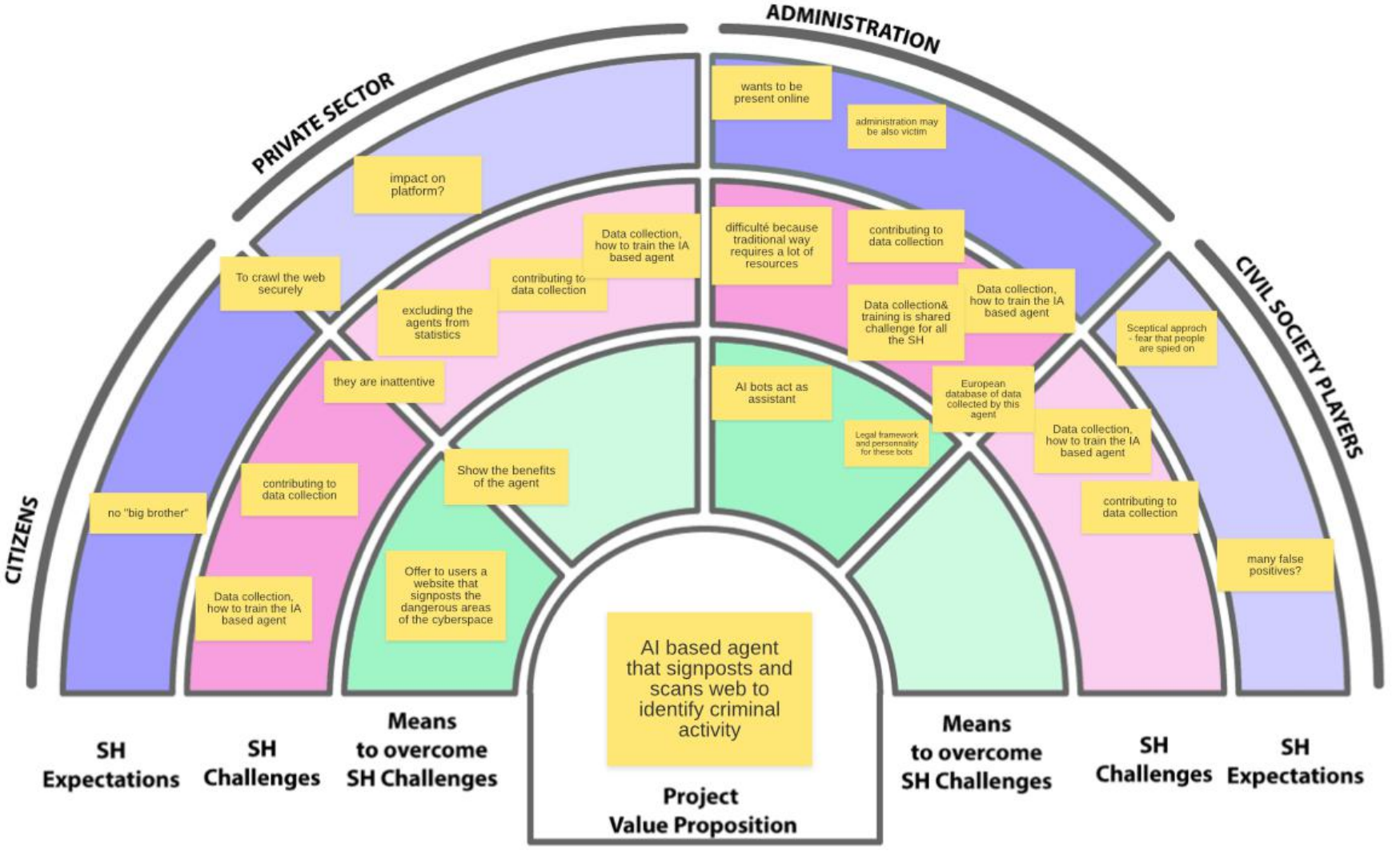


Figure 20: Example of Multiple Stakeholders analysis used to confront the recommendation with

Once the stakeholders were analysed, the participants were asked to assess the impact of the recommendation in quantitative terms. To do this, we used a variant of the OMOC matrix (Tools, Business, Organisation, Culture) which considers Organisation, Behaviour, Operations and Competencies instead as described in Figure 21. The attendees were asked to grade each component. We consider when the grade is in the range of 1 or 2, the impact on the organization is weak, there is an opportunity. When the grade is in the range of 3 or 4, the impact is more important. Then, if it is always possible to change, LEA has to consider a precise and well documented change plan to avoid reluctance to change.

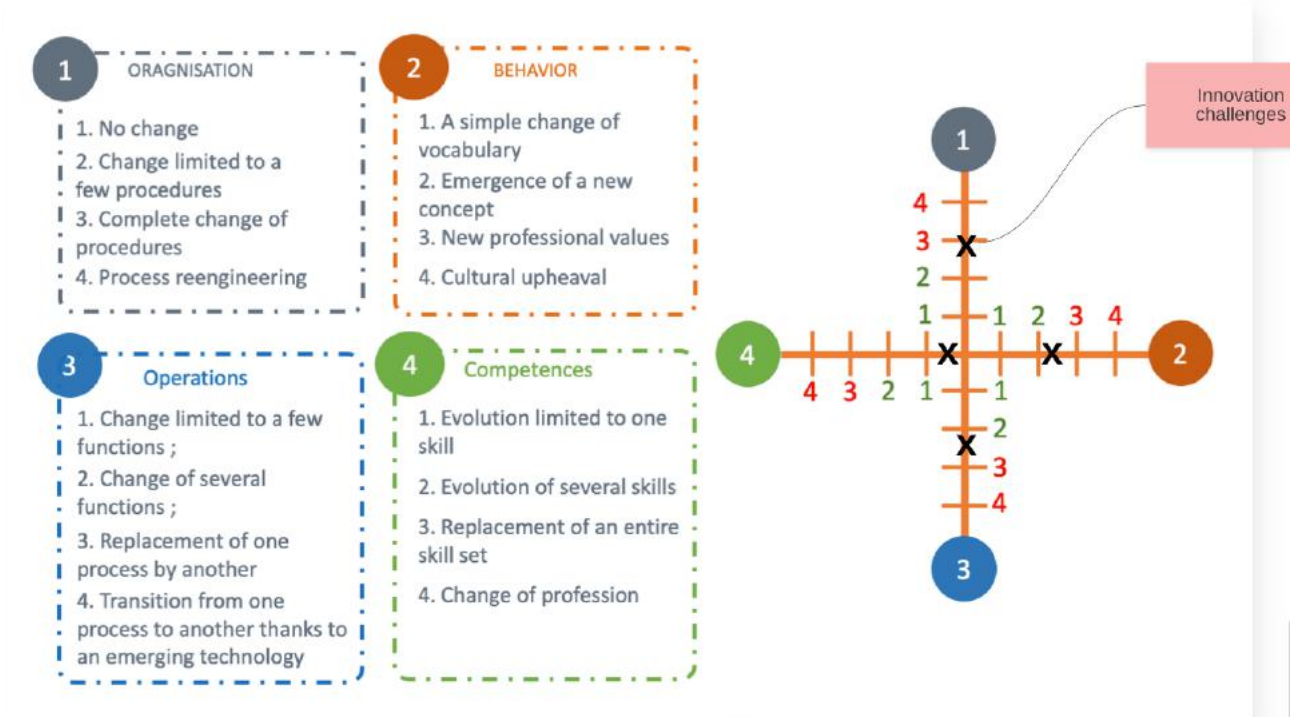


Figure 21: Example of OBOC matrix used to assess quantitatively the impact of a recommendation

Once evaluated the impact of the recommendation, the method was completed by exploring, the existence of part of solution or complete solution or simply innovators able to fulfil the needs of the recommendation in the innovative ecosystem of the European Union.

To this aim, the European innovation ecosystem was researched into using SME databases (patents, fund-raising, recipients of public aid) and also incubator networks such as the European Business Network (EBN). The value proposition of the companies identified was then analysed and characterised according to various characteristics such as: TRL; BRL; date of creation; acceptability, etc.

In this way, it was possible to find out whether or not there was a solution for a given need.

In our view, there are three possible outcomes to this analysis:

1. The need expressed is based on elements (technologies, for example) that already exist, are accessible and have proved their worth in the LEAs context. It may involve the sharing of experience between LEAs in different countries (such as Constable Daniel in Finland). In this case, the work consists of listing these possibilities, knowing their cost and the implementation requirements in order to integrate them into a roadmap.

2. The need expressed is based on elements that exist in other contexts but not in the LEAs' context. We therefore need to list them and study their adaptability to the context required by LEAs. This can be done through experiments such as public-private partnerships or the use of living labs.

3. The need expressed is completely new and requires R&D work to develop it before it can be tested. This work may involve partnerships with private entities (SMEs or large groups) or public entities (public research laboratories, for example). In this case, the research could be financed by national or European public funding.

Validating these hypotheses would require to hold a joint meeting, convening LEAs with technological experts and innovators.

4 Lessons learnt and improvement propositions

No improvements to scenario generation will be reported in this deliverable. As previously emphasised, the strategy involving A.I. was only put in place due to a severe lack of time at the start of this exercise, as the project had to critically review existing solutions, set up a network of experts, explore weak signals, create the alpha version of the framework from scratch and start the exercise. This way of generating scenarios won't be repeated in the next exercises.

As far as the experts' review of the scenarios is concerned, it is important to have a good level of non-LEA experts. At least 4 of the 6 STEEPL components need to be represented in order to have a quality exchange. We have learnt that if the online session is feasible, the debate between experts is the best option. For this reason, the meeting of non-LEA experts would benefit from taking place in person. In any case, it seems complicated for the experts to debate amongst themselves and to use collaborative tools such as post'it™.

During the Stockholm session with the LEAs, it became apparent that it can be difficult for LEA representatives to get inside the mind of a criminal. There are various reasons for this: the subject may not be familiar to them, emerging technologies may be unfamiliar, potential crimes may not have been encountered.

In the next exercise, we will test a modification to the moderation process: support for the group by a technology expert, a criminology expert and the setting up of two sub-groups. The first sub-group will act as a criminal team, while the other will retain its LEA role.

For the third stage of the process, the remote use of collaborative tools such as Klaxoon is a good strategy. The first part of this last stage was easy. It seems that the second part, which involves working on the impact of change, needs to be better explained. The LEAs attending the session took longer to adapt.

These lessons learnt are findings from the research side, not including feedback from LEAs based on the use they could individually make of the foresight process in its alpha version. Next step involves the organisation of a "roadshow" aiming to test this alpha version with all the interested LEAs in their local context. This practical approach is meant to collect direct feedback from LEAs and to fine tune the modularity of the framework.

4.1 LEA Feedback

Two online surveys were administered using Qualtrics survey platform during the December 13, 2023 workshop. The purpose was to determine foresight efficacy in participants and garner feedback from the workshop session.

In the first survey that preceded the workshop, participants reported demographic information (i.e., age, occupation), foresight experience, future thinking ability, intellectual curiosity, and creative imagination. Future thinking ability was tested based on Sitra "Futures Frequency" foresight evaluation procedures [18]. Intellectual curiosity and creative imagination were tested using the Big Five Inventory – 2 subscales [19]. The BFI-2 is a reliable and valid personality measure, which we used to gather a deeper understanding of the personal characteristics of participants in relation to the efficacy of foresight activities. 18 workshop participants completed the survey. The participants reported being between the ages of 27 and 60, with 41 being the mean age. Participants included senior law enforcement officers, including superintendents, department heads, innovation managers, and specialists. Participants had a range of prior foresight experiences. 44% of participants reporting having never taken part in scenario-based foresight exercises. The

remainder reporting having taken part in scenario-based foresight exercises once (13%), a few times (38%), or many times (6%). The majority (98%) of participants self-reported average or excellent future thinking abilities. Further, 82% of participants self-reported having average or high intellectual curiosity and 85% self-reported average or high creative imagination (See Figure 22).

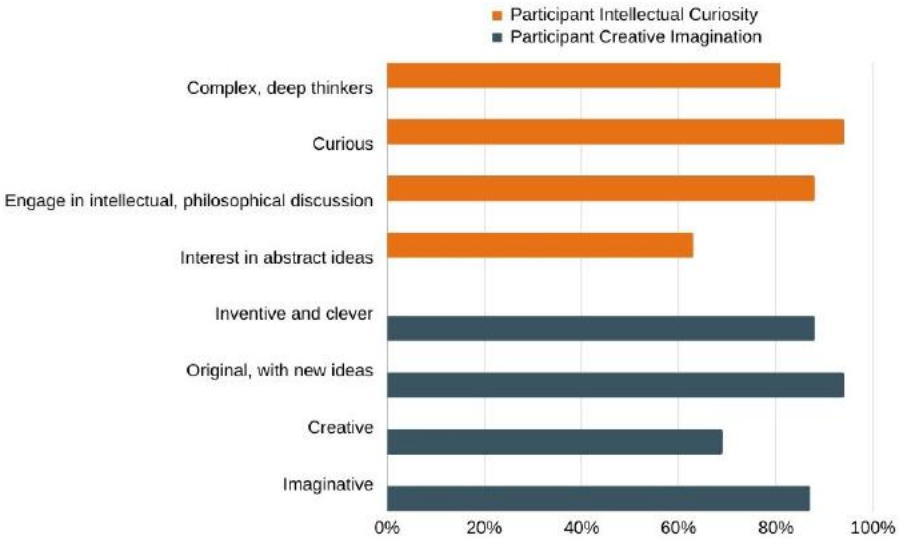


Figure 22: Graph 1 - Participant characteristics

A follow-up survey with seven participants shortly after the conclusion of the workshop expanded on perceptions of the efficacy of exploring criminal opportunities, the foresight method, and practical applications. Participants were also able to offer qualitative feedback. Respondents found the criminal opportunity phase most useful. 71% of respondents indicated that the workshop content was relevant, provided insights, and challenged or expanded thinking regarding criminal opportunities. 63% of responses indicated positive assessments of the foresight methodology (see Figure 23). Based on the participant response, the methodology is perceived favourably overall, with room for improvement in ease of understanding tasks and ability to change thoughts about the future.

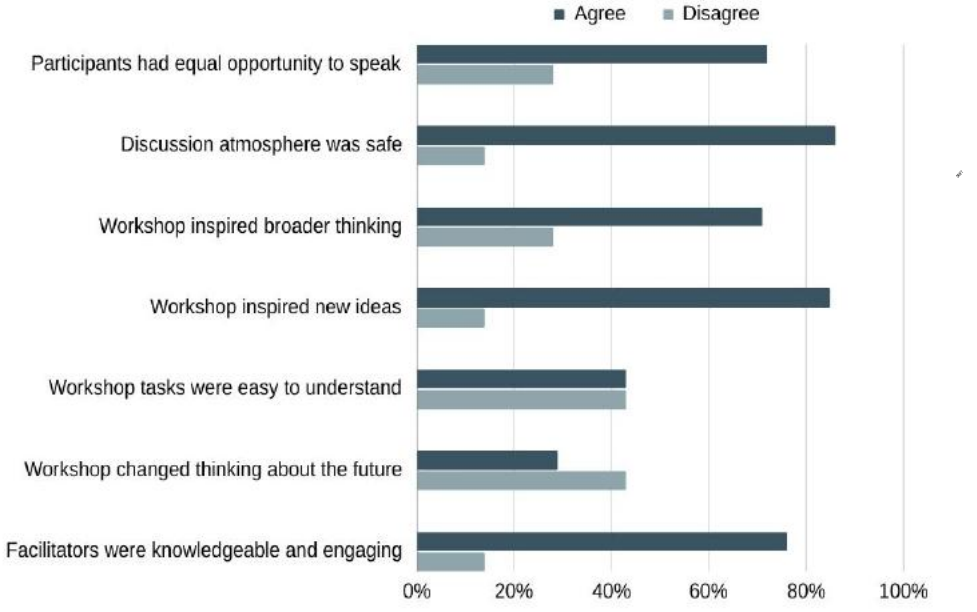


Figure 23: Graph 2 - Foresight method assessment

Regarding practical applications, 75% of responses indicated that the workshop had useful practical applications.

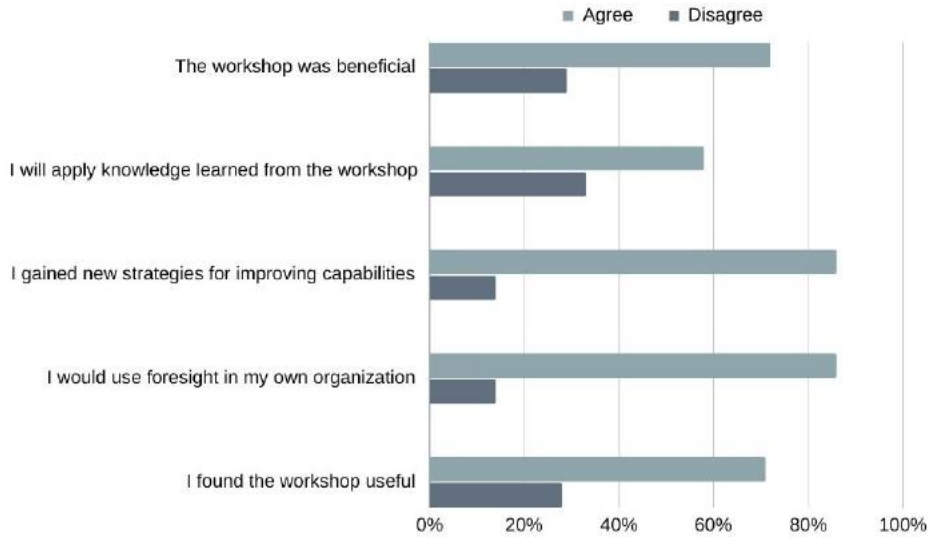


Figure 24: Graph 3 - Practical applications for law enforcement

Based on qualitative feedback from the survey, participants offered suggested regarding the scenarios. It was requested that future scenarios be more specific and include reasoning behind scenario content. Further, allowing participants access to the scenarios prior to the workshop was suggested. It was indicated that this would allow for more fruitful discussion time. Regarding the discussion of capabilities, greater operationalization of capabilities was suggested. In addition, working in smaller groups and changing groups was suggested. Feedback indicated that the facilitator role could be less dominant and more adaptable.

Additional qualitative feedback on the methodology from the stage 3 meeting indicated the importance of addressing cultural attitudes regarding unwillingness to change and adapt, including broad consideration of contextual factors such as legal and ethical issues in particular, and ease of understanding through receipt of preparatory material in advance of workshops.

5 CONCLUSION

This deliverable presents the alpha version of the AHEAD framework. Special care has been made to ensure that this framework is based on evidence from established literature, reports and law enforcement practice.

The first exercise saw the active participation of various LEAs, both members and non-members of the consortium, at various stages of the process. LEAs' interest in accessing such a framework can therefore be evidenced.

During the discussions, we were able to confirm the existence of complementary building blocks, or those more suited to the local context, among the various members of the project. This confirms the usefulness of having devised a modular framework capable of integrating the tools already in use by the LEAs. Indeed, changing tools and habits is one of the biggest obstacles to organisational change. This reinforces our decision to organise a roadshow to validate the framework under normal conditions of use, individually taking into account LEAs.

Moreover, this framework also respects the LEAs' desire for a user-friendly tool that is simple to understand and implement, enabling security practitioners to share their points of view and, almost importantly, to help them prepare to respond to future threats.

The format chosen proves suitable for both physical use and an online version. In addition, an online prototype has been produced using a Klaxooncollaborative board.

Figure 25: First test of the proposed methodology during the first foresight exercise

The next foresight exercises, in complement to the roadshow, will enable us to complete and refine the framework. The second foresight exercise can be anticipated to reach the beta stage, with the third one demonstrating a good level of maturity.

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ANNEX

LEAs' Workshop
Session Manual

FACILITATOR MANUAL

WORKSHOP GOAL

The workshop has two main goals :

1) For LEAs, in a certain context, to propose the potential threats that criminals may imagine,
2) For LEAs, to list the requirements to accomplish their missions and to detail if they are capable or not at the moment of the workshop.

PREPARING THE SESSION

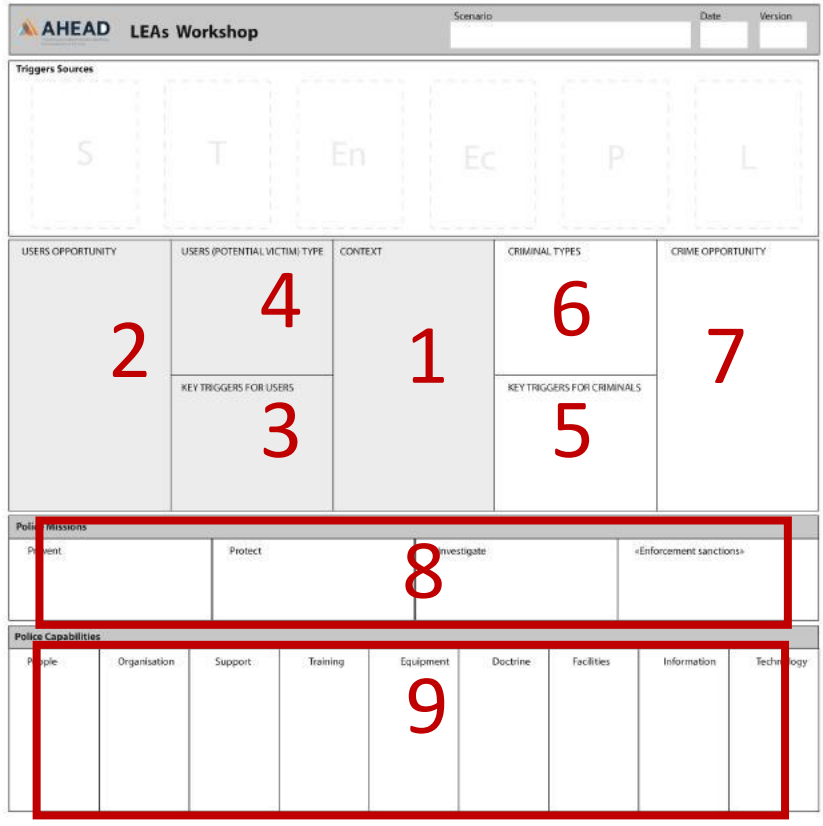
1- After an ice-breaker, LEAs are splitted into groups of 4-6 persons (4 groups maximum),
2- Each group has a facilitator to help them during the session
3- Each group occupies a table with the follwing materials :

- a board game (mate),
- key triggers cards dispatched regarding STEEPL Components. Each deck is composed by 60 cards + 14 unpredictable event cards + tehnology cards,
- a set of envelopes containing the scenarios to be studied. Each scenario is composed of 3-5 key drivers for the future and an examplification of the context,
- stickers, post-it, pens, blank cards to complete the workshop,

OPENING THE SESSION

1- each facilitator present the the game board and the aim of the exercise :

- firstly : enumerate potential new crime opportunity,
- secondly : evaluate the police readiness to fight these new threats,



The sequence (cont'd)

For the whole session each group will have to treat :
- 3 constrainted scenarios
- 1 open scenario (where they will have to describe their usage scenario by they own). Groups have 3 hours to treat 3 scenarios. The open scenario will be executed during the afternoon session.

2- each group opens the first enveloppe and give the example to participants that read it. The facilitator place pre-filled card on the grey area (the key drivers +the context area, and the technology cards realted to the example in the key trigger area (1 to 4).

5- COMMENTING EXPERTS'WORK. (Phase duration 1 min). Facilitator comments the work of experts : explaining the key triggers and the examplyfied scenarios

6- FINDING NEW CRIMES OPPORTUNITIES. (Phase duration : 20 to 30 min). The LEAs will in turn be working on the types of criminals, their motivations and the threat opportunities that this generates. To do this, the discuss from their experience, what kind of triggers, motivations and opportunities could appears. The facilitator uses the STEEPL cards in two possibles ways :

- to unstuck the group, if there is no idea that come;
- to challenge the vision of the group. The facilitator has, at least to challenge the group using the UNCERTAINTY cards.

***Remark**: The cards are described in a neutral way, so when we study the implication of a card we have to ask the question in positive or negative terms. e.g. the existence of a law or its absence can generate opportunities for criminals. In scenario 4, for example, the increasing use of phishing and scams relies on people remaining credulous and accepting by default that what comes over the Internet is true (the use of deepfake will reinforce this point).*

This work will fulfill the areas 5,6 & 7.

7- IMPACT ON LEAs' MISSIONS. (Phase duration : 10 min). AREA 8. Facilitator presents the four components of the LEAs Mission - reminder : the components are generic for the framework, some LEA may have just 3 components instead of 4 ; no need to argue or comment our choice. LEA will have to align the context with their missions. In this case they may be capable to formulate an high level action / tool to illustrate how they fulfill their missions or not. At this point area 8 has to be filled.

8- LEAs READINESS. (Phase duration: 20 min). AREA 9. The last phase consist in looking at the detailed capabilities. Facilitator presents the POSTEDFIT components. For each component of the POSTEDFIT framework, LEAs have to describe if they are « Not ready at all », « Work in Progress », « Ready », « Can not say ».

N.B.: for the LEAs exercise in Stockholm, as an exception, LEAs will answer this part on the mate by team but also on they own side on a A4 sheet where the matrix MISSIONS x POSTEDFIT is printed.