DELIVERABLE REPORT D5.1

DELIVERABLE

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v0.3	17/10/23	Input recruitment, ecosystem pilots,...	Catho Van Den Bosch, Edward De Vooght, Laurien Desimpelaere, Todor Galev, Boryana Velcheva	VRT, AHS, CSD
v0.4	26/10/23	2nd iteration common deplomentmethod, Informed consent	Catho Van Den Bosch, Edward De Vooght, Laurien Desimpelaere, Marie Hoff	VRT, AHS, DBT
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DISCLAIMER

STATEMENT OF ORIGINALITY

This Deliverable contains original unpublished work except where clearly indicated otherwise. Acknowledgement of previously published material and of the work of others has been made through appropriate citation, quotation or both.

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EXECUTIVE SUMMARY

Deliverable D5.1 **describes how the implementation of the TITAN solutions will be piloted in 3 different use cases**: higher education in Flanders (Belgium), NGOs in Bulgaria and neighboring countries and migrant students in Italy. The goal of the pilots it to provide insights in the adoptability of the TITAN solutions in real European ecosystems, identify enablers and barriers in the user experience and establish the impact of the use of TITAN on users' attitudes, behavior and critical thinking. In line with the TITAN's iterative development approach, pilots will be scheduled to facilitate a fast feedback loop to ensure the development process is heading the right way.

The pilot operation plan describes the **context, procedures and methodologies first generally and then specifically per use case**, because the different use cases require a more customized approach, depending on local differences and the stakeholders involved. The General Evaluation Strategy for the piloting consists of 2 iterations in a mixed-method design: The first pilot is focused on user experience and adopts a qualitative methodology comprising user observation, focus groups and log analysis. Second, a larger-scale pilot iteration is focused on impact and adopts a more quantitative methodology, consisting of social-scientific and psychological metrics in survey together with quantitative data of users' actions in TITAN. In order to provide a detailed plan of conduct, the deliverable covers various aspects of testing, including recruitment and engagement strategies, timing, user support, pilot communications, data collection procedures, risk assessments, mitigation measures and assigned responsibilities.

The pilot operation plan **also covers a monitoring plan** for the implementation of the three pilot use cases. The purpose of this plan is twofold: it ensures that the implementation meets the planned objectives, including the achievement of the initially defined KPIs, and gathers the information and data necessary for early feedback and for reporting and evaluating the implementation of the three pilots in subsequent project phases. The monitoring plan follows the logic of the Evaluation strategy and the respective planned activities within each of the use cases. It also supports the iterative development approach of the TITAN system.

This plan is the result of extensive interdisciplinary collaboration, including meetings and workshops, between various partners participating in the consortium's use cases.

INTRODUCTION

The goal of the TITAN project is to develop an AI-based digital solution, named TITAN, that functions as a personal coach for EU-citizens by increasing their critical thinking in the face of disinformation. **The use case pilots are an essential part of the project as it is the first test of its real-world implementation in established ecosystems**. In other words, the project implements the TITAN solutions in three different existing ecosystems in multiple countries **to evaluate its adoptive potential, user experience and impact**. Through proper scheduling and rigorous testing and evaluation, the outcomes derived from these use cases will not only evaluate user experience and impact of the TITAN tool but also drive continuous refinements.

The various functions of the TITAN solutions are implemented in **three different use cases**. The **first Use Case is focused on higher education in Flanders** and targets students who have to enhance their critical thinking to become independent and critical citizens regardless of their academic discipline. Project partners VRT and AHS will lead Use Case 1, which explores the possibility to adopt the TITAN solutions in an educational setting. The **second Use Case targets members of NGOs in Southeast Europe** who are often highly engaged and seek to expose malpractices from both governments and organizations and especially in the recent times of global spread of hostile disinformation and propaganda from authoritarian states. Project partner CSD will implement the TITAN solution to provide civil society activists but also their organizations with a comprehensive and unified framework that will increase their capacity for critical thinking and assessing the trustworthiness of the information they consume and communicate, enhance the fact-checking knowledge and skills. **The third Use Case is concerned with disinformation about migration and refugees in Italy**. Project partner UNINETTUNO launched the University for Refugees91 initiative in 2016, providing migrants and refugees access to degree program scholarships provided by UNINETTUNO. TITAN tool will support migrants, refugees and students' counter-narrative ideation and definition, providing support in verifying information, access to reliable sources, and describing how a fake news spread in social media.

The pilot operation plan is meant to give **an overview of the procedure, monitoring and evaluation methodology of the three ecosystem implementations** of the use cases. The goal is to provide project partners and future research with a blueprint for this large-scale implementation of newly developed digital tools targeted at citizens. It is therefore both a guideline for the pilots which are planned in the TITAN project and a report on the work done in this project. The pilot operation plan ensures smooth organization and evaluation of the different pilots in the project.

A difficulty that has to be taken into account when reading the pilot operation plan is that TITAN is an ongoing research project in constant evolution, due to its iterative development approach supporting fast feedback loop. So, it is partly uncertain what the TITAN tool will look like at specific moments in time during the use case testing period. The pilot operation plan provides a reliable structure and methodology for the testing. By establishing standardized testing methods, it reduces operational uncertainties, and it ensures that testing is done in a uniform way across the different countries / Use Cases, while allowing each Use Case their own specifics and nuances.

The pilot operation plan follows a clear structure. Because of the scale of the project, the pilot operation plan first lays out the General Evaluation Strategy (**Section 1**) followed by an in-depth discussion on each use case (**Section 2**). The General Evaluation Strategy consists of two pilot iterations which will be discussed separately. In the section on the use cases, a general overview of the ecosystem and how the TITAN tools will be implemented is followed by a concrete description of both pilot iterations in each use case. Deviations from the General Evaluation Strategy are clearly stated. **Sections 3 and 4** of the pilot operation plan discuss the risk mitigation and the technical

support during the piloting. Finally, **Section 5** provides a pilot monitoring plan to ensure smooth organization and evaluation of the different pilots in the project.

KPIs

A crucial consideration within the pilot operation plan is the imperative fulfillment of Key Performance Indicators (KPIs) associated with each use case. Table 1 provides a comprehensive overview of the predetermined KPIs across various pilot projects.

Number	Type	Indicator
KPI5.1	Number of iterations	2 iterations per use case
KPI5.2	Gender balance	Min 50% users are female
KPI5.3	Geography	Users are from min 3 EU States
KPI5.4	Skills	50% have not fact checked before
KPI5.5	No. of sessions on TITAN ecosystem (number of log ins)	min 1000
KPI5.6	Citizen's Perceived usefulness	Iteration 1: 60% ; Iteration 2 : 80%
KPI5.7	New fact-checking collaborations	Iteration 1: 5 ; Iteration 2: 10

Table 1: Summary of the pre-established Key Performance Indicators (KPIs) for the pilots

For the KPIs that require achieving high numbers (e.g. KPI5.5) or significant app usage, the focus to achieve this is **primarily on the second iteration**, as further discussed in this deliverable in **Section 5**, **the pilot monitoring plan**.

1 EVALUATION STRATEGY

The deployment of the pilots is structured via two iterations in order to ensure maximal acceptance and impact at the final release (thereby reaching KPI5.1). In order to obtain rich and complete results, the Evaluation strategy **adopts a mixed-method design**: While the first iteration of 5 months (M20 – M24) focuses on small groups of users to gain qualitative insights on usability, perceived impact and acceptance and attitude, the second iteration of 8 months (M27-M34) aspires to deploy the TITAN Tools with large groups of users to gather quantitative insights into usability and impact.

Figure 1 Use Case Testing (Timeline)

The Evaluation strategy, which is outlined in the remainder of this section, **complies with the legal and ethical requirements formulated by the Ethics by Design and Ethics of Use Approaches for AI by the European Commission. This is done by adhering to the mitigation actions proposed** in Deliverable D1.4. As such **Respect for Human Agency** is safeguarded by piloting in human-controlled conditions, called research modules, in which clear communication between experimenters and users is paramount. **Privacy and Data Governance** is addressed in the Data Management plan of the project in Deliverable D1.2. All data collection is preceded by an informed consent stating clearly which data is being collected and for what purposes, which also tackles risks regarding **Transparency**. **Biases in the System** are mitigated by the design of the pilots, which build on open communication and interaction, which means participants are able and even encouraged to highlight any occurrences of bias. **The individual and Social Well-being** is protected by piloting with volunteers, engaging in open dialogue and implementing the tools in existing ecosystem frameworks, which does not represent additional burden for the participants. Piloting happens in the presence of experimenters who ensure a safe space. **The Accountability and Oversight** is attributed to the Pilot Administrators and the Technical Support Team who are mentioned in Annex 3 of this document. Participants can directly address the Pilot Administrators when issues or questions arise.

The remainder of this section covers the Evaluation strategy across all three use case pilots. The first and second pilot iterations are described respectively. For each iteration the research questions, procedure and evaluation methods are clearly provided.

1.1 First Iteration

The first iteration methodology aims to gather insights on the **usability**, **functionality**, **user experience** and **attitudes** of users with **regards to both the TITAN tools** itself and its functions **as well as the ecosystem implementation** of each Use Case.

Pilot Administrators will organize a **series of research modules with 5 to 10 participants** (users and ecosystem facilitators), who are carefully selected to represent the Use Case target users well in terms of background and gender balance.

To achieve this, **a multimethod approach is employed**, encompassing the following phases:

- **Phase A** – **User Observation**: participants in the research modules perform certain tasks in a workshop and are observed to identify enablers and barriers.
- **Phase B** – **Focus Group**: after working with the TITAN tools, participants engage in a focus group to share experiences and disclose their attitudes towards TITAN.

- **Phase C – Chat Analysis**: The conversations between participants and the TITAN chat bot are analysed to identify improvements.

The use of TITAN in an ecosystem holds two main audiences: the target users and the ecosystem facilitators. To ensure a smooth implementation of the TITAN solutions, both these audiences must be considered and probed in the first iteration.

For the target users, at least 3 research modules should be organized, each consisting of a different focus in Phase A (User Observation):

- **Research Module 1** - **Interaction**: focus on the users interacting freely with the TITAN tools (given certain tasks)
- **Research Module 2a** - **Implementation**: focus on how the TITAN tools will be implemented in the ecosystem (in educational packages, with introduction, etc.)
- **Research Module 3 – Collaboration**: focus on the collaboration module of TITAN. Users participate in at least 2 collaborative discussions

For the ecosystem facilitators research module 2b is organized per facilitator:

- **Research Module 2b** – focus on how the TITAN tools will be implemented in the ecosystem (in educational packages, with introduction, etc.)

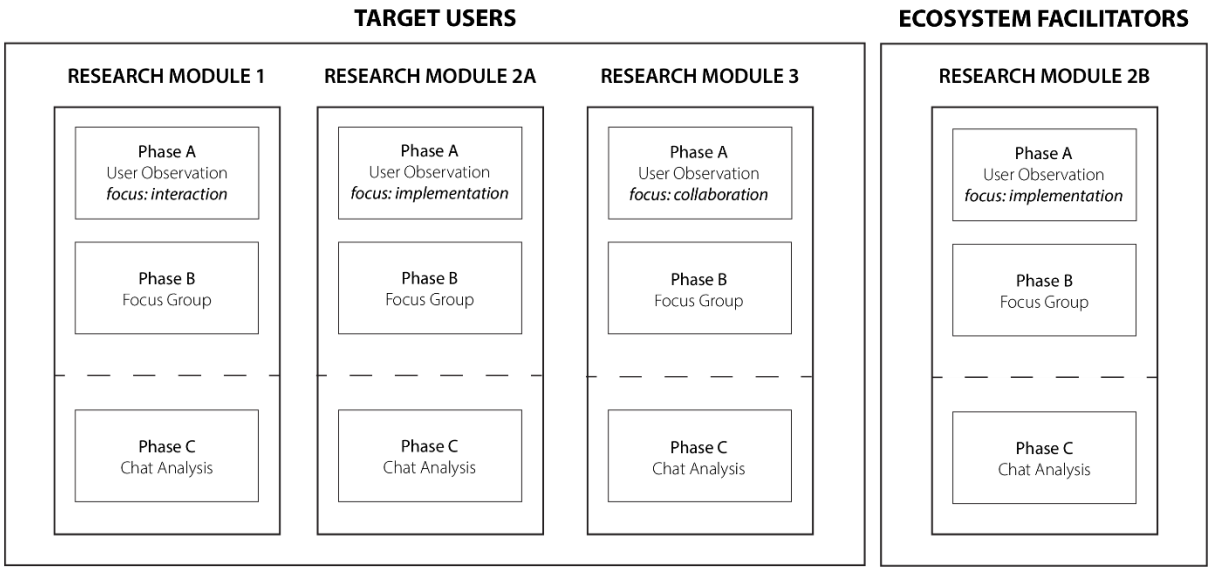


Figure 2 First Iteration Methodology (Overview)

The number of research modules a pilot should comprise in the first iteration is determined by the variety of target users and stakeholders of the Use Case Ecosystem. The minimal number is 4 comprising three research modules for target users and 1 research module for a type of ecosystem facilitator. When there are more target user and ecosystem profiles the number of research modules will increase, which will be dealt with in section 4.

In order to gather sufficient insights, each Reseach Module with target users is to be organised twice. In this way, two independent heterogenous groups will test and evaluate the TITAN tools, providing enough variability in the responses and behaviour to conduct the qualitative analyses.

The remainder of this section covers each **p**hase of the research modules. Research modules specifics are discussed under each research phase.

1.1.1. Phase A - Observation

The goal of the observation phase is to identify enablers and barriers for target users and ecosystem facilitators in the TITAN solutions. This is done by means of observation of the behaviour of participants in relation to the user experience of the TITAN tool (login, conversation with the chat bot, navigation between functions, conversations…) and the ecosystem embedding (i.e. the workshop in which TITAN is introduced).

Observation is used to have clear and concrete behavioural cues and examples to understand the experiences that will come up during the focus groups in phase B and to identify technical anomalies.

Procedure & Materials

The observation phase follows a three-step procedure:

Step 1 includes an introduction to the TITAN project (goals & methods) and an introduction to the Research Module methodology. Participants will sign an informed consent that allows us to collect anonymized data for analysis and report purposes (See Annex 1).
Participants are also asked to fill in **a short online questionnaire (in Qualtrics) including**:

Regulatory Self-Efficacy in Sharing Misinformation [9] - When facing a piece of news that seems dubious or ambiguous to you, how well do you think you can perform the following activities? (1: Not at all - 10: Completely)

1. Avoid spreading it even if not doing so might lead to disagreements with people important to you.
2. Choose not to share it even if it could enhance your popularity or influence.
3. Refrain from sharing it even when doing so seems to be a prevalent trend among people important to you.
4. Express your scepticism about the information even if your important peers seem to accept it.
5. Find and share credible and verified sources even if they may challenge the prevailing narrative in your group.
6. Refrain from sharing it even if it aligns with your beliefs.
7. Search for different perspectives and sources on the same news story, even if doing so could question your beliefs.
8. Take the time to verify the information's sources even when it feels boring or time-consuming.

Critical thinking assessment-scale short form [1] - (Reduced to 18 items and rephrased to be more comprehensible) To what extent do you agree or disagree with the following statements? (1=strongly disagree; 5= strongly agree):

1. I try to figure out the content of the problem.
2. I classify information in a systematic way.
3. I examine the values that underlie information.
4. I examine how opinions relate to each other.
5. I figure out the reasoning process behind what others say or write.
6. I figure out whether the reasoning of others builds on claims for which they give no proof.
7. I seek the truthfulness of the evidence that someone provides for their claim.
8. I search for additional information that might support or weaken an argument
9. I examine the reasoning of an objection to a claim

10. I collect abundant evidence to back up opinions.
11. I figure out the merits and demerits of a solution while comparing them to other alternatives in order to make decisions.
12. I arrive at conclusions that are supported with strong evidence.
13. I can describe the consequences of a problem by thinking logically.
14. I can logically present results to tackle a certain problem.
15. I can explain a key concept to clarify my thinking.
16. I review sources of information to ensure important information is not overlooked.
17. I continually revise and rethink strategies to improve my thinking.
18. I reflect on my thinking to improve the quality of my judgment

Fact-checking experience – How much experience do you have in fact-checking information? (2. Quite a lot, 1. Somewhat, 0. Almost none).

Step 2 varies greatly between Research Modules and Use Cases and comprises the actual observation. In general, this step will include participants interacting with the TITAN solutions in different ways to obtain a rich understanding of the effectiveness of the TITAN tools.

Step 3 includes **a second online survey (in Qualtrics)** to be completed by the participants including the **Regulatory Self-Efficacy in Sharing Misinformation [9], the Critical thinking assessment-scale short form [1]** and t**he inclination to factcheck:** How likely are you to factcheck information you see on social media in the future (1=not at all likely, 10=very likely)?

Step 2 in the observation phase differs greatly between research modules and Use Cases. As was explained in the above 3 types of research modules are organized.

For the target users there are 3 research modules:

- **Research Module 1** - Interaction: focus on the users interacting freely with the TITAN tools (given certain tasks)
- **Research Module 2a** - Implementation: focus on how the TITAN tools will be implemented in the ecosystem (in educational packages, with introduction, etc.)
- **Research Module 3** – Collaboration: focus on the collaboration module of TITAN. Users participate in at least 2 collaborative discussions.

Ecosystem facilitators are studied separately in a research module 2b, which is almost identical to Research Module 2a (except for some differences in Phase B):

- Research Module 2b – focus on how the TITAN tools will be implemented in the ecosystem (in educational packages, with introduction, etc.)

The materials needed in this phase are:

- Informed consent form (Annex 1)
- Participant list
- Presentation introduction (e.g. short videos, or PPT with screenshots, mockups, etc.)
- Projection screen
- Projector
- Recording material
- Computers
- Smartphones

- Drinks
- Incentives
- Users need a personal computer or tablet

The room is arranged as follows:

- Participants (5-10) are seated at a desk
- There are at least 2 observers in the room in addition to a moderator.

Research Module 1 Specifics

In **Research Module 1** target users will **interact with the whole of the TITAN tools** completing a series of tasks.

It is important to note that this Research Module will focus on the Critical Thinking Assessment and the chatbot. For the first pilot, users can choose between a fixed set of articles divided into 2 groups. The first 3 articles of group A will prompt a prebunking- and content-focused dialogue, while the latter 10 articles of group B will start an analytical dialogue.

The tasks that are *common* between Use Cases are:

1. Create an Account on the Titan Tool
2. Complete the CTA (Critical Thinking Assessment)
3. Choose an article of group A
4. Complete the dialogue
5. Choose an article of group B
6. Complete the dialogue

Further specific tasks including different functions or different applications of the tools will be explained per Use Case in section 2)

Research Module 2a/2b Specifics

In **Research Module 2a/2b respectively** target users and ecosystem facilitators will experience the ecosystem **implementation of the TITAN solutions:** by means of the workshops developed per Use Case.
These workshops consist of theoretical expansions and interactions beyond the TITAN tools combined with specific use of certain functions in TITAN. Both aspects are observed in this phase to identify enablers and barriers. The nature of these interactions and functions is explained further per Use Case in section 2.
In Research module 2b, both the chat function and collaboration function should be at least shortly demonstrated.

Research Module 3 Specifics

In **Research Module 3** participants **interact with the collaboration modules** that will be implemented in TITAN. After a short introduction, participants will partake in two collaborative discussions, curated by the Pilot Administrators. In order to test the self-explanatory nature and user friendliness of the collaboration module, participants will engage in the first discussion without instructions, besides that they have to propose arguments and opinions regarding the discussion statement. The second discussion will be preceded by a short set of instructions to explain all the possibilities and functionalities of the tool in order to test the usability of the complete set of functions.

Each collaboration will have two stages: first users are asked to dissect an article on a certain topic and then users will be asked to complete the argument map with their own opinions, knowledge and

information they checked. **After each stage, there will be a short group discussion** on the topic to exchange ideas on the content of the article and the argument mapping afterwards.

1.1.2. Phase B: Focus Group

The goal of the focus groups is to identify the barriers and enablers of the TITAN tool with regards to:

- the **specific interaction with the TITAN tool** in terms of navigation, chat function and other functions that are UC-specific; and
- the **ecosystem-embedding,** e.g. the workshop in which the tool is implemented in each Use Case

Procedure & materials

The focus groups aim at exploring the enablers and barriers that participants have experienced while interacting with the TITAN tool and the workshop.

The focus groups immediately follow after phase A in which the participants have used the TITAN tool or the workshop, and ideally take place in a setting suitable for focus groups (viz. a room in which participants can comfortably take place in a U- or circle-shaped arrangement of seats and where external noises are minimized for optimal audio quality). There are two researchers present: one who moderates the interview and the other who facilitates the interview and takes notes during the focus group.

The materials needed in this phase are:

- at least one computer, so that, if necessary and desired, participants can identify and demonstrate the specific difficulties they have encountered while testing the tool, to the researcher during the focus group.
- Pen and paper for participants to write down their thoughts.
- Videorecording material

Interview guide: common deployment

Each interview guide consists of three parts: briefing, body, and wrap-up. While the first and the third part are largely the same, the second part, the body, can be entirely adapted to the specific circumstances of the research modules (see Interview guide: Research modules specifics) and the target group (see 4. Use Cases).

Briefing: The moderator welcomes the participants, introduces themselves and provides an initial briefing, including the following aspects:

- explanation of the focus group format with explicit mentioning of ground rules (e.g., no right or wrong answers, respectful listening to others, one speaking at a time, role of moderator as simple guider of the discussion);
- brief introduction of the topic;
- the notion that the focus group will be videorecorded;
- participants' right to decline to answer questions and to withdraw from the study at any time;
- the notion that participants' identifying data will be removed from the final dataset.
- In this part, each participant signs the informed consent document.

Body: In this part, after some ice-breaking questions, questions regarding the specific enablers and barriers that participants have encountered while interacting with the TITAN tool or while using the workshop. Specifically, different variables will be evaluated (viz. user friendliness, efficiency, accessibility, value of the functionality and output, attractiveness of the interface, language usage, task flow, and trustworthiness of the tool), where the specific enablers and barriers are always

examined. Below this paragraph is an overall structure for the focus group. Each category of questions must be addressed, however, not all questions need to be asked.

- **General kick-starter**
  - What was your initial impression or reaction when using the TITAN tool?
  - Can you recall a time when you faced a challenge using the tool? How did you overcome it, and were there any features that assisted or hindered you?
- **User friendliness:**
  - How easy was it for you to learn to use the tool?
  - Did you find the functions intuitive and easy to understand? Or did you have difficulties in finding your way?
  - Is the navigation clear?
  - How would you rate the overall user-friendliness of the tool? Can you provide examples of interactions that influenced this rating?
- **Value of the functionality, output and interface**
  - What did you think of task X, Y, Z (these depend on Research Module and Use Case)?
  - Imagine you could only keep one feature of the tool. Which feature would it be, and why is it indispensable to you?
  - If you could give the tool a digital upgrade or enhancement, what would it be, and how would it improve your overall experience?
- **Efficiency:**
  - Did the tool help you to find a quick answer to your question? When was that? What made it efficient?
  - Conversely, are there tasks where you found the tool less efficient? What improvements would you suggest enhancing efficiency?
- **Accessibility:**
  - Did you feel like you had enough pre-existing knowledge to start using the tool?
  - Do you think people with limited knowledge (regarding critical thinking, technical skills etc.) can use the tool? What should be improved within the tool to someone with limited technical expertise/critical thinking etc.?
  - Are there specific accessibility features you find beneficial or areas where you think the tool could be more inclusive?
- **Value of functionality and output:**
  - What did you initially expect to receive from the tool? Was the output (answer) that you got from the tool in line what you had expected from it?
  - Did you value the output? Was it useful?
  - Do you think that the answer improved your critical thinking? What specific aspect improved your critical thinking?
- **Attractiveness of the interface:**
  - How would you rate the interface? Why this score?
  - Can you pinpoint particular design elements that contributed to your evaluation?
  - Reflecting on your experiences, are there specific moments where the visual appeal of the interface positively influenced your engagement or understanding?
  - Conversely, have you encountered situations where the design negatively impacted your interaction or perception of the tool?
- **Language usage:**
  - Did you understand everything in the tool? Were the specific buttons well described? Did the description meet with what you expected from the button?
  - Can you recall a specific instance where the language used in the tool contributed to clear communication or, conversely, caused confusion?

    - Are there any parts of the tool where you feel the language could be refined for better user comprehension?
- **Task flow:**
    - Take us through the workflow you performed with the tool. How did you navigate?
    - How easily could you perform the tasks? What did you do first, what next? Was this a logic flow to you? Where there features that impeded the process?
- **Trustworthiness of the tool:**
    - Do you trust the tool and its output?
- When considering recommending the tool, what specific aspects would you highlight to potential users?
- Is there any aspect of your experience with the tool that we haven't discussed, but you feel is important to mention? Any additional insights or suggestions you would like to provide?

Wrap-up: During this part, the moderator summarizes the participants' experiences, enablers and barriers they have encountered while using the TITAN tool or the workshop, asks whether the participants want to discuss or add anything further, and finally thanks the participants for their cooperation and valuable input.

Interview guide: Research modules specifics

The interview guide, wherefor a commonly deployment is described in the above, can be further modified to the specificities of the research modules. Especially, with respect to Research Module 2a, Research Module 2b and Research Module 3, in addition to the commonly deployed interview guide, there are certain concepts that should be tested.

Regarding Research Module 1, in which the TITAN chatbot is tested twice by means of two articles which prompt different types of dialogues, **the following question must be considered**:

- **Lessons learned**: What have you learned in your interaction with the chatbot? In which conversation did you get these insights? When in the conversation did you feel you got these insights?

Regarding Research Module 2a in which the tool is implemented in the ecosystem (viz. workshop), specific questions regarding the relevance of the workshop should be asked. Following questions may be considered:

- **Attractiveness** - Did you like the workshop? Why (not)?
- **Effectiveness** - How valuable were the workshop materials and resources provided?
- **Impact** - Do you feel like your critical thinking has improved after following the workshop? Was that because of the intervention of the teacher, or rather the use with the tool?
- **Content** - Were there parts of the workshop that were now underexposed and that should receive more attention? Parts that were not covered?
- **Value** - Would you recommend the workshop? Why (not)?
- When considering recommending the workshop, what specific aspects would you highlight to potential users?

In Research Module 3, the same interview guide can be used but should be targeted at probing the attitude towards the collaboration module.

Regarding Research Module 2b, in which the tool is implemented in the ecosystem (viz. workshop) and which asks for the user experience of the ecosystem facilitators, specific questions regarding the relevance of the workshop and the easiness to implement it should be asked. Following questions may be considered:

- In what way would you see an implementation of the TITAN functions feasible in the ecosystem?
- Did you feel skilled enough to teach the workshop? How easy was it to implement the workshop? Was there information missing on how to teach the workshop?
- How valuable were the workshop materials and resources provided?
- How useful is the workshop in improving critical thinking among target users? Did you see improvement?
- Were there parts of the workshop that were now underexposed and that should receive more attention? Are there any issues that were not coveremated?
- Would you use this workshop in the future? If not, what should be changed?
- When considering recommending the workshop, what specific aspects would you highlight to potential users?
- Imagine you could only keep one feature of the workshop. Which feature would it be, and why is it indispensable to you?

1.1.3. Phase C: Chat Analysis

After the workshop, the chat history of participants is systematically gathered for in-depth analysis. This process involves topical analysis of the chats between users and the chat bot in order to:

- **Identify barriers in the interaction between user and chatbot**
- **Formulate improvements to create smoother and more critical conversation**

Procedure & Materials

Chat transcripts are collected and identified per participants in order to link them to the results of Phase A and Phase B.

Two coders perform a topical analysis on the transcripts identifying enablers and barriers in terms of:

- Coherence and consistency in the conversation
- Miscommunication between the chatbot and the user
- Positive feedback from user (evaluative coding)

Research Module Specifics

In research module 3, the analysis concerns the final structure of the argument mining in the collaboration module. Besides identifying the aspects mentioned above, the two discussions (one without instructions and one with instructions) are compared to assess the intuitiveness of the tool.

1.2 Second Iteration

The goal of the second iteration, which lasts 8 months (from M27 to M34) **is to pilot a large-scale implementation in the eco-system as intended in the Use Case Scenarios.** As such the main focus lies on reaching the KPIs formulated across and within Use Cases.

The weight of the second iteration lies on **establishing positive technology acceptance and user rate and measurable impact on critical thinking towards misinformation for which a quantitative research method will be used.**

Testing the effectiveness of the developed software system is one of the main scopes of the pilot execution and therefore, the mixed-method design proposed in the Evaluation strategy is targeted at measuring the impact amongst other factors related to user experience and adoption potential.

Especially in the second iteration, quantitative measures of critical thinking and reported behaviour will be analysed to assess the impact of interaction with TITAN on critical thinking and behaviour towards disinformation.

To ensure as much as possible adherence with the theoretical dimensions of reference, the test to assess the level or ability to think critically against misinformation was designed starting directly from the theoretical definitions of **the most robust and validated conceptual model in the psychological literature, that of Facione [9]**. In addition, the options for choosing among the test responses were also kept binary multiple choice based on the preliminary focus groups to avoid burdening the user and to ensure fast and reliable automatic scoring via software. Along with the five specific dimensions of the critical thinking model declined on the content related to the most prevalent misinformation online, variables related to motivation toward online truthfulness or tendencies toward reflexivity were also considered to consider the importance of personal and motivational factors related to self-regulation (as per Facione's model).

In the following sections, the procedure and measures in place for the second pilot iteration will be discussed.

1.2.1. Procedure

Concretely, Use Cases will organize their TITAN-Research Modules in which users are introduced to the TITAN tools in their own specific ecosystems. **Participants will be asked three times to fill in a survey with necessary measures** (socio-demographics, closed questions and Likert scales): once before the Research Module, once directly at the end of the Research Module and once after 3 weeks in a come-back session organised by the pilot administrator. As such, both the short-term and medium-term impact can be assessed.

Moreover, **in order to separate the impact of the TITAN chatbot, the collaboration module and the impact of the framework/workshop** each Use Case adopts in their ecosystem implementation, target users that participate in the pilots will be divided **into three experimental groups**: The first group of participants will receive an introduction to TITAN without any further context besides the assignment to keep practicing for a certain period of time (at least 2 weeks, Use Case specific). The second group will be confronted with the full ecosystem implementation (see Use Cases), including any workshop or other contextual activities that Use Case Facilitators would implement while adopting TITAN. Finally, a third group will receive an introduction to the collaborative module and collectively partake in multiple collaborative discussions. In doing so, the comparison between both groups in three Use Cases will allow us to identify the impact of TITAN, separate from the Ecosystem context.

The timing of the second iteration is illustrated in the table below and encompasses a period of 8 months, of which the first four are used for the implementation of the research modules (RM) and data collection, three months for analysis (A) and the three final months are reserved for reporting (RE) the findings and preparing **D5.2. Pilot Evaluation.**

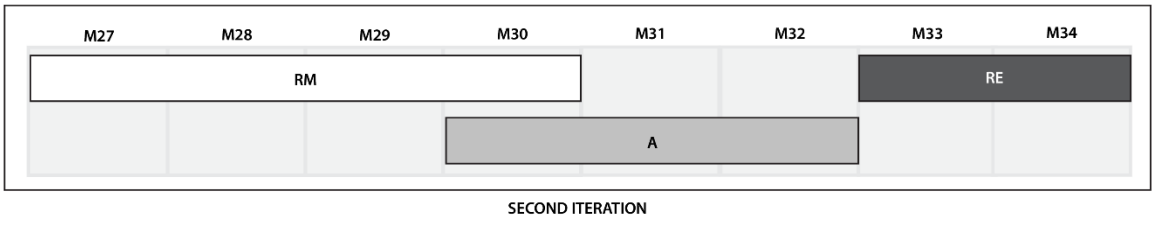


Figure 3 Second iteration (Timeline)

1.2.2. Measures

Each Use Case will use the same basic set of measures, which can be completed with some specific additional measures needed for the Use Cases' internal KPIs.

Six types of data will be collected.
The TITAN system will collect:

A. Log data, such as number of sessions, number of dialogues and other functions (e.g., use of microlessons,…)
B. Critical thinking level, which will be contrasted with their initial assessment.

The following data is collected by means of a survey:

C. Socio-demographic information
D. Attitudes and perceptions of users regarding the user-friendliness, trustworthiness, usefulness of the TITAN tools
E. Attitudes and perceptions of users regarding the user-friendliness, trustworthiness, usefulness of the implementation workshops
F. Intended future behaviour of users regarding fact checking and critical thinking

A. Log data

The following data will be logged by the TITAN system:
In general:

- **Participant ID**: an ID unique to each user and knowledgeable for this user (such as a profile name).
- **Number of logins per week**: How many times has a user logged into TITAN.

Regarding conversations:

- **Number of conversations per week:** How many different dialogues has a user started?
- **Number of conversations started per default article:** How many conversations did a user have per default article in the Use Case.
- **Number of conversations started based on an uploaded article**: As users can upload their own articles, this variable represents the number of conversations users had based on such articles instead of the default ones per Use Case.
- **Number of completed conversations per week**: How many different dialogues has a user completed?
- **Average completion rate per conversation**: If there is a way to assess the completion status of a conversation (e.g. in %), this variable indicates the average across conversations.
- **Average conversation satisfaction rate:** Users rate each completed dialogue on a 5-star scale. This variable is the average of all the user rates of completed conversations.
- **Average conversation satisfaction rate per week:** Users rate each completed dialogue on a 5-star scale. This variable is the average of all the user rates of completed dialogues in a specified week.
- **Total number of chatbot answers per week:** How many times the chatbot gave an answer?
- **Average number of chatbot answers per conversation:**
- **Number of Question Category 1 to 6:** With regards to the 6 categories of Socratic Inquiry, this variable is the number of questions the chatbot asked the participants per Socratic category (6 variables in total).

Regarding other functions:

- **Number of impact propagations per week:** How many times did a user propagate an impact per week.
- **Number of microlessons started per week:** How many times did a user attend a microlesson per week.
- **Number of collaborations started per week** How many times did a user collaborate per week.
- **Number of interactions done in collaborations per week:** How many times did the user contribute to a collaborative chat?
- **Average propagation satisfaction rate:** Users rate each completed impact propagation on a 5-star scale.
- **Average collaboration satisfaction rate:** Users rate each completed collaboration on a 5-star scale.
- **Average micro-lesson satisfaction rate: Users** rate each completed micro-lesson on a 5-star scale.

B. Critical thinking scores

TITAN will log the following data:

- **Critical Thinking:** a total score or scores per dimension on the Critical Thinking Assessment. This assessment is taken before the workshops, directly after the workshop and in the come-back session.
- **Assessment date:** The time stamp of the critical thinking assessment.

The survey will measure **the dispositional critical thinking level** additionally in all three assessments by means of the CTAS (reduced to 15 items) [1]

C. Socio-demographic information

The survey will measure the following socio-demographic information:

- **Login name used in the TITAN platform** (to link the log data with survey data)

The variables below are only measured in the first assessment:

- **Age**
- **Gender** (Female, Male, Non-Binary, I would rather not say)
- **Education level** (No education, elementary, primary, secondary, higher)
- **Country of residence**

The following variables are measure in the first and last assessment:

- **Active News Consumption** (Daily, weekly, every two weeks, monthly, less than monthly)
- **News Media Literacy scale** (short version of [2])
- **General attitude towards AI:** GAAIS [3]
- **Personality in relation with disinformation:** the Propensity to engage in Analytical Reasoning (4 open questions questions) [4]

D. Attitudes towards TITAN

The survey will include the following measures in the second and third assessment:

- **User-friendliness of the TITAN-tools:** System Usability Scale (10 items, 5-point Likert scales) [5]
- **Attitude towards the TITAN tools:** Participants are asked to what extent they found the TITAN tools unappealing-appealing, bad-good, nice-not nice, useful-not useful on a 5-point semantic differential scale based on Spears and Singh [6].
- **Trustworthiness of the TITAN tools:** Participants will rate 6 items on 5-point Likert scales based on the Ethics guidelines for trustworthy AI proposed by the High-Level Expert Group on AI presented Ethics Guidelines for Trustworthy Artificial Intelligence [7]. Participants are asked to indicate to what extent they agree with the following statements: (1) TITAN empowers me to make informed decisions fostering my fundamental rights. (2) I find TITAN resilient, safe and secure. (3) I trust TITAN with the personal data I gave it. (4) I am aware that I am interacting with an AI-based system. (5) I find TITAN fair and unbiased in my interactions with the tools. (6) TITAN benefits all human beings, including future generations. The final guideline of the High-Level Expert Group on accountability was not modifiable into a user-related statement.

E. Attitudes towards the implementation

The survey will include the following measures in the second assessment:

- **Attitude towards the implementation workshop**: Participants are asked to what extent they found the implementation workshop unappealing-appealing, bad-good, nice-not nice, useful-not useful on a 5-point semantic differential scale based on Spears and Singh [6].

F. Intended future behaviour

The survey will include the following measures in all three assessments:

- **Value placed on Truthfulness** (VT; 4 items): “Please think about a topic that is particularly crucial to you. Rate the importance of the following statements on a scale from 1 (Not at all important) to 10 (Extremely important). If you can, avoid giving exactly the same rating for all four items. (1) How important is it for you to learn new things about that topic, even when it requires a very big effort? (2) To you, how important is truthfulness concerning that topic, even when it might lead to uncomfortable situations? (3) How important is it for you to question your knowledge concerning that topic, even when it may involve a major change in your current perspective? (4) To you, how important is acquiring new knowledge concerning that topic, even when it may involve a major commitment?
- **Regulatory Self-Efficacy in Sharing Misinformation** (RSSM; 8 items) [8]
- **The inclination to factcheck** by means of a 10-point Likert scale: How likely are you to factcheck information you see on social media in the future (Not at all likely – very likely)?
- **The intent to keep using TITAN in the future**: by means of a 10-point Likert scale: How likely are you to make use of TITAN solutions in the future (Not at all likely – very likely)?

2. USE CASES

Because the different use cases require a more customized approach, depending on local differences and the stakeholders involved, the present section describes the pilot operation per use case. First the context, stakeholders and envisaged user journey is presented. Then the concrete implementation of resp. The first and second pilot iteration is described more in detail. Deviations from the Evaluation strategy are clearly presented. Where there are no deviations from the Evaluation strategy, this is explicitly stated.

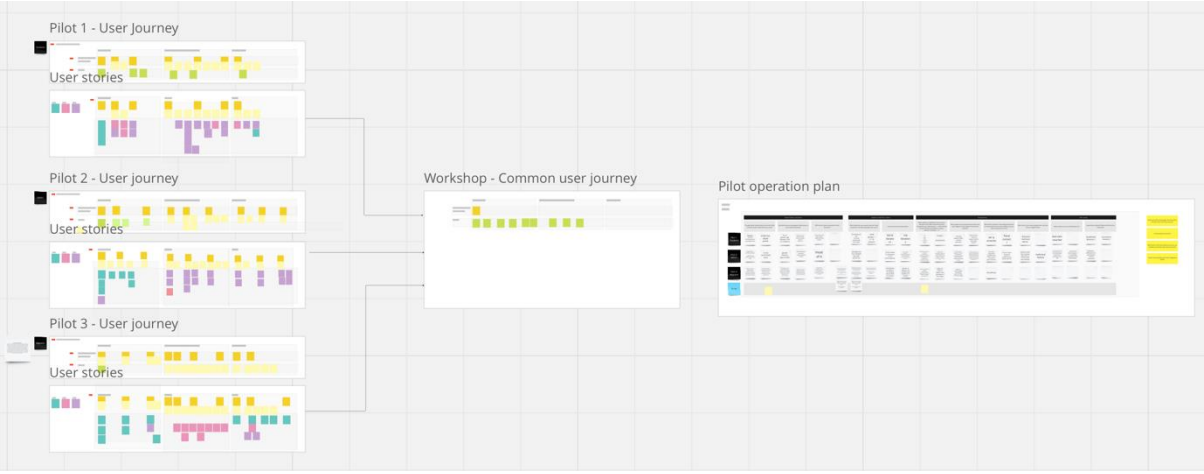


Figure 4 Overview workshop user journeys

Figure 4 provides a comprehensive overview of the workshop conducted to develop specifications for various use cases. This workshop took place during the consortium meeting in Rome, and access to the corresponding Miro board is available through following link. For further details regarding the Miro board, please refer to Annex 6.

2.1 Use case 1: Students (VRT, AHS)

2.1.1 Context

Higher education institutions prepare the citizens of the future, which need to be actively included in the fight against disinformation. Hence, these institutions are responsible for fostering critical thinking and a “fact-checking state of mind” among their students. These students serve as a concerned group of citizens, actively involved in the ubiquitous information environment, hence should have high levels of critical thinking and (news) information literacy.

Within this use case, we want to research if we could support the students and their educators to develop a critical state of mind. By organising workshops, they practice with the TITAN chatbot and learn more about how to be critical themselves.

2.1.2 Users and stakeholders

Main target users – students in higher education

The main target users in this use case are students, and our objective is to ensure diversity by striving for an equitable representation of genders and ethnic backgrounds. Additionally, we are targeting students at various stages of their educational journeys (bachelors and masters), typically ranging in age from 18 to 24 years old.

Our goal is to facilitate workshops that include students from a wide array of educational backgrounds, encompassing not only those specializing in communication, journalism or social sciences who are probably familiar with the concept of critical thinking but also in other fields such as medicine and engineering.

As time in higher education setting is scarce, it is not feasible to bind students and educational programs to a long TITAN trajectory. We will therefore try to reach a large group of students and hope that they will be willing to commit to this educational trajectory.

Ecosystem Facilitator 1 – Lecturers

Our second group of stakeholders are lecturers in higher education, because they are responsible for instructing students and guiding them in discerning trustworthy from questionable (online) information. In the ever-evolving landscape of education, the Titan tools can serve as invaluable supplementary teaching resources, helping educators navigate the increasingly complex teaching environment.

Ecosystem Facilitator 2 - Journalists

There are several journalists and other media professionals actively involved in the Titan program. Their great interest lies in the opportunity it offers to connect with a younger audience. Their objectives include gaining insight into the interests, questions, and concerns of this target group around news and trust. During this process, they also gain insight into what misinformation is circulating among young people, so that they can tailor their news reports accordingly. The journalists involved mainly work in the investigative journalism department. For the public media, it is within their field to unmask viral fake news, for example by writing fact checks.

2.1.3 Ecosystem implementation

The implementation of the TITAN solutions in the ecosystem of Use Case 1 has the objective to create a tailored educational toolbox seamlessly integrated into the higher education curriculum. To achieve this goal, we are implementing the design methodology employed for EDUBoxes—a series of educational kits centered around specific themes. VRT has previously partnered with several collaborators to launch more than 25 EDUBoxes.

The difference between this EDUBox and conventional EDUBoxes lies in the target group, in this case it is an older target audience (students in higher education instead of students in secondary school). For this we expect users to go through the following scenario.

This specific implementation strategy entails the following user journey (a full schematic representation of the user journey is included in annex 6):

Awareness

Educational institutions are being notified of VRT's collaborative effort with field specialists in developing a new EDUBox. Consequently, they can effortlessly integrate this box into the curricula of various study programs that require additional support in fostering critical thinking skills.

Kick-off (workshop)

The EDUBox kicks off with an engaging workshop attended by diverse stakeholders. The objective of this workshop is to offer students initial insights into critical thinking. While it delves into various theoretical aspects, there is also enough time for interactive discussions. This approach allows students to explore different facets of critical thinking. Throughout the workshop, students can connect with peers and actively engage with journalists.

In this workshop, we'll introduce the Titan chatbot. Students are encouraged to make a profile on the Titan platform and have conversations with the chatbot. This provides them with an opportunity to become familiar with the tool and ask questions in case they have questions.

Learning by doing

After the initial workshop, students continue their own learning paths. They are strongly encouraged to maintain regular interactions with the chatbot, as these Socratic dialogues enhance their comprehension of the essential principles of critical thinking. Additionally, they have access to various features within the Titan application, such as microlessons, to further enrich their learning experience and to fully master the concept of critical thinking.

Final Event

The Titan program wraps up with a final event where students come together to share their experiences and the knowledge they've gained. This event provides an opportunity for them to exchange insights with their lecturers and journalists.

2.1.4 First iteration

Analogous to the Evaluation strategy, the first iteration consists of two runs of several Research Modules:

- 3 research modules with the target user of Use Case 1: higher education students
- 1 research module with lecturers
- 1 research module with journalists

This results in 5 Research Modules for each of the 2 runs of the first pilot iteration, being 10 in total.

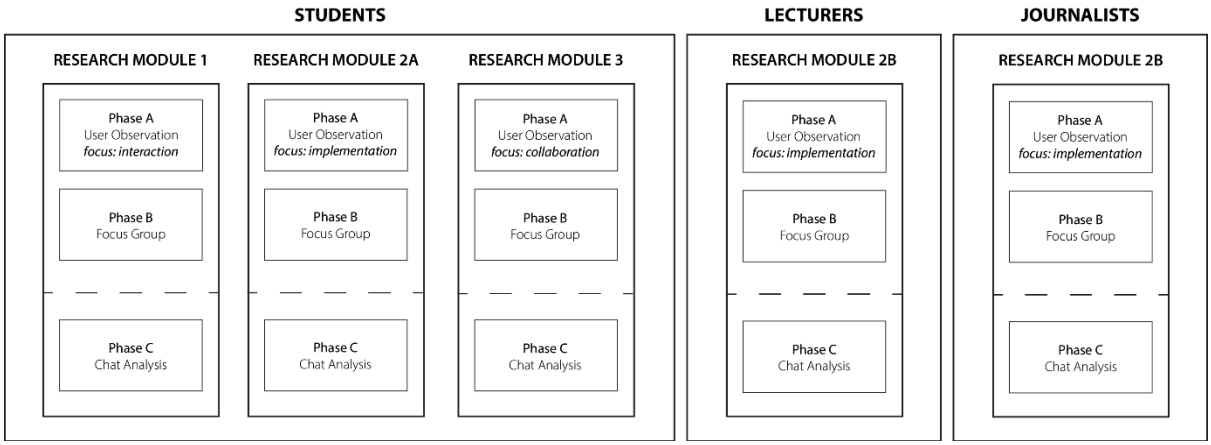


Figure 5 Overview of the Research Modules for Use Case 1

Research Module 1

Participants & recruitment

Research module 1 in Use Case 1 focusses on higher education students. For this Research Module, 5 to 10 higher education students will be recruited in such a way that the sample reflects diversity in terms of gender, background, and educational program (both Humanities as Exact Sciences).

We will engage with students through the standard communication channels commonly employed within universities, such as mailing lists, newsletters, and online learning platforms. To facilitate this, we will create a visually appealing (digital) document (poster) containing all the essential information

for workshop enrolment. An incentive in the form of a voucher worth 35euros will be offered to students that participate.

We will also use our network of lecturers, as they can motivate their students to participate in the workshops.

Procedure, materials and measures
This research module follows the same procedure as the Evaluation strategy in section 1.

Extra inquiries Phase A
No additional steps or analyses is needed. As the focus in this Use Case lies on the conversation function of TITAN. Phase A will prioritize on tasks that are related to this function.

Extra inquiries Phase B
No additional inquiries needed.

Extra Materials
No additional material is needed.

Research Module 2a
Participants and recruitment
Participants and recruitment are identical to Research Module 1.

Procedure, materials and measures
This research module follows the same procedure as the Evaluation strategy in section 3.1.

For this Use Case, the ecosystem implementation consists of an introductory workshop using the EDUbox Critical Thinking that was developed by VRT and Artevelde University of Applied Sciences. The contents of this workshop and further explanation is given in section 2.1.3 Ecosystem Implementation.

Extra inquiries Phase A
The tasks that will be performed with the TITAN tools during the workshop using the first version of the EDUbox Critical Thinking.

Extra inquiries Phase B
In phase B we want to assess the effectiveness of the Titan tool within the context of a workshop, specifically as it is implemented in the EDUbox kit. Evaluating this educational package is critical to understanding its role and impact on participants' propensity to use the Titan tool with or without the EDUBox. To gather comprehensive feedback, we will ask a series of questions designed to elicit insightful responses from participants.

- Why do you believe the workshop and the Titan tools are beneficial (or not) for your education?
- How would you rate the structure of the workshop in terms of its effectiveness in delivering educational content?
- In what ways did the workshop contribute to providing you with additional context relevant to your studies?
- Were there any aspects of the Titan tools or the workshop that you found particularly challenging or confusing?
- Do you feel more motivated or inclined to incorporate the Titan tools into your regular learning activities after participating in the workshop?

- In your opinion, what additional features or improvements could enhance the effectiveness of both the workshop and the Titan tools?

Extra Materials
The EDUBox – Critical Thinking functions as the framework workshop. Because the EDUBox is currently in the development phase, the version to be tested is not yet final. The insights gained during the workshop will guide the optimization and improvement of its content.

Research Module 3

Participants and recruitment

Participants and recruitment are identical to Research Module 1.

Procedure, materials and measures

This research module follows the same procedure as the Evaluation strategy in section 3.1.

Extra inquiries Phase A
No additional inquiries.

Extra inquiries Phase B
No additional inquiries.

Extra Materials
No extra material needed.

Research Module 2b - Lecturers

Participants and recruitment

Participants in this research modules are lecturers in higher education organizations responsible for courses that include critical thinking as a requirement or educational goal. They are consulted to inquire to what extent they feel the TITAN tools and the way it is implemented in Use Case 1, by means of the EDUbox Critical Thinking, is applicable and useful in their educational environment.

For this Research Module, 5 to 10 higher education lecturers will be recruited in such a way that the sample reflects diversity in terms of gender, background and educational program (both Humanities as Exact Sciences).

Procedure, materials and measures

This research module follows the same procedure as the Evaluation strategy in section 3.1. and the procedure of Research Module 2a above, specifically.

Extra inquiries Phase A
No additional inquiries are needed

Extra inquiries Phase B
In this Reseach Module, the implementation strategy and potential are given a higher priority and more elaboration by adding the following questions, early on in the process:

- Do you think this EDUbox and these tools fit higher education pedagogies? Does it fit your course and why/why not?
- Effectiveness of learning material: how effective in conveying core concepts?
- Is the workshop something you would integrate in the Educational Programs? Why/why not? How would you do this?
- To what extend do you believe the kit can support the learning objectives of your course?

- Do you expect the kit to enhance student engagement with the subject? Why? Why not?
- If we are going to develop this instrument further, what should we definitely not delete?
- If we continue to develop this instrument, what else should we add?

Extra Materials
The EDUBox – Critical thinking, which serves as the introductory workshop and a demo of the collaboration module.

Research Module 2c - Journalists

Participants and recruitment

We will work together with journalists affiliated with the VRT news department, especially those involved in investigative journalism. These individuals have valuable experience in exposing disinformation, as evidenced by their role in conducting fact checks as part of their responsibilities within the VRT news department.

To achieve our objectives, we will work with journalists already associated with the VRT news department, more specifically those who work for the investigative journalism department.

Procedure, materials and measures

This research module follows the same procedure as the Evaluation strategy in section 3.1.

Extra inquiries Phase A
No additional inquiries are needed

Extra inquiries Phase B
In this Reseach Module, the implementation strategy and potential are given a higher priority and more elaboration by adding the following questions, early on in the process:

- How do you perceive the role of educational kits like ours in fostering critical thinking skills among students across different disciplines?
- From your experience, what challenges do students commonly face in developing critical thinking abilities, and how can our kit address these challenges?
- How do you envision our kit contributing to the broader goal of creating a generation of students who are not only knowledgeable but also adept critical thinkers across various disciplines?
- How can the EDUBox stay relevant in an evolving media landscape?

Extra Materials
The EDUBox – Critical thinking, which serves as the introductory workshop.

2.1.5 Second iteration

Participants & Recruitment

The recruitment process for participants will mirror that of the first iteration. However, the emphasis now lies in expanding outreach to a larger pool of students. Lecturers in various disciplines are invited to host a guest lecture. This approach ensures a sufficient number of participants from diverse educational backgrounds, facilitating a comprehensive exploration of the entire process. Our strategy involves leveraging the partner networks of Arteveldehogeschool and various educational institutions affiliated with VRT to broaden our reach and engage a more extensive student demographic.

Procedure, materials and measures

We will adhere to the previously outlined methodology, incorporating an additional component that involves posing questions related to the EDUBox and the accompanying educational framework. Participants will be queried about the impact of these tools on their critical thinking skills and how they have contributed to their overall improvement.

The group that receives the workshop in the Use Case will participate in a class where the EDUbox Critical Thinking is used. In this workshop they will be introduced to and practice with the Socratic chatbot of the TITAN solutions.

2.2 Use case 2: NGO - citizens as activists for Europe (CSD)

2.2.1 Context

NGOs are frequently proactive in their efforts to unveil malpractices, not only from governments but also from various stakeholders. Notably in South East Europe (SEE), there has been a recent surge in the propagation of disinformation and propaganda, often intensified by foreign and domestic entities such as government officials, politicians, political parties, and private businesses. To ensure credibility and trustworthiness, NGOs must diligently verify the information they encounter, particularly when addressing issues of disinformation and propaganda, to prevent perpetuating the cycle of false or misleading information. Furthermore, as NGOs actively involve citizens in their initiatives, it becomes imperative for them to educate, guide, and empower these individuals to discern and refrain from disseminating disinformation.

The goal is TITAN to equip civil society activists and their organizations with a holistic framework to enhance critical thinking, fact-checking capabilities, and trustworthiness assessment of information. This includes supporting algorithm training and bolstering the capacity for crowd-sourced fact-checking and disinformation mitigation.

Addressing this, TITAN offers an ecosystem to verify and counter disinformation. In our pilot phase, we partner with the SELDI initiative, an anti-corruption coalition in Southeast Europe (SEE) spanning fourteen countries. Several SELDI partners have already tackled mis- and dis-information issues, undertaking fact-checking and debunking, involving citizens in these efforts. Their primary focus is disinformation undermining core European values in SEE countries. In addition, due to logistics and budget barriers of organising in-person events (workshops and focus groups) for users residing in different countries, the pilot will focus on NGOs and active citizens from Bulgaria through in-person sessions, amended by online sessions (workshop, focus-group) with participants from SEE countries.

2.2.2 Users and stakeholders

Main target users – NGO employees, volunteers, citizens

The pilot test participants predominantly comprise NGO employees and active citizens, whether they have prior experience in combating disinformation. Among those with disinformation expertise, are NGO employees and other experts and practitioners such as academic researchers, think-tank researchers, coaching and training staff, etc. The workshops will also include active citizens (and/or volunteers), i.e. citizens that work with or supports NGOs' activities or are community or politically active.

Ecosystem Facilitators – Experts (journalists, media professionals and fact-checkers)

The group of facilitators comprises of journalists, media professionals and fact-checkers, i.e. practitioners dealing production of news and online information for the general public, as well as with debunking and checking trustfulness of information in their everyday professional activities. In

addition, for the facilitators' group, TITAN system could serve as an additional tool for trainings and capacity building of other users but also for self-learning. While not necessarily experts in disinformation, the facilitators possess experience in creating, analysing and communicating information.

2.2.3 Ecosystem implementation

Our objective is to empower NGO employees, active citizens, media professionals and other experts dealing with disinformation by implementing a comprehensive framework that enhances critical thinking and ultimately improves their ability to assess information trustworthiness. To achieve it, we will rely on the stable long-term collaboration with a vast network of NGOs and other similar organisations and individual experts across the SEE countries and Bulgaria, incl. for implementing various co-creation and participatory approaches in the last decade. Secondary aim will be to engage the most active users of similar tools and services among the active citizens and NGO employees, who are dealing with creating and analysing information in their everyday professional practices in the development of the TITAN system. To do so, we will offer them both internal capacity building through deeper understanding how these tools and services work and a possibility to contribute to the formulation of guidelines and reliability criteria, facilitating the identification of misinformation/disinformation online.
To achieve these objectives, we will design a workshop, which offers the participants to acquire new knowledge and skills that could help them to integrate critical thinking assessment and the TITAN tools into their everyday but also professional activities.

CSD aims to achieve this through a combination of online workshops for SEE (SELDI) regional users and in-person sessions for local (Bulgarian) users.

Awareness

NGO employees in SELDI countries and those from the same countries not part of the SELDI network, media professionals, fact-checkers, disinformation researchers, and civil society activists will receive invitations to contribute to the development of a new services in the domain of assessing the trustfulness of online information, through participation in upcoming workshop series. The value proposition will concern the integration of TITAN tools in their future everyday work.

Kick-off (workshop)

The initial events will introduce the TITAN chat-bot and Critical Thinking Assessment to the participants in the wider context of a discussion about the use and facilitation of critical thinking in consumption of online information. The workshops are planned to be conducted in person in Bulgarian, followed by a hybrid format workshop in English, targeting NGO employees in SELDI countries, in and outside the SELDI network as well as civil society activists. The workshop structure will encompass several phases: initially gathering participants, introducing critical thinking concept to them, introducing them to TITAN's tools via "how-to" sessions and after the workshop, CSD will collect preliminary feedback from all partakers.

Learning by doing

After the initial workshop, participants will have a week to engage with the TITAN system independently. They will be encouraged to conduct several sessions with the chatbot (incl. using their own articles, if this option is working, as expected according to the current planning for the TITAN tools deployment), aiming both at increasing their understanding of the critical thinking principles, and at collecting additional data (dialogues) that could be used as a training set for the chat-bot. Subsequently, CSD will distribute an online feedback questionnaire, collecting responses from the participants' experience with the chat-bot and the critical thinking assessment exercise or any other tools that are ready to be used, such as the citizen collaboration platform. This comprehensive

approach will allow us to analyse and evaluate the effectiveness of the event and the individual participants' engagement with the TITAN tools.

Final Event

CSD will uphold the structure from the kick-off workshop series. Participants will be invited to provide feedback, specifically addressing potential enhancements to the chat-bot, Critical Thinking Assessment methodology or/and the Citizen Collaboration platform. Additionally, we will explore shifts in participants' attitudes toward recognizing disinformation personally and professionally since the workshops began. Insights into their expectations for the second release of the TITAN tools will also be gathered.

2.2.4 KPIs

KPIs to be reached (together with 1st iteration):

- 60+ citizens follow TITAN workshops;
- 50+ users of TITAN tool;
- 60+% finds TITAN useful;
- 150+ dialogues initiated and completed;
- 30+ citizen fact-check on own websites and TITAN repository;
- 15+ flagged fact-check via TITAN;
- 5+ networked or collaborative fact-checks;
- 60+% of 5 different skill levels feel more empowered.

2.2.5 First iteration

In line with the Evaluation strategy, the first iteration consists of two runs **of several Research Modules:**

- 3 research modules with NGO employees and active citizens
- 1 research module with Experts (journalists, media practitioners, fact-checkers)

This results in 4 Research Modules for each of the 2 runs of the first pilot iteration, being 8 in total.

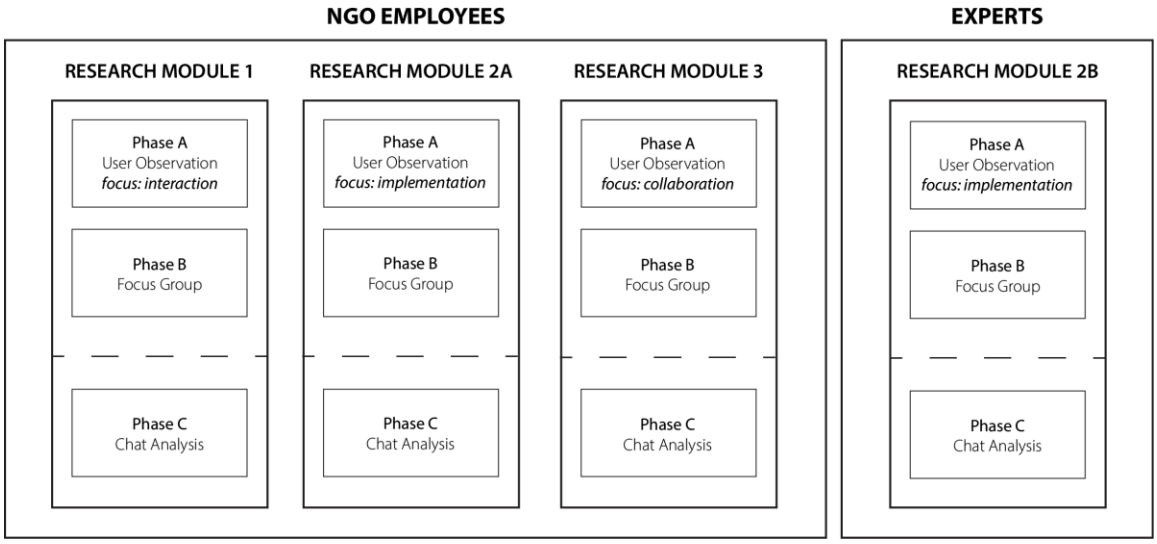


Figure 6 Overview of the Research Modules for Use Case 2

Research Module 1 – NGO employees

Participants & recruitment

We will request NGOs from the SELDI network to share a list of organizations and active citizens they collaborate with. In case GDPR restrictions prevent the sharing of such a list, we propose that they forward our invitation to these contacts on our behalf. Simultaneously, CSD will compile its own list of contacts, reaching out to individuals known to us in SELDI countries (not exclusively part of the SELDI network). In Bulgaria, CSD's understanding of the NGO sector spans three decades, providing a solid foundation for our approach. We will compile a list of organizations and individuals for involvement, emphasizing diversity. Realistically, our focus in Bulgaria involves engaging individuals with diverse backgrounds, working within the NGOs, active citizens and media professionals.

We aim to establish a list of approximately 50-100 people, anticipating successful recruitment of 10-15 individuals, respecting diversity criteria in terms of gender and age at least. As an incentive, we will provide regular updates on new tools developed by TITAN, allowing them to track implementation progress and utilize these tools effectively.

Procedure, materials and measures

This research module follows the same procedure as the Evaluation strategy in section 1.

Extra inquiries Phase A

No additional steps or analyses is needed.

Extra inquiries Phase B

The following main question is posed: "In your perspective, do you think that the interaction with the TITAN tools could be affected by the specifics of your professional activities?" The aim is to understand better the potential enablers and barriers for basic interaction with TITAN tool in particular professional or everyday practices of the participants (i.e. NGOs, academy, civil society groups and initiatives).

Additional questions will be asked to collect information regarding:

- Type of professional setting / activity and corresponding tasks, in which the users will interact with the TITAN tools. Are there any differences that could arise depending on these specifics, e.g. analysing news articles or social media posts by the chat bot.
- Is it possible that potential users/"clients" of the participants to experience specific barriers when they interact with the TITAN tools? In what use cases? What kind of barriers? How could be overcome?

Extra Materials

MIRO or similar service is needed for the online events with non-Bulgarian users.

Research Module 2a

Participants and recruitment

Participants and recruitment are identical to Research Module 1.

Procedure, materials and measures

This research module follows the same procedure as the Evaluation strategy in section 1. The focus of this research module will be on the implementation of the TITNA tools within the framework of the workshop as an ecosystem, as described above.

Extra inquiries Phase A

No additional inquiries

Extra inquiries Phase B

The workshop will focus on the implementation of TITAN tools in the professional activities of the participants, posing the following main question: "In your perspective, how do you believe your professional activities and your organization could benefit (or not) from participating in this workshop and utilizing the TITAN tools?" The aim is to understand better which are the features and functionalities of the TITAN tools that could be applicable in the different professional settings (i.e. NGOs, academy, civil society groups and initiatives) of the users.
Additional questions will be asked to collect information regarding:

- Type of professional setting / activity and corresponding tasks, in which TITAN tools could be used.
- Collaboration settings / procedures in the respective professional activity/task and how TITAN tools could be applied (will TITAN facilitate or burden collaboration – how and why).
- Who are potential "clients"/volunteers, that the participants are working with and how they could benefit from the TITAN tools.

Extra Materials
For online events - MIRO or similar service.

Research Module 3

Participants and recruitment

Participants and recruitment are identical to Research Module 1.

Procedure, materials and measures

This research module follows the same procedure as the Evaluation strategy in section 3.1.

Extra inquiries Phase A
The tasks are aligned with the Evaluation strategy and will focus on the collaboration when using TITAN tools in the eco-system (i.e. the workshop and the original professional settings of the users). Depending on the professional background of the participants, specific tasks will be discussed and given to them, e.g. plan the integration of Critical Thinking Assessment in training activities or use chatbot as a support tool in preparing media article on disinformation (e.g. debunking stories).

Extra inquiries Phase B
The following question is posed: "In your perspective, how TITAN tools could support collaboration needs within and outside your professional organisation / setting?"

Extra Materials
For online events – MIRO or similar service to facilitate conducting an online "focus group".

Research Module 2b – Experts

Participants and recruitment

The participants in this research module are experts, dealing with production of online information, incl. collection, analysis and production of online information, such as media practitioners, journalists, fact-checkers, etc.

We'll ask SELDI NGOs to share their collaboration list of such contacts; if GDPR restricts it, we suggest forwarding our invitation. Simultaneously, CSD will create its contact list, including but not limited to SELDI partners in the respective countries. In Bulgaria, CSD will create a list of potential contacts, comprising of journalists, media professionals and fact-checkers, focusing on individuals, and not on organisations. We anticipate recruiting 5-10 experts from SELDI countries and 5-10 experts from Bulgaria. Depending on the level of English language proficiency of the selected participants, either common online events will be organised for the whole group or the events will be divided for SEE and

Bulgarian participants. As incentives, CSD plans on facilitating networking opportunities with other professionals in the field for them, creating a collaborative environment for sharing insights and experiences. Depending on the budget availability, the participants would be rewarded also in monetary terms, which is expected to increase their engagement.

Procedure, materials and measures

This research module follows the same procedure as the Evaluation strategy in section 1.

Extra inquiries Phase A

No additional inquiries are needed.

Extra inquiries Phase B

In this research module, the aim is to obtain more detailed information about the potential implementation of the TITAN tools in the specific professional context of the experts (journalists, media professionals and fact-checkers). Possible questions to be added since the very start of the module, will include:

- Do you think that TITAN tools (or ones with similar functions) could be applicable in the business processes of your profession, e.g. content production and editorial processes in the newsroom, fact-checking procedures, etc.? Why do you think so?
- How effective TITAN tools (or ones with similar functions) could be for solving specific questions you face at your job? What kind of questions/tasks you would like to solve with similar tools?
- Do you think that the application of the TITAN tools can improve the quality of your products?
- Which additional functions or features, that are not present in the current version of the TITAN tools, you would like to be developed in the future?

Extra Materials

For online events CSD plans on using the MIRO platform.

Phase C of Research modules 1, 2a, 2b, and 3 will follow the Evaluation strategy, as described above. It entails analysis of the chat history and/or any other technical log-data of the participants.

2.2.6 Second iteration

Participants & Recruitment

As stated in the Evaluation strategy, the goal of this iteration is to pilot a large-scale implementation of the TITAN tools in the respective eco-system, i.e. NGOs and active citizens. In addition, this iteration aims at reaching the envisaged KPIs in terms of numbers. The necessary information and data about the participants and their experience with TITAN will be collected by quantitative research methods, i.e. log data (number of sessions, number of conversations, critical thinking levels “before and after”, number of incomplete tasks, etc.) and online survey (socio-demographic information, attitudes and perceptions of users regarding the user-friendliness and usefulness of the TITAN tools, etc.).

The recruitment process for participants will include contacting predefined lists of individuals and organisations (mirroring the procedures of the 1st iteration) but this time trying to have as many as possible contacts in the list (minimum 300 in Bulgaria and 300 in other SELDI countries). Measures will be taken to ensure diversity, incl. gender, age, nationality, domain of professional activity, etc.

Procedure, materials and measures

CSD will implement its own online survey platform, based on the LimeSurvey solution, to conduct the necessary surveys among the participants.

2.3 Use case 3: Migrants (UNINETTUNO)

2.3.1 Context

The European Union is experiencing large migrant and refugee flows, both internal and external, due to the economic environment and socio-economic instability in the greater region, with large populations near or within war zones. The public perception of the "refugee crisis", framed by media shifting from careful tolerance over summer 2015, to an outpouring of solidarity and humanitarianism in September 2015, and to a securitization of the debate and a narrative of fear starting in November 2015, has reasonably represented an obstacle and a threat to effective integration processes.

Furthermore, information manipulation campaigns contributed to increasing hatred against minorities and hence they have a direct negative impact on the fundamental right to human dignity. The integration of migrants and refugees in European cities and the labour market will be addressed in TITAN with a holistic approach to literacy, which is the basis for autonomy, self-realization and occupational integration. Supporting all-round literacy involves bringing together the linguistic, cultural and technological components in a single path. Language through chatbot conversation; culture through contexts, values and interactions in the storytelling; and technological literacy as both a challenge and an opportunity for unleashing the educational potential of interactive technologies.

TITAN tool will support migrants, refugees and students' counter-narrative ideation and definition, providing support in verifying information, access to reliable sources, and describing how a fake news spread in social media. TITAN will support both individual and collaborative researchers, while migrants, refugees and students will benefit from the opportunity for acquiring critical reasoning skills, fact-checking skills in an inquiry-based (informal) learning setting.

In the broader Use Case 3 ecosystem, UNINETTUNO will employ the University for Refugees initiative launched in 2016, providing migrants and refugees access to degree program scholarships by the same entity. Within the University for Refugees and other social integration projects, migrants and refugees work together with UNINETTUNO students for increasing their XXI century skills (collaboration, advanced digital skills, critical thinking) and fighting the fake narratives about migrations' motivations and impact on EU. The contents produced by the participants with the support of TITAN tool will impact citizenship at large through social media and web-based channels, allowing participants to act as "advanced fact-checking based storytellers" and the social media users to receive validated and reliable information about the actual migration process and its background motivations and impact in their countries.

2.3.2 Users and stakeholders

Main target users – Migrants

Use case 3 target group will be composed by representative users for the following migrants and refugees profiles:

- migrants and refugees welcomed in the second Italian reception system Sistema di accoglienza e integrazione (SAI) (ex SPRAR/SIPROIMI) and in the Extraordinary Reception system, currently engaged in UNINETTUNO partners' network activities and service provision;
- migrants and refugees engaged in UNINETTUNO initiatives, including former and current students of the University for Refugees (https://www.universitaperrifugiati.it/en/default.aspx), migrants, asylum seekers and refugees participating in Erasmus+ initiatives coordinated or participated by UNINETTUNO, and migrants and refugees using services or working for volunteer organizations collaborating with UNINETTUNO in running projects and initiatives focused on supporting migrants' integration.

Both migrants in the first phase of their hosting period, during the year of protected housing procedure; and migrants that are outside the reception process and already in their social integration process will not be considered representative users of the target group.

Ecosystem Facilitator 1 – Students from a National panel
Current UNINETTUNO University students living in Italy will be engaged in a national panel;

Ecosystem Facilitator 2 -Students from an international panel
Current UNINETTUNO University students living abroad will be engaged in an international panel;

Ecosystem Facilitator 3 -Local Service Providers
Trainers, social workers and cultural mediators providing migrants and refugees with support for the social integration process will be also involved through Local Service Providers currently partner of UNINETTUNO University, like for example CIES - Centro Informazione e Educazione allo Sviluppo and Programma Integra.

2.3.3 Ecosystem implementation

In this specific scenario, our aim is to develop an educational format, the Titan Laboratory, including both the educational method and the tool, customized for both engaging migrants and students in Use Case 3 implementation. To accomplish this, we are employing a hybrid participatory and collaborative design (co-design) methodology for online and in presence educational sessions as already experimented by UNINETTUNO in former research involving migrants, refugees and service providers. In Titan the different target groups will be entailed in participating to:

- UNINETTUNO Interactive Classes System and online Educational Laboratories,
- in presence Educational Laboratories at Uninettuno Technological Poles and Partners' Network premises.

Iterative Co-design Workshop sessions and Visual Storytelling of the narratives will be integrated as strategies to consider the holistic approach to literacy advocated in the section above. Both the methods will support participation and involvement of migrants and refugees, as well as local service providers, working on integration and migrant support from the very first iteration. In particular UNINETTUNO students, beneficiaries of the initiative "University for Refugees - Education without Borders") will be providing an essential contribution to design and research.

Awareness
UNINETTUNO Partners' Network is being informed that UNINETTUNO is launching the Titan Laboratory through direct communication. Subsequently, UNINETTUNO will define the integration of the Titan Laboratory into migrants and refugees vocational training courses.
UNINETTUNO professors in Psychology and Communication Science curricula will be involved about the integration of this additional educational Laboratory around disinformation and critical thinking in the context of their courses.

Kick-off (workshop)
The Titan Laboratory kicks off with an interactive workshop where the various stakeholders are present. The goal of this workshop is to provide migrants and students with the first insights into critical thinking and the Titan tool. Migrants and students will be encouraged to create a profile on the Titan platform and engage in multiple conversations with the chatbot.
During this workshop visual storytelling will be implemented to assure contents' accessibility and users effective, inclusive, and meaningful participation and to represent cultural aspects and individual

differences, explore different situations, describe personal reactions and feelings, and evaluate the usability of system functions. Visual narratives will also support the Titan Chatbot design and ideation by allowing to analyse, compare and explore different characters and cultural attributes based on ethnographic case studies through scenario-based tasks.

Learning by doing

After the initial workshop, migrants and students will be involved in online and in presence Educational Laboratories to both continue their own learning paths and assure feedback collection. Beyond autonomous and assisted interactions with the chatbot, they will have access to various features within the Titan application, such as microlessons, to further enrich their learning experience and to fully master the concept of critical thinking.

Final Event

The Titan program concludes with a final event where migrants and students gather to share their experiences and the knowledge they have acquired. All the target users, relevant stakeholders and the whole Uninettuno students' community will be engaged in sharing the results of the pilot study and exchange knowledge about how the role of AI in enhancing critical thinking in disinformation.

2.3.4 First iteration

Analogous to the Evaluation strategy, the first iteration consists of **two runs of several Research Modules:**

- 3 research modules with the target user of Use Case 1: migrants
- 1 research module with students national panel
- 1 research module with students international panel
- 1 research module with local service providers

This results in 6 Research Modules for each of the 2 runs of the first pilot iteration, being 12 in total.

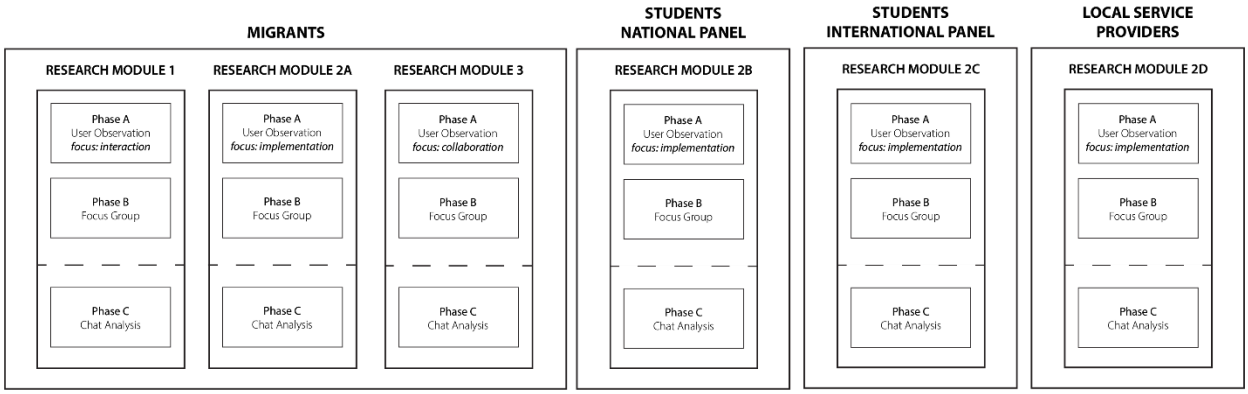


Figure 7 Overview of the Research Modules for Use Case 3

The first iteration of the Titan Laboratory will employ iterative co-design cycles, that will be used to connect target users, physical and virtual spaces, to foster interpretation, planning, and decision-making . Co-design will be applied as an iterative yet incremental process through the following procedure.

Research Module 1

Participants & recruitment

- Official University communication channels; Official University for Refugees channels; National and international students
- e-mail newsletter; media contents (social media posts, short video about Titan + information about the specific case)

Procedure, materials and measures

Research Module 1 user observation will allow the determination of the use context and the recognition of users' needs and requirements; and will engage migrants and refugees in experiments with the Titan Tools, with a specific focus on language issues, cultural discrimination issues and dialogue understanding (5 participants).

Research Module 1 Focus Group will involve Migrants and Refugees and Uninettuno Students, with the goal of exploring different perspective on migration narratives and foster critical thinking on disinformation (5 participants).

Extra inquiries Phase A

In this Research Module, the observation will focus on dialogue and conversation. Logical sequences and exchanges will be tested with the goal of understanding eventual issues with concepts, lexicon, and expressiveness of the agent.

Extra inquiries Phase B

In this Research Module, the implementation strategy and potential are given a higher priority and more elaboration by adding the questions related to the adoption of TITAN in scenario-based and simulation-based training.

Extra Materials

No extra materials are required.

Research Module 2a

Participants and recruitment

Participants and recruitment are identical to Research Module 1.

Procedure, materials and measures

Research Module 2a will allow the determination of the use context and the recognition of users' needs and requirements; and will engage migrants and refugees in experiments with the Titan Tools, with a specific focus on language issues, cultural discrimination issues and dialogue understanding (5 participants).

Extra inquiries Phase A

In this Research Module, the observation will focus on interaction and interface with TITAN.

Extra inquiries Phase B

Focus Group involving Migrants and Refugees and UNINETTUNO Students and professors, with the objectives of cross-fertilization in the Titan Laboratory implementation (5 participants).

Extra Materials

AI chatbot interaction will be complemented by visual narratives to represent cultural aspects of the interactions between the story plot, its characters, and their environment. The development of the narrative will be achieved through a fluid exploration of the characters in their environment, with dialogue added as the characters came to life. Both the two main factors of a narrative – plot, and

story – will be conceived based on user research: plot as the presentation of narrative events and story as the relationship and connection of these events.

Research Module 3

Participants and recruitment

Participants and recruitment are identical to Research Module 1.

Procedure, materials and measures

Research module 3 will engage UNINETTUNO students and professors in experimenting with the Titan Tools; with a focus on Titan Laboratory implementation in the following UNINETTUNO courses: under Communication Science, the Communication Science Lab, the Global Journalism Master, and the Sociology of Communication; and under Cyberpsychology, the Psychology of online deviance, Psychotechnology and Experience Design (5 participants);

Extra inquiries Phase A

In this Research Module, the observation will focus on familiarization strategy, memorability and learnability of the TITAN Collaboration Tool.

Extra inquiries Phase B

Migrants and Refugees will be followed in both individual and group sessions during long-term use of the Titan Collaboration Tool, with a focus on impact of the tool' adoption and on the effectiveness and sustainability of Titan Laboratory implementation (5 participants);

Extra Materials

TITAN Collaboration Tool interaction will be complemented by visual narratives to represent cultural aspects of the interactions between the story plot, its characters, and their environment. The development of the narrative will be achieved through a fluid exploration of the characters in their environment, with dialogue added as the characters came to life. Both the two main factors of a narrative – plot, and story – will be conceived based on user research: plot as the presentation of narrative events and story as the relationship and connection of these events.

Research Module 2b – Students national panel

Participants and recruitment

Participants and recruitment are identical to Research Module 1.

Procedure, materials and measures

Research module 2b will engage UNINETTUNO students Interaction in experimenting with the Titan Tools, with a specific focus on cultural perspectives and narrative about migration (5 participants).

UNINETTUNO students and professors Interaction experiments with the Titan Tools; with a focus on Titan Laboratory implementation in the following UNINETTUNO courses: under Communication Science, the Communication Science Lab, the Global Journalism Master, and the Sociology of Communication; and under Cyberpsychology, the Psychology of online deviance, Psychotechnology and Experience Design (5 participants). Module participants will be recruited with the support of Communication Science and Psychology Faculties by engaging courses' Professors in assigning 3 CFU of their courses to the TITAN Laboratory.

UNINETTUNO students and professors will be followed in both individual and group sessions during long-term use of the Titan Tools, with a focus on impact of the tools' adoption and on the effectiveness and sustainability of Titan Laboratory implementation (5 participants);

Extra inquiries Phase A

In this Research Module, the observation will focus on language understanding, possible misunderstanding and conflicts, and fluid exchange among participants.

Extra inquiries Phase B
Focus group sessions will have with a focus on impact of the tools' adoption and on the effectiveness and sustainability of Titan Laboratory implementation;

Extra Materials
AI chatbot interaction will be complemented by visual narratives to represent cultural aspects of the interactions between the story plot, its characters, and their environment. The development of the narrative will be achieved through a fluid exploration of the characters in their environment, with dialogue added as the characters came to life. Both the two main factors of a narrative – plot, and story – will be conceived based on user research: plot as the presentation of narrative events and story as the relationship and connection of these events.

Research Module 2c – Students international panel

Participants and recruitment

Participants and recruitment are identical to Research Module 1.

Procedure, materials and measures

Focus Group will involve Migrants and Refugees and Uninettuno Students from an international panel and professors, with the objectives of evaluating the cross-fertilization in the Titan Laboratory implementation (5 participants). Module participants will be recruited with the support of Migrants associations in Uninettuno networks by engaging migrants and refugees in the TITAN Laboratory with a shopping voucher as a reward for their time and availability.

Extra inquiries Phase A
In this Research Module, the observation will focus on language understanding, possible misunderstanding and conflicts, and fluid exchange among participants.

Extra inquiries Phase B
Focus group sessions will have with a focus on narratives and counternarratives implementation in TITAN..

Extra Materials
AI chatbot interaction will be complemented by visual narratives to represent cultural aspects of the interactions between the story plot, its characters, and their environment. The development of the narrative will be achieved through a fluid exploration of the characters in their environment, with dialogue added as the characters came to life. Both the two main factors of a narrative – plot, and story – will be conceived based on user research: plot as the presentation of narrative events and story as the relationship and connection of these events.

Research Module 2d – Local Service Providers

Participants and recruitment

This research module follows the same procedure as the Evaluation strategy in section 1 and foresees the involvement of Migrants and Refugees experimenting with the Titan Tools, with a focus on Titan Laboratory implementation in the UNINETTUNO partners' network initiatives (5 participants).

Trainers, social workers and cultural mediators providing migrants and refugees with support for the social integration process will be also involved through Local Service Providers currently partner of

UNINETTUNO University, like for example CIES - Centro Informazione e Educazione allo Sviluppo and Programma Integra.

Procedure, materials and measures

Research Module 2d will involve various stakeholders. The goal of this workshop is to provide local service providers with the first insights into critical thinking and the Titan tool. Migrants and students will be encouraged to create a profile on the Titan platform and engage in multiple conversations with the chatbot.

Extra inquiries Phase A

No extra inquiries are required.

Extra inquiries Phase B

Focus group sessions will have with a focus on power structures, social inclusion, and intersectionality in segregation and marginalization of migrants and refugees.

Extra Materials

AI chatbot interaction will be complemented by visual narratives to represent cultural aspects of the interactions between the story plot, its characters, and their environment. The development of the narrative will be achieved through a fluid exploration of the characters in their environment, with dialogue added as the characters came to life. Both the two main factors of a narrative – plot, and story – will be conceived based on user research: plot as the presentation of narrative events and story as the relationship and connection of these events.

2.3.5 Second Iteration

Participants & Recruitment

The recruitment process for participants will mirror that of the first iteration. However, the emphasis now lies in expanding outreach to a larger pool of students, migrants and refugees.
Lecturers in various disciplines are invited to host a guest lecture and Cultural Mediators and social workers to act as facilitators for the engagement in the second iteration.
This approach ensures enough participants from diverse educational backgrounds, facilitating a comprehensive exploration of the entire process. Our strategy involves leveraging the partner networks of Uninettuno to broaden our reach and engage a more extensive student demographic.

Procedure, materials and measures

We will adhere to the previously outlined methodology, incorporating an additional component that involves the materials foreseen in the TITAN Laboratory. Participants will be queried about the impact of these tools on their critical thinking skills and how they have contributed to their overall improvement.

The group that receives the workshop in the Use Case will participate in a class where the TITAN Laboratory is implemented. In this workshop they will be introduced to and practice with the Socratic chatbot of the TITAN solutions.

3 RISKS & MITIGATION

In our research project, we are aware of the potential risks that may arise and have outlined strategies to mitigate them to ensure the smooth execution of our pilot tests. The first concern is the occurrence of technical issues. Given that the tool we are testing remains a prototype, it is always possible that

technical problems may emerge. To address this as effectively as possible, we have developed a technical support plan.

A second risk involves the possibility of not having enough testers or experiencing tester dropouts during the testing period. To counteract this, we plan to recruit more participants than are actually needed, ensuring a buffer to maintain the required sample size throughout the study.

Thirdly, there is a risk that the timing of the tests may be disrupted by the schedules of both participants and technical partners, due to significant dependencies between these different elements. Recognizing this potential issue, we are committed to maintaining flexible and open lines of communication with all involved parties, allowing us to adjust and realign schedules as necessary to accommodate everyone's needs and ensure the testing proceeds as planned.

Another risk is that the group of participants is not representative enough; we need to ensure that there is sufficient variation among the participants in terms of gender, age, educational background, and geographical location.

An additional risk is that somethings are unclear for the participants while they are using the tool. To address this, we have developed a manual for using the tool. Moreover, we will also discuss with the facilitators about possible situations that could arise during the workshop. We are considering scenarios such as:

- People don't engage in the exercises they are presented with.
- Some participants don't say anything or don't take part in the discussions.
- One participant is too dominant in the group discussions, which limits other participants' chance to state their opinion.
- Some participants have a negative reaction to the exercises they are presented with.
- Some participants don't understand the exercises, for example, because of language barriers.

We cannot entirely eliminate these risks, but we will engage in discussions with the facilitators to explore plausible scenarios and exchange ideas on how to best address them. Furthermore, we are collaborating with experienced facilitators, which we believe will assist in identifying effective solutions to these issues.

4 TECHNICAL SUPPORT PLAN

During the testing phase, it is imperative to have robust technical support in place, given that we are working with a prototype that is still undergoing development. To ensure this as smooth as possible we have set up a technical support plan.

Planning
We will alert our technical partners at least 2 weeks in advance about the ongoing testing activities. The goal of this is twofold; On the one hand, this should ensure that they can provide backup and resolve technical problems if they arise during these tests. On the other hand this should ensure that no major software updates are planned during this test phase.

Internal stress tests

In anticipation of important technical changes that coincide with the testing phase, we will conduct internal stress tests with various pilot partners. These stress tests will simulate potential scenarios that will require technical adjustments during the pilots, allowing us to assess the resilience and readiness of the system.

First line support
We will set up a dedicated Teams channel to facilitate communication between the technical partners and the pilot partners. This channel will serve as a centralized platform for technical issues that will arise during the pilots.

There are 2 errors that could occur during the test:

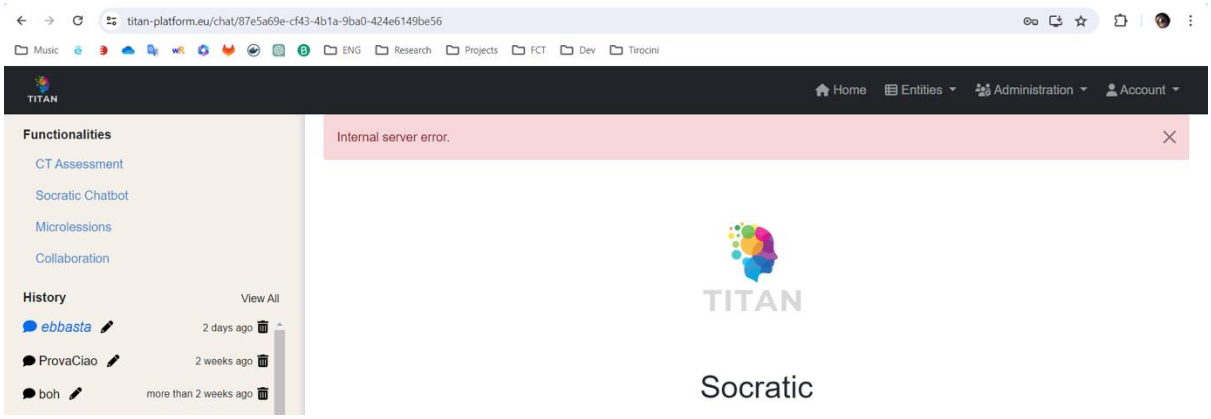


Figure 8 Error message 1, the error message refers to app errors

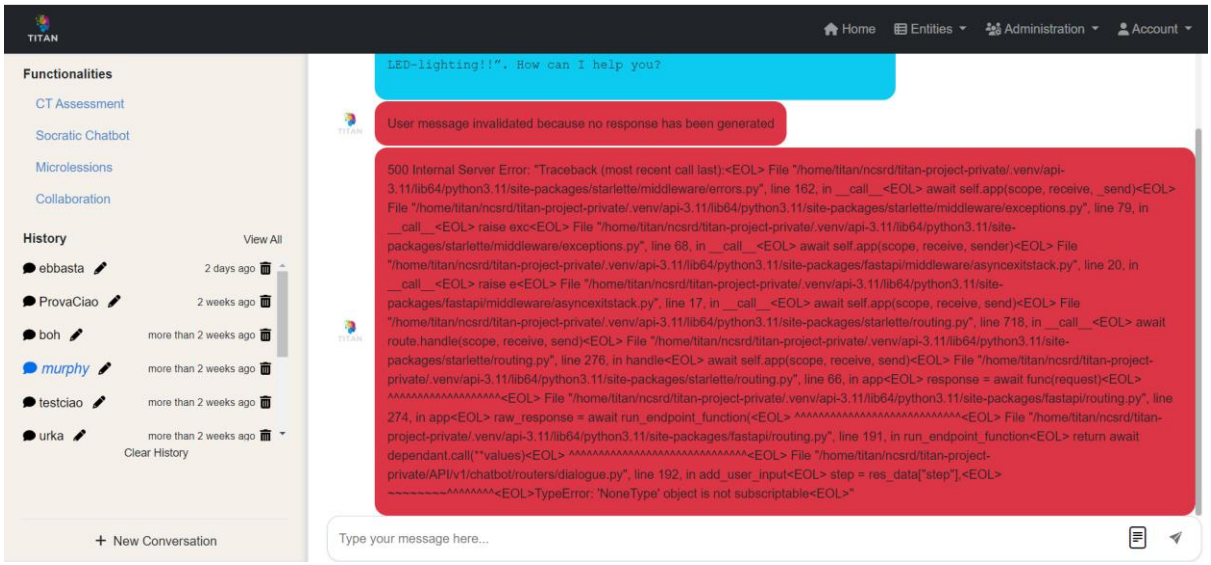


Figure 9 Error message 2, the error message refers to errors related to the chatbot service from NCSR

5 MONITORING PLAN

Purpose: This plan aims to guide the monitoring of the proper execution of the three pilot use cases as described in the previous chapters. Its purpose is twofold: to ensure that the execution meets the planned objectives, incl. the achievement of the initially defined KPIs, and to collect the necessary information and data, that would help to provide early feedback and to report and evaluate the

implementation of the three pilots to ensure the development process is heading the right way. It should also help the project partners to conduct the pilot in a timely and sound manner. However, the monitoring plan is not dealing with the evaluation of the pilots, i.e. the end-user experience of TITAN results, which will be assessed separately (in Task 5.4).

The monitoring plan follows the logic of the Evaluation strategy and the respective planned activities within each of the use cases. It also supports the iterative development approach of the TITAN project. Thus, both the Evaluation strategy and the Monitoring Plan provide for iterative development with short cycles, so that early user feedback can be collected, analysed and fed back into the next cycle, while keeping detailed account for future reviews.

Despite the common approach in the development and application of the Monitoring Plan, it could be customised for each use case through the adaptation of the methods and indicators based on the specific learning objectives and the context of the use case. The Plan will also ensure that monitoring methods don't overburden participants or pilot partners. Last but not least, the plan aims at promoting a learning environment, emphasizing that monitoring results and feedback are used for improvement of the process of developing TITAN tools rather than for individual assessment.

Monitoring methods:

1. Pre-implementation:

- **Develop a timeline for the implementation of each case study,** following the general terms of the Evaluation strategy, but specifying the details according to the specifics of the use case. The timeline should cover both First and Second iterations, and is intended to be a living document that will need to be adapted in the light of feedback and implementation needs. The timeline needs to address not only the relevant steps - research modules and their respective phases or stages (as per the Evaluation strategy) but also relevant internal deadlines and milestones for specific activities, e.g. preparation of summary of results from a given stage, etc.
- **Adjust and if necessary – reformulate the originally planned KPIs for** each use case, detailing the sources and the frequency of collection of relevant information and data. Any reformulation of already planned KPIs must be properly justified.

Each use case timeline will be developed per weekly periods, indicating when the particular stage will take place and detailing as much as possible three steps in the implementation of each stage – preparation, execution and summarisation of results.

2. Implementation

Following the timeline established for each use case and in accordance with the Evaluation strategy, detailed information and data should be collected for each planned event using pre-defined templates, including as a minimum:

- Number and basic socio-demographic characteristics (i.e. age, gender, relevant recruitment criteria and other background information) of the participants;
- Date, location and type of event
- Components of the TITAN tools that have been tested and their relevant version
- A short feedback form to be completed and collected at each event to gather participants' insights on the content, delivery, and overall effectiveness of the event.
- Data and information required to report on the achievement of predefined KPIs per use case. The predetermined KPIs refer to two sub-groups of indicators: general ones that are valid for the three pilot use cases in total and specific indicators per use case as presented below.

Number	Type	Indicator
KPI5.1	Number of iterations	2 iterations per use case
KPI5.2	Gender balance	Min 50% users are female
KPI5.3	Geography	Users are from min 3 EU States
KPI5.4	Skills	50% have not fact checked before
KPI5.5	No. of sessions on TITAN ecosystem	min 1000
KPI5.6	Citizen's Perceived usefulness	Iteration 1: 60% ; Iteration 2 : 80%
KPI5.7	New fact-checking collaborations	Iteration 1: 5 ; Iteration 2: 10

Table 2: General KPIs

UC1: Need for 'fact-checking state of mind'	UC2: Erosion of citizens' trust towards institutions	UC3: Misinformed migrant perception in EU
5.1 150+ citizens in TITAN workshops;	5.1 60+ citizens follow TITAN workshops;	5.1 50+ citizens follow TITAN workshops;
5.2 100+ users of TITAN tool;	5.2 50+ users of TITAN tool;	5.2 50+ users of TITAN tool;
5.3 60+% find TITAN useful;	5.3 60+% finds TITAN useful;	5.3 60+% finds TITAN useful;
5.4 400+ dialogues initiated;	5.4 150+ dialogues initiated and completed;	5.4 150+ dialogues initiated and completed;
5.5 50+ citizen fact-check update by VRT;	5.5 30+ citizen fact-check on own websites and TITAN repository;	5.5 10+ citizen fact-check from citizen community on own websites and TITAN repository;
5.6 50+ flagged fact-check via TITAN;	5.6 15+ flagged fact-check via TITAN;	5.6 15+ flagged fact-check through TITAN;
5.7 30+% shorter fact-check time;		
5.8 15+ networked fact-checks;	5.7 5+ networked fact-checks;	5.7 5+ networked fact-checks.
5.9 60+% of 5 different skill levels feel more empowered.	5.8 60+% of 5 different skill levels feel more empowered.	

Table 3: Specific KPIs

The pre-defined templates (see Annex 2) for information and data collection will also include a specific section on lessons learnt, i.e. a summary of possible feedback from the event on specific issues or challenges faced during the event that should be addressed in next events or in the overall

development of the TITAN tools. To achieve better integration of the monitoring results in the project planning and activities, WP5 team will conduct a regular monthly or bi-monthly meetings with other project partners to facilitate the integration of users' feedback in the TITAN system.

All the information and data to be collected will be in a structured format that allows for aggregation within and across the use cases. To ensure this, the partners will develop the necessary templates in advance. The information and data, collected according to the monitoring plan could partly overlap with the respective information and data, collected as part of the implementation of the pilot use case, e.g. the socio-demographic information of the users participating in the Second iteration could also be used for monitoring purposes, while the attitudes and perceptions of the users with regard to the user-friendliness, trustworthiness, and usefulness of the TITAN tools, would be beneficial for the evaluation of the overall feedback from the tools development.

3. Post-implementation:

Use case review: In order to support fast feedback integration of monitoring results into the overall project planning and execution, each pilot partner will summarise the information and data collected for the respective use case at the end of each Research module in the framework of First iteration, as well as at the end of Second iteration, with a particular focus on:

- Information collected through the feedback forms, focusing on recurring themes related to the workshop content, delivery, and impact that could be fast addressed in next development cycles of the TITAN system.
- Achievement of the pre-defined KPIs

The intermediate reviews (3 or 4 per use case) for the First iteration will then feed the final monitoring report for this iteration.

4. Reporting:

- Summarise the collected data into clear reports that highlight key findings and areas for improvement. During the First and the Second iterations, at the end of each use case a short working report should be produced for each one of them, summarising the information and data collected. These reports will early feed in the necessary information into the TITAN iterative development process, as well as the preparation of the respective Technical report of the project (i.e. administrative reporting requirements).
- Share the reports across the use cases and with other project partners to keep them informed and to encourage data-driven decision-making in the project planning. Monitoring results will be periodically shared and reviewed by a multidisciplinary team, including technical and SSH partners, to support the iterative development of the TITAN tools.

6 REFERENCES

[1]	Payan-Carreira R, Sacau-Fontenla A, Rebelo H, Sebastião L, Pnevmatikos D. Development and Validation of a Critical Thinking Assessment-Scale Short Form. Education Sciences. 2022 Dec 19; 12(938): 1-19.
[2]	Maksl A, Ashley S, Craft S. Measuring news media literacy. Journal of Media Literacy Education. 2015;6(3):29-45.
[3]	Schepman A, Rodway P. The General Attitudes towards Artificial Intelligence Scale (GAAIS): Confirmatory validation and associations with personality, corporate distrust, and general trust. International Journal of Human–Computer Interaction. 2023 Aug 9; 39(13): 2724-41.
[4]	Thomson KS, Oppenheimer DM. Investigating an alternate form of the cognitive reflection test. Judgment and Decision making. 2016 Jan;11(1):99-113.
[5]	Brooke J. SUS-A quick and dirty usability scale. Usability evaluation in industry. 1996 Jun 11;189(194):4-7.
[6]	Spears N, Singh SN. Measuring attitude toward the brand and purchase intentions. Journal of current issues & research in advertising. 2004 Sep 1;26(2):53-66.
[7]	AI H. High-level expert group on artificial intelligence. Ethics guidelines for trustworthy AI. 2019;6.
[8]	Paciello M, Corbelli G, D'Errico F. The role of self-efficacy beliefs in dealing with misinformation among adolescents. Frontiers in Psychology. 2023 May 18;14:1155280.
[9]	Facione P. Critical thinking: A statement of expert consensus for purposes of educational assessment and instruction (The Delphi Report); 1990; Newark, USA.

ANNEX 1: INFORMED CONSENT FORM

Dear participant,

Thank you for taking part in this workshop.

In order to organize the event, we will collect information about your:

Name

Age

Gender

Area of living

Education

Email

[payment information and address, for transport reimbursement]

We will collect this data to ensure diversity in the people participating in the workshop and to be able to contact you with practical information.

Your personal data will only be used for this purpose and will not be shared with any third parties.

Your contributions during the event will be anonymous and will after the event be used for analysis in a public report.

Information with personal data used to organize the meetings will be kept until all administration has been finalized, except for the sign-up sheet and payment information, which we are legally obliged to store for financial reporting, for 5 years after the project is completed in 2026. Then it will be deleted.

The workshop is organized by **[please fill in your own name and organisation],** on behalf of TITAN.

You can withdraw your consent to participate at any time and request that your data be deleted by contacting **[please fill in your responsible project manager, organisation and her/his email].** However, you cannot withdraw contributions when they are anonymized, or data necessary for financial reporting.

I have understood the terms and would like to participate.

Date: _____ Signature: _____

ANNEX 2: KPI DASHBOARD + TIMELINE

The Monitoring plan uses pre-defined templates, which will allow the pilot partners to collect the information and data, necessary for the planning and monitoring of the pilots' execution. Examples (screenshots) of the elaborated templates are presented below, while the actual templates will be used in EXCEL format as a living document, which will be revised during the pilots. The templates (and particularly the "timeline" of each pilot) will serve also as coordination tool for all project partners, that need to coordinate their activities, related to the development and deployment of the updated functionalities of different TITAN tools. Particularly, the "Pilots' timeline" could be implemented also in form of shared Google calendar, if the project partners consider it as better option for keeping all partners updated through active notifications about the different steps in the pilots' implementation.

UC1: Timeline

		Feb24	Mar24	Apr24	May24	Jun24	Jul24	Aug24	Sep24	Oct24	Nov24	Dec24	Jan25	Feb25	Mar25	Apr25	May25	Jun25
		M18	M19	M20	M21	M22	M23	M24	M25	M26	M27	M28	M29	M30	M31	M32	M33	M34
		First iteration									Second iteration							
											Research modules & data collection						Reporting	
														Analysis				
Research module 1: Students	**Phase A: User observation**																	
	No of participants			5										25				
	Preparation (put dates)			15.03 - 14.04										10.01 - 20.01.2025				
	Execution (put the date)			15/04/2024										########				
	Summarisation of results (put dates)			16.04 - 30.04										26.01 - 15.02.2025				
	TITAN components to be tested			CTA v.1, chatbot v2, microlessons										CTA v.1, chatbot v2, microlessons				
	Phase B: Focus group																	
	No of participants																	
	Preparation (put dates)																	
	Execution (put the date)																	
	Summarisation of results (put dates)																	
	TITAN components to be tested																	
	Phase C: Log analysis																	
	Summarisation of results (put dates)																	

UC1: Participants details

First iteration

Research module 1: Students	Phase A: User observation	No	TITAN system ID	Participant's name	Gender (F/M)	Age	Educational program	Note on background	Nationality	Fact-checking skills (Y/N)
	[add as many rows as necessa	1								
		2								
		3								
		...								
	Phase B: Focus group	No	TITAN system ID	Participant's name	Gender (F/M)	Age	Educational program	Note on background	Nationality	Fact-checking skills (Y/N)
	[add as many rows as necessa	1								
		2								
		3								
		...								
Research module 2A: Students	Phase A: User observation	No	TITAN system ID	Participant's name	Gender (F/M)	Age	Educational program	Note on background	Nationality	Fact-checking skills (Y/N)
	[add as many rows as necessary]									
	Phase B: Focus group	No	TITAN system ID	Participant's name	Gender (F/M)	Age	Educational program	Note on background	Nationality	Fact-checking skills (Y/N)
	[add as many rows as necessary]									
Research module 3: Students	Phase A: User observation	No	TITAN system ID	Participant's name	Gender (F/M)	Age	Educational program	Note on background	Nationality	Fact-checking skills (Y/N)
	[add as many rows as necessary]									
	Phase B: Focus group	No	TITAN system ID	Participant's name	Gender (F/M)	Age	Educational program	Note on background	Nationality	Fact-checking skills (Y/N)
	[add as many rows as necessary]									
Research module 2B: Lecturers	Phase A: User observation	No	TITAN system ID	Participant's name	Gender (F/M)	Age	Educational program	Note on background	Nationality	Fact-checking skills (Y/N)
	[add as many rows as necessary]									
	Phase B: Focus group	No	TITAN system ID	Participant's name	Gender (F/M)	Age	Educational program	Note on background	Nationality	Fact-checking skills (Y/N)
	[add as many rows as necessary]									
Research module 2C: Journalists	Phase A: User observation	No	TITAN system ID	Participant's name	Gender (F/M)	Age	Educational program	Note on background	Nationality	Fact-checking skills (Y/N)
	[add as many rows as necessary]									
	Phase B: Focus group	No	TITAN system ID	Participant's name	Gender (F/M)	Age	Educational program	Note on background	Nationality	Fact-checking skills (Y/N)
	[add as many rows as necessary]									

Second iteration

Research module 1: Students	Phase A: User observation	No	TITAN system ID	Participant's name	Gender (F/M)	Age	Educational program	Note on background	Nationality	Fact-checking skills (Y/N)
	[add as many rows as necessa	1								
		2								
		3								
		...								
	Phase B: Focus group	No	TITAN system ID	Participant's name	Gender (F/M)	Age	Educational program	Note on background	Nationality	Fact-checking skills (Y/N)
	[add as many rows as necessa	1								
		2								
		3								
		...								
Research module 2A: Students	Phase A: User observation	No	TITAN system ID	Participant's name	Gender (F/M)	Age	Educational program	Note on background	Nationality	Fact-checking skills (Y/N)
	[add as many rows as necessary]									
	Phase B: Focus group	No	TITAN system ID	Participant's name	Gender (F/M)	Age	Educational program	Note on background	Nationality	Fact-checking skills (Y/N)
	[add as many rows as necessary]									
Research module 3: Students	Phase A: User observation	No	TITAN system ID	Participant's name	Gender (F/M)	Age	Educational program	Note on background	Nationality	Fact-checking skills (Y/N)
	[add as many rows as necessary]									
	Phase B: Focus group	No	TITAN system ID	Participant's name	Gender (F/M)	Age	Educational program	Note on background	Nationality	Fact-checking skills (Y/N)
	[add as many rows as necessary]									
Research module 2B: Lecturers	Phase A: User observation	No	TITAN system ID	Participant's name	Gender (F/M)	Age	Educational program	Note on background	Nationality	Fact-checking skills (Y/N)
	[add as many rows as necessary]									
	Phase B: Focus group	No	TITAN system ID	Participant's name	Gender (F/M)	Age	Educational program	Note on background	Nationality	Fact-checking skills (Y/N)
	[add as many rows as necessary]									
Research module 2C: Journalists	Phase A: User observation	No	TITAN system ID	Participant's name	Gender (F/M)	Age	Educational program	Note on background	Nationality	Fact-checking skills (Y/N)
	[add as many rows as necessary]									
	Phase B: Focus group	No	TITAN system ID	Participant's name	Gender (F/M)	Age	Educational program	Note on background	Nationality	Fact-checking skills (Y/N)
	[add as many rows as necessary]									

UC1: Lessons learnt

For each event describe a summary of possible feedback on specific issues or challenges faced during the event that should be addressed in next events

Research module 1: Students	**Phase A: User observation**	
	Lessons learnt	*[describe here]*
	Phase B: Focus group	
	Lessons learnt	*[describe here]*
	Phase C: Log analysis	
	Lessons learnt	*[describe here]*

ANNEX 3: INVOLVEMENT AND RESPONSIBILITY OF THE PILOT PARTNERS

Task	Organisation	Persons involved
Pilot operation plan	VRT, AHS	Tim Van Lier, Catho Van Den Bosch, Edward De Vooght
Pilot monitoring	CSD	Todor Galev, Svetoslav Malinov, Connor O'Kelley
Data collection pilot 1	VRT, AHS	Tim Van Lier, Catho Van Den Bosch, Edward De Vooght, Marie-Bénédicte Poittie, Femke De Loose, Simon Truwant, Laurien Desimpelaere, Jan Boesman
Data collection pilot 2	CSD	Todor Galev, Svetoslav Malinov, Connor O'Kelley, Goran Georgiev, Gloria Trifonova
Data collection pilot 3	Uninettuno	Giuseppe Corbelli, Alessandro Pollini
Technical support chatbot	ENG	Marco Cipolla
Technical support collaboration tool	Swarmcheck	Marcin Wozniak

ANNEX 4: PRELIMINARY MANUAL FOR THE TITAN TOOL

TITAN TOOL

To get started using the TITAN tool:

- You need to create a user by making a username and an email.
- You don't have to put your actual email, but to be able to log in again, you need to remember both the username and email you used.
- The tool has an option called "forgot password," but it is not configured yet, and therefore you will not get any information from the tool, about passwords or other things.
- If you forget your password, the email you used, or username, you would have to create a new user.
- The data used for training the tool will be anonymised, which means that the login name and email are not used in the training materials.

What is the TITAN tool and how does it differ from other tools:

- TITAN is not a fact-checking tool. First of all, it will not give concrete answers on whether something is disinformation or not. The chatbot will ask the user questions to help them think about different disinformation aspects, stimulating critical thinking is central here.
- It differs from other tools by providing a Critical Thinking Assessment, which it considers in the dialogue.
- It differs from, for example, ChatGPT, which answers questions from its users very concretely. TITAN does it the other way around. It asks its users questions and never gives an answer (using the Socratic method as the central part of the functionality).

How the TITAN tool works currently:

- Currently, two functionalities are available in the TITAN tool: A CTA and a chatbot offering a Socratic dialogue with the chatbot about 10 predefined articles.
- The TITAN tool analyses the articles; it looks for specific predefined disinformation signals and bases its questions in the dialogue on the signals that were found in the specific articles.
- Furthermore, it uses the CTA score to adapt the dialogue, using different questions depending on the score of the user. (If the user has a good CTA, the highest level is 3, the chatbot will skip the first step in the dialogue, meaning it is shortened a bit. Each dialogue goes through six different steps, based on literature about six steps in the critical thinking process. If a user scores high on the CTA, the first step is skipped, and “only” five steps remain in the flow of the Socratic dialogue.)

How it will work in the final version:

- In the final version of the tool, you will be able to add your own article, by pasting a URL/link, and then the tool will analyze the disinformation of the article.
- The dialogues will be shorter and more to the point. Possibly, you can also decide on different kinds of dialogues, depending on the goal you have for training your own critical thinking.
- The micro-lessons will be fully implemented.
- There will be a collaboration component as well as a propagation impact assessment (PIA) component.

- The tool will be available in different languages.
- The TITAN project ends in 2025, and hopefully, we will have a final version of the tool ready by then.

What do you contribute to when testing the TITAN tool:

- The dialogues done by the citizens/participants are used to train the TITAN AI model. It will make it possible to develop the questions of the chatbot from being predefined (rule-based) to make the chatbot capable of asking the users questions based on their responses. Therefore, each dialogue from citizens will train the machine learning model to make better questions and dialogues in the future.
- You need to answer the chatbot in English. You would be able to answer it in other languages too, however, this will not be helpful for the training of the machine learning model.

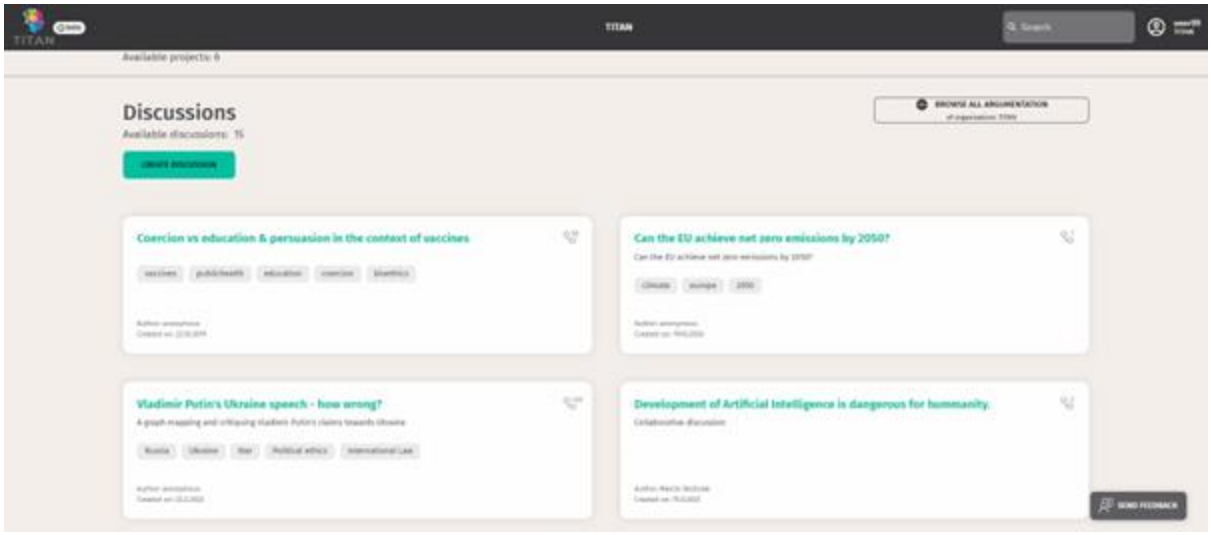
COLLABORATION TOOL

Instructions on how to use TITAN collaboration module

I. Logging in. This step will be compleatly skipped in next release of TITAN. However, currently shared TITAN login is under construction. Temporarily users need to separately login into the module. To make this process faster it is recommended to create test accounts for users before pilots. And log in for them.

1. Click on the link for Collaboration Module:
   https://app.swarmcheck.ai/org/TITAN?share=NjUxNjg3YjcxZTRhYjY1NDAxNTcwYmRjLjBkZGNiYWVhY2E0ZWIzMmI3OWRmMTgzNDcwYWMyOGUzNTgzNjE4ZDBlMTE5MTVjMTM1YjgxNzQ4ZDA3M2UzYzc=&lang=en
2. Click “log in”
3. Pick a method of creating an account:
   Options Google or Microsoft require only loging into respective account. -> Skip to step 11
   Option “Email” will check if the email is registered into platform.
   If email is not registered yet click on button “register”

4. Select “send verification code”
5. Open your email and copy verification code
6. Copy verification code into the input box and select “verify code”
7. Type new password and select “create”
8. Create your username and accept terms and conditions and privacy policy
9. Select all languages you want to see discussions in from the list
10. You should see list of discussions in TITAN:



II. Browsing discussion list

1. Pick a discussion topic by selecting green title

2. Or start a new discussion by selecting “create discussion” and providing following information:

III. Discussion

Argument mapping helps with navigating the intellectual space of any given topic without getting lost. Imagine yourself as a cartographer who relevals any relevant statement and share their discoveries with a community who shares the same purpose.

1. Familiarize yourself with the anonymous argumentation of other group members written on a shared map. You can browse the argument map with mouse scroll or arrow keys on the keyboard.
2. Every box contains a claim (thesis statement) that can be addressed.
3. Green arrows points to conclusions being supported by a claim, red arrows points to conclusions being undermined by a claim.
4. Threads naturally form in the discussion. It is important to address them directly.
5. To address a given claim/thesis, click on the button  and then select the action type this will determine the type of relation.

Types of action available

- Agreement prompts you to type claim that supports selected claim.

- Disagreement prompts you to type claim that undermines selected claim.

- Steelman prompts you to rephrase a claim to formulate it more precisely.

- Source allows to add bibliography and or links as a source or multiple sources of selected claim.

6. When typing the thesis, you can reuse the same sentences in different contexts, thus creating a new connection between different claims on the map or between different discussions.
7. You can edit or delete your own arguments after selecting icon and choosing which action you want to do. This is possible until someone addresses them or reuses them. After that they have become a part of public discourse.

ANNEX 5: SECOND PILOT ITERATION COMPLETE SURVEY

PART 1 - INFORMED CONSENT
(see annex 1)

PART 2 – SOCIO-DEMOGRAPHICS

This part is only included the first of three measurements comprising the second pilot iteration.

Age – What is your age?
Gender – With which gender do you identify the most?
(1. Female, 2. Male, 3. Non-Binary, 4. I would rather not say, 5. None of the above)
Education level – What is the highest diploma you obtained?
(1. Primary, 2. Secondary, 3. Bachelor, 4. Master or PhD, 5. None of the above)
Country of residence – In which country are you currently living?
Fact-checking experience – How much experience do you have in fact-checking information?
(2. Quite a lot, 1. Somewhat, 0. Almost none).

PART 3 – CRITICAL THINKING

This part is included in all three measurements comprising the second pilot iteration

Critical thinking assessment-scale short form [1] - (Reduced to 18 items and rephrased to be more comprehensible) To what extent do you agree or disagree with the following statements? (1=strongly disagree; 5= strongly agree):

1. I try to figure out the content of the problem.
2. I classify information in a systematic way.
3. I examine the values that underlie information.
4. I examine how opinions relate to each other.
5. I figure out the reasoning process behind what others say or write.
6. I figure out whether the reasoning of others builds on claims for which they give no proof.
7. I seek the truthfulness of the evidence that someone provides for their claim.
8. I search for additional information that might support or weaken an argument
9. I examine the reasoning of an objection to a claim
10. I collect abundant evidence to back up opinions.
11. I figure out the merits and demerits of a solution while comparing them to other alternatives in order to make decisions.
12. I arrive at conclusions that are supported with strong evidence.
13. I can describe the consequences of a problem by thinking logically.
14. I can logically present results to tackle a certain problem.
15. I can explain a key concept to clarify my thinking.
16. I review sources of information to ensure important information is not overlooked.
17. I continually revise and rethink strategies to improve my thinking.
18. I reflect on my thinking to improve the quality of my judgment

PART 4 – BEHAVIOR AND DISPOSITIONS

This part is included in the first and last of three measurements comprising the second pilot iteration

Active News Consumption – How frequently do you actively consume news articles online or in print?
(1. Daily, 2. Weekly, 3. Monthly, 4. (Almost) never)

News Media Literacy [2] – To what extent do you agree or disagree with the following statements (1=strongly disagree; 7= strongly agree)?

1. The owner of a media company influences the content that is produced.
2. News companies choose stories based on what will attract the biggest audience.
3. Individuals can find news sources that reflect their own political values.
4. People pay more attention to news that fits with their beliefs than news that doesn't.
5. Two people might see the same news story and get different information from it.
6. People are influenced by news whether they realize it or not.
7. News coverage of a political candidate will influence people's opinions.
8. News is designed to attract an audience's attention.
9. Lighting is used to make certain people in the news look good or bad.
10. Production techniques can be used to influence a viewer's perception.
11. When taking pictures, photographers decide what is most important.
12. News makes things more dramatic than they really are.
13. A news story that has good pictures is more likely to show up in the news.
14. A story about conflict is more likely to be featured prominently.
15. A journalist's first obligation is to the truth.

General attitude towards AI [3] - (Shortened from 20 to 10 items) To what extent do you agree or disagree with the following statements? (1=strongly disagree; 5= strongly agree):

1. Organisations use Artificial Intelligence unethically. (Reverse coding)
2. I am impressed by what Artificial Intelligence can do.
3. I think artificially intelligent systems make many errors. (Reverse Coding)
4. I am interested in using artificially intelligent systems in my daily life.
5. I think Artificial Intelligence is dangerous. (Reverse Coding)
6. Artificial Intelligence can have positive impacts on people's wellbeing.
7. An artificially intelligent agent would be better than an employee in many routine jobs.
8. I shiver with discomfort when I think about future uses of Artificial Intelligence. (Reverse Coding)
9. Much of society will benefit from a future full of Artificial Intelligence
10. People like me will suffer if Artificial Intelligence is used more and more. (Reverse Coding)

Propensity to engage in Analytical Reasoning [4] - Four open-ended question items; PAR returns raw textual strings, and must go through simple response coding. The 3 different response possibilities are clearly formulated. After averaging the values, the test results range between 1 (impulsive-incorrect responses only) and 2 (correct responses only).

> Please answer these questions:
> • If you're running a race and you pass the person in second place, what place are you in?
> (intuitive incorrect answer: first; correct answer: second; other-incorrect answer)
> • A farmer had 15 sheep and all but 8 died. How many are left?
> (intuitive-incorrect answer: 7; correct answer: 8; other-incorrect answer)
> • Emily's father has three daughters. The first two are named April and May. What is the third daughter's name?
> (intuitive-incorrect answer: June; correct answer: Emily; other-incorrect answer)

• How many cubic feet of dirt are there in a hole that is 3’ deep x 3’ wide x 3’ long? (intuitive-incorrect answer: 27; correct answer: none; other-incorrect answer)

PART 5 – ATTITUDES TOWARDS TITAN

This part is included in the last of three measurements comprising the second pilot iteration.

User-friendliness of the TITAN tools [5] - (shortened from 10 to 6 items) To what extent do you agree or disagree with the following items? (1=strongly disagree; 5= strongly agree)

1. I think that I would like to use TITAN frequently.
2. I think I would need the support of a technical person to be able to use TITAN. (Reverse coding)
3. I found the various functions in TITAN were well integrated.
4. I imagine that most people would learn to use TITAN very quickly.
5. I found TITAN very awkward to use. (Reverse coding)
6. I needed to learn a lot of things before I could get going with TITAN. (Reverse coding)

Attitude towards the TITAN tools [7] - To what extent did you find the TITAN tools... (5-point semantic differential scale)

1. unappealing-appealing,
2. bad-good,
3. nice-not nice,
4. useful-not useful.

Trustworthiness of the TITAN tools - To what extent do you agree or disagree with the following items? (1=strongly disagree; 5= strongly agree)

1. TITAN empowers me to make informed decisions fostering my fundamental rights.
2. I find TITAN resilient, safe and secure.
3. I trust TITAN with the personal data I gave it.
4. I am aware that I am interacting with an AI-based system.
5. I find TITAN fair and unbiased in my interactions with the tools.
6. TITAN benefits all human beings, including future generations.

PART 6 – ATTITUDES TOWARDS TITAN IMPLEMENTATION

This part is included in the second of three measurements comprising the second pilot iteration.

Attitude towards the TITAN implementation workshop[7] - To what extent did you find the TITAN workshop... (5-point semantic differential scale)

1. unappealing-appealing,
2. bad-good,
3. nice-not nice,
4. useful-not useful.

PART 7 – BEHAVIOR

This part is included in all three measurements comprising the second pilot iteration.

Value placed on Truthfulness - Please think about a topic that is particularly crucial to you. Rate the importance of the following statements on a scale from 1 (Not at all important) to 10 (Extremely important). If you can, avoid giving exactly the same rating for all four items.

1. How important is it for you to learn new things about that topic, even when it requires a very big effort?

2. To you, how important is truthfulness concerning that topic, even when it might lead to uncomfortable situations?
3. How important is it for you to question your knowledge concerning that topic, even when it may involve a major change in your current perspective?
4. To you, how important is acquiring new knowledge concerning that topic, even when it may involve a major commitment?

Regulatory Self-Efficacy in Sharing Misinformation [9] - When facing a piece of news that seems dubious or ambiguous to you, how well do you think you can perform the following activities? (1: Not at all - 10: Completely)

1. Avoid spreading it even if not doing so might lead to disagreements with people important to you. (inhibitory factor)
2. Choose not to share it even if it could enhance your popularity or influence. (inhibitory factor)
3. Refrain from sharing it even when doing so seems to be a prevalent trend among people important to you. (inhibitory factor)
4. Express your scepticism about the information even if your important peers seem to accept it. (active factor)
5. Find and share credible and verified sources even if they may challenge the prevailing narrative in your group. (active factor)
6. Refrain from sharing it even if it aligns with your beliefs. (inhibitory factor)
7. Search for different perspectives and sources on the same news story, even if doing so could question your beliefs. (active factor)
8. Take the time to verify the information's sources even when it feels boring or time-consuming. (active factor)

The inclination to factcheck - How likely are you to factcheck information you see on social media in the future (1=not at all likely, 10=very likely)?

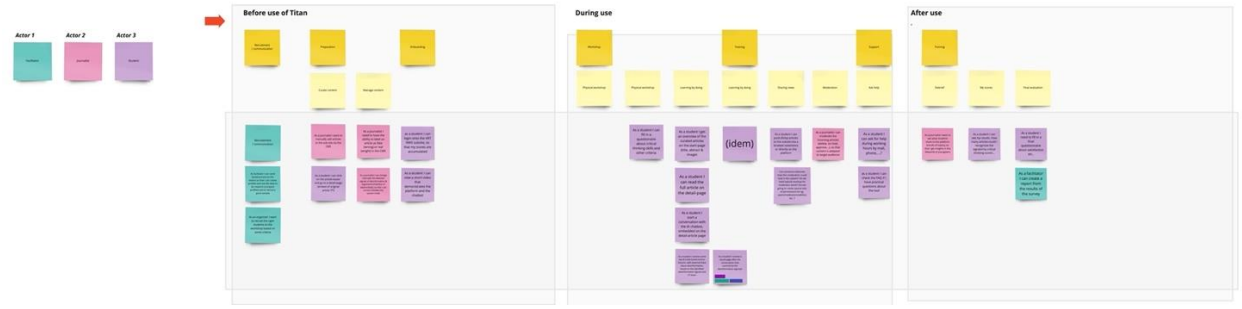
The intent to keep using TITAN in the future (only last measure) - How likely are you to make use of TITAN solutions in the future (1=not at all likely, 10=very likely)?

ANNEX 6: WORKSHOP USE CASES

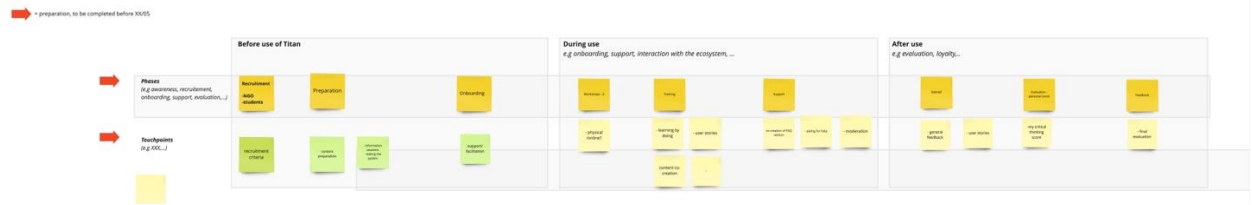
The Miro board is available through following link.

Pilot 1 – user journey

Pilot 1 – user stories



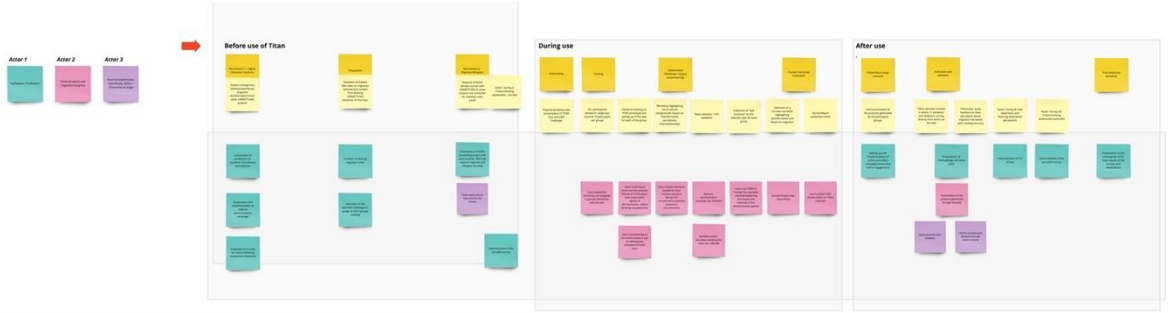
Pilot 2 – user journey



Pilot 2 – user stories

Pilot 3 – user journey

Pilot 3 – user stories


Actor 1
Actor 2
Actor 3
Before use of Titan
During use
After use