

## D.4.3<sub>1</sub> METHODOLOGICAL GUIDELINES FOR THE OPEN CALL #3 HUMAN CENTRED APPROACH

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## D4.3 METHODOLOGICAL GUIDELINES FOR THE OPEN CALL #3 HUMAN CENTRED APPROACH

### HOW TO IMPLEMENT THE HUMAN-CENTRIC APPROACH AND THE USER CENTRIC DESIGN IN THE DEVELOPMENT OF DIGITAL SOLUTIONS ON DIGITAL IDENTITY.

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## EXECUTIVE SUMMARY

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Throughout this deliverable, the **human-centred approach for the development of OC3 projects is defined**, as well as the phases in which the user is incorporated, and the methodologies used to incorporate the user in each part of the process.

It also justifies the **methodological approach sought for the OC3 winners**, which is mostly qualitative. This is because it is necessary to holistically understand the needs that users have and to demonstrate that it is possible to build economics and democracy solutions that meets their needs.

Additionally, this deliverable defines **how to incorporate users into the research** process: examples of methodological approaches will be presented, as well as challenges, risks, and requirements.

Finally, it states the **requirements and expected outcomes**: representativeness, co-creation, validation, and iteration process required in Use Centric Approach (UCA) for OC3 projects. are described in depth.

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## 1 INTRODUCTION

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The results provided by the OC3 TRUSTCHAIN winning projects offer the ability to create and use novel and decentralised tools that strengthen both the real ownership and control of citizens over their own data while revolutionizing the paradigm in economics and democracy.

However, the success and widespread adoption of these solutions is highly dependent on user experience and acceptance. To ensure that solutions are accessible, as well as intuitive and satisfying, a user-centric approach is essential from the early stages of the solution development.

**This deliverable presents a framework to be followed for the application of the human-centric approach in the development of TrustChain OC3 economics and democracy solutions.** It will explore the main stages and practices involved in this approach, from user research and requirements definition to iterative design and continuous evaluation. In addition, it will highlight the key benefits of adopting this approach, both for end-users as well as for developers and solution providers.

At the end of the reading, it is intended to generate a solid grasp of the human-centric approach and its importance in the development of economics and democracy solutions. Furthermore, **it is intended to provide the tools and practical knowledge to integrate this approach into the winning projects of TRUSTCHAIN Open Call 3.**

By following this guide, the winning projects of OC3 will ensure that their approach to a user-centric methodology is appropriate and compliant with the TRUSTCHAIN standards.

This guide has been refined and tailored to better serve the needs of the TRUSTCHAIN OC (in this case 3) winners. This has been done with the gained expertise in previous OCs and better understanding of the needs of the winning projects.

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## 2 USER CENTRIC APPROACH – DEFINITION

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The User Centric Approach (UCA) is a design philosophy which places the user, stakeholders, and citizens at the centre of all design decisions when creating digital products.

The UCA puts the end-user, at the centre of the design and development process. It is based on understanding the needs, objectives, and context of the users, as well as actively involving them in all phases of the solution lifecycle. By adopting this approach, challenges and barriers associated with the mass adoption of these solutions can be addressed and a more effective and satisfying user experiences can be delivered.

To follow this **approach, one should first gather the user needs and requirements for later onboarding end-users in the development and final validation of the product.**

**The aim is to create digital products that make sense in the user’s context and give response to his/her real needs.** This encompasses ease of use, reward while interacting with the product during the overall

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holistic experience of use. By understanding the user's goals and needs, the designer can create a digital product that is tailored to their particular goals and needs. This can be beneficial not only for the user but also for the designer, as the solution will be more effective and have higher user engagement and satisfaction.

UCA is an iterative<sup>1</sup> development and design methodology that puts the user at the centre of all the technical development and interface design decisions, by involving them throughout the design process. UCA follows specific **core principles**:

- The design is based upon an explicit understanding of **user's characteristics**.
- The design is based upon a deep understanding of the **user's context**.
- The solutions developed are refined by **users' evaluation**.
- The development addresses the **whole user experience and user context**, not simply the use of the technology.

Many UCA methodologies follow the international standard 13407 (ISO 12407, 1999) of Human-Centred Approach (HCA) and have been proven to lead to highly successful products.

It is worth to note the ISO standard defines HCA but not UCA, as it defines human-centred design and consider both terms synonyms. although the ISO 9241 preferably uses the first by considering that it impacts all the humans involved in the system, not only the end users of the product. The preference for the term "User-Centred Design" is justified by common usage in the market (ISO 9241, 2010). Also, the UCA considers the relationship between the user and any type of element. This may include interactive systems or non-interactive. For example, the cases that Don Norman explains in the "Design of everyday things" (Norman, 2013).

UCA avoids costly oversights and errors and reduces rework or wasted time by placing an emphasis on user experience to ensure the product meets user's their needs and expectations. This approach also offers an engagement of users, allowing them to be productive and motivated and headed towards the launch of a new product, in some cases, generating a community of users before the project is launched.

According to the [Interaction Design Foundation](#), the user-centred design method involves understanding the context of use, which can be achieved through contextual inquiry and observing actual users in their context. The human-centred approach is also necessary for ensuring that design requirements relating to a device or service are appropriate and address the intended use of the device, including the needs of the user, as mandated by 21 CFR 820.30 (c). Ultimately, involving end-users in the design phase ensures that their needs, preferences, and learning styles are taken into account, making the final product more appealing and effective for its intended audience (Arsand et Demiris, 2008). As a result, User-centred Design has been shown to be effective and offers many advantages to businesses, including improving user experience, increasing sales, reducing development costs, and enhancing customer loyalty (Mofokeng, 2022).

**All the projects funded by the OC3 Economics and democracy are requested to follow a user centred approach** in their projects. To do so, it's not only to research and test with the end-user, but also know the

<sup>1</sup> This means the process is completed in several iterations or phases: Tools are first conceptualized together with users (or through research about the user's needs) and then designed and finally validated together with users.  
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cultural behaviour of citizens that could potentially use the digital solution (for example: adults on behalf of their child or elderly people). It has to be used in the different steps of the ICT tool development: from the definition of the use cases to the testing and piloting of the final tool. As Ortiz Crespo et al. (2020: 3) highlight, this avoids large gaps between design and reality.

As it clearly appears in the research made by Roehrer et al. (2011) using user-centred design requires not only to involve the user from the beginning in the process and in all the steps, but it also requires a multidisciplinary work permitting the constant “translation” of the users’ reality into technical requirement as to understand how to adapt the technological barriers as close as possible to the user’s needs.

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## 2.1 COMMON MISCONCEPTIONS AND MISTAKES REGARDING USER-CENTRIC APPROACHES

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To better explain the concept of UCA one must pay attention to initiatives and projects that while involving users cannot be called user-centric, since the user is not at the centre of the process.

Some **common practices to avoid are:**

### 1 Projects whose moving force is exclusively technological or academic.

It is very common that there are projects whose primal motivation is to develop a new technology, protocol or tool, with innovative features. In this case, the demand for this project is not born from a community of users, but rather from the demands of industry and innovation. Thus, it is common that developers in these initiatives end up seeing user engagement as an “obstacle” and a pointless requirement.

- If the project is technologically centred, an extra effort needs to be made to onboard, explain and motivate the community of end users in the solution, so innovation comes at hand to their specific demands. Bear in mind that innovation makes no sense without adoption, and this is a fantastic way to start.

### 2 Projects that “use” users as tools for measuring the capabilities of a technology not caring for users feedback.

It is not uncommon to involve users in the testing of the digital product, but just as “testing human machines” that provide metrics through their use of the application. When this happens, it is not users’ opinions and feedback, what is under evaluation, but the response that the technology has to users is giving to users.

- Engaging users in these kinds of activities without full knowledge and information of what they are doing is capital for project ethics. You can incur in “extractivist” practices with the users.
- What matters in user-centric approach is user’s needs, feedback, opinion, and context.
- The interest is in the user response to the technology and not the other way around.

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### 3 Projects in which the user-centric cycle is not complete.

In some occasions, there are projects and solutions proclaimed as user-centric which do not complete the full cycle of co-creation and validation that will be explained in detail in the subsequent sections.

- A single interaction with potential end-users or research participants is not enough to ensure user centricity.
  - The process should be iterative and flow for the entirety of the project.

### 4 Projects that believe that user centricity is only about the UI (user interface).

Another common misconception is to think that a user centric approach consists on simply bringing users to test sessions to test the look of the interface, in short, that User Research is just about making “nice interfaces” While UI is a part of the project, it is not the core activity of user centric approach.

- A solution even with a nice interface can be not conceptualised and thought in the way users want.
  - It may lack functions, have a wrong focus, be too complex or too simple... there are many ways besides UI in which an app would need from user centric approach.
- The same a good interface does not ensure good functionality; it does not ensure that the solution is relevant and adequate for users.

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## 2.2 UCA CONCEPTUALLY: FIVE STEP DESIGN THINKING PROCESS

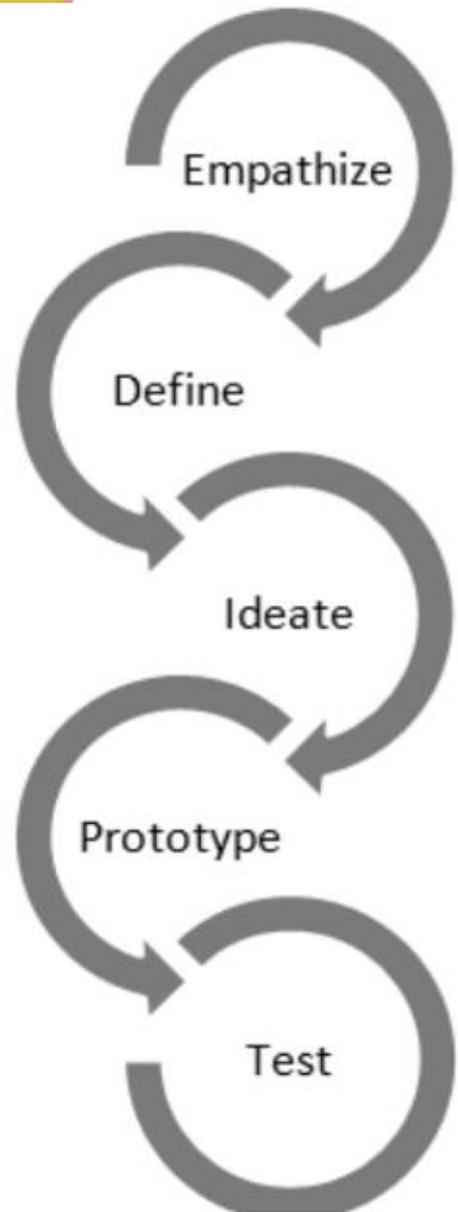
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Conceptually, the **5-step design thinking process** (Wolniak, 2017, Ambrose & Harris 2010) is used to identify problems and iterate solutions by focusing on users, with the goal of creating a product that is tailored to the user's needs in an effortless way. This process involves:

This approach should be taken as what it is: a work methodology and a design philosophy. Thus is meant to be adapted to the different contexts in each project and take form differently.

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- **1 - [EMPATHIZE]** Understanding the users and their context,
  - This means researching user's needs in-depth regarding the field of the digital solution. This is a crucial step and errors in it compromise the user centricity of the rest of actions.
- **2- [DEFINE]** Specifying requirements for both the business and user,
  - Once the need of the previous point is understood they should be translated into digestible requirements, also something to do from the business. These requirements should be then, conveyed.
- **3- [IDEATE]** Designing solutions in accordance with the previous two steps.
  - These requirements should take the form of concrete actions and developments. This is the phase in which the development of the solution takes place for the first prototype.
- **4 - [PROTOTYPE]** Evaluating the designed solutions with users.
  - This is the moment for testing and piloting. The prototype is tested with end-users and the feedback is gathered and translated again into requirements.
- **5- [TEST]** Iterating and repeating the process.
  - This process should be repeated



up until the pilots gather data that means validation.

During TRUSTCHAIN, **these processes have to be conducted with actual users or potential end-users** during each stage of the process from requirements, pre-production models and postproduction. The selection of the participants should be justified.

### 3 UCA METHODOLOGIES: BEST PRACTICES

To achieve an effective user-centred design, a range of qualitative and quantitative methodologies can be employed. **For the TRUSTCHAIN OC3 it is required<sup>2</sup> that the majority of methodologies applied are qualitative. This means, that every project includes at least one qualitative round of methodology at some point** (prospectively the first phase, user’s needs assessment and requirement gathering) unless this is impossible given the nature of the project.

The reason behind it is that at some point of a user-centred methodology there is always the need for not only the “*whats*” of user’s needs and feedback but also the “*hows*” and “*whys*”. These are matters that concern almost exclusively qualitative methodology. For instance, one can know through a survey that a user thinks that digital wallets *are* cumbersome but cannot quite reliably get into *why* he thinks that and *how* does he think this can be bettered.

Although qualitative and quantitative methods can be complementary and provide a holistic view of the issue, it should be noted that qualitative methods are indispensable when constructing digital solutions.

While quantitative methods are good for understanding the “*what*” (the morphology of a behaviour, for example in UCA, number of clicks), qualitative methods focus on the “*how and why*” (the reasons behind a given behaviour, the reasons behind that number of clicks). Thus, and since we want to understand the reasons behind the attitudes towards a technological solution.

Aside from that, qualitative methods make it possible to study cultural aspects (Cremers et al. (2014: 35) without isolating them from their historically shaped contexts, nor from a single point of view. This makes it possible to explore the underlying emotions, perceptions, and motivations of users. It is also due to the holistic view provided by qualitative methods in that they allow understanding the user, enabling designers and developers of digital solutions to better understand users' needs, desires, and behaviours. Qualitative methodologies help to obtain detailed and in-depth information about users' experiences, problems, and opportunities to improve their digital experience.

#### 3.1 EXAMPLES OF RECOMMENDED METHODOLOGIES: GENERAL GUIDELINES AND GOOD PRACTICES

- **User interviews** involve asking participants (users of the product or service) to share their thoughts and opinions about the digital solution, their context of use, their relation with a given technology.
  - Recommendable during the phases 1 and 2 stages of the 5-steps design thinking project to gain insight on their expectations and needs towards a particular technology.
  - Also, useful right after or before the usage of the platform subject of testing (stages 4 and 5) to see if expectations meet reality and summarise what can be improved.

<sup>2</sup> By the Trustchain project’s design

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- Interviews can take two different focuses: open and closed.
    - Open interviews are those in which there is not a fixed set of questions but simply some general topics and questions that work as starters for participants to relate their own view.
    - Closed interviews are those that consist of a fixed set of questions with an expected kind of answer.
  - The resulting information may be chaotic and not usable. Some of the guiding principles are:
    - The objectives of the interview must be set beforehand
    - The interviews must be transcribed and processed,
  - There must be a demonstrable link between the insights from the interviews and the design specifications/requirements drawn from there.
- **Focus groups**, involve bringing together a group of people to discuss a product or context of use and share their thoughts and opinions. Focus groups provide an opportunity for users to engage in an open discussion about the product and share their thoughts on its features and functionality.
    - This methodology is particularly useful for phase 1 of the 5 steps process , where we want to know about the context that surrounds the use of our solution and understand expectations as well as brainstorm with users possible technical developments.
    - These informal and loosely structured customer interviews usually consist of 8 to 12 participants and a trained moderator who guides the discussion based on a predetermined outline (Krueger et al., 2020). But it can be done with less participants.
    - To conduct a successful focus group, it is important to set clear objectives
      - The moderator should keep the discussion focused on the topic, involve all participants, and encourage reactions to each other's comments.
    - It is important to ensure a diverse representation of users and to recruit the right participants who represent the target audience.
      - The members of the focus group should be taken as “avatars” or “ambassadors” of a certain target population
        - *For example, in a focus group centered in a healthcare application patients, practitioners and data administrators should be invited, with a diversity based on age, experience, gender, etc*
  - **Observational studies/ usability testing.** Observational studies refer to the interpretation and recording of data. While the user interacts with the solution, the research team annotates the valuable insights.
    - Observations, in the form of Usability Testing are a powerful approach for the first and second encounter of users of the platform (phases 4 and 5)

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- The users interact with the platform subject of testing and perform tasks while recorded. This helps unfolding usability issues. Then this transcripts are discussed with developers.
  - To begin the process of usability testing, it is important to
    - create a test plan that defines the goals of the test and how the results will be analysed
    - create a task list that focuses on specific features of the product that will be tested and breaks every possible interaction that the user has with the platform.
    - During the testing process, the users are observed, and data is collected by researchers or facilitators.
      - The transcriptions and recordings from participants using the platform is a bridge of empathy between users and developers. Developers are confronted with the reality of users making use of the platform and reacting to it.
  - The way this data is analysed or collected may vary.
    - Testing can be done in a lab environment, using a one-way mirror, so developers can see on-site how users interact with their tool.
    - Also, transcriptions or notes can be made and processed for posterior handover to the developer's team. The feedback from users, including the “chokepoints” in which they may get stuck can be annotated in a data matrix as well. .

**Surveys** are a way of collecting large amounts of data from a diverse group of users. Longitudinal and cross-sectional surveys can be conducted to gather data at different time durations and analyse it quantitatively. The advantages of survey research are its ease of administration, low cost, and remote accessibility. However, it may suffer from a lack of flexibility and bad design and may not provide complete data.

- Surveys allow for the gathering of feedback from a larger pool of users, which can be helpful for validating assumptions and identifying common user needs and preferences.
- If surveys are chosen, avoid using them for insights that need qualitative analysis. For example, **“satisfaction” is qualitative by definition.** Numerical rates of satisfaction (p. e from 1 to 10) are usually not a proper way to measure it. This method is useful for phases 1 and 2
  - For instance, what for a user means a “7/10” rate of satisfaction with a certain interface, for another user would be a “5/10”. The indicators would be completely arbitrary.
- In order to ensure a positive survey experience for customers, (and avoid abandonment of the task) it is important to make the process enjoyable and satisfying by showing that their concerns and complaints are being heard.

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- Survey approach is no effective if no representative sample is taken. Bear in mind representativeness (error margin and confidence level) of the target population. If reaching such user base is not possible, consider applying other methodologies instead.
- **A/B testing** involves comparing two versions of a digital product to see which one performs better.
  - This method allows for objective measurements and statistical analysis of user behaviour. Useful for phases 4 and 5 of the 5-step process.
  - It requires a large sample, thorough indicators (and a careful crafting of the sample composition) size to be statistically valid.
    - Indicators are those items to measure within the platform(s)
    - The sample refers to the number of A/B testing conducted.
  - A matrix should be drafted to systematically collect the comparative data between both of the versions.
  - There are some pre-made matrixes for A/B testing in UX dashboards published online such as Varify.io or Dynamic Yield
- **Analytics** involve tracking user behaviour through metrics such as page views, bounce rate, and click-through rate. Analytics on the user interaction in the tool can be very useful to understand engagement in a given platform. The sample of this method must be large, since a large number of users is capital to bring relevance to the data extracted.
  - This method provides real-time insights into user behaviour and allows for quick decision-making.
  - While it captures the behaviour of users, it does not give hints on the reasons behind it.
  - The kind of data extracted can vary. It can range from number of clicks, heat maps or mouse pathing.
  - The optimal way to conduct analytics is to select whichever data is relevant for the specific testing.
    - *For instance, if what users need in the platform is to minimise the time of use (p.e. in a wallet) the analytics could be focused on time or number of clicks.*

Although these are some of the most common methods to test and validate a digital solution, there are some others, particularly in terms of co-creation with participants such as **card sorting** (to organise hierarchies of information with users) or **mental models** to understand the ways in which users expect a certain digital product to work. In this section some methods were detailed but other can be applicable if justified to the specific situation and stage of the 5-step process.

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### 3.2 USER ACCESS, RECRUITMENT AND ONBOARDING.

**User recruitment and access:** is a crucial part of the UCA. Without it, all the previously mentioned methodologies can not be carried out. There is no universal guideline on how to recruit and gather users, however there are some important matters to take into account.

#### 1 Do not trust social media recruiting. Do not expect users to come to you.

- Although recruitment forms, LinkedIn, X or other social media recruitment are good as complementary sources of users, it is strongly recommended that they are not the primary source of it since commitment tends to be low through these ways.

#### 2 Build alliances with entities that represent a userbase. Go where users are.

- The best way to get access to users and their community is through reaching the place where users are. This implicates contacting the places where target users will be (it could be a company, educational institution, consumer association...) And scheduling testing and pilots, which are recommended to happen also in those very places.
- If for any reason this is not possible, user pools are available online for UX research, although it is a paid service.

#### 3 Make sure informed consent exists.

- Have in mind that users should be aware of the reasons why they are involved in a co-creation loop.
  - It is recommended to hand over information sheets and consent forms explaining the goals of the user testing, the goals of the project and the source of funding.

#### 4 Piloting, concept testing and validation within the company is not valid.

- Trying the digital solution inside the company that develops it (p.e. with employees or students) is not valid enough since the results of the test are conditioned by relations of power. UCA should be carried out with a real sample of target users.

#### 5 Build a schedule of contacts and trace the response of participants

- Doing so is necessary for a successful participation, and should be reflected for OC3 winner reports

Launching a digital solution requires more than just the solution itself: it necessitates the implementation of a **comprehensive user onboarding strategy** to ensure that the solution is adopted efficiently and effectively. Whether or not a digital solution will be successful is often determined by the user onboarding

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process. The strategy should give users the information and tools needed to start using the product quickly, while also establishing an ongoing positive user experience. It should also include clear instructions on how to use the digital solution, a detailed onboarding checklist, and a process to monitor user feedback. A successful user onboarding strategy should also address user needs and use data to inform improvements to the overall user experience (Terres et al., 2019) even after the digital solution is launched.

The key elements of an effective user onboarding strategy include **defining clear goals, understanding the customer lifecycle, creating a product adoption program, keeping an eye on user status, keeping communication open, measuring success objectives, and automating the process with technology** (Terres et al., 2019). When user onboarding is done correctly, it can be the key to a successful product launch.

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## 4 UCA REQUIREMENTS

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Decentralised user identity management that will have successfully implemented a human-centred approach will be one of the main outcomes of the months of work of OC2. During the 9 months the projects need to develop their solution. To do so, implementing the UCA, **the first step is to create a roadmap** with the methodologies that better suit the projects' objectives and the phase in which the project team will gather information about the participants. Once the various methods are identified, the user sample needs to be defined.

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### 4.1 REPRESENTATIVENESS

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**The sample needs to be representative**, which means that it must have the appropriate size, has been selected using a random procedure, and the characteristics observed in the sample correspond to the population from which it was drawn (Ras, 1980). It is not possible, in any case, to be certain of the degree of representativeness, but there should be a reasonable probability of representativeness.

Representativeness is a function of several factors, depending not only on randomness and sample size, but also on the sample design, which is very specific to each case, the use of key auxiliary information, the sample design, and a useful and up-to-date sampling frame. The term representative is used as long as the sample faithfully represents the variable under study, which has a probability distribution in the population and the frequency distribution in the sample should be a mirror or very similar to that of the population.

Representativeness can be achieved through the following approaches:

- sample selection (selecting careful few participants after a careful study of the sociodemographic composition of the target audience (Ladner, 2014)) to represent,
- or though sample size (Omair, 2014). It is essential to have the required sample size as well as to select a representative sample using the appropriate sampling technique. Among others some sample techniques are purposive sampling, random sampling, simple random sampling, stratified random sampling, cluster sampling and systematic random sampling (Singh et Masuku, 2014).

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The different methods to be followed should mostly be qualitative research methods. It is possible to complement the data collected in the qualitative sessions with other quantitative methods. **These can only be complementary.** It is not possible to base the whole research on a quantitative questionnaire and use qualitative methods as a support.

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## 4.2 CO-CREATION

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Another requirement is the **inclusion of users or potential users during the co-creation phase** and the validation phase. Include users and stakeholders or potential users during the validations and the co-creation phase of the tool. Complementarily, insights can be proposed by non-users. This decision must be justified in the corresponding deliverable.

One example of a methodology that is not carried out with users is usability testing with experts that can provide a lot of usability knowledge in general terms, but not as rich as the data provided by end-users.

Ultimately, both methods and samples could be combined as the experience has two components: the subjective or user-perceived component, related to emotions triggered by the use of the digital product or service, and the objective or technical component, referring to design principles, best practices, and any other elements of the experience that are more likely to be seen only by experts.

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## 4.3 VALIDATION

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The main requirement in the Open Call 3 is that all the tools are validated by the end- users of the decentralized digital identity solution.

Once the tool is ready on a TRL 7 and the use case is completely developed, it must be validated. The validation process consists of conducting usability tests, could be moderated or unmoderated. In the validation process, the tool will be passed, or it will need some implementation before launch.

It could be possible that after the launch some implementation will be needed. So, in this process it is necessary to evaluate and justify the launching of the solution to the market. In every usability test there will be some requirements and specifications to implement in order to refine the human centric approach. But, if these requirements are not fundamental to use the solution, it could be launched.

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## 4.4 ITERATION

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The **last requirement involves iteration, in the case of digital solutions that are already created with a medium TRL, at least one iteration is sought**, that is, a validation round with users in which the status of the tool is acknowledged and improvements implemented. In those projects that are going to carry out a preliminary study of needs identification and/or co-creation with the end users, it is required that the feedback from the users has been correctly implemented in the development of the digital solution.

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## 4.5 EXPECTED OUTCOMES

Regarding the user centred approach, there are several expected outcomes that are requested to the TRUSTCHAIN OC3 funded projects, which are the following:

- Frame the sample and the ideal candidates to participate in the research. Based on the representativeness requirement (See Section 6.2)
- Define and describe all the recruitment process either for the co-creation ideation stage and/or the validation stage of the project.
- While the sample is being framed, the methodological roadmap must be prepared. In the corresponding deliverables it is requested to define the specific methods to answer the project objectives.
- To have the information about the piloting execution, it will be necessary to adequately describe the phases.
- Reflect the pilot analysis made by the team, showing the key point that were raised from those sessions.
- Reflect the decisions that the team made about the iterations and justify them with the pilot analysis.

The results of all the processes are to develop an empathetic design. This design should integrate all the design specifications provided by the users that participate in the previous pilots. The design needs to be validated but a representative sample and the final prototype needs to be validated by the end-users.

Because users should be the centre of the solution, the whole process should take into account their needs and perspectives.

The overall expected outcome is to build a decentralized digital identity solution that is a more efficient, satisfying, and provides a user-friendly experience for the users.

## 5 RISK AND MITIGATIONS

Risks	Mitigation actions
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<p>Do not have enough time to conduct the methodologies and to translate them into design specifications</p>	<p>Before starting the project, organise the tasks, the activities, and deliverables, foreseeing that some activities could be delayed for external reasons.</p>
<p>Do not have access to people who are the end-users</p>	<p>Contact associations, organizations, institution, post a survey online that the end-users could sign, or publish calls on social media groups related to the target users as a way to contact the end-users you need.</p>
<p>The design does not stand out from the market competitors</p>	<p>Study the design of the competitors and detect their weaknesses and try to improve the design overcoming these weaknesses</p>
<p>The components are not well integrated</p>	<p>From the beginning, pay attention that all components have a coherence of being together and that they have a link, and that this link is also perceived by the user.</p>
<p>The design is not usable by the end-user</p>	<p>Go back to the data of their needs and try to redesign the solution answering their needs and in the simplest and easiest way.</p>
<p>After the sessions there is contradictory information from the end-user</p>	<p>If groups have many conflicting requirements, a possible solution is to create two interfaces adapted to each user category, to respond to their needs. If not, try to find common grounds and try to address conflicts in a way that it is not limiting for the other user.</p>
<p>Participants do not want their personal data collected during the pilot</p>	<p>Ask them to try it out without the need for them to register</p>

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## 6 CONCLUSIONS

This deliverable has explained the HCA and UCA procedure and all of its stages, and discussed how they should be implemented by the Open Call 2 projects, following the specifications of TRUSTCHAIN. It also exposed some guidelines on how to incorporate the users in the research process and provided some examples, and it identified the challenges, risks and proposed mitigations, requirements and expected outcomes.

A human-centred approach should be incorporated in all aspects of the creation, design, development, and validation of a digital product, with special emphasis in the creation and validation processes that are where the potential end-users will participate. Throughout the process, end-users should be actively involved, providing their feedback and insights to make the product successful. From the initial design phase, it is important to consider the needs and preferences of the users, as this will determine the direction and functionality of the economics and democracy digital solution. During the development stage, the end-users should be interviewed to evaluate the product's usability, and to refine the design and features based on their feedback. User testing should be carried out frequently to ensure that the digital product is meeting the user's needs, and that the design and functionality of the product are aligned with the user's expectations. In the validation phase, the end-user's feedback remains critical to assess the effectiveness of the digital product, and to make any necessary changes. Ultimately, a user centric approach ensures that the digital product is designed to meet the needs and preferences of the end-users and will result in a product that will be well received, used frequently, and achieve the desired outcomes.

To satisfy the requirements, product creators should take a predominantly qualitative approach, which can be complemented with quantitative methods. By combining these methodologies, product creators can gain a comprehensive understanding of their users and create products that meet their needs. It is important to note that user needs and feedback can change over time, and it is crucial to continually gather data and reassess the product to ensure that it remains relevant and user-friendly.

Involving users in the creation and validation phases of digital products is paramount to producing products that satisfy customer needs and expectations. Developers can embrace several tools to connect with users throughout the design process, including usability testing, surveys, and focus groups. For instance, through usability testing, developers can gain real-time feedback on how customers interact with products, which aids in refining the user experience. In addition, surveys provide a platform for customers to express their preferences and opinions, thereby enabling developers to tailor their products accordingly. Meanwhile, focus groups can offer more in-depth insights into customer attitudes, motivations, and behaviours, leading to more targeted and effective product design. Incorporating users in the creation and validation phases of digital products not only enhances customer engagement but also drives profitability.

To ensure the best possible user experience, a comprehensive onboarding strategy should include setting goals and objectives, organizing user information, and providing the right resources, such as user guides, tutorials, and customer support. Furthermore, an effective user onboarding strategy should consider the user's preferences, provide tailored support, and be continually monitored and evaluated. With careful planning and proper resources, a digital solution launch can be successful and lead to positive user adoption.

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