Co-Creation Methodology

General guidelines on the application of co-creation methodologies on the D-CARE Innovation Content Applicants

version (Final): April 2022

1. Scope and Purpose of the Document

Within the Danube Transnational Programme, the project entitled **"Developing, piloting and validating smart care service models in Danube region for supporting social innovation, improving competences and entrepreneurship"** - D-CARE envisions to tackle the socio-demographic challenges facing Danube region countries. D-CARE aims to connect national and transnational stakeholders from the quadruple helix (academia, public institutions, companies, and end-users) and form environments where their cooperation and collaborative co-development of new solution/product/service for the smart care area takes place. Within this framework 8 Smart Care Labs were established with the goal to foster innovation and to **co-create, test, evaluate and validate innovative solutions** all along the value chain of integrated care for older adults and medical services, including technological solutions and social innovations, **improving competences, and generating new business models, new businesses, new jobs, and new skills.**

In Smart care labs a network of partners with different backgrounds and rich experiences from their field is created with the aim to **work together** to **develop new and improve existing models** (concepts, solutions, products, services, etc.) to tackle health care challenges in the region. Methodologies used in smart care labs will vary from region to region as smart care models will vary and will be very specific in each lab. Before solutions enter into a pilot testing phase in each smart care lab region, they will be co-developed and improved together with prospective users and other related stakeholders from academia, businesses and policy makers. This document (**D.T2.4.1 Co-Creation Methodology**) focuses on **co-creation** – a process where end-users and other stakeholders collaboratively work together throughout the design process of an innovative solution. The document will provide the description of the concept, processes of co-creation, tools and methods used for the development of the smart care service models.

1. What is Co-Creation/The concept of Co-Creation
    a. Origins of the concept

The idea of co-creation became **prominent at the beginning of the 21st century**, because of the **evolved role of customers**, who developed/moved, from isolated, unaware, and passive to connected, informed and active, which was thanks to a wide array of technological advancements. With access to unprecedented volumes of information, consumers are now able to take better informed decisions. As the notion of co-creation has gained worldwide attention, value creation has moved away from a focus on the role of companies to the role of customers.

    b. Principles of co-creation

Co-creation is perceived as an important aspect of the innovation **process to better understand end-user needs** (putting the user into the real-life setting) and **increase the chance of finding a sustainable solution**. The development of the quadruple helix approach and putting the collaboration into the living lab (Smart care lab) have added a new dimension to stakeholder collaboration. "*Living Lab is about experimentation and co-creation with real users in real-life environments, where users together with researchers, firms and public institutions look together for new solutions, new products, new services or new business models" (ENoLL, 2008).*

At this moment there is no unified definition of co-creation nor its essential elements; however, studies shed light on different aspects of co-creation that mainly complement rather than exclude each other. Some studies understand **co-creation** as an active, creative, and social process based on **collaboration between producers and users**, initiated by the company to create value for customers (Allen et al., 2009). Other studies have explored co-creation in an inclusive public space, living lab, etc., where **multiple stakeholders experiment with new strategies, co-create and test new methods, and explore new innovation models** to develop new solutions (Bylund et al., in Nguyen, 2021). Ramaswamy (2011) pointed out that the process of co-creation, where **products/services are developed jointly** by **companies and their stakeholders**, opens up a whole new world of value creation. The process describes the way stakeholders behave, interact, interpret, experience, use and evaluate propositions based on social constructions of which they are a part (Ranjan and Read, 2016). Jansen (2018) defines the 7 principles of complete co-creation, on how to create sustainable value with end-users and other relevant parties (see figure 1).

The 7 Principles of Complete Co-Creation

	Principle	Activities
1	Together	Involve all internal and external players (especially end-users and influencers); ensure diversity; stress open, empathetic and equal dialogue
2	With end-users	Conduct market research, street research; tap end users for information, inspiration, development, production, marketing, evaluation; reward them
3	Ongoing	Involve end-users in all 5 phases: founding, finding, forming, fine-tuning, following up; blend observing and interviewing methods
4	Productive	Appoint, empower and support a competitive co-creator (with time, money, resources, budget, power); keep the enthusiasm and momentum going
5	Transparent	Be open about content, process information, roles, and practical tips; promote clarity, involvement, trust and insights
6	Supported	Install a multi-disciplinary advisory board; communicate regularly; overcome barriers of creativity, capacity, time, cost, fear
7	Value-driven	Ensure relevance, reality, resonance, reaction; deliver value at 3 levels: end-user, organisation, society/planet/ environment

1. Figure: The 7 principles of complete co-creation (Source: Jansen, 2018)

Co-creation is not identical with the term value (co)creation. Co-creation refers to joint action, interaction, and communication. Value creation refers to the benefit that emerges through cocreation. There are numerous terms used to describe similar phenomena from different theoretical and practical perspectives. Examples include Co-production, Open innovation, Collaborative production and consumption, Prosumer or Co-worker.

Co-creation can offer significant advantages in the innovation process:

- ✓ Developing a **good understanding of end-user needs** (obtaining real-life feedback from end-users).
- ✓ Developing **new ideas** throughout the process.

- ✓ Accessing a **broader network of stakeholders** to share knowledge, experiences, ideas, and resources.
- ✓ **Shortening time to market** – faster solution development cycles shorten time to market (Kwan A., 2022).
- ✓ **Reducing costs and risks** in the development process (Kwan A., 2022)

Co-creation for the topic of older adults' care is the focus of this methodology. It is characterized by the following features:

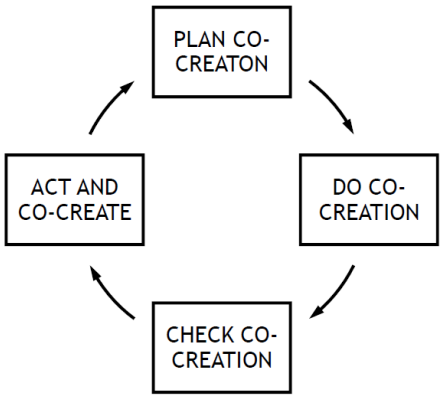
> Co-creation is a process that involves joint activities of a provider with other stakeholders and aims to generate value for the parties involved and for other beneficiaries. Co-creation with older adults narrows the focus to providers and potential elderly customers, their support networks as well as stakeholders from academia and public actors.

2. Co-creation process

The special needs of older adults are a societal challenge. Innovative products and new services (the application of competences for the benefit of another party) can be utilized to meet these needs. New business potential is created for providers who find suitable solutions. However, the question arises of how these solutions can be identified, conceived, developed, and marketed. Providers can carry out innovation processes in a technology-driven or customer-oriented manner. However, both pathways quickly reach their limits, since finding suitable solutions is usually more successful if ideas, knowledge, and skills that are outside the company's boundaries are integrated. This requires the willingness and ability to co-create solutions with other parties, especially with older adults, with companies, with the public authorities and with researchers.

a. Best practice of co-creation process (I-CARE)

The I-CARE project of the Central Europe Interreg Programme developed a handbook on adapting the principles of co-creation in smart elderly care. They identified 4 main steps in the process of co-creation, which we consider state-of-the-art in region on this topic. It is clear, the present model is an iterative and recurring process. The model works well with the co-creation of completely new solutions.



2. Figure: 4-step model of co-creation (Source: I-CARE Project)

Plan co-creation

1) Formulate the initial idea
2) Consider business model
3) Search for important actors
4) Stakeholder analysis
5) Determine how the cooperation with the partners should proceed
6) Setup requirements for the structures and systems to be created or revised

Do co-creation

7) Establish connection, present solution, including benefits, receive feedback
8) Establish trust between partners
9) Define rules for co-creation, determine who contributes what
10) Create shared goals

Check co-creation

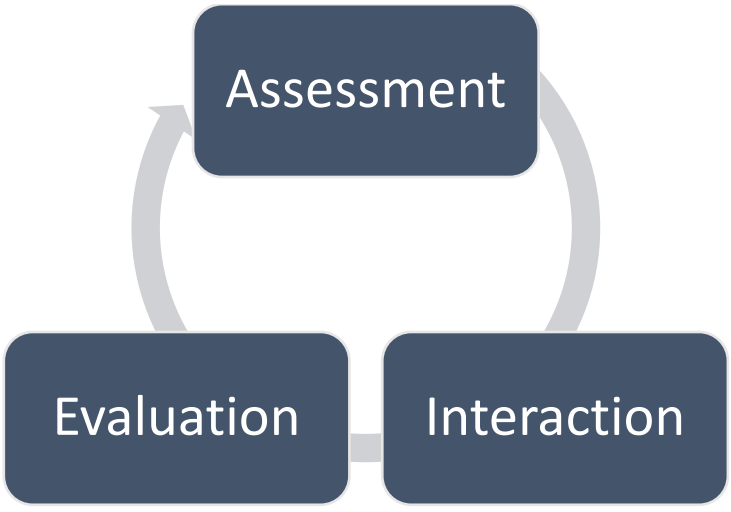
11) What are the common goals between partners?
12) Is it feasible to further develop the solution with partners?
13) Are there any missing gaps (competency, resources)?

Act and co-create

14) Coordinate with involved actors
15) Make the project flexible, but make sure that the objectives are not out of focus
16) Regularly check the contributions of the partners and motivate them
17) Show the progress of the project and highlight the contributions of the partners

b. Proposed process for D-CARE

Building upon the findings of the I-CARE model, we propose a more condensed, and hands-on model. The proposed process entails the three steps of (1) assessment, (2) interaction and (3) evaluation. This approach is a simpler and more practical version of the I-CARE model, ideal for cases, when a solution is already existing, not necessarily in the market-ready product, but at least an idea phase solution



i. Assessment phase
   1. Better understand the solution

2. Better understand the target group
3. Establish necessary connections
4. Understand actor goals and find common areas
5. Setup rules and structure for co-creation
6. Define roles and responsibilities
7. Who contributes what and when?
8. Setup boundaries
9. What is feasible, and what not?

ii. Interaction phase
1. Prepare for the co-creation
2. Facilitate an environment for mutual trust and objectives
3. Let actors connect to each other and understand each other
4. Exchange information and knowledge
5. Reach out to other stakeholders (e.g., social media)

iii. Evaluation phase
1. Evaluate the feasibility of the solution and its adaptability
2. Test user acceptance
3. Test and validate the roll-out of the service / product to the users

Due to the fact, that applicants are having different levels of development, this structure allows to initiate the co-creation at different stages of the development process depending on the readiness levels of the solutions. Therefore, this three-step structure is especially suitable for co-creation processes that engage with existing solutions while still allowing to accommodate the requirements for the co-creation posed by different levels of development of the solutions. In contrast, the I-CARE concept is more apt for co-creation processes covers the whole journey of co-creation, where neither the challenge nor potential solutions are readily identified. For more focused exercises the proposed methodology is more fit.

c. Stakeholder involvement
i. Which stakeholders are in any way affiliated or affected by the solution/product?

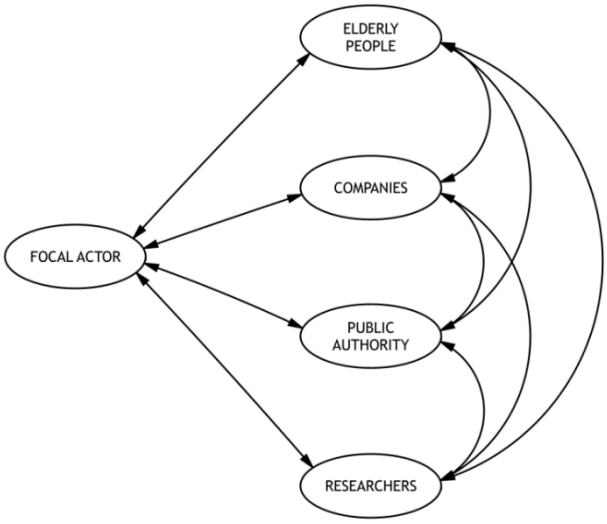
Co-creation is a process in which several actors work together to design and implement solutions that create value for the parties involved. Deciding on who should be involved is a cornerstone of a co-creation project and must be planned, controlled, and implemented. The active participation of customers (or users) during the development process creates space to determine pain points and needs. Other stakeholders (companies, public authorities, researchers) are also involved in co-creation processes, allowing each stakeholder to contribute and share their unique knowledge through participation. Including a greater number of actors from different societal areas will enhance the positive effects of co-creation while at the same time make the process more complex and resource intensive. Hereby, the requirements for efficiency and timely restraints as well as possibilities for implementation need to be balanced with the potential benefits from involving a higher number of stakeholders.

Older adults are the primary target group for whom the innovations are conceived, developed, produced, and marketed. They are characterized by unique features that must be taken in account: (1) they possess a lot of experience; (2) suitable communication platforms are necessary because they are not tech-oriented; (3) they do not focus on profit and efficiency.

Companies pursue a business mission/goal/objective, be it profit maximization, shareholder value or the stakeholder approach. The business models, company sizes and company cultures vary across regions and industries resulting in different motivations and capacities to engage in co-creation processes.

Public authorities operate in special economic environment. It is crucial to understand political guidelines and typical patterns of action.

Researchers can take on different roles. They may be interested in co-creation and consider the project as a study object. But they can also bring in expertise and thus a resource that is crucial for innovation (state-of-the-art, research projects).



3. Figure: key stakeholders of co-creation in elderly care (I-CARE)

Checklist for important components

- Analyse the applicant and see what the partner wants to achieve and whether this is compatible with their business activities/vision. Show that the project is compatible with the business mission.
- Check whether the business model and the pilot action fit together or whether a fit can be created. Show the partner that the innovation stabilizes, improves, or has a radically positive influence on the business model.
- Understand the corporate culture and consider whether it fits the co-creation project. Communicate your ideas of the co-creation project.
- Build up contacts and relationships. Make sure that the partner does not act opportunistically. Document arrangements. Show the employees involved that to the co-creation project will have positive effects on a personal level (e.g., reputation in the partner company).

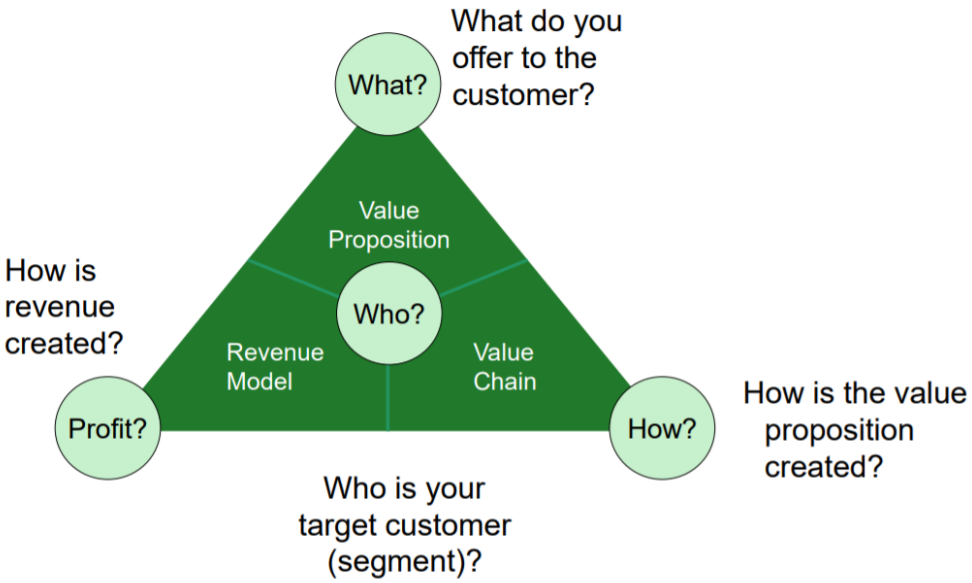
ii. How can we reach and involve them? In which combinations or constellations?

In an ideal world, stakeholders from across the value chain have been intimately involved in the co-creative process. This is co-design, one end of the stakeholder involvement spectrum. At the other end users/stakeholders are sometimes completely excluded from the design and development process. The development is only based on mere assumptions and statistical data and the company simply rolls out the product to the market. In more advanced cases, end-users are observed, interviewed, and brought in to test an Alpha or Beta, but otherwise they still had no active role in the co-creative process. In the middle lies participatory design approaches that involve users/stakeholders to various degrees. Co-creation strongly favours co-design, but that is up to company and its client. All that we can do here is reiterate the value of diversity in collective creativity. The decision, from our perspective, should not be about whether to include diverse stakeholders. Rather, it is concerned with when to include them.

Whenever engaging a user with a prototype, the key objective is to better understand him or her and the reaction to the solution-in-progress. Often with prototypes, companies ask the user to experience something newly created, and gain insight by observing their reaction and by talking to them about the experience. The intention with a user-driven prototype is to gain understanding by watching the user create something, rather than try something on the user that a company developed.

Monetary factors are important to motivate stakeholders to join a co-creation process. However, this factor does not ensure their engagement. Additional factors must be identified that motivate stakeholders to engage in-depth into joint innovation development projects. The following factors play a crucial role:

a) **reducing risks** associated with development: co-created products and services are considered to be less risky investments by companies;
b) **building new relationships**: co-creating new products and services provides all involved partners with the opportunity to build new relationships while increasing their engagement in the current co-creation process; networks between stakeholders involved in recurring co-creation processes;
c) **developing new knowledge**, by interacting directly and intensely with users and various stakeholders among each other actors gain first-hand insights on each other's positions, needs and challenges. This includes insights which might be hard to gain via other tools of market research or the perspective of stakeholders which are otherwise not represented or accessible for each other;
d) **building new capabilities process**: better user interaction; how to design user-centred co-creation process; organisational and individual level capabilities;
e) **developing new/upgrading existing ideas, services, products**: ideas, services, products are shared and improved together with stakeholders through collaboration (open innovation);
f) speed up the open innovation process: accelerating lab to market process, rapidly engage stakeholders and incorporate user needs to development.



d. Validation of the solution

Co-creation is an interactive process that includes constant feedback loops between the company, the users, and other involved stakeholders. In this context, the validation of the co-created solution in a real-life environment is a pivotal aspect of co-creation. Only in this way companies can verify that the solution indeed meets user needs, fits user, legal and economic requirements and, thus, will be successful once rolled out to the market.

In the validation process, we focus on „problem-space“, „solution-space“ and business-model verification/development. For the business model verification and development, the business model canvas (BMC) is a preferred methodology, which will be presented in Deliverable testing Methodology.

i. Validation and testing in the smart care pilots

In the context of the D-CARE project, validation takes place via smart care pilots which are conducted in each smart care lab region (Austria, Bosnia and Herzegovina, Bulgaria, Czech Republic, Germany, Hungary, Romania, Slovenia). Under the coordination of the regional project partners the co-created solutions will enter a testing phase. The solution is thereby introduced into a real-life setting of its envisioned use cases and challenges and benefits as well as points for improvement of the usage are being documented by a testing panel which is put together by the regional project partners. The testing panel is comprised by experts from each project country and is responsible for developing a methodology and framework for the testing as well as supervising the testing period. The panel is responsible for the collection of data during the testing phase, analysing the data after the conclusion of the testing phase and deriving recommendations for adaptation and/or market introduction of the solution.

ii. Inclusion and adaptation of insights or feedbacks from the pilots

The results of the testing need to be fed back to the company to be integrated into the final version of the product to complete the co-creation-loop. For the D-CARE project, the testing panels will issue a report comprising all data gathered during the testing phases as well as their conclusions drawn regarding adaptation and/or market introduction of the product. Based on

these reports, the regional project partners will facilitate the exchange with the companies to integrate these insights into the final versions of the product. At this point it would be possible to enter another testing and feedback loop, a process which can be reiterated until the testing does not yield any significant results regarding improvement of the solution anymore. Here, again, the general possibilities of the co-creation-approach need to be weighed against aspects of timely constraints, efficiency, and individual capacities of all stakeholders involved.

iii. Development of a market-ready solution

Once the results of the testing have been received the development of the market ready solution is in its final stages. When the company has integrated recommendations for adaptation and/or the market introduction of their solution the MVP stage is reached. This comprises the co-created solution, the business as well as the market entry plan. For solutions which have already been introduced to the market the latter can either be adopted or adapted to the further developed product. The smart care lab consortia are, moreover, fertile seeding grounds to find business partners and/or investors for a market roll-out of a solution.

3. Customization of the co-creation process/selection of methods

a. Goal of the process/Strategic objectives

The ultimate goal of the co-creation process is to increase the market potential of the selected innovative solution. Every product that wants to enter the market comes from a different background in terms of business model, technology, target group, maturity, financial stability, team composition, etc. It is important for the co-creation process to realize what specific attributes are unique to the solution.

The following objectives can be set out for the customization process:

- ✓ Determination of the innovation phase, or technology maturity, where the solution is currently positioned.
- ✓ Identification of the key development areas or strategic goals, that the solution owner wants to improve
- ✓ Define measurement of success, the type of indicators that shows how the product was improved
- ✓ Definition of the scope: what areas of the solution is to be tested and how
- ✓ What would be the tangible outcome of the process?
- ✓ Determination of the business model (using ideally a Business Model Canvas)

b. What do we want to achieve with the co-creation process?

The co-creation process outcome will be based on the identified ambitions and objectives of the solution owner, together with the end-user. Generally, there is a problem area, or field of challenge, which the company wants to improve, with the aim of increased user acceptance and business attractiveness. The specific parameters and conditions that measure the improvement in these areas is also determined in this phase.

The following dimensions shall be considered as outcomes from corporate perspective:

- ✓ Better market alignment of the solution, particularly redesigning business model
- ✓ Better market acceptance, increased customer/user acceptance rate

- ✓ Increased exposure of the solution to target audience
- ✓ Number of new business connections created (networking)
- ✓ Quantity and quality of market intelligence, gathered by the company
- ✓ Better understanding how products perform from a technical point of view at real life environment (product testing)
- ✓ Price acceptability, identification of a price range that is acceptable among customers
- ✓ Increased legitimisation of company action, by involvement of co-creators

The following dimensions shall be considered as outcomes from user (older adults) perspective:

- ✓ Increased usability
- ✓ Better liveability and enhanced access to services
- ✓ Lower costs, better budgetary options available
- ✓ Optimally fit solutions for user needs
- ✓ Increased awareness of users about the product and the addressed challenge

The following dimensions shall be considered as outcomes from academia perspective:

- ✓ Strengthen linkages between academia, private and public sector
- ✓ Better access to primary data
- ✓ Increased number of publications

The following dimensions shall be considered as outcomes from public sector perspective:

4. Tool & Method collection

Depending on the objective of the co-creation process different methods show different effectiveness/are suitable. If the process comes in at a very early stage where potential solutions to a previously determined challenge are not defined, open formats such as workshops in the world café style or open hearings will return most well-fit outcomes. In contrast to this, if co-creation is employed at a later stage of the development cycle/process when a solution or service has already been developed or conceptualised, methods that are more targeted on user feedback and stakeholder resonance offer better prospects.

Which method is employed during a co-creation process therefore largely depends on the objective of the co-creation and thereby the stage of the innovation or development process at which it is implemented?

The following offers a collection of co-creation tools and methods describing their purpose, procedure, strength, and weaknesses as well as outcomes that can be expected. As in the D-CARE innovation programme the co-creation process is implemented at a stage where actors that have already developed a solution are brought together with their users and stakeholders from the quadruple helix the methods will focus more on user feedback and stakeholder resonance. The prototyping phase that generally forms part of co-creation is additionally shifted to a separate time interval (the smart care pilots) in the D-CARE project.

Following the three phases of assessment, interaction and evaluation the following methods can be implemented at each stage:

1. Assessment:
   a. **User insights/personae:**

i. **Purpose**: based on existing data and knowledge as well as optionally own research archetypes of users are created that assemble typical characteristics of groups of users. This allows to adopt the status-quo perspective of the user and subsequently define challenges faced as well as potential solutions
ii. **Procedure**: collect existing data and optionally gather data oneself; detailed quantitative and qualitative analysis of the data; clustering and summarizing the data into "typical" user profiles
iii. **Strengths**: time efficient as already existing data can be used; great amount of data can be analysed and compiled, increases representativeness; eases a change of perspective
iv. **Weaknesses**: usefulness depends on the quality and depth of information obtained; average building might miss important peculiarities
v. **Expected outcomes**: several well described "typical" users that represent a wide range of user groups
vi. More Information: https://unalab.enoll.org/user-personas/

b. Service safari

i. **Purpose**: obtain a hands-on experience of the existing service landscape in a certain area including strengths and weaknesses of existing solutions and potential gaps in the existing offer.
ii. **Procedure**: identify relevant existing solutions and services; experience these solutions from the perspective of a user, e.g., try them out in a real-life setting, take a walk-through retailer stores etc.
iii. **Strengths**: lived and shared experience of the user perspective on existing solutions; obtain inspirations for product design and features; cost-efficient learning experience on strengths and weaknesses of existing products
iv. **Weaknesses**: accessibility of existing solutions might be reduced; potentially limited transferability of subjective experience to that of the real target users
v. E**xpected outcomes**: encompassing overview over the existing market; solid understanding of the user's perspective
vi. **More information:** http://gonano-project.eu/wp-content/uploads/2018/05/cocreation-handbook.pdf (p. 40)

c. User journeys

i. **Purpose**: map the timely steps of a user's contact and experience of a solution or service to anticipate or understand challenges and/or improve a solution or service
ii. **Procedure**: gather a group of relevant users; map their experience of the solution, including feeling, expectations, assessments, in every step from the first becoming aware of the solution through its use and potential change of use
iii. **Strengths**: detailed examination of the user experience allows for precise analysis of challenges and/or improvement potential; first-hand understanding of the user's perspective

iv. **Weaknesses**: validity of perspective potentially limited due to small number of cases and subjectivity of users
v. **Expected outcomes**: detailed encompassing process map from user perspective
vi. **More information:** http://gonano-project.eu/wp-content/uploads/2018/05/cocreation-handbook.pdf (p.30 and 47)

d. World Café

i. **Purpose**: gather a broad range of perspectives from different stakeholder groups on a topic
ii. **Procedure**: invite a diverse range of individuals concerned with a topic to an event/workshop; participants bring in a topic or aspect of a topic which they host at a table; remaining participants spread to the table and work on the topic for a given amount of time; participants subsequently move around the topic-tables while hosts stay at their respective table; joint wrap-up session presenting all results
iii. **Strengths**: broad range of perspectives can be gathered; find access points to a topic; first touch-point survey of current needs and challenges regarding specific topics; close interaction with participants and understanding of their perspective
iv. **Weaknesses**: focusing on specific details or working on a concrete road map for a process is not possible; implementation and design of the discussions largely dependent on hosting participants
v. **Expected outcomes**: broad overview over existing perspectives, needs and challenges concerning a specific area or topic
vi. **More information:** https://www.interreg-central.eu/Content.Node/I-CARE-CO-Handbook-Final-Version.pdf (p. 15)

e. Questionnaires

i. **Purpose**: gather higher amounts of data on a specific topic; purpose of questionnaires can vary, e.g., first exploration of a topic, need-assessment, user feedback etc.
ii. **Procedure**: questionnaires require careful preparation of the questions to avoid as much as possible bias in the formulation, structure or access to the questionnaires; conduct research on the topic, the target group and potential differences in access, response structure etc.; set up the questionnaire – including question format, e.g. multiple choice, free text answers; conduct a pre-test optimally with members of the later target respondents; distribute the questionnaire to respondents (targeted/untargeted; digitally/on paper; etc.); collect questionnaires; analyse the obtained data (quantitatively/qualitatively)
iii. **Strengths**: allows to gather a high(er) amount of data on a specific topic in a standardized way; insights on very specific aspects can be obtained; distribution to a wide circle of respondents possible; flexible in the design to account for different contexts and purposes
iv. **Weaknesses**: bias in questionnaire design hardly avoidable; pre-structuring of the topic risks missing important aspects; imbalances in

response rate may lead to biased data; might be difficult to reach the intended group of respondents; quite resource intensive

v. E**xpected outcomes**: several sets of data responding to a pre-defined set of questions on a specific topic; specific information on specific questions on a topic

vi. **More information**: http://www.internet-of-things-research.eu/pdf/D01_01_WP01_H2020_UNIFY-IoT_Final.pdf (p. 46); generally all socio-scientific knowledge on questionnaire research

f. Focus group/One-on-one interviews

i. **Purpose**: deep dive into the perspective of the users and/or other related stakeholders; precisely understand their needs, reasons behind it, current challenges and potentially requirements of and ideas for solutions

ii. **Procedure**: select a clearly defined group of users which you want to conduct the focus group or interviews with; write a discussion or interview guide beforehand; inform them about your data processing procedure and their rights to privacy protection before the session; conduct the interview or focus group in a friendly, welcoming space and record or note down important points; analyse the content subsequently

iii. **Strengths**: detailed insights in user/stakeholder perspective; understand the motivations or history behind certain needs or challenges

iv. **Weaknesses**: time consuming; only a small number of interviews possible which reduces the number of perspectives one can gather on a topic; appropriate user/stakeholder groups might be difficult to reach

v. E**xpected outcomes**: detailed knowledge on specific user needs, challenges faced, requirements of and ideas for solutions

vi. **More information**: http://gonano-project.eu/wp-content/uploads/2018/05/cocreation-handbook.pdf (p. 29, 32, 34)

g. Open Nature Innovation Arena

i. **Purpose**: Digital Collaboration tool for municipalities and administrations with their local or regional citizens. Citizens can bring in issues which are addressed by the administrative authority through an open access challenge the results of which feed into the political response to the issue.

ii. **Procedure**: promote access to the online tool (http://onia.unalab.eng.it/); citizens can raise an issue online; municipality/administration then opens a challenge with open access for all citizens and promotes participation; municipality/administration issues clear criteria of evaluation for the proposed solutions; proposed solutions are evaluated after the deadline; winning participant is engaged in a further co-creation process the result of which is promoted by the municipality/administration for implementation

iii. **Strengths**: Stakeholder involvement, Shared responsibility, Social cohesion, Transparency

iv. **Weaknesses**: reaching all affected (citizen) groups might be difficult; quality and readiness of the proposed solutions might vary considerably; longer-term commitment of the municipality/administration necessary
v. E**xpected outcomes**: integrated solution finding and optimally implementation process which returns tailormade and socially accepted solutions to relevant issues for the citizens
vi. **More information**: https://unalab.enoll.org/co-creation-arena/

2. Interaction

h. Open Lab/events

i. **Purpose**: provide a context for business-user- and potentially further stakeholder interaction; obtain insights on different perspectives, needs and challenges; create ideas and solutions; prototype, test and feedback solutions
ii. **Procedure**: define area or topic for the lab/event; set timeframe and implementation style; define further use/purpose of insights and outcomes of the lab/event; identify and engage relevant stakeholders; choose methodologies/activities to be offered in the lab or event; conduct, manage and disseminate lab/event; ensure thorough data collection; build on lab/event according to predefined purpose
iii. **Strengths**: real-life interaction between a broad range of stakeholders allows for encompassing assessments of status quo situations, effective and efficient solution finding as well as prototyping and testing; new and/or enhanced collaborations between stakeholders
iv. **Weaknesses**: resource intensive (time, personnel, space – physical or digital); knowledge and expertise in setting up and facilitating co-creation and innovation in open labs necessary
v. **Expected outcomes** E: user-need fit and market-ready innovations or solutions to challenges; active collaborations between various stakeholders
vi. More information:

https://ccn.waag.org/navigator/zone/sessions (including other sections)

i. Moderated online panels/communities

i. **Purpose**: obtain information and feedback from an online community or panel on a specific topic; iteratively engage in an exchange with stakeholders
ii. **Procedure**: define a topic or area; define stakeholder involvement strategy or rules; determine a management structure for the community/panel; set up an online space for a panel or community; engage stakeholders in discussions, moderate, gather obtained information; analyse and feed back insights, development steps etc.
iii. **Strengths**: low access hurdles; controlled interaction with the possibility to determine the involved stakeholders clearly; rather low maintenance costs; iterative engagement and several feedback loops possible
iv. **Weaknesses**: establishment requires considerable timely and personnel resources; relevant stakeholders might not be easy to reach

through online channels; engagement of actors might vary strongly; quality of the input highly dependent on motivation and expertise of participants to contribute

v. **Expected outcomes**: continuous exchange and feedback with relevant stakeholders on a certain topic or area

vi. **More information**: https://www.thestrategydistillery.com/news/consumer-co-creation-research/

j. Storyboard

i. **Purpose**: graphical tool to map the timeline of an implementation process of a solution or the user experience of a solution to anticipate challenges beforehand and compare different solutions directly to each other

ii. **Procedure**: set a group of participants/target users; set a topic or goal for the workshop; organise a workshop; each participant for themselves first draws up an implementation process or a user experience for the set topic/solution on a piece of paper; storyboards are then presented, compared and discussed

iii. **Strengths**: allows engagement with different users with different needs and perspectives at the same time; little resources needed

iv. **Weaknesses**: rather little technical detail possible; might lead to unrealistic hopes/expectations from the solution; no iterative work on the solutions together with users possible

v. **Expected outcomes**: collection of comparable graphical maps and ideas for an implementation process or user experience of a specific solution

vi. **More information**: https://unalab.enoll.org/storyboard/

k. 5 Why's

i. **Purpose**: deep dive analysis of a problem; understand root causes

ii. **Procedure**: gather stakeholders familiar with the challenge and process; organise a virtual or on-site workshop; describe or observe the challenge/problem, if possible, in real life; ask "why" in iterative steps; once the participants provided a reason ask "why" for this reason again; stop when you reach the ground of reasons, i.e., further asking "why" does not produce useful answers anymore; define counter measures; monitor their implementation and effectiveness

iii. **Strengths**: in-depth understanding of the root causes of a challenge or problem; intensive interaction with stakeholders/users; targeted response to challenges

iv. **Weaknesses**: process needs to be well guided not to get lost in non-related issues or too abstract or hypothetical reasons; only fit for challenges with low to moderate complexity for which solutions can be determined with a small group of involved stakeholders and implemented without high systemic integration costs

v. **Expected outcomes**: detailed understanding of a problem; set of potential measures or solutions to counter the challenge

vi. **More information**: https://unalab.enoll.org/5-whys/

l. Walt Disney

i. **Purpose**: analyse, understand and develop potential solutions for an issue from different perspectives
ii. **Procedure**: gather a group of stakeholders that are affected by a challenge or familiar with a certain process; define and describe the challenge as detailed as possible (potentially build on work done in previous workshops/processes); each of the participants in a row steps into the roles of the dreamer, the critic and the realist while elaborating on the challenge at hand from their view; participants physically move spots when they change the mental perspective; ideas or critical points can be run through the entire process again until no further critical points appear or "realistic" solutions can be further tested/implemented
iii. **Strengths**: enhances creativity; encompasses different perspectives on a topic (in the same group/individual); fuses expectations and perspectives into feasible solutions
iv. **Weaknesses**: clear separation of/empathy with different perspectives oftentimes difficult for participants; rather time consuming
v. **Expected outcomes**: realistic propositions; harmonisation and understanding of different perspectives on a topic/challenge
vi. **More information**: https://unalab.enoll.org/walt-disney-method/

m. Lego Serious Play

i. **Purpose**: enhance creativity and productive solution finding through a creative, handiwork process; harmonise and join together different understandings or visions of a challenge, e.g. in a team or among different stakeholders
ii. **Procedure**: engage a well-versed facilitator for the workshop who also provides the material; plan and organise the workshop; invite relevant stakeholders; give a short introduction to the methods and its purposes; conduct short skill building exercises that familiarize participants with the lego material, its features and enhances creative thinking; in teams or as individuals participants start to build their own models answering a specific question/challenge that has been defined by the facilitator/the organisers of the event beforehand; present and share the models and ideas; facilitator guides the process and if applicable goes into further detail; document models and their meanings; process is either repeated or a joint model built in the end, comprising both elements and ideas of all individual models
iii. **Strengths**: team building/cooperation enhancement; creativity enhancement; collect several perspectives, visions and ideas on a topic while also joining them together eventually; well fit for strategy and concept development, out-of-the-box innovation design
iv. **Weaknesses**: requires strong skills in workshop facilitation and with the method itself; resource intensive; low suitability for developing concrete solutions or measures – needs intensive follow-up work

Project co-funded by European Union funds (ERDF, IPA, ENI)

v. **Expected outcomes**: collection of individual perspectives on a concept, strategy, challenge as well as potentially a joint model, physically and ideationally, of a process/solution/vision/strategy etc.
vi. **More information**: https://ccn.waag.org/navigator/tool/lego-serious-play

n. Value Proposition Canvas

i. **Purpose**: gather an in-depth understanding of user needs and develop tailormade solutions
ii. **Procedure**: gather a group of relevant users (digitally or physically); draw up a value proposition canvas comprising of a user and a value proposition section; ask three questions in the user segment: (1) what jobs/tasks to they need to perform, (2) what are current pain points/difficulties, (3) what would be the gains/potentials of a solution; solutions/ideas are developed answering to the needs of the users and listed in the value proposition section; users reassess in what way the proposed solutions are pain relievers or gain creators; draw clear connections between solutions and the needs of users
iii. **Strengths**: efficient and effective solution development for concrete challenges of users; good understanding of users perspective; iterative fitting of solution to user needs
iv. **Weaknesses**: sensitive guiding through the process and obtaining users' needs might be challenging; best fit solutions might not work from an economical perspective
v. **Expected outcomes**: well fit solutions to user needs for a specific challenge or task
vi. **More information**: https://unalab.enoll.org/value-proposition-canvas/

3. Evaluation

o. Service blueprint

i. **Purpose**: visualised map of a process involving several stakeholders or levels, mapping touchpoints as well as potential friction points
ii. **Procedure**: set up a process map including all involved stakeholders; fill in their perspectives, tasks and activities; identify touchpoints, potential friction points and challenges; address those before starting the process
iii. **Strengths**: good overview over all involved stakeholders; anticipation of potential friction points and challenges; process can be smoothened in advance
iv. **Weaknesses**: obtaining all relevant perspectives for a process might be challenging; time consuming
v. **Expected outcomes**: comprehensive visualised map of a service/solution process; information on potentially challenging points/aspects of a process from different perspectives
vi. **More information**: https://www.interreg-central.eu/Content.Node/I-CARE-CO-Handbook-Final-Version.pdf (p. 16)

p. Acceptance test

i. **Purpose**: Technology (TAT) and User Acceptance Tests (UAT) can be used to evaluate the intention of potential users to adopt and

innovative offer. TAT applies statistical tests in early phases of the innovation (even when no prototype is available) project to evaluate basic features. UAT applies to technically mature solutions when they can be tried out by potential users.

ii. **Procedure of the Technology Acceptance Test**:
    1. Identification of domain-specific reasons for and against acceptance. For this purpose, the idea (or a prototype) must be presented to the target group and the reasons for and against the solution must be identified. Based on this finding, the core reasons are to be extracted, for example with the help of a qualitative content analysis.
    2. Creation of a measurement model and transfer into a questionnaire. Here it usually meaningful to consult external experts, as this step is accompanied by great challenges and wrong or bad measurement models lead to wrong or bad results.
    3. Interviewing the target group. Basically, attention should be paid to representativeness. However, convenience samples can also produce important findings under favourable circumstances.
    4. Analysis and evaluation of the collected data. A suitable statistical method should be used for this purpose. Structural Equation Models are a preferable choice. Under certain circumstances, simpler statistical methods such as Partial Least Squares can be utilized. Since the evaluation is essential for a meaningful interpretation of the results, external expertise should be incorporated if it is not available in the project team.
    5. Interpretation of the results and derivation of ideas for modifying the innovative solution. The goal here is to find a solution that increases the acceptance of the innovative solution.

iii. **User Acceptance test procedure**:
    1. Define criteria from which it can be deduced whether the solution functions as it should from the user's perspective.
    2. Create a User Acceptance Test scenario. This is a collection of concrete scenarios and expected results. The latter refers to the expected problem solution from the user's perspective.
    3. The scenarios must be executed by the users. This is followed by an evaluation from the user's perspective (does the solution do what it is supposed to do?). Eliminate relevant deficiencies.
    4. After completion of the tests, a final acceptance round should be performed with the users. Here the main question is whether the major weaknesses have been eliminated and whether the innovative solution meets the expectations.

iv. **Strengths**: TAT and UAT are comprehensive and reliable tools to evaluate the intention of users to use an innovative solution either in the early or mature state. The results are translated to statistical

solutions, which can be easily built into production. User centric factors such as interpersonal influence, experience, computer anxiety, trust, perceived risk, convenience, reactance, knowledge, triability or awareness can be included in the test, increasing its reliability.

v. **Weaknesses**: The implementation and evaluation of Technology Acceptance Tests require a lot of experience, knowledge, skills and especially in the field of statistics. It is therefore recommended to integrate external expertise into the innovation project.
vi. **Expected outcomes**: clearer understanding of user needs and better product performance.
vii. **More information**: https://www.interreg-central.eu/Content.Node/I-CARE-CO-Handbook-Final-Version.pdf (p. 17)

q. A/B testing

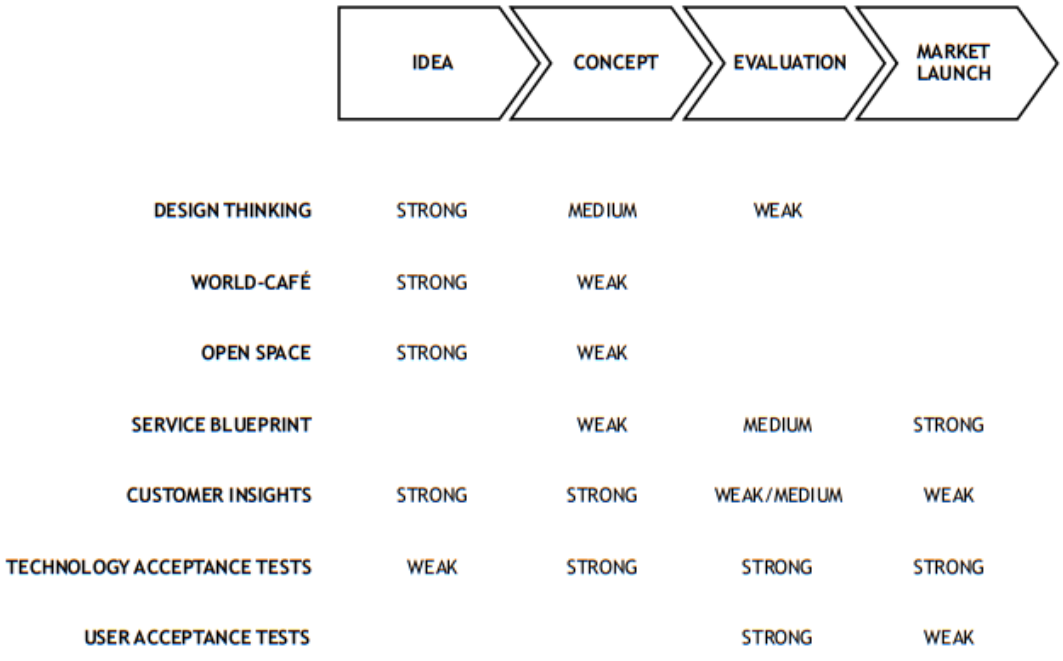
i. **Purpose**: A/B testing is the act of serving two different versions (feature, functionality, etc.) of an innovative product or service, and seeing which yields the best user acceptance rate.
ii. **Procedure**: (1) determine performance indicator to improve, (2) hypothesize change, (3) identify the variables and create variations, (4) run experiment, (5) measure results.
iii. **Strengths**: A/B testing in a good methodology to check and analyse, how different features of the product should be set, with the aim of further enhancing user acceptance and experience
iv. **Weaknesses**: A/B testing is a method has its limitation; only if clear different versions, features of the product can be presented in a testing environment, it is feasible to accept any changes. In case the changes to be implemented come with significant costs, the usability is also questionable.
v. **Expected outcomes**: increased user acceptance and customer experience.
vi. **More information**: https://unalab.enoll.org/a-b-testing/

5. Conclusion

The following table summarize the key methods and techniques, recommended for the D-CARE co-creation process, based on the adopted three-step framework.

Assessment	▪ User insights/personae ▪ Service safari ▪ User journeys ▪ World Café ▪ Questionnaires ▪ Focus group/One-on-one interviews ▪ Open Nature Innovation Arena
Interaction	▪ Open Lab/events ▪ Moderated online panels/communities ▪ Storyboard ▪ 5 Why's ▪ Walt Disney ▪ Lego Serious Play ▪ Value Proposition Canvas
Evaluation	▪ Service blueprint ▪ Purpose: Technology (TAT) and User Acceptance Tests (UAT) ▪ User Acceptance test procedure: ▪ A/B testing

Figure 4. below gives an overview of the usability of the investigated methodologies in various stages of co-creation and open innovation.



4. Figure: Ideal innovation process and concepts for co-creation (Source: I-CARE)

Co-creation does produce several positive impacts for all stakeholders involved but also bears some risks that should be considered when planning and implementing a co-creation process:

- **Involvement**: Stakeholders (both employees of the provider and older people) identify more with the innovation when they realize that their involvement has influenced the outcome. These people are more willing to participate in further co-creation projects.
- **Consistency**: People who have contributed positively to an innovation tend to behave consistently in the sense of acceptance of the innovation. The more influence was exerted on the outcome of an innovation, the higher the acceptance of the innovation.
- **Satisfaction and loyalty**: Contributors who have co-created an innovation are more satisfied, which leads to more loyalty and positive word-of-mouth advertising to customers.
- **Identification**: Contributors who have co-created an innovation identify more with the result.
- **Perceived risk reduction**: The more customers are involved in the co-creation of an innovation, the less risk they perceive in using the innovation.
- **Feeling of exploitation**: Customers who participate in co-creation may feel exploited if they feel that they are being used as co-workers without receiving the appropriate recognition from the partner.
- **Resistance**: Bad experiences with the co-creation process leads to resistance against further cocreation processes and to resistance against the innovation.

Each co-creation activity is embedded in a concrete context (roughly: situation) that influences this process. Based on the prior knowledge and on the analysed materials, the following aspects are of relevance:

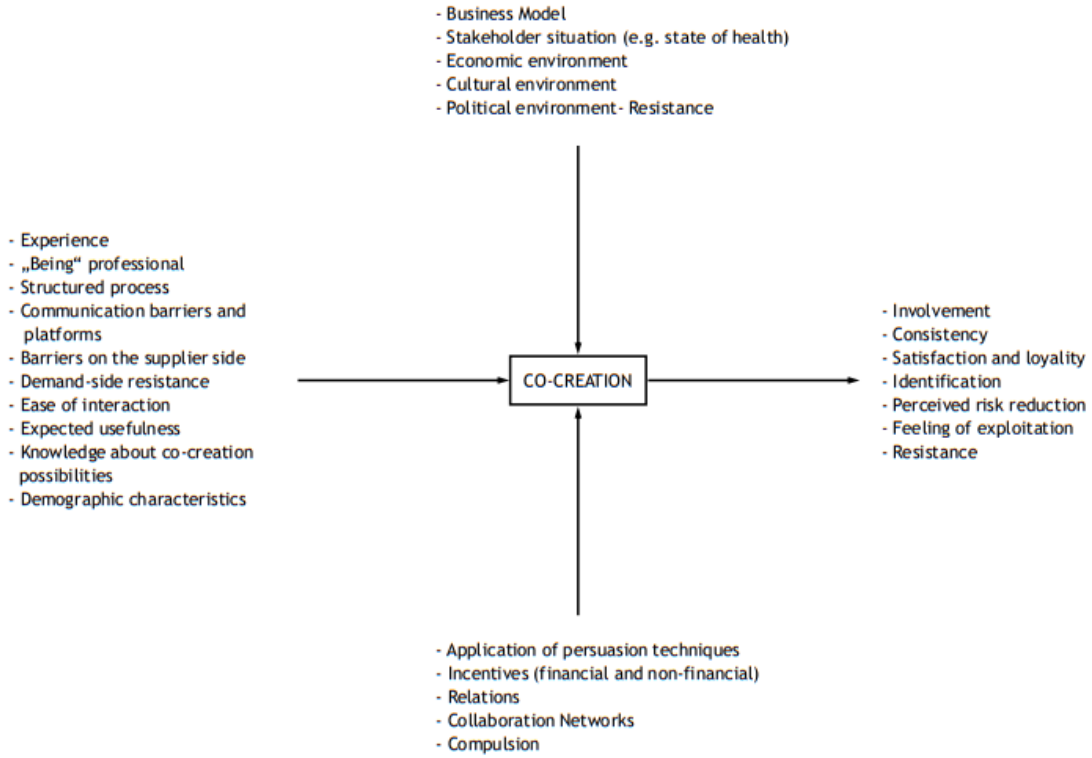
- **Business Model**: The business model of the provider influences the way co-creation can be carried out. It also influences the willingness of customers to participate in co-creation. The more social the business model is perceived, the higher the willingness to cooperate.
- **Stakeholder situation**: The specific situation of those involved must be considered. This refers to the ability to cooperate, to the intellect, to personal goals and to the personal life situation.
- **Economic environment**: The economic situation is not identical in the partner regions. This influences the ability and willingness to co-create for all parties involved.
- **Cultural environment**: Cultural influences (signs, language but also basic assumptions, e.g., regarding the way of doing business) must be considered and incorporated into the design of a co-creation platform
- **Political environment**: The political system, in particular the design of the health care system, determines the willingness to participate and the possibilities of co-creation.

To increase the readiness for co-creation, several strategies seem to be suitable:

- **Application of persuasion techniques**: To initiate co-creation with older people, classical influencing techniques are suitable. In particular:
    - Reciprocity (showing mutual favours),
    - Consistency (co-creation initially on a small scale and gradually expanding),
    - Liking (building up sympathy, for example by showing common goals),
    - Authority (presenting expertise),

- Social proof (showing that other older people are also involved) and
- Scarcity (co-creation as an exclusive process).

- **Incentives** (financial and non-financial): Financial and non-final grants support the readiness for cocreation. The latter aspect can, for example, be achieved by acknowledging the performance of the person concerned.
- **Relations**: The development and expansion of personal relationships can be used as a strategy for initiating and implementing co-creation.
- **Collaboration Networks**: Support through professional networks for collaboration increases the willingness and ability to participate in co-creation.
- **Compulsion**: In certain situations, it is impossible to develop an innovation and position it on the market if customers do not participate. This is the case, for example, if the innovation is specifically tailored to a particular life situation and can only be functional if the customer cooperates by providing information or other resources. This, however, is very rare and would need the involvement of policy makers that are able to exercise authority in the field of care solutions. For the scope and solutions co-created in the D-CARE project this case is unlikely to be expected.



5. Figure: Overview of 4 main aspects of Co-creation in D-CARE project

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