# CIPTEC

COLLECTIVE INNOVATION FOR PUBLIC TRANSPORT

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# D3.1 Collective intelligence conceptual framework and guidelines

(Version 1.0, 29/09/2015)

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| Participant # | Participant organisation name | Short Name | Country |
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| 1 (Coordinator) | Aristotle University of Thessaloniki-Transport Systems Research Group | AUTh | Greece |
| 2 | KU Leuven – The Research Centre for Marketing and Consumer Science | KU Leuven | Belgium |
| 3 | Mobycon Concordis Groep | Mobycon | The Netherlands |
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| 8 | Metropoolregio Rotterdam Den Haag | MRDH | The Netherlands |
| 9 | TIEMME | TIEMME | Italy |
| 10 | traffiQ Local Public Transport Authority of the City of Frankfurt am Main | traffiQ | Germany |
| 11 | European Passenger's Federation | EPF | Belgium |
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## Abstract

The specific aim of this document is to provide guidelines on how to use **crowdsourcing** and **co-creation / co-design** in CIPTEC in order to support the generation of innovative public transport ideas. These guidelines will define the framework under which relevant stakeholders can potentially benefit from these two forms of collective intelligence methods and will assist in designing and developing the CIPTEC crowdsourcing platform in "Task 3.2 Crowdsourcing new innovative concepts and incentives in public transport" (Month 5-36) and in running the co-creation co-design workshops in "Task 3.3 Co-creation co-design workshops" (Month 11-20).

**Crowdsourcing** is the the act of a company or institution taking a function once performed by employees and outsourcing it to an undefined (and generally large) network of people in the form of an open call.

There are plenty of tasks and areas of interest that crowdsourcing has been applied. Crowdsourcing has been used to gather data, to develop new content, to generate innovative ideas, to raise funds etc.

In CIPTEC, crowdsourcing will be used to generate innovative ideas from users and to forward the best of these ideas to the co-creation / co-design workshops. Both competitive and collaborative type of crowdsourcing will be used for that purpose:

- competitive crowdsourcing will be used to gather new innovative ideas from a diverse group of stakeholders, and
- collaborative crowdsourcing will be used to allow discussions, reviews, ratings etc. on the submitted ideas.

The best ideas will be forwarded to the co-creation workshops. A **co-creation workshop** is a type of workshop focused on action, where all participants collaborate, in order to co-create new approaches to products, services and business models and to find and create ways to address the needs of the workshop. This is done through creative knowledge sharing and constructive activities where the team is invited to negotiate and generate new innovative concepts. The undertaking of creativity processes that use co-creation workshops, starts with the definition of the workshop's scope, objective and goals and continues with the preparation phase, where the process model and tools for the creativity sessions will be selected, participants will be defined and invited and decisions about the rest of the co-creation workshop's important components will be made (e.g. venue, facilitator, recording methods, evaluation of co-created concepts, thematic topics of focus, documentation of workshop's results, etc.).

This document includes an indicative planning for applying crowdsourcing and for setting up the co-creation workshops. A list of open issues is also included.

# Executive summary

In order to support **innovation** and increase **attractiveness** of public transport, CIPTEC utilises two forms of collective intelligence methods: **crowdsourcing** and **co-creation / co-design**. The specific aim of this document is to provide **guidelines** on how to use crowdsourcing and co-creation / co-design in CIPTEC in order to support the generation of innovative public transport ideas. These guidelines will define the framework under which relevant stakeholders can potentially benefit from these two forms of collective intelligence methods and will assist in designing and developing the CIPTEC crowdsourcing platform in "Task 3.2 Crowdsourcing new innovative concepts and incentives in public transport" (Month 5-36) and in running the co-creation co-design workshops in "Task 3.3 Co-creation co-design workshops" (Month 11-20).

***Crowdsourcing***

**Crowdsourcing** is not a new concept. Examples of crowdsourcing have appeared many times throughout history and long before the invention of the internet. Although successful crowdsourcing examples have been mentioned in the literature, the term "crowdsourcing" first appeared in 2006 in Howe's (2006) article. Jeff Howe, editor at Wired Magazine, coined the term "crowdsourcing" after conversations about how businesses were using the Internet to outsource work to individuals. Howe came to the conclusion that what was happening was that companies were "**outsourcing** the work to the **crowd**".

There are plenty of tasks and areas of interest that crowdsourcing has been applied. The document presents various successful crowdsourcing examples both from the private sector and from the public transport sector. The aim is to utilise the knowledge generated from the review of several successful crowdsourcing initiatives, to put this knowledge into the context of CIPTEC (open innovation) and to come up with a plan on how to effectively use crowdsourcing for collective intelligence.

In CIPTEC, crowdsourcing will be used to gather ideas: calling for ideas, opinions and analyses has emerged as a viable and enriched resource of big organisations. It is rapidly becoming a procedure for generating innovative solutions for a vast range of corporate and societal issues. Crowd is becoming a very popular tool that helps organisations acquire external knowledge by capturing user ideas and transforming them into innovations.

In CIPTEC the most innovative and popular ideas will be forwarded to the co-creation workshops for evaluation. In order to successfully run crowdsourcing in CIPTEC, this document presents the steps that should be followed by the organisers of the crowdsourcing activities:

**Step 1: Definition of the campaign**. In CIPTEC users will be able to submit ideas and the most promising ones will be forwarded and further discussed during the co-creation / co-design workshops. The crowdsourcing platform will be deployed in the four areas that the workshops will take place:

1. Germany (coordinated by partner traffiQ),
2. Netherlands (coordinated by partner MRDH),
3. Italy (coordinated by partner TIEMME),
4. Greece (coordinated by partner AUTh).

**Step 2: Definition of the rules of the campaign**. In CIPTEC, **any registered user** can participate in the crowdsourcing initiative and can a) submit innovative ideas, b) comment on existing ideas, c) rate existing ideas, d) interact with other users. Incentives will be given to the users to participate. At each area there will be at least two winners receiving benefits (the ones with the two most promising ideas). The specific benefits will be further discussed and decided with the partners coordinating the crowdsourcing contests. A preliminary plan is to give a

financial reward to the first selected idea and to give free entrance to public transport services for a period of time to the second best idea.

**Step 3: Releasing the campaign online**. In CIPTEC an open source crowdsourcing platform will be used and customised according to the requirements that will be gathered in Task 3.2. A state-of-the-art user friendly interface will allow users to easily perform various tasks (submit idea, rate idea, comment idea, discuss with other users) both through a pc and a mobile phone. Location based services will be also integrated for better identifying where the idea was generated and compare it to the certain circumstances of that place for further evaluation.

**Step 4: Advertising the campaign**. CIPTEC will be using both online and offline advertising to promote the crowdsourcing campaigns. The reason for using both is that the groups that should participate in the crowdsourcing initiatives must be diverse to ensure their success. It is important that during the crowdsourcing contests all partners of the consortium are active and promote the contests accordingly.

**Step 5: Gathering contributions**. In CIPTEC a rough estimation of the number of participants and the number of platform visitors has been made bearing in mind the demographics of each area, the period that the contests will run and similar successful paradigms in the literature. The numbers are presented below and refer to each area separately:

- 3,000 – 5,000 platform visits
- 300 – 1,000 registered users
- 150 – 400 submitted ideas
- More than 500 comments on submitted ideas
- At least 500 rates
- An idea should receive at least 50 interactions (including comments, rates etc.) to be able to be forwarded to the workshops for evaluation

**Step 6: Evaluation process and rewards**. In CIPTEC, the preliminary plan / process for evaluating the ideas and selecting the winners of the CIPTEC crowdsourcing campaigns is the following:

- One week before each workshop takes place, the ten most popular ideas (at each area) will be selected. An algorithm will be used to automatically retrieve the popular ideas based on specific criteria (rating, views and comments).
- Five more ideas will be selected by the partners responsible for coordinating each workshop based on their specific criteria.
- During the workshops the fifteen ideas will be discussed, their quality will be assessed and will be ranked with the assistance of the Experts Advisory Board. Since two workshops are foreseen at each site, thirty ideas will be evaluated in total.
- The two ideas with the highest ranking will win the predefined prizes.

A preliminary schedule of the CIPTEC crowdsourcing campaigns is the following:

- Month 12 (April 2016) the platform will be ready and deployed to the four areas,
- Month 13 (May 2016) the crowdsourcing campaigns begin,
- Month 18 (October 2016) the crowdsourcing campaigns finish,
- Month 13 – Month 18 the best crowdsourcing ideas are forwarded to the co-creation workshops for evaluation,
- Month 18 – Month 20 the evaluation process continues,
- Month 20 (December 2016) rewards will be given.

***Co-creation workshops***

Co–creation / co-design is the second collective intelligence process that will be applied in the framework of CIPTEC. It is a user-centered, collaborative approach based on collective creativity that aims to the production of new, innovative ideas. Co-creation / co-design has become a foundational premise of the service-dominant logic and refers to the collaboration and the active involvement of users and other significant stakeholders in the design process of a product or service, in order to jointly create value. It is a form of collective intelligence that is increasingly popular in many projects and organisations, something that can be attributed to its proactive market orientation.

Co-creation / co-design employs several methods and one of them is the concept of the co-creation / co-design workshops. A co-creation workshop is conceived as a type of workshop that is primarily focused on action and where all participants collaborate and contribute to find and co-create ways to serve the objectives of the workshop. This is done through creative knowledge sharing and constructive activities where the team is invited to negotiate and generate new innovative concepts. Co-creation workshops aim to “outsource” innovation and value creation to the users, by giving them an active role in the idea generation and concept development process. Within this context, the deployment of co-creation workshops, can be expected to lead to benefits for both users and organisations, such as greater customer satisfaction, increased attitudinal loyalty of users, increased perceived customer value and customized services / products.

The undertaking of such a co-creative process includes several basic steps. Understanding a need that has to be served through the workshop and identifying the process’s desired goals are the steps from which the process should begin. Once the objectives and the intended benefits of the co-creative activities are identified, an alignment of those two can be achieved, by selecting the most appropriate co-creation practices and applying them in ways that contribute optimally to the co-creation process. Therefore, after having identified its scope and objectives, the success of a co-creation workshop lies in the optimal selection of its participants, process models, moderators, co-creation tools, evaluation methods, logistics and the rest of the organizational aspects (e.g. languages, recordings methods, documentation).

Even though there is a variety of structures, methodologies and key elements, there are some specific important characteristics that a co-creation workshop must have. In particular, the co-creation workshops must ensure the minimal participant’s training and be collaborative, creative, pragmatic, inclusive and cost effective to run. Furthermore, the co-creation workshops should not constrain their participants by promoting certain types of behaviors and ideas.

The co-creation workshops are being applied in a wide range of contexts including, among others, the transportation area. In fact, there are many examples of co-creation workshops with objectives that refer directly or indirectly to public transport, thus demonstrating the suitability of this process regarding transport oriented projects. Several of these cases are presented in the frame of this deliverable in order to offer insight into their structure and successful practices. The findings from these cases indicate that the application of the co-creation concept in the public transport sector could lead to a better understanding of users’ needs and could facilitate the decision making process and improve new products / services development. In addition, cost efficiency and user engagement could be increased. The presented cases share several common features that seem to have contributed to their success. These common features are the focus on users, the heterogeneity of the participants, the participants’ intrinsic motivation and strong interest in the workshops’ objectives as well as the engagement of a strong moderator to carry out the co-creativity sessions.

CIPTEC aims to apply the process of the co-creation workshops in order to stimulate the generation of creative and innovative new business concepts (services and products) in the field of public transport. The co-created concepts, should be tailored on the identified needs (users’, PT operators’ and PT authorities’ needs) and the market and social trends that will

have been identified in WP1. Special focus will be given in developing concepts that exploit new technologies and new business models. These innovative concepts are expected to increase the attractiveness of public transport, create a competitive advantage for it and eventually increase its market share.

It has to be underlined that CIPTEC's co-creation workshops will be closely connected with the project's crowdsourcing platform, since the latter is going to provide valuable input to the co-creativity sessions, where the potential of the most promising ideas that will emerge from crowdsourcing will be further investigated. Overall, the co-creation workshops have a substantial role in the framework of CIPTEC as its outputs are going to be exploited in the upcoming phases of the project and in particular in WP4 "Advanced marketing research and consumer experimentation", WP5 "Toolbox for Public Transport Innovation" and WP6 "Social innovation, toolbox validation and policy recommendations".

At the current stage of the project an indicative planning is made concerning the structure and the main parts of the co-creation workshops that CIPTEC will apply. The proposed preliminary guidelines and alternative options, are based on the co-creation workshops' practices and the key elements of the successful cases that are presented. However, the CIPTEC co-creation workshops may not be homogeneous in many of their aspects. Therefore, this deliverable identifies and lists a number of open issues and major points on which decisions have to be made. These open issues will be determined in close collaboration with the CIPTEC's partners who will implement the co-creation workshops in their respective countries, in order to account for each location's unique features concerning the users' needs, public transport operators, public transport authorities, legal framework and local stakeholders.

In particular, the CIPTEC's partners that are involved in the undertaking of the co-creation workshops will have to decide on matters that include the objectives, the participants, the process model / methodology, the co-creation tools, the evaluation methods, the logistics, the language, the recording methods and the documentation of each workshop. The final plan for setting up and carrying out the co-creation workshops in the framework of CIPTEC will be included in the D3.3 "Plan for co-creation / co-design workshops".

# 1 Introduction

This document is the first deliverable of "WP3 Developing innovative concepts in public transport sector by collective intelligence", it belongs to the first task of WP3 and aims to present conceptual guidelines about how to use and deploy collective intelligence process, specifically crowdsourcing and co-creation / co-design, to support innovation as a way to increase attractiveness of public transport and create competitive advantage for it.

The document is divided in two parts. The first part (Section 2) introduces the concept of crowdsourcing and the second part (Section 3) introduces the concept of co-creation / co-design. These two parts are interconnected since during WP3, and while crowdsourcing and co-creation / co-design will be running, the best ideas that will come from crowdsourcing will feed the co-creation and co-design workshops.

Section 2 and Section 3 begin with a literature review on crowdsourcing and co-creation / co-design (Section 2.1 and Section 3.1 respectively). Both sections continue with presenting relevant examples (Section 2.2 presenting crowdsourcing examples and Section 3.2 presenting co-creation / co-design examples). Finally, both sections end with recommendations and guidelines on how to use these two forms of collective intelligence in CIPTEC (Section 2.3 presents guidelines on crowdsourcing and Section 3.3 presents guidelines on co-creation/co-design).

The work of this deliverable is feeding Task 3.2 and Task 3.3 where the crowdsourcing platform will be developed and the co-creation / co-design workshops will be running. As depicted in Figure 1, WP3 belongs to the second phase of the CIPTEC work programme, it is related with WP4 (that is also in the same phase) and feeds directly WP5 that belongs to the third phase.

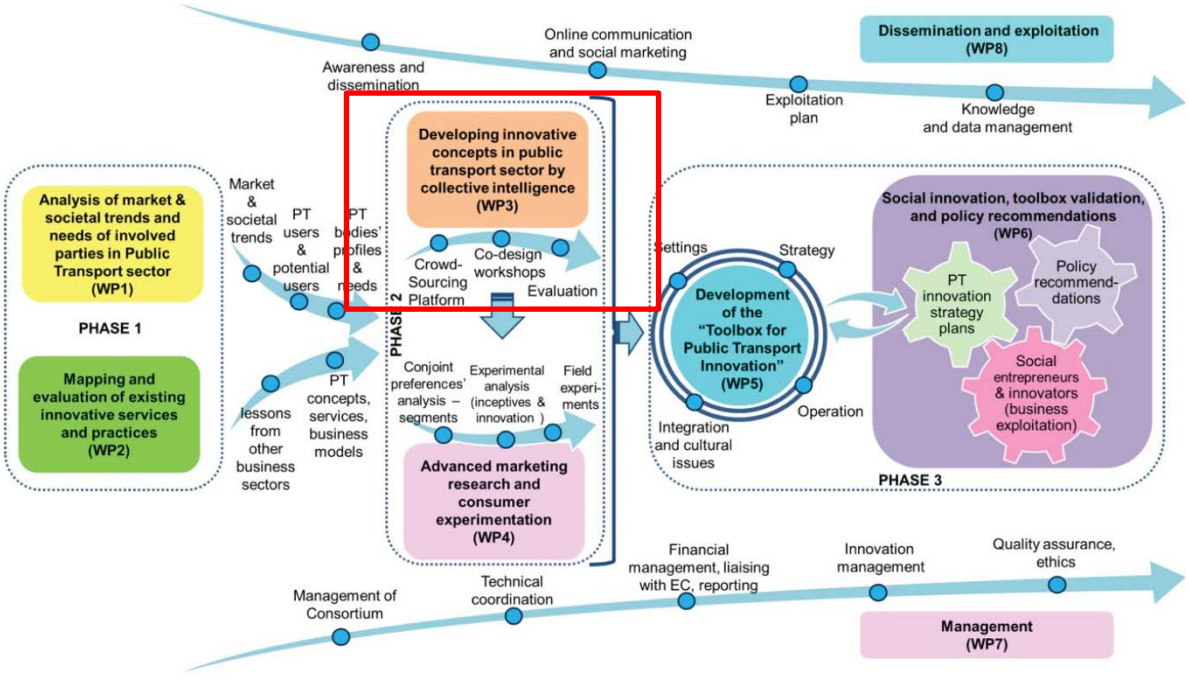


**Figure 1: CIPTEC components**

# 2 Crowdsourcing in CIPTEC

One of the concepts that the collective intelligence term encompasses is the term of crowdsourcing. As mentioned in the Grant Agreement, CIPTEC will utilise this form of collective intelligence to gather new ideas that will promote innovation in public transport.

The specific aim of this section is to provide **guidelines** on how to use crowdsourcing in CIPTEC in order to support the generation of innovative public transport ideas (from the "crowd") that will be further elaborated during the co-creation workshops (Section 3). These guidelines will define the framework under which relevant stakeholders can potentially benefit from crowdsourcing and will assist in designing and developing the CIPTEC crowdsourcing platform in "D3.2 Crowdsourcing platform" (Month 12 / April 2016).

In order to explore the full potential of crowdsourcing, a literature review on crowdsourcing practices is performed in **Section 2.1**. The report continues (**Section 2.2**) with a presentation of successful crowdsourcing initiatives / examples (both generic examples and examples of crowdsourcing applications in public transport). Finally, generic crowdsourcing guidelines (steps) and recommendations on how public transport authorities and operators should use the CIPTEC crowdsourcing platform are presented.

## 2.1 Crowdsourcing: literature review

### 2.1.1 The concept of crowdsourcing

Crowdsourcing is not a new concept. Examples of crowdsourcing have appeared many times throughout history and long before the invention of the internet. One interesting example is taken from the 18th century when Napoleon Bonaparte was busy conquering parts of Europe. At that time, he created a contest offering 12,000 Francs to anyone who could figure out how to keep food fresh on the battlefield. Out of the crowd came Nicolas Appert who responded to the challenge and his solution was canned goods. Another well-known example is when in 1714 the British government in an attempt to prevent the loss of ships at sea created a prize purse of 20,000 pounds to map longitude. The contest that was considered almost unsolvable was won by John Harrison, the son of a carpenter. Harrison invented the 'marine chronometer' (i.e. an accurate, vacuum sealed pocket watch). Wikipedia [1] mentions at least 15 such examples summarised in the following figure:

[1] https://en.wikipedia.org/wiki/Crowdsourcing

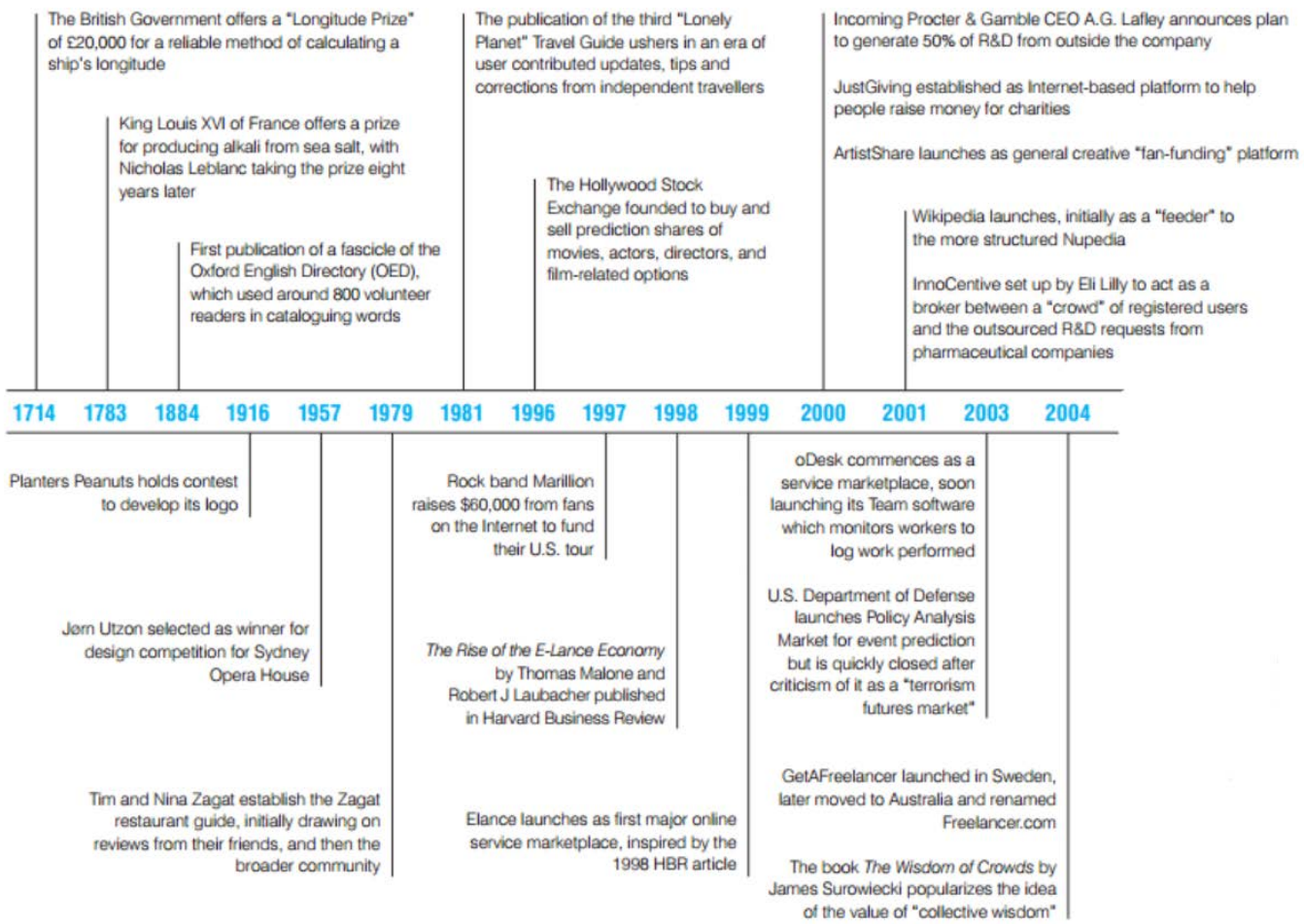


**Figure 2: Major historical crowdsourcing examples**

Source: *[A brief History of Crowdsourcing, 2015]*

Although several successful crowdsourcing examples have been mentioned in the literature, the term “crowdsourcing” first appeared in 2006 in Howe’s (2006) article. Jeff Howe, editor at Wired Magazine, coined the term "crowdsourcing" after conversations about how businesses were using the Internet to outsource work to individuals. Howe came to the conclusion that what was happening was that companies were “**outsourcing** the work to the **crowd**”. This is how the first definition of crowdsourcing came up. Howe defined crowdsourcing as “*the act of a company or institution taking a function once performed by employees and outsourcing it to an undefined (and generally large) network of people in the form of an open call. This can take the form of peer-production (when the job is performed collaboratively), but is also often undertaken by sole individuals. The crucial prerequisite is the use of the open call format and the wide network of potential laborers.*”

Later, in 2008, Howe gave another definition: *“Crowdsourcing is the act of taking a job traditionally performed by a designated agent (usually an employee) and outsourcing it to an undefined, generally large group of people in the form of an open call”.* Howe continued his arguments on crowdsourcing and in a book on the topic that appeared in 2009 he asserted that crowdsourcing could be used to solve any kind of problem. He noted that, “*Some professionals rightly regard crowdsourcing as a threat; others, likewise, view it as a solution. In fact it is both*” (Howe 2009).

The term was further simplified by Brabham (2008): “*Crowdsourcing is an online, distributed problem solving*” and by Greengard (2011): “*In essence, crowdsourcing is based on a simple, but powerful, concept: virtually everyone has a potential to plug in valuable information*”.

After studying more than 40 definitions of crowdsourcing in the scientific and popular literature (Estellés-Arolas, 2015), researchers at the Technical University of Valencia developed a new integrating definition: "*Crowdsourcing is a type of participative online activity in which an individual, an institution, a non-profit organization, or company proposes to a group of individuals of varying knowledge, heterogeneity, and number, via a flexible open call, the voluntary undertaking of a task. The undertaking of the task, of variable complexity and modularity, and in which the crowd should participate bringing their work, money, knowledge and/or experience, always entails mutual benefit. The user will receive the satisfaction of a given type of need, be it economic, social recognition, self-esteem, or the development of individual skills, while the crowdsourcer will obtain and utilize to their advantage that which the user has brought to the venture, whose form will depend on the type of activity undertaken*".

Zhao and Zhu (2012), distinguish crowdsourcing from open innovation and from open source code development by noting that crowdsourcing was not “open” but relied on individual and independent work. They also differentiate crowdsourcing to outsourcing: outsourcing depends on business relationships while crowdsourcing depends on participation of a diverse crowd. They also argue that crowdsourcing mainly involves three components: 1) **the organisation** that is benefiting and that is initiating the process of crowdsourcing (assigner), 2) **the crowd** that are individuals or members of a community (providers) and 3) **the platform** that establishes a link between assigners and providers.

According to Saxton et al (2013) crowdsourcing can best be understood as lying at the intersection of three key elements: the “crowd,” outsourcing, and advanced internet technologies.

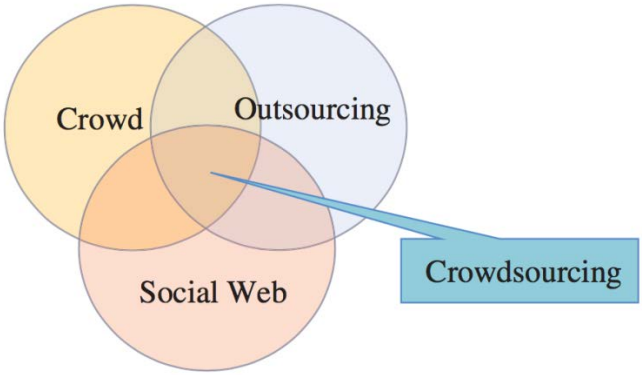


**Figure 3: The three defining elements of crowdsourcing**

Source: *[Saxton et al, 2013]*

Despite the various definitions and opinions on crowdsourcing, there are some constants that crowdsourcing initiatives have: a) an organisation broadcasts a problem to the public through an open call for contributions, b) users submit solutions, c) usually the best crowdsourcing contributions are compensated with prizes or with recognition.

Since the introduction of the crowdsourcing definition by Howe, there have been more than 400 articles published in the literature regarding this term. An interesting study (Tarrell et al, 2013), analysed the keywords that appear in around 150 articles. The result is depicted in Figure 4. The connections between the nodes show other keywords which are included in those same research articles. Innovation, co-creation, collective intelligence, knowledge management are some keywords that regularly appear with the term crowdsourcing.

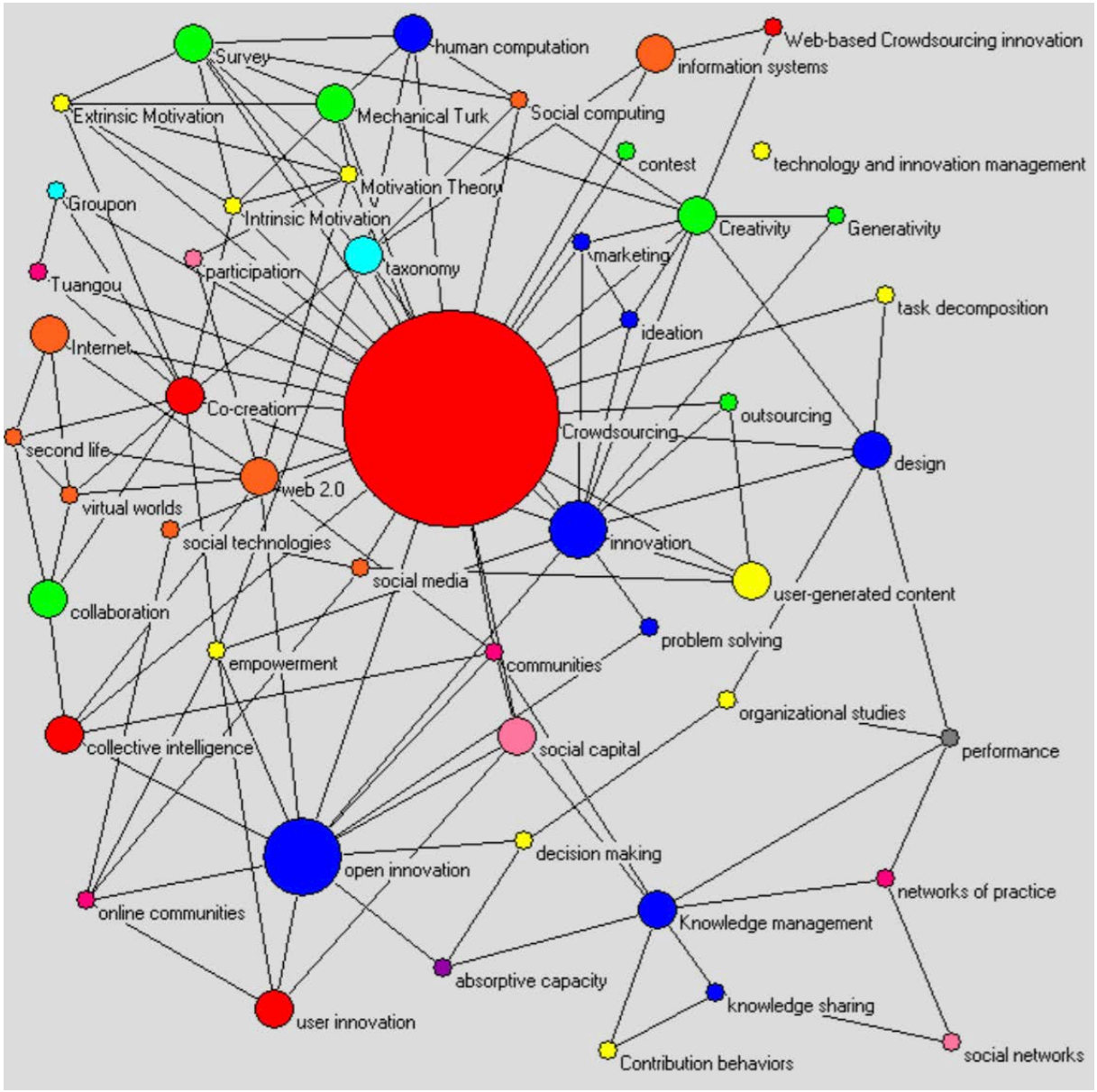


**Figure 4: Keyword Analysis and Relationships for Crowdsourcing Publications**

Source: *[Zhao and Zhou 2014]*

The use of crowdsourcing started exploding in parallel with expansion of the use of internet and Web 2.0 technologies (Rouse 2010). Since then, many organisations worldwide started realising the potential of crowdsourcing and launched campaigns (Coca-Cola, Nokia, Unilever, Procter & Gamble, Starbucks, General Motors). However, crowdsourcing is not only used for business purposes. There are a lot of non-profit organisations that have adopted crowdsourcing for problem solving. Its adaptability and flexibility allows its use to several disciplines by various types of organisations. Crowdsourcing has been used in many disciplines including astronomy, journalism, ornithology, genetic genealogy, public policy etc.

In Figure 5 we can see the interest of the term “crowdsourcing” as this appeared in Google searches.

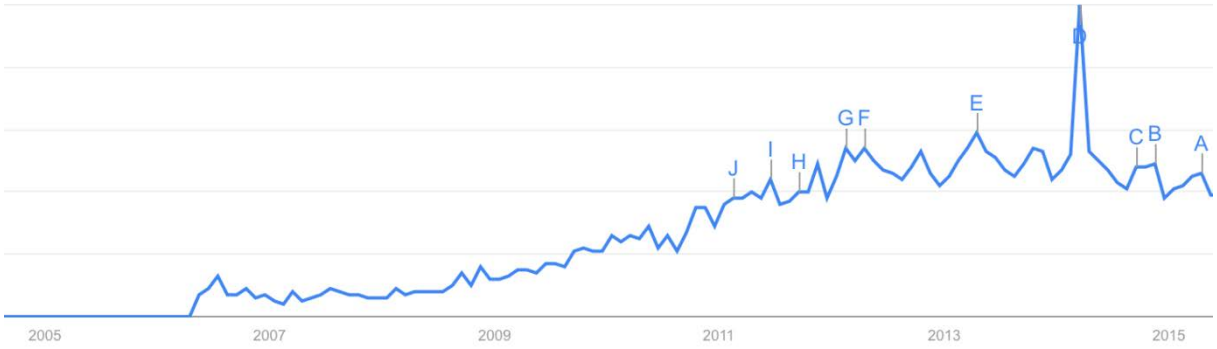


**Figure 5: Interest over time of the "crowdsourcing" term**

Source: *[Google trends, 2015]*

### 2.1.2 Advantages and disadvantages of crowdsourcing

Approaching the crowd and using it to gather contributions can help organisations identify solutions to various challenges. J. Shuroveski (2007) in his book "Wisdom of Crowds" argues that searching a solution to a specific problem and relying on the combined knowledge of many users, **when conditions are prescribed properly**, may be a more effective method than the use of experts.

According to the literature, the most significant advantages of using crowdsourcing are: cost, speed, efficiency, quality, flexibility, scalability, and diversity (Alonso 2013, Alonso and Mizzaro 2012, Morris et al 2012). On the other hand, the most significant disadvantages that should be taken into consideration are data accuracy and quality, confidentiality and difficulty in managing the process of crowdsourcing. Below we summarise the main advantages and disadvantages of using crowdsourcing:

**Advantages**:

- Large number of users with diverse backgrounds lead to more ideas, and it is likely that among these ideas there are some smart and innovative ones.
- Users become 'owners' of the crowsourced solution, in the sense that they develop trust, acceptance and endorsement towards the winning solution.
- It is usually cheaper to outsource some work to the users instead of hiring experts to do this job.
- It usually takes less time to gather innovative contributions and ideas than to wait for experts to do the job.
- The organisations increase their users' loyalty and as a result the organisations brand and value is increased.
- The risks of the uncertainty of the demands of the market is decreased as the ideas now arise directly from the users.

**Disadvantages**:

- By allowing public contributions, organisations loose their competitive advantage. Competitors might find out about the plans of the organisation or see and steal the online ideas.
- There are cases where many of the contributions of the users are not very relevant, inconsistent or do not have the appropriate quality. Sometimes users also disregard the specific criteria posed by the organiser of the campaign.

- Sometimes, the number of votes and idea gathers, has nothing to do with whether it is feasible or the market finds it appealing. In that case, the organisation ends up with popular contributions of low quality.
- There is an imminent risk that the crowdsourced solution will not be representative of its society mix, because not all users are technology-savvy enough to engage in collaborative online processes. This may have a detrimental impact on the product's success in the market (uptake lower than anticipated).
- Organisations cannot count on the fact that they will receive what they need and when they need it. It needs a lot of effort and resources to advertise the campaign to as many and diverse users as possible, in order to receive valuable contributions.
- Crowdsourcing needs to be managed effectively; it has to confront and overcome bureaucratic processes and technical issues, secure financing sources and engage trained staff.

### 2.1.3 Motivating users to participate to crowdsourcing initiatives

One of the most challenging issues in crowdsourcing is the incentives that the organiser will give to the users to motivate them to participate to the campaign. Users actively participate in such initiatives only if they have specific motives. Brabham 2010 notes that understanding the motivations for participation are crucial when designing a crowdsourcing call, but that there is no single set of motivations that work for all crowdsourcing actions.

It is interesting to mention here what the literature mentions about the reasons consumers want to participate in crowdsourcing projects. Ryan and Deci (2000), state that there are two types of motivations. On the one hand it is the person that performs an activity in order to obtain some kind of external reward, e.g. recognition for work done, fame, benefits for one's career, the satisfaction of pursuing common goals or the opportunity to receive financial rewards. Zheng et al. (2011) go further and suggest that good practice should anticipate the power of public recognition as a major motivator. On the other hand, it is the user who wants to participate in a crowdsourcing project for his or her own sake. Motivations could be a possible employment or working experience. Since there is a worldwide economic crisis, participating in a crowdsourcing project can be a good manner to improve one's Curriculum Vitae. Other researchers summarise the most frequently mentioned motives of users participating in crowdsourcing: (1) money, (2) altruism, (3) fun, (4) reputation / attention, and (5) learning (Doan et al 2011, Tokarchuk et al 2012, Buettner 2015).

### 2.1.4 Crowdsourcing for innovation

In CIPTEC, our research focuses on using crowdsourcing for innovation, more specifically for idea generation and for idea selection. Innovation has now become a more democratic process for many organisations; through the use of internet, ideas can now come from anyone not only inside the organisation. These ideas are considered valuable and there is a need for organisations to understand that and to remain open to the requests of the external world. Crowdsourcing represents an important facet to this innovation processes (Chesbrough et al 2006, Niehaves et al 2012). It is a key technique for innovation, assigning a challenge to a large and diverse group with the hope to gather new solutions more robust than those found inside the organisation.

One of the reasons that crowdsourcing is a popular innovation methodology is the ability it has to bypass the weaknesses of internal innovation methods. Within the organisations boundaries it is difficult to create disruptive innovations because the internal professional teams have a certain thinking pattern. The way they think is influenced by the certain structure of the organisation. Furthermore, there is no or very little competition involved. This makes it very hard for them to think "outside the box" (Bonabeau, 2009). With crowdsourcing organisations can use external people with different expertise to innovate for them. However, this needs to be done in a clever and structured way. Studies (Poetz and Schreier 2012 and Schuurman et al 2012) examined the different ideas that were generated both by the crowd and by the

research and development professionals. The results show that the ideas of the professionals are less innovative and have less benefit for the end-user, but their ideas are more feasible (implementable). This might be due to the fact that professionals think too much about the feasibility of the ideas. Another interesting study (Ogawa and Piller, 2006) revealed that ideas generated by the crowd can be more commercially successful compared to ideas generated internally. This is due to the fact that the crowd has a solid understanding of its needs.

## 2.2 Crowdsourcing examples

There are plenty of tasks and areas of interest that crowdsourcing has been applied. According to the literature, the following are some of the basic uses of crowdsourcing:

- **Gather data** (e.g. reporting traffic problems, real-time coverage of weather events across the world) and develop **new content** with platforms such as Google Maps, Wikipedia, Linux, Amazon's Mechanical Turk (Greengard, 2011),
- Collaboratively **develop something** (e.g. design a website, design a logo, design furniture etc.).
- **Raise funds** (e.g. crowdfunding to give money to a cause).
- **Gather ideas** on improving products (e.g. Dell Ideastorm, My Starbucks Idea, Coca Cola, Nokia, Proctor and Gamble etc.).

In CIPTEC, crowdsourcing will be used to gather ideas: calling for ideas, opinions and analyses has emerged as a viable and enriched resource of big organisations. It is rapidly becoming a procedure for generating innovative solutions for a vast range of corporate and societal issues. Indeed, crowdsourcing is becoming a very popular tool that helps organisations acquire external knowledge by capturing user ideas and transforming them into innovations (Djelassi and Decoopman 2013, Feller et al., 2012). In the past decade, several firms have begun to realise that their innovation goals cannot be fully satisfied through internal resources and capabilities (Chesbrough 2003, Huston and Sakkab 2006, West and Boggers 2014). Through external user innovation, organisations can sometimes identify new ideas faster and cheaper than through traditional internal innovation. Of course, how an organisation can profit from these ideas is a complex and rather challenging task (Bogers et al., 2010) that is not part of this study.

Companies generating novel ideas via crowdsourcing is already becoming a trend. Coca-Cola, Nokia, Adidas, Dell, Threadless, and General Mills are just a few of the major companies that are already letting a “crowd” of non-experts innovate for them.

It is important to note here the two basic types of crowdsourcing (Fähling et al., 2013): competitive and collaborative. In the collaborative crowdsourcing scenario, the crowd is collectively working on providing a solution to a specific problem. In the competitive crowdsourcing, independent solutions are gathered in a tournament-based style. Zhao and Zhu (2014) consider that both types are **not mutually exclusive**, so by using them firms could increase performance. As we will see later in this document, in CIPTEC we will be using both types.

Over the past decade, with the evolvement of the World Wide Web and in particular with the introduction of the new Web 2.0 technologies, several crowdsourcing examples have been recorded. In the following paragraphs we try to present the most notable ones, trying to identify the characteristics that made them successful.

### 2.2.1 Generic crowdsourcing examples

After reviewing the existing literature using search engines, blogs, the general press and social media the most notable and successful cases of crowdsourcing initiatives are mentioned. Our aim is to understand how they work and which characteristics made them successful in order to utilise this knowledge when running the CIPTEC crowdsourcing contests. Most of the

crowdsourcing examples summarised in Table 1 below are connected with private sector product design and innovation process.

**Table 1: Companies that use crowdsourcing**

Source: *[Dimitrova, 2013]*

| Industry Sector | Brands |
|---|---|
| Manufacturing | Nivea (Beiersdorf), L'Oreal, Henkel, Colgate, Johnson & Johnson, Unilever, John Fluevog Boots & Shoes, Converse, Adidas, Swarovski, Ducati Motor Holding, BMW, Audi, Fiat, Chrysler, Chevrolet, Citroen, IBM, LG, Philips, Dell, BASF, Life Technologies, Microsoft, Sony, Siemens, Cisco, Kraft, General Mills, Sara Lee, Starbucks, Pepsi Canada, Big Al's kitchen, McDonald's Procter & Gamble, Unilever, Clorox, Newell Rubbermaid, Stanley, BASF, 3M, Sony, Syngenta Thoughtseeders, Pfizer, Life Technologies, Roche, DuPont, Bombardier Transportation, Boeing, Lego |
| Transportation and warehousing | American Airlines, Air France, British Airways, Estonian Air, Finnair+ Helsinki Airport, KLM, Lufthansa Cargo, Ryanair, SAS Scandinavian, Westjet, NASA |
| Finance and insurance | Kickstarter, Indiegogo, RocketHub, Rock The Post |
| Accommodation and food services | Starbucks, McDonald's |
| Public administration | Government of Iceland, US Government, Canadian Government, City of Amsterdam |
| Health care and social assistance | WWF-Switzerland, Rockefeller Foundation |
| Educational services | Oxford University |
| Professional, scientific and technical services | PwC Canada, KPMG |
| Information and cultural industries | Chicago Sun-Times, Popular Science Magazine, The Economist, Orange UK |
| Utilities | Orange UK, British Telecommunications |
| Mining, quarrying, and oil and gas extraction | Goldcorp |
| Real Estate | Prodigy Network |

A short description of the most notable examples follows:

***Threadless***

One of the oldest, most notable and successful example of crowdsourcing is Threadless[2]. Threadless is an online T-shirt design company which relies its design process on crowdsourcing. Started in 2000 (long before the introduction of the crowdsourcing term by Howe), the company created an online community in order to give artists and designers a common place to submit their design ideas fitted on a t-shirt canvas. Through crowdsourcing, the company built a successful business model around an online community that could drive innovation. Threadless crowdsourcing approach was to actively engage the crowd in every process of product development. Users join the community with a free account. Members of the online community submit their ideas for T-shirt designs and all ideas enter in a contest where the best entries are printed and offered for sale. The crowd provides new ideas for designs, votes and evaluates posted designs, chats, socialises and shops crowd-designed T-shirts. The company offers monetary rewards and gift certificates to top voted designs, prints those winning designs on T-shirts and sells them back to the crowd. As a result of this innovative business model that relies on crowdsourcing, the Threadless community has grown from few thousands to million users and the company is making millions in sales.

***Dell Ideastorm***

In 2007 the computer company Dell, launched Ideastorm in an effort to talk directly to customers. Seeking for new product ideas, Dell created an online platform where users invited to share their ideas and solutions and discuss them with the company's employees. Until the adoption of the crowdsourcing system, the company suffered because of a negative perception that was built around its brand after losing its connection with the users. Through Ideastorm, users can submit, vote and comment new ideas. The most popular ideas are reviewed by Dell's internal employees and experts. The company's crowdsourcing system is based on user willingness for participation and there are no financial incentives or monetary rewards. Dell honours top users by mentioning them publicly, thus motivating the participation. The success of Ideastorm can be measured by numbers: to date, over 23,000 ideas generated by the community, over than 747,000 votes on ideas, more than 101,000 comments posted on ideas and 540+ ideas implemented by Dell.

***Lego Ideas***

Crowdsourcing made recently an appearance in the toy industry and Lego Ideas is by far the most interesting example. Lego Ideas formerly known as Lego Cuusoo launched in 2011 a crowdsourcing business model that enhances the unbounded creativity of Lego fans. Anyone can share new Lego set design ideas. Submitted ideas are in the form of digital photos, drawings, screenshots, etc. Once a design is uploaded to the Lego Ideas platform, Lego fans can evaluate it having various options to interact, comment, discuss and vote. Submissions receiving support via votes is most crucial on the platform because new ideas need to reach 10,000 supporters in order to be reviewed by Lego staff to get the chance to become an official Lego product. If a design is selected for production, the creator of the idea receives 1% royalty of the product's net sales, community recognition and the satisfaction of having his own idea produced by Lego.

***Co-creation lab of BMW group***

The co-creation lab of BMW launched a successful crowdsourcing project in 2010. BMW developed an online platform offering various co-creation contests to the crowd: user toolkits, concept tests, innovation research studies and user application forms (Bartl et al, 2010). BMW managed to attract more than 500 participants from all over the world in six weeks time, gathering more than 250 ideas.

[2] https://www.threadless.com

***Microsoft Windows crowdsourcing initiative***

Microsoft developed a dedicated blog to crowdsource the production of Windows 8.0. and collected several suggestions and ideas for the design and development its product (Thomas 2011). After the first successful crowdsourcing project, Microsoft crowdsourced the development of Microsoft Office 2010. Nine million users downloaded Microsoft Office 2010, and gave feedback on the beta versions before its official launch. More than 2 million comments were received that led to the development of Office 2010. Microsoft also conducted some tests to a number of selected users in order to identify unarticulated needs (Chen, 2010).

### 2.2.2 Crowdsourcing examples in public transport

Although the examples of using crowdsourcing in public transport are not as many as in other domains, the literature mentions one, big successful crowdsourcing initiative that can be a good lesson for CIPTEC.

***Bombardier Transportation***

Bombardier Transportation (BT) is the rail equipment division of the Canadian firm Bombardier Inc. BT is one of the world's largest companies in the rail-equipment manufacturing and servicing industry. Today, it is a global leader in the railway sector, with 64 production and engineering sites and 19 service centres in 26 countries and a global headquarters in Berlin, Germany. BT has six divisions and 36,000 employees, and it generated revenues of $8.1 billion in 2012.

Until now, Bombardier Transportation has held three successful crowdsourcing initiatives presented below: Innovation Express, YouRail, and YouCity.

Innovation express

In 2009, the Chief Innovation Officer of BT, drawing on his previous experience in BMW, introduced the idea of using Web 2.0 technologies for idea management. His efforts led to the development of an internal crowdsourcing platform for innovation, problem solving and collaboration. The platform has the ability to manage innovative ideas from the moment a proposal is submitted to the platform to the moment it is forwarded to the R&D department or is stored as an archive (Dimitrova, 2013).

Employees can submit ideas and suggestions related to three characteristics of products and internal processes: simplicity, energy efficiency, and customer / user satisfaction. These three focus areas are always open for submission of new proposals. The platform also hosts more targeted ad-hoc problem-solving campaigns that usually last from four to six weeks. Employees can use the platform in various ways: they can post ideas and browse proposals that have been posted by others; they can also create communities on the platform, which function like discussion and problem-solving forums.

Innovation Express does not offer any monetary incentives to participants. The only incentive for participants is to gain recognition within the company.

At present, Bombardier Transportation is seeking ways to improve the functionalities of the platform. Ideas for future improvements include direct access to the platform for blue-collar workers, community voting and ranking of ideas, and opening up the internal crowdsourcing tool to allow input and collaboration by suppliers, customers, and academia

The pilot phase of Innovation Express was introduced in 2009, and the platform was officially launched at the end of 2010.

YouRail

At the end of 2009, Bombardier Transportation Innovation Management launched its first external crowdsourcing contest with the title “Your personal vision of modern transportation”. The purpose of the contest was to allow people from all over the world share their ideas and designs with the railway manufacturer along with their vision of the trains of the future. The contest was open to anyone interested in submitting ideas. The designs could be submitted as freehand drawings, computer-generated illustrations, or simply written explanations of the design ideas (Dimitrova, 2013).

Bombardier Transportation was convinced that in order to motivate people to start using public transportation rather than their own cars, it is important to come up with totally new design solutions that take into consideration the “convenience factor and the emotional factor” that is usually “totally disregarded” by public transportation manufacturers (CIO, 2013). That is why the launched this big crowdsourcing project.

The YouRail competition also garnered significant media attention and coverage: more than 150 articles about the contest were published throughout the world. The advertisement strategy of the YouRail competition was particularly targeted to attract design students from prestigious universities and design professionals from around the world. It is important to note that one of the participants in the YouRail contest was hired on a freelance basis thanks to the contest

The contributors with the three best freely created designs amongst all three topics won cash prizes up to 2.000 Euros. The contributors with the three best configured designs also won cash prizes up to 600 Euros. The contributors with the 4th to the 10th best freely created designs won netbooks. The winners were announced in March, 2010, and BT presented the results of the competition at the world’s leading trade fair for the rail industry, InnoTrans 2010, in Berlin, Germany.

The winner selection process of the YouRail design contest included the following phases: a) ranking by the online community on the platform, b) ranking by the internal BT expert jury, and c) final ranking by the design contest jury. The jury included members of its internal design department, the sales staff and the Innovation Management team. The whole crowdsourcing process is briefly depicted in Figure 6:

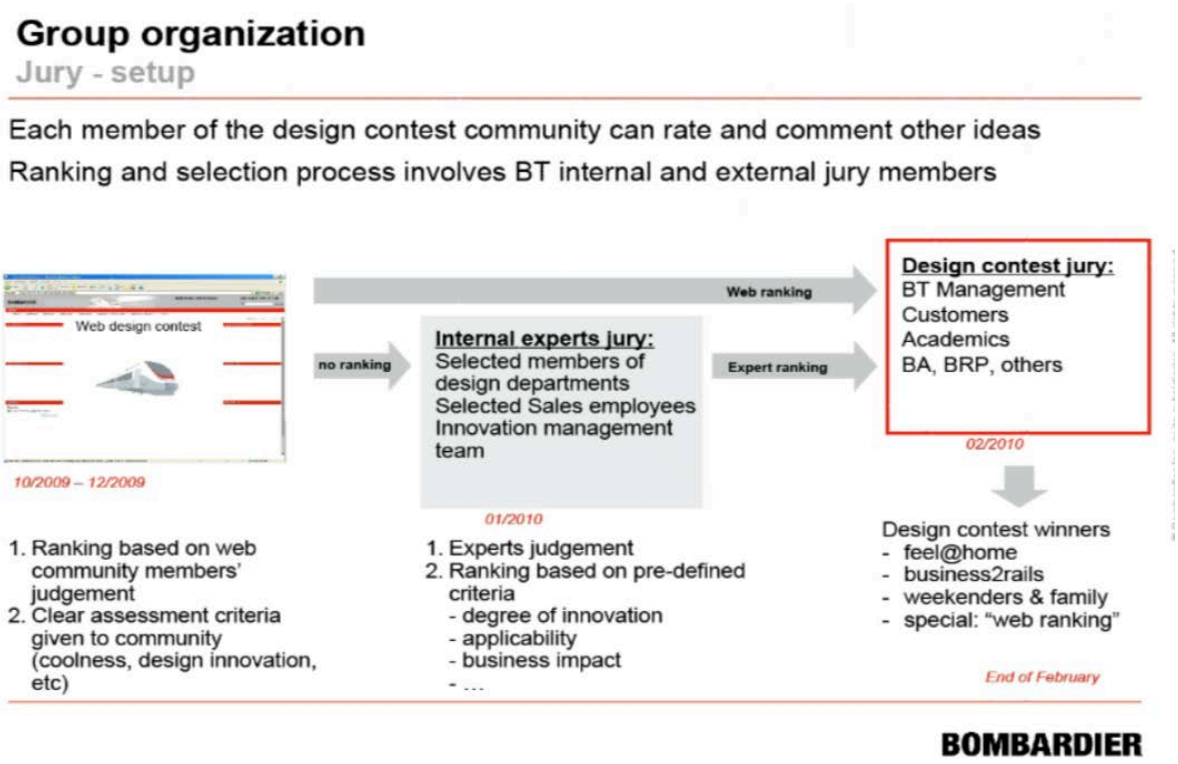


**Figure 6: YouRail evaluation process by Bombardier Transportation**

Source: *[Dimitrova, 2013]*

The evaluation criteria are shown in the following Figure 7:


**Figure 7: YouRail Contest: Criteria for expert evaluation**

Source: *[Dimitrova, 2013]*

Below are some statistics regarding the use of the YouRail platform:

- Participants: 2,486 from 102 countries
- 4,239 designs (3,807 configured designs and 432 freely created)
- 26,000 evaluations
- 8,500 comments
- 3,500 messages

Some examples of the designs the crowd submitted are shown in Figure 8:

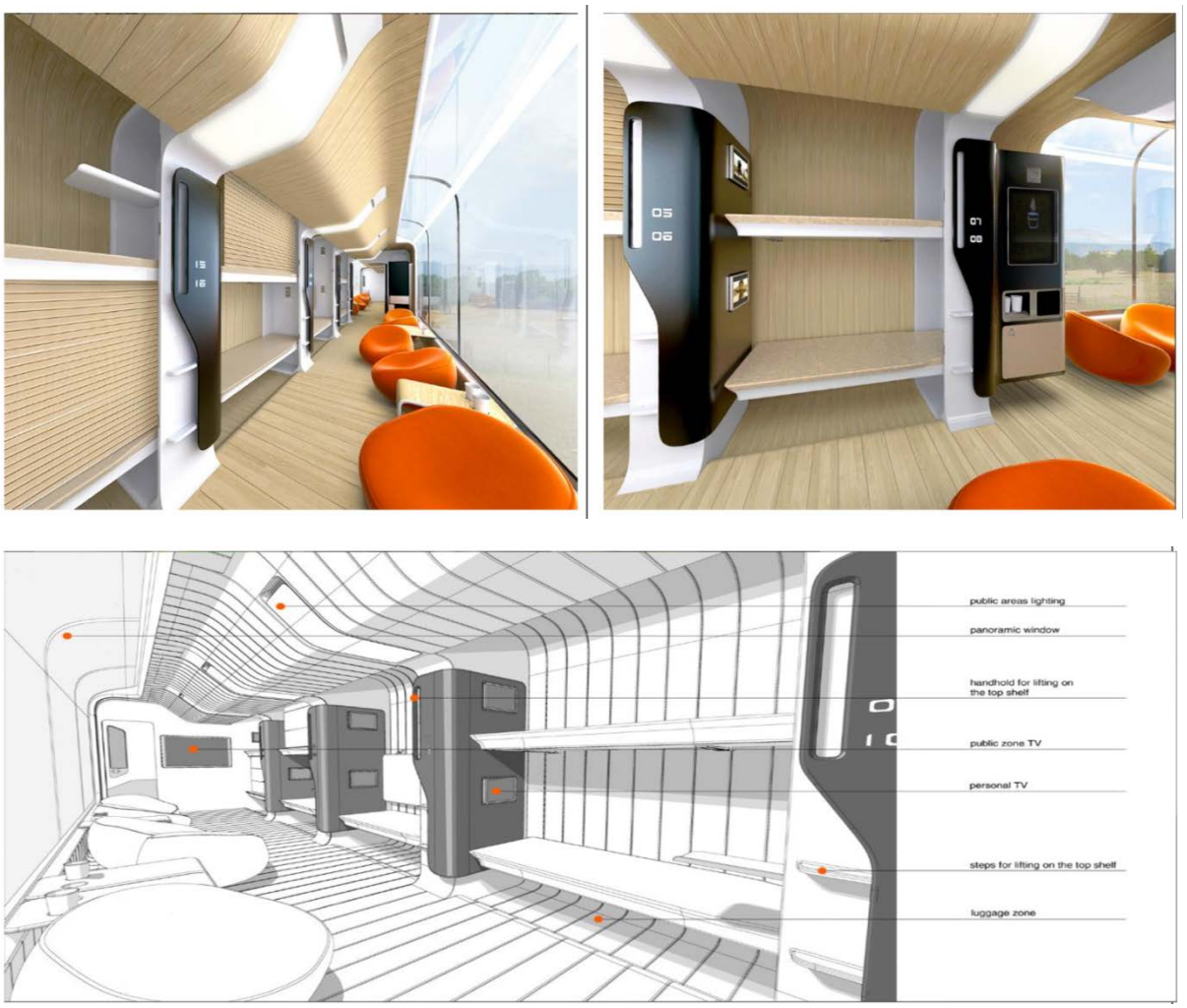


**Figure 8: YouRail contest example by Bombardier Transportation**

Source: *[Dimitrova, 2013]*

### *YouCity Innovation contest*

In 2012, Bombardier Transportation launched the YouCity urban mobility innovation contest. The competition was open to all citizens who wanted to share innovative ideas and their vision about the future of urban mobility in developed and emerging cities. BT selected three target cities that represented typical urban mobility markets: London (UK); Belo Horizonte (Brazil), and Vientiane (Laos).

The competition consisted of three tasks:

a) First task: participants were asked to define current and upcoming issues related to urban mobility in their city, analyze the situation, and develop solutions to the identified problems.
b) Second task: participants were asked to present a holistic proposal describing how their urban mobility solutions fit the global vision of the city of interest.
c) Third task: an offline workshop called “Innovation Workcamp” was held in late 2012 in Berlin, Germany for the three winning teams from each stream (engineering, business, and urban planning).

During the competition the teams could produce two-minute videos on the topic “Your vision of tomorrows’ urban mobility.” They could upload them on YouTube and link them to the crowdsourcing Web platform of YouCity. Based on votes by viewers and experts, the teams could earn additional bonus points.

Below are some statistics regarding the use of the YouCity contest:

- 809 registered users
- 215 proposals submitted (101 proposals for the first task, 87 for the second task, and 27 for the video challenge)

Thirteen finalists were selected and invited to an Innovation Workcamp held in Berlin. The expert jury selected three winning teams, one for each stream (engineering, business, and urban planning). They also selected the most active participant of the platform (based on the results of the participants’ activity counters) and a winner (winning team) for the video challenge. The winners were invited to take part in a four-day workshop in Berlin, and each team was awarded €2,000. The most active community member and the winner (winning team) for the video challenge were also invited to the workshop and awarded €500. In addition, the winner (winning team) for the video challenge made a video document of the workshop.

Below are some example proposals received for the YouCity crowdsourcing contest.


**Figure 9: YouCity example proposal (Vientiane)**

Source: *[Dimitrova, 2013]*

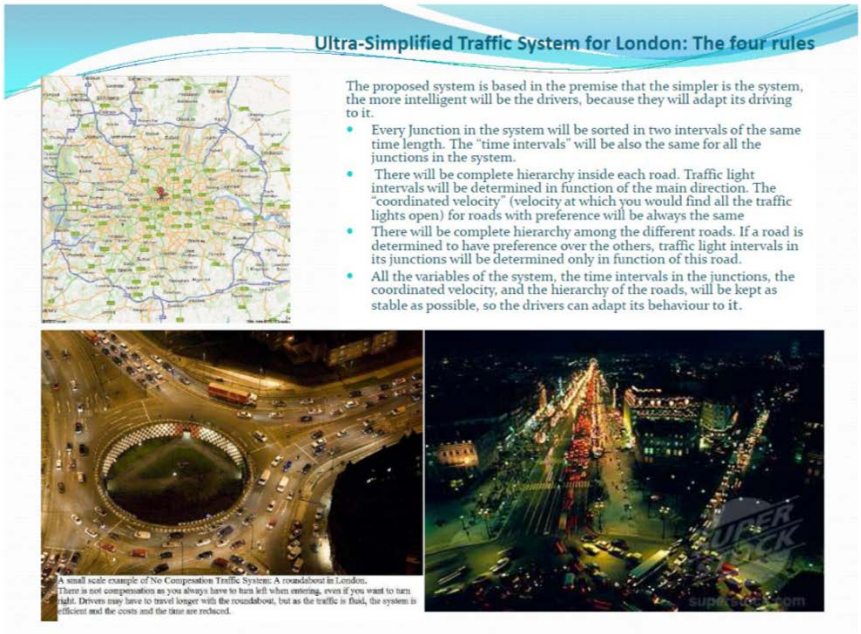


**Figure 10: YouCity example proposal (London)**

Source: *[Dimitrova, 2013]*

## 2.3 Guidelines for the CIPTEC crowdsourcing platform

To gain the benefits that the crowdsourcing concept has to offer to CIPTEC, there is a need to develop practical guidelines (CIPTEC crowdsourcing conceptual framework). These guidelines will assist the design and development of the CIPTEC crowdsourcing platform and will allow PT authorities in optimally using crowdsourcing, to facilitate innovation in public transport. The guidelines will be based on:

1. CIPTEC objectives from crowdsourcing.
2. An extended literature review that has been performed in the previous sections (Section 2.1 and Section 2.2) and shows how successful and relevant crowdsourcing initiatives implemented crowdsourcing.

These conceptual guidelines will be presented to the CIPTEC consortium in a dedicated session during the 2nd CIPTEC project meeting. The guidelines will be finalised in "*Task 3.2 Crowdsourcing new innovative concepts and incentives for public transport*" (Month 12 – April 2016), where the final crowdsourcing platform will be delivered.

The guidelines are:

- **Generic enough** so that they can be used not only in the public transport domain but in other areas as well. One of our main aims from WP3 is to develop a state-of-the-art crowdsourcing platform (accompanied with robust guidelines) that will be commercially exploited (in collaboration with WP8) during and after the end of the project.
- **Specific enough** so that the CIPTEC consortium will be guided on how to apply crowdsourcing for generating new innovative ideas. The most promising ideas will be then further developed during the co-creation workshops (Section 3 and "Task 3.3 Co-creation/ co-design workshops").

### 2.3.1 CIPTEC objectives from crowdsourcing

In order to innovate, transport scientists and public transport providers need to become more "disruptive" in their thinking. They have to introduce disruptive innovation not only addressing overserved customers seeking lower cost business models, but further competing against non-consumption. CIPTEC approach based on innovation will be beneficial as it aims to accelerate the creation of service innovations. That is why in CIPTEC, we will be using crowdsourcing; to **generate innovative ideas** from different groups of individuals while at the same time **stimulating dialogue and discussion** among all parties involved in the PT sector. The two main inputs that we have when designing the crowdsourcing platform are: a) the objectives of the crowdsourcing platform and, b) the users of the platform.

Objectives of the CIPTEC crowdsourcing platform:

- Stimulate dialogue and discussion
- Generate innovative ideas

In CIPTEC, the crowdsourcing platform will be an online tool that will be used by:

- Authorities & Transport policy makers
- Mobility providers & PT operators
- Passengers & travellers associations / networks
- Citizens & Community Groups
- Trade Unions
- Marketing and Innovation Agencies
- Industry: Manufacturers & Supporting Technology Suppliers
- Experts
- Other stakeholders

From the above (CIPTEC objectives from crowdsourcing), it is obvious that in CIPTEC we will be using both competitive and collaborative types of crowdsourcing:

- **competitive crowdsourcing** will be used to gather new innovative ideas from a diverse group of stakeholders, and
- **collaborative crowdsourcing** will be used to allow discussions, reviews, ratings etc. on the submitted ideas.

### 2.3.2 How to use crowdsourcing in CIPTEC

There is a lot of information available on crowdsourcing and there are a lot of successful paradigms. This section tries to utilise the knowledge generated from the review of several successful crowdsourcing initiatives, to put this knowledge into the context of CIPTEC (open innovation) and to come up with a plan on how to effectively use crowdsourcing for collective intelligence. This plan is an actual workflow that describes the steps for successfully running crowdsourcing in the context of public transport innovation. To make the mechanism of crowdsourcing work several preconditions must be met, and this section tries to integrate these preconditions in the guidelines.

It is important to note that the newness of the crowdsourcing term indicates that there is not any significant literature on how crowdsourcing has been used for innovation purposes in an organisation (Poetz and Schreier, 2012; Marjanovic et al., 2012; Zhao and Zhu, 2014). What is presented here (guidelines) is the result of a comprehensive analysis of the relevant literature and of the successful "crowdsourcing for innovation" paradigms. These guidelines will be implemented, validated and exploited during the whole project period.

The steps presented below will further help us identify the requirements for the crowdsourcing platform in "D3.2 Crowdsourcing platform" and will assist public transport authorities in running the crowdsourcing initiatives (from Month 13 to month 20). An evaluation of the guidelines presented below will be included in "D3.4 Summary reports for collective intelligence initiatives" (month 20).

**Step 1: Description of the campaign (challenge)**

In this step, the organisation identifies the puzzle that wants to solve with the assistance of the crowd. This is a meaningful description of the campaign and the definition of its goals. This definition should be short, clear and understandable by everyone. It should be accompanied by a "catchy" and clever name that will be used for marketing purposes. Examples of campaign names: "*My burger*" campaign by McDonald's, "*This is ahh*" campaign by Coca-Cola, "*Pop-Up Bar*" campaign by Heineken, "*Do Us a Flavor*" by Lay's. With a strong name, it is very possible to strengthen the sustainability of the brand. It is not uncommon for successful crowdsourcing campaigns to be mentioned in the media: a perfect and inexpensive way of advertising for organisations and products.

Ideally, the campaign should come together with a video that will cover all the details of the contest (video pitch). Video clips give a better idea of the challenge and they hold attention. The video is the first thing most people will see before they decide to participate in the campaign. The video (if exists) must be simple, short and professional. An amateur video will not convince people to get involved.

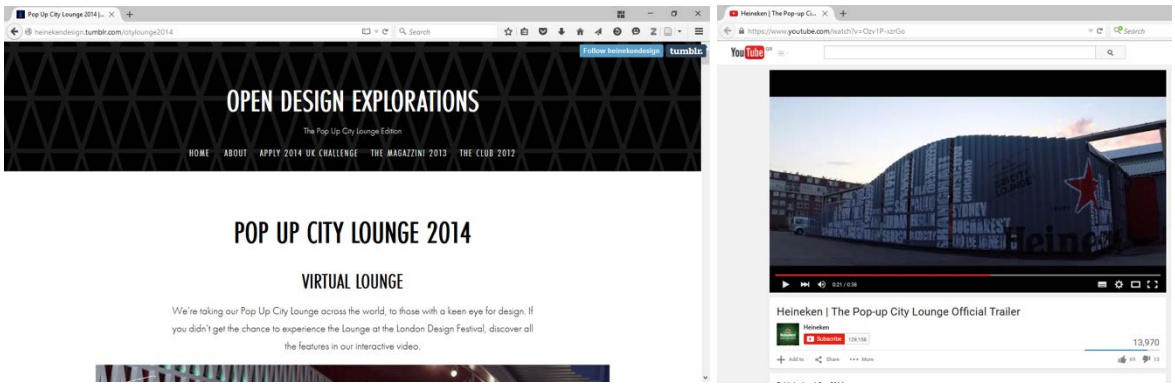


**Figure 11: "Pop-Up Bar" campaign by Heineken**

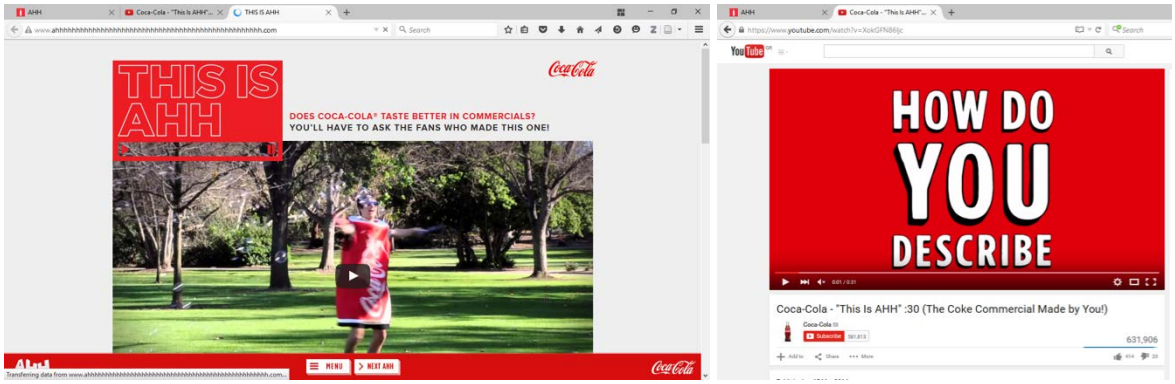


**Figure 12: "This is ah" campaign by Coca-Cola**

In this first step it is also important to define the form of crowdsourcing that will be used. As we have seen, crowdsourcing comes in several forms crowd contests, crowd creation, crowd voting, crowdfunding, or some combination - and it is essential that the form fits the purposes of the specific aim of the organisation responsible for the crowdsourcing initiative.

In CIPTEC the **contest and partially the crowd voting version of crowdsourcing** will be used in order to gather and evaluate new innovative concepts and incentives for public transport. User ideas will be evaluated (see step 6) and the most promising ones will be forwarded and further discussed during the co-creation / co-design workshops (Section 3). Since the crowdsourcing initiatives are closely connected with the workshops, the crowdsourcing platform will be deployed in the four areas that the workshops will take place:

- Germany (coordinated by partner traffiQ),
- Netherlands (coordinated by partner MRDH),
- Italy (coordinated by partner TIEMME),
- Greece (coordinated by partner AUTh).

Four instances of the crowdsourcing platform will run in parallel (one in every language), and users will be requested to:

- "Identify and submit new innovative ideas regarding public transport"

A professional video will be developed that will act as a dissemination channel for promoting the crowdsourcing initiatives. The video will be translated (subtitles) in the four languages that the crowdsourcing platform will run. The detailed description of the campaigns will be translated to the local languages.

**Step 2: Definition of the rules of the campaign**

In this step, the organiser of the campaign sets out the rules for participation. Every campaign should have clear rules. Questions that should be answered are the following:

- Who can and who should participate in the campaign (e.g. public transport users, all citizens, experts) and how (e.g. register first)?
- What is the crowd requested to do (e.g. write a new idea, comment on existing ideas, rate, evaluate) and what is the type of crowdsourcing contents (e.g. idea generation, product development, crowdfunding etc.)?
- What is the timeline of the campaign (start and end date)?
- How is the evaluation of the crowdsourcing input going to be performed (the evaluation and selection of the entries can be performed by an internal team of professionals, but this can also be done by the crowd itself, in most instances by voting)?
- Where do the IP rights belong (IP rules)?
- What is the prize for the winner of the campaign / what are the motivations and incentives for the users to participate (e.g. one or more winning entries receive a financial reward or credits)?

The rules of the campaign should be clear and easily understandable by all. At least the prize (if any) and the starting and ending date should be visible at the front page of the campaign. A link to the analytical rules should also be visible from the front page.

In CIPTEC, **any registered user** can participate in the crowdsourcing initiative. During the registration, users will be requested to submit their personal details including the type of stakeholder group they belong to. Users will be requested to select one of the following types:

- Authorities & Transport policy makers
- Mobility providers & PT operators
- Passengers & travellers associations / networks
- Citizens & Community Groups
- Trade Unions
- Marketing and Innovation Agencies
- Industry: Manufacturers & Supporting Technology Suppliers
- Experts
- Other stakeholders (please define)

All registered users have the same privileges and they can:

- Submit new innovative ideas. Any user can submit an unlimited number of ideas.
- Comment on existing ideas.
- Rate existing ideas.
- Interact with other users.

Since it is a **contest based crowdsourcing** initiative, incentives must be given to the users. At each area there will be at least two winners receiving benefits (the ones with the two most promising ideas). The specific benefits will be further discussed and decided with the partners coordinating the crowdsourcing contests. A preliminary plan is to give a financial reward to the first selected idea and to give free entrance to public transport services for a period of time to the second best idea. Other forms of incentives to all users is to utilise the power of recognition and allow users participation to the co-creation workshops, mentioning their names in the project website news etc.

A preliminary schedule of the CIPTEC crowdsourcing campaign is the following:

- Month 12 (April 2016) the platform will be ready and deployed to the four areas,
- Month 13 (May 2016) the crowdsourcing campaigns begin,
- Month 18 (October 2016) the crowdsourcing campaigns finish,
- Month 13 – Month 18 the best crowdsourcing ideas are forwarded to the co-creation workshops for evaluation,
- Month 18 – Month 20 the evaluation process continues,
- Month 20 (December 2016) rewards will be given.

We envision the CIPTEC crowdsourcing platform to act as PT innovation marketplace where new ideas arise. The development of the CIPTEC crowdsourcing platform could comprise an ongoing sustainable initiative after its completion. For that purpose, after the first iteration of the crowdsourcing contests, new contests will be initiated and will last until the end of the project.

**Step 3: Releasing the campaign online**

This is the step where the organisation responsible for the crowdsourcing initiative develops an appropriate platform and releases it online. The platform is now available to all users to participate according to the rules defined in the previous step. The online platform should have a nice professional design (bootstrap[3] template is suggested), should meet the requirements defined in step 1 and in step 2 and should be easy to use and understandable by all.

Regarding the development and customisation of the crowdsourcing platform, an organisation has three alternatives:

a. Develop a crowdsourcing platform from scratch. This needs a lot of development effort and resources.
b. Use an existing open source platform. Here the organisation can use one of the existing open source crowdsourcing platforms. However, customisation is needed and the development effort depends on the specific requirements defined in step 1 and step 2. Examples of open source crowdsourcing platforms are: USHAHIDI[4] and Mark-a-Spot[5].
c. To rely on an existing online solution such as eYeka[6], Brightidea[7], Uservoice[8], Ideascale[9], Kindling[10], Spigit[11], Innocentive[12]. These are companies that offer consulting services, software services and support services for crowdsourcing. The advantage here is that the organisation does not need internal resources to develop the platform. The disadvantages are security and cost.

In CIPTEC an open source crowdsourcing platform will be used and customised according to the requirements that will be gathered in Task 3.2. Most probably, the open source USHAHIDI platform will be used as the basis for the development. A state-of-the-art user friendly interface will allow users to easily perform various tasks (submit idea, rate idea, comment idea, discuss with other users) both through a pc and a mobile phone. Location

[3] http://startbootstrap.com/
[4] http://www.ushahidi.com
[5] http://www.markaspot.de/en/
[6] https://en.eyeka.com
[7] http://www.brightidea.com/product/brightworks/
[8] https://www.uservoice.com
[9] http://ideascale.com
[10] https://www.kindlingapp.com
[11] https://www.spigit.com
[12] http://www.innocentive.com

based services will be also integrated for better identifying where the idea was generated and compare it to the certain circumstances of that place for further evaluation.

**Step 4: Advertising the campaign**

By the time that the crowdsourcing platform has been developed and ready to be used, the organisation responsible for running the campaign has to advertise it in order to gather as many contributions as possible. Online and offline advertising campaign will aim at spreading the news to a diverse audience. Some advertising tools that can be used are the following:

- online advertising through the website, social media (Facebook, twitter), newsletters, online presentations (e.g. slideshare), search engine optimisation techniques etc.,
- offline communication channels such as newspapers, radio and tv channels, brochures etc.

CIPTEC will be using both online and offline advertising to promote the crowdsourcing campaigns. The reason for using both is that the groups that should participate in the crowdsourcing initiatives must be diverse to ensure their success. Some example actions for spreading the word include:

- Use the projects Facebook account and like other pages that might be interested in spreading the word (use this account on a daily basis especially as long as the campaign is running).
- Use the projects twitter account and tap into conversations and post new items using hashtags # e.g. crowdsourcing (use this account on a daily basis especially as long as the campaign is running).
- Spread the word to friends and other contacts and ask them to spread the word too.
- Create a mailing list (friends, co-workers, customers, bloggers, journalists etc.) and send newsletters to inform them about the initiative.
- Organise public consultation events in cooperation with administrative authorities and stakeholder groups (e.g. commercial and technical chambers).
- Inform local newspapers about the initiative.
- Participate in events and promote the campaigns.

It is important that during the crowdsourcing contests all partners of the consortium are active and promote the contests accordingly.

**Step 5: Gathering contributions**

This is the step where the crowdsourcing platform is running and users participate by contributing content. During this step the registered users can participate in the crowdsourcing initiative with the following ways:

- Submit content (e.g. ideas, videos, problems etc.).
- Comment on existing content (e.g. comment on how to improve an idea, comment on videos, comment on problems identified by other users etc.).
- Interact with each other (e.g. by discussing and exchanging opinions etc.).
- Rate content (e.g. rate ideas, videos, problems from scale one to five).

It is important that during this step the organisation responsible for the crowdsourcing initiative remains active and supports the crowd in any problems they may encounter or in issues that they may arise.

In CIPTEC a rough estimation of the number of participants and the number of platform visitors has been made bearing in mind the demographics of each area, the period that the contests will run and similar successful paradigms in the literature. The numbers are presented below and refer to each area separately:

- 3,000 – 5,000 platform visits
- 300 – 1,000 registered users
- 150 – 400 submitted ideas
- More than 500 comments on submitted ideas
- At least 500 rates
- An idea should receive at least 50 interactions (including comments, rates etc.) to be able to be forwarded to the workshops for evaluation

These are preliminary numbers that the consortium should target in order to run successful crowdsourcing contests.

During step 5 (Month 13 – Month 18) partner Tero will support users in any technical problems they might encounter, while the coordinating partners of the crowdsourcing contests will support them in any organisational issues answering to various questions they might have.

**Step 6: Evaluation process and rewards**

In this phase, the campaign has come to an end according to the rules (end date) that were defined in step 2. Here the process of evaluating the contributions begins. It is important that during this process, the platform is being updated with content about the evaluation process (how the evaluation process works, when should the crowd expect results etc.).

In CIPTEC, the preliminary plan / process for evaluating the ideas and selecting the winners of the CIPTEC crowdsourcing campaigns is the following:

- One week before each workshop takes place, the ten most popular ideas (at each area) will be selected . An algorithm will be used to automatically retrieve the popular ideas based on specific criteria (rating, views and comments).
- Five more ideas will be selected by the partners responsible for coordinating each workshop based on their specific criteria.
- During the workshops the fifteen ideas will be discussed, their quality will be assessed and will be ranked with the assistance of the Experts Advisory Board. Since two workshops are foreseen at each site, thirty ideas will be evaluated in total.
- The two ideas with the highest ranking will win the predefined prizes.

Though minor changes might be made to this preliminary plan, the concept is that the ideas need to be evaluated both by the users and by experts. The final plan and further details for the evaluation process will be included in the FAQ (Frequently Asked Questions) section of the crowdsourcing platform.

Figure 13 summarises the CIPTEC crowdsourcing steps mentioned above.

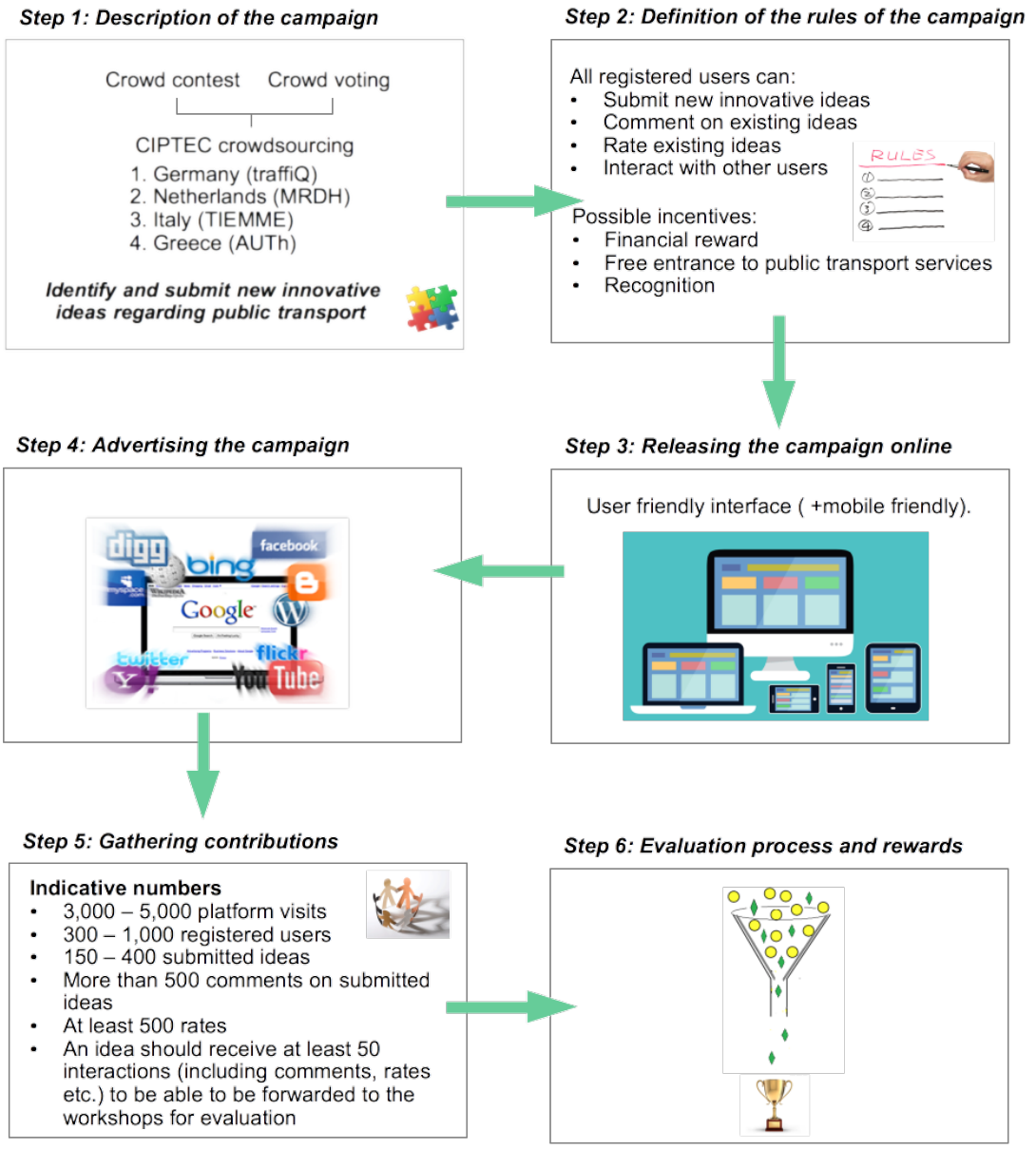


**Figure 13: CIPTEC crowdsourcing guidelines**

# 3 Co-creation / co-design workshops in CIPTEC

## 3.1 Co-creation / co-design workshops: literature review

As already mentioned in the introduction, collective intelligence employs several processes and one of them is the co-creation / co-design process. In this section we introduce some related concepts and benefits of the processes that will be used in the CIPTEC project. These concepts are related to (i) the co-creation / co-design process and (ii) the co-creation / co-design workshops.

***What is co-creation / co-design?***

Although sometimes the terms co-creation and co-design are used as synonyms, there is controversy about their context and opinions about which should be used, when, and in what role, vary widely. The most common distinction between these two terms is that co-creation refers to any act of collective creativity, whereas co-design refers to collective creativity as it is applied across the whole span of a design process. Co-creation is a very broad term with applications ranging in a wide spectrum of activities. In this context one can argue that co-design is a subset and a specific instance of the wider notion of co-creation (Sanders & Stappers, 2007; Steen et al., 2011; Cruickshank et al., 2013). However, in order to avoid confusion, in the CIPTEC project the two terms will be used interchangeably.

Co-creation/co-design is a process that is based on collective creativity, i.e. creativity that is shared by two or more people, and aims to the production of new, innovative ideas (Sanders & Stappers, 2007). It is a user-centered, collaborative approach where multiple stakeholders, with specialized skills and talents, (users, firms, professionals,) are actively involved in the design process of a product or service, in order to jointly create value (Lusch et al., 2007). Co-creation refers to collaboration with users for the purposes of innovation and has become a foundational premise of the service-dominant logic (Prahalad & Ramaswamy, 2004). It is a dynamic and continually changing process, as it involves interactions between the customer, the firm and significant stakeholders and these interactions change along with changes in the market (Randall et al., 2011). Co-creation / co-design employs several methods such as, co-creation/co-design workshops, action research, participatory design, empathic design, etc.

This form of collective intelligence is increasingly popular in many projects and organizations, and partly this can be attributed to its proactive market orientation. Market orientation is an approach that focuses on identifying and meeting the stated or hidden needs of users. Unlike past marketing strategies that concentrated on establishing selling points for existing products, market orientation works in reverse, attempting to tailor products to meet the demands of customers. Market orientation can be reactive or proactive. The former involves a company discovering, understanding, and satisfying the expressed needs of customers, whereas the latter involves discovering, understanding, and satisfying the latent needs of customers. Nevertheless, a business should practice both forms of market orientation if it is to attract and retain customers, but the challenge lies in identifying and satisfying the latent needs of customers, making co-creation/co-design an attractive marketing research method (Narver, et al., 2004).

***What are the benefits of co-creation?***

One of the key benefits that co-creation methods offer, is the fact that they are user-centred. When users are involved in the design or development of a good/service, the end value is enhanced because they can tailor the product according to their needs. Therefore, through the adoption of co-creation approaches the ability of an organization to provide personalized products/services and better customization to its users/ is considerably increased. Moreover, the participation of users in the co-creation process can offer a competitive advantage by turning just-in-time knowledge from users into just-in-time learning for their organisation

(Terblanche, 2014). The benefits resulting from the multiple co-creation methods are summarized in Table 2.

**Table 2: Benefits from the application of co-creation/co-design methods**

| |
|---|
| **Customized products/services** |
| **Offer competitive advantage** |
| **Better customer needs satisfaction** |
| **Higher customer satisfaction and loyalty** |
| **Identification of users' latent or unarticulated needs** |
| **Increased product quality** |
| **Reduced costs** |
| **Reduced risk of innovation efforts that do not meet customer needs** |
| **Reduced time to market for innovations** |
| **Increased sales and profits for organizations** |
| **Continuous improvements of products/services** |
| **Better decision making** |
| **More successful innovations** |
| **Direct customer input** |

Source: [*Narver, et al., 2004; Terblanche, 2014; European Commission, 2014]*

***The Co-creation / co-design workshop concept***

CIPTEC aims to apply co-creation / co-design workshops in order to co-create, with relevant stakeholders, innovative concepts that will eventually increase public transport's attractiveness.

A co-creation / co-design workshop is conceived as a type of workshop that is primarily focused on action and where all participants collaborate and contribute to find and co-create ways to serve the objectives of the workshop. This is done through creative knowledge sharing and constructive activities where the team is invited to negotiate and generate new innovative concepts [6]. Co-creation workshops may as well aim at the evolution of existing concepts (products or services), finding a solution to an existing problem, analysing, interpreting and evaluating concepts or assisting in the decision making process. Moreover, according to the type of sessions they include, there can be brainstorming, gamification, introductory, creativity, idea generation and evaluation co-creation workshops.

The typical aim of co-creation workshops is the creation of new approaches to products, services or business models (Butterfly Works, 2013) and to enhance organisational knowledge processes, by involving the customer in the creation of meaning and value. The co-creation workshop aims to 'outsource' innovation and value creation to the customer and transforms the customer into an active partner for the creation of future value (Roser et al., 2009)**.** Those impacted by the design are invited to work actively with designers to shape the definition and direction of the project. As shown in Figure 14, during a co-creation workshop key roles get interchanged, as the person who will eventually be served through the design process is given the position of 'expert of his/her experience', and is called to play an active role in knowledge development, idea generation and concept development.

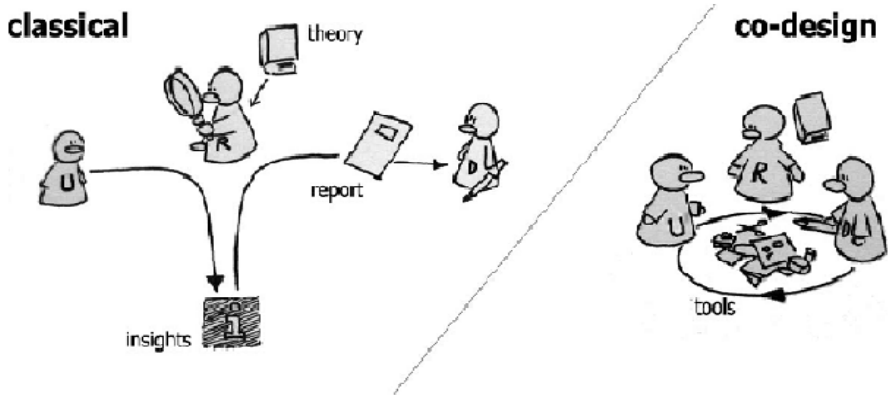


**Figure 14: Classical roles of users, researchers, and designers in the design process (on the left) and how they are merging in the process of the co-creation workshops (on the right).**

Source: [*Sanders & Stappers, 2007*]

Within this context, deployment of co-creation approaches and in particular of co-creation workshops, can be expected to lead to direct and indirect/intangible benefits for both users and firms as well. Some of these benefits can be the greater customer satisfaction, increased attitudinal loyalty of customers towards service/product providers, increased perceived customer value and Increased chances of positive word-of-mouth (C2C communication) (European Commission, 2014)

In particular for service design projects, the benefits that co-creation workshops can offer, may fall into three categories, as shown in Table 3.

**Table 3. Benefits from co-creation / co-design workshops in service design projects**

| | Benefits for the organization(s) involved | Benefits for the service's users | Benefits for the service design project |
|---|---|---|---|
| **Improving idea generation** | • Improved creativity<br>• Improved focus on users<br>• Cooperation between disciplines | | • Better ideas from users<br>• Better idea generation<br>• Better knowledge about customer's needs |
| **Improving the service** | | • Better fit between service & users<br>• Higher service quality<br>• More differentiated & customized services | • Better service definition<br>• More successful innovations |
| **Improving longer-term effects** | • Successful & Improved innovations<br>• Enthusiasm for innovation<br>• Better public relations<br>• Higher customer's loyalty<br>• Higher customer's satisfaction | | • Better decision making<br>• Improved creative process<br>• More efficient organization of the project |

Source: [*Steen et al., 2011*]

Based on the information for the related concepts and benefits of co-creation / co-design and co-creation workshops as well, we can deduce that the use of co-creation workshops in the CIPTEC project, will aim to stimulate the generation of creative and innovative new business concepts (services and products), increase the attractiveness of public transport, create a competitive advantage for it and eventually increase its market share.

## 3.2 Co–creation / co–design workshops examples

As previously mentioned, CIPTEC will organise co-creation / co-design workshops in order to generate and identify innovative business concepts for the public transport. A co-creation workshop is a type of workshop focused on action, where all participants collaborate in order to co-create new approaches to products, services and business models and to find and create ways to address the needs of the workshop. This is done through creative knowledge sharing and constructive activities where the team is invited to negotiate and generate new innovative concepts (Butterfly Works, 2013). This section presents the practices that are applied in the co-creation workshops throughout every phase of their implementation. Moreover, several case studies are included in order to demonstrate their structure and key elements that led to their success.

### 3.2.1 Related practices of co-creation / co-design workshops

***Defining the scope, objective and goal(s) of the co-creation workshop***

Understanding a need that has to be served through the workshop and identifying the desired goals of the co-creation/co-design process are the things from which the process should begin. The co-creation workshop may be used to develop a specific solution to a problem or to develop a specific product. It could also be used in order to produce new ideas that allow for an opening of entirely new opportunities. In addition, the objective may be to either continuously improve existing products or create radically new ones (Bertini & Plumpley, 2014). By identifying the desired goals and the intended benefits of the co-creative activities, an alignment of these goals and benefits can be made, by selecting the appropriate co-design methods and applying them in ways that contribute optimally to the co-creation process (Steen, et al., 2011).

***Considerations before getting involved in a co-creation workshop***

A co-creation workshop requires significant planning, stakeholder involvement and an open minded approach. In order to ease the process, there are some suggestions for the interested organizations, before getting involved in it, that are summarised in **Error! Reference source not found.**.

**Table 4: Key suggestions before deciding to organize a co-creation workshop**

| |
|---|
| **Evaluate if the organization is ready** |
| Not all organizations are ready to take on the challenge of involving users in the creative process. It may take time to challenge long-held beliefs, but it's worth waiting until the design team can keep an open mind before bringing users in to work with them. |
| **Explore the problem and context** |
| Before bringing users in the process, everyone on the design team has to understand the reasons behind the new product launch or innovation. It will help the team, feel they are part of the process, and it will make it easier for them to welcome the users and learn from them |
| **Be committed to take action** |
| The worst thing an organization can do is to disregard the outcomes of a co-creation session. If nothing is done with the findings and ideas, then not only you have wasted time and energy, but participants will feel ignored as well. By taking action, the organization shows users that it cares about their input, but even better, it will make use of their most valuable asset: user insights |

Source: [*Bertini & Plumpley, 2014*]

***Basic steps for setting up a co-creation workshop***

Depending on the project for which the workshop will be applied, the ways in which this collaboration takes place may vary (Roser et al., 2009). However**,** setting up a workshop-based co-creation process requires some basic steps that are summed up in Figure 15.

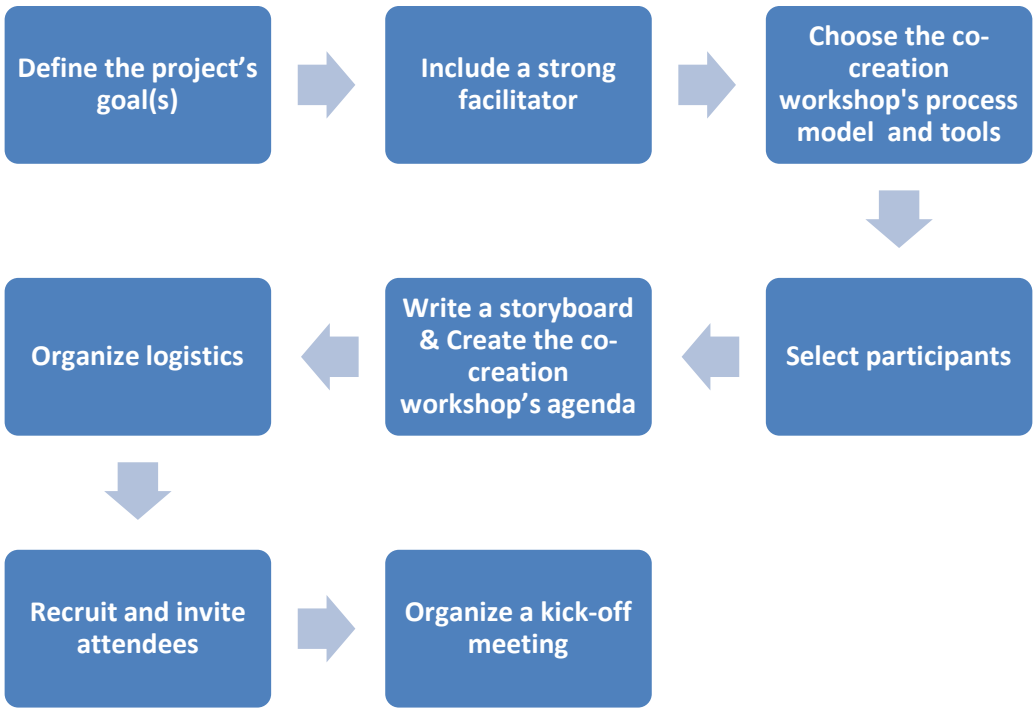


**Figure 15: Basic steps for setting up a co-creation workshop**

Source: *[3S3C Project, n.d.]*

1. **Define the project's goal(s).** For what purpose and to what end it is beneficial to involve end users and other stakeholders and collect their thoughts and ideas? What is the desired output and/or result of the co-creation process?

2. **Include a strong facilitator.** Facilitation is particularly important when bringing together diverse groups of people. A good moderator will have an understanding of design methods and approaches, and will excel at managing group dynamics to make the most of everyone involved (Bertini & Plumpley, 2014)

3. **Choose the co-creation workshop's process model and tools.** Select an existing structure and adapt it to the respective goals of the project and local circumstances (target group characteristics, desired results, etc.). Decide how many workshops will be organized.

4. **Select participants.** Finding the right participants is the key to a successful co-creation workshop. Think about the target customers, and involve a mix of primary persona types to help bring different perspectives to the process. Invite business stakeholders with technical knowledge or market insights, and keep the number of participants at a level that ensures productivity.

5. **Write a storyboard / create the co-creation workshop's agenda.** Co-creation works best when it's highly structured. Following the selection of the co-creation process model and tools, the storyboard of the workshop must be made, including a detailed script, specific milestones, the desired contribution of participants, the expected results and the workshop's goals. All these will provide participants with a clear idea of what to expect and

how to succeed (Bertini & Plumpley, 2014). The workshop's agenda must be created as well, including the following parts (Hill, n.d.):

- **Main Points**. Create a list of main points to discuss, and then break down each larger point into details that you want to communicate to the participants.
- **Visual aids**. List the visual aids that will be used for each point.
- **Discussions and activities**. Take time to list exactly which group discussions and activities you'll have at each point in the workshop and how much time will you allow for each exercise. Make sure your activities are appropriate for the size of the group, and ensure that your venue has the resources (e.g. seminar rooms) needed to run sessions.

6. **Organize logistics.** Set the workshop dates and timeframe, select a location (venue), organize catering, additional resources or infrastructure, etc.
7. **Recruit and invite participants.** According to the selection in step 4, participants need to be recruited. Especially when working with individuals who are supposed to participate voluntarily, it is highly recommended to invest in a thorough recruitment process to ensure their participation during the whole process. In practice offering some kind of monetary or nonmonetary incentive, can motivate them to get engaged. Additionally, some material can be sent to participants, providing food for thought for the creativity sessions that will follow.
8. **Organize a kick-off meeting.** Project/consortium partners and other stakeholders involved in the process should be invited to a kick-off meeting, preceding the first workshop. The aim of the kick-off meeting is to manage expectations, inform partners and stakeholders about the objectives of the co-creation process, the conceptual ideas behind the co-creation method and the storyboard for the first workshop(s). Furthermore, it should be discussed what role or input is expected from each partner/stakeholder.

***Process models of co-creation/co-design workshops***

The structure of co-creation/co-design workshops is usually based on generic process models that can be tailored towards specific project objectives and activities. There are many variations, but all co-creation structures come down to more or less the same line of activities. Regardless of the process model and tools that will be used, there is a parity in all these models' content. Therefore, every co-creation workshop includes the following sessions, either in this form, slightly altered or combined with other sessions:

- **An initial session** where participants are introduced to the basic concepts, ideas and goals of the respective project.
- A second session in which participants, utilizing a number of tools and participating in individual or collaborative creative exercises, **generate innovative concepts** that serve the objectives of the project. The entire process in this phase, could be triggered by an idea.
- **A final session**, where the generated concepts are assessed, mainly in terms of feasibility and potential.

In this section some process models that are used in co-creation workshops, are presented. Their structure and tools can be tailored to suit each particular project. The generic co-creation

workshop process model that is depicted in Figure 16, is built up in five phases. Each phase requires one or multiple workshops, depending on the subject matter, the objectives and the group of participants. The bullets next to each phase describe the activities that can be carried out in the respective phases.

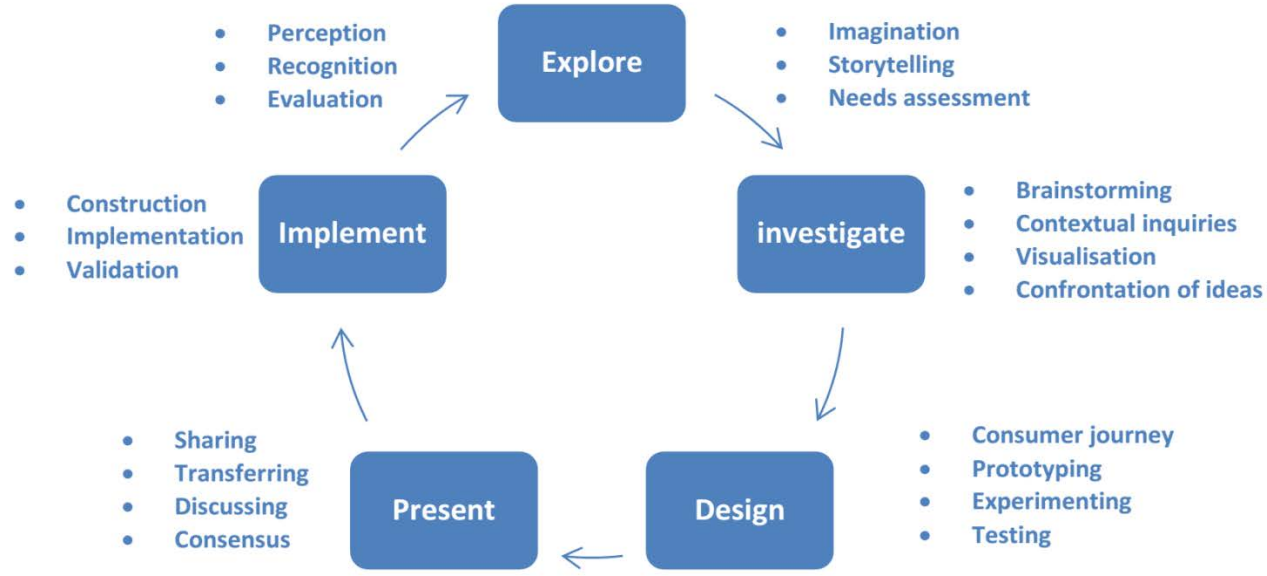


**Figure 16: Generic 5-phase co-creation workshop's process model**

Source: *[3S3C Project, n.d.]*

Another multi-phase process model is depicted in Figure 17. Initially, it consists of 3 phases (**The Critique Phase, The Fantasy Phase, The Implementation Phase**) but several modifications can be applied. In particular, this co-creation workshop's structure can be further developed with the integration of **metaphorical design**, where metaphors are introduced at critical points by the facilitators to broaden the perspectives of the participants (Kensing & Madsen, 1991). Another modification could be the addition of a **Trigger phase**, where possible technological or non-technological solutions are demonstrated to aid the participants to imagine what might be possible (Arvidsson, 2002).

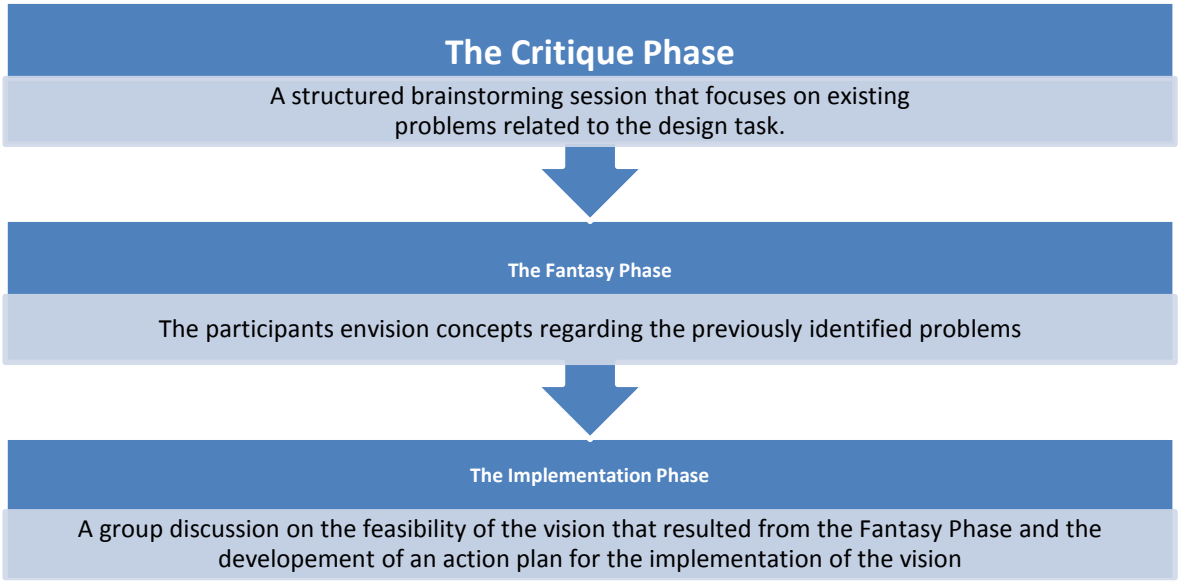


**Figure 17: A three-phase co-creation workshop's process model**

Source: [*Kensing, 1987*]

The third workshop's structure displayed in this section, is similar to the one depicted in Figure 17. It is a process model build up in the following three stages, with each stage including one workshop (Circle Economy, 2015):

- **Initiate.** Participants get introduced to the project's basic concepts
- **Ideate.** Participants get involved in brainstorming sessions, collaborative activities and individual sessions in order to stimulate their creative thinking
- **Implement.** Conceived concepts from ideation stage are assessed and the best suggestions are promoted for implementation.

It is obvious that there is a variety of co-creation workshop process models. However, every co-creation workshop must have a structure that employs certain features. These important features of a co-creation workshop process model are the following (Vavoula & Sharples, 2007):

1. **Ensure minimal participant training.** Participants must have the ability to participate in all workshop's sessions and use all technological components after only brief descriptions.
2. **Collaborative.** Workshops must include group creativity sessions that will give the chance to participants to collaborate and interact with each other.
3. **Creative.** Workshops must involve activities and venues that evoke creative thinking and ideas from people who might not automatically consider themselves as 'creative thinkers'.
4. **Cost-effective to run.** Even though costs are subject to each particular project and objectives, the general rule is that a workshop must have a structure that while facilitating the goal of the project, it keeps costs limited.
5. **Open-ended.** Workshops must not constrain the participants or the outcomes by requiring (or excluding) certain patterns of behaviour or certain ideas. They must give participants a broadly defined activity area, letting them free to explore and define innovative concepts in an open-ended manner.

6. **Pragmatic.** They should be able to identify those concepts that meet the workshop's objectives and are also conceivable.
7. **Inclusive.** They should be representative of their society/customer/user mix, so that different views are incorporated democratically, increasing the take-up of the product/solution

### *Tools and material for the co-creativity sessions*

A typical co-design workshop has at least two different parts. One that helps as an **"ice breaker"** where participants are interviewed about current experiences in order get to know each other and start the conversation (Newman, 2001) and one where **hands-on co-design exercises take place**. The workshops generally involve a collection of materials and tools for the co-creation workshop's exercises (Naranjo-Bock, 2012). These tools and material unlock the creativity of the participants. They are used to elicit their emotional responses and expressions, as well as to uncover meaning and cognitive understanding and finally inspire the co-creation process (Vavoula & Sharples, 2007). The materials and tools used for each workshop should be designed to satisfy the needs of the specific study and therefore they should vary depending on the project. Apart from **brainstorming, discussions and creative problem solving,** some examples of such tools and material that are commonly used in co-creation sessions in order to uncover a variety of insights are listed in Table 5.

**Table 5. Tools and material used in co-creativity sessions**

| **Games** |
|---|
| Games are a very important way of getting to know people, and unlocking people's imagination. They help break down people's inhibitions and encourage them to be playful right from the start of a workshop, helping set a comfortable and non-intimidating tone for the day (Moon, 2012). Design, brainstorming, and innovation games can all be applied to co-designing in a variety of ways. |
| **Modelling** |
| Modelling includes physical mock-ups of tangible products, spaces, or experience journeys. Sometimes, modelling can also be used to co-design group dynamics or deconstruct complex systems. Tools for modelling include collections of 3D shapes in a variety of different materials (e.g., Liz Sanders' velcro modelling kits, construction kits (Mecano, LEGO, etc.) or Play-Doh (Naranjo-Bock, 2012). |
| **Lego Serious Play** |
| The Lego Serious Play tool, is mentioned separately from the Modeling tools because it is very well known among the workshop's designers and it is being more and more used. The Lego Serious Play thinking, communication and problem solving technique unlocks the full potential of a team quickly, effectively, and deeply. The LEGO bricks are used as a medium to build and to express complex ideas through storytelling and metaphors. The bricks also act as a mediator between participants, allowing people to overcome hierarchies and power games that often affect workshop-like activities and co-creation initiatives. A custom designed session includes several "challenges" that need to be solved by the participants and this hands-on building involves areas of the brain that are not used in typical brainstorms or meetings. Lego Serious Play is a unique co-creation tool and that can be demonstrated by the fact that Lego Serious Play is a service that has created its own certified facilitators, the Lego Serious Play Certified Facilitators (Team Dynamics Boston, 2014). |

**The World Café**

The "World Café" technique is a structured conversational process intended to facilitate open and intimate discussion. The World Café is a creative process for facilitating collaborative dialogue and the sharing of knowledge and ideas to create a living network of conversation and action. In this process a café ambiance is created, in which participants discuss a question or issue in small groups around the café tables. At regular intervals the participants move to a new table. One table host remains and summarizes the previous conversation to the new table guests. Thus, the proceeding conversations are cross-fertilized with the ideas generated in former conversations with other participants. At the end of the process the main ideas are summarized in a plenary session and follow-up possibilities are discussed (Sloccum, 2003).

**Paper prototyping and sketching**

When the design team has already produced some initial concepts of the product but there is still plenty of room for exploration, paper prototypes or sketches of wireframes can serve as the main elements for co-design activity. These can be printed on large sheets of paper with enough space to draw or comment on. Tracing paper can also be used as an overlay for the participants to draw with the wireframes below as a guide. A whole interface can also be broken down in pieces of paper to let users build their ideal interface out of these initial parts (Naranjo-Bock, 2012).

**Cognitive and context mapping**

This is the process of creating mind maps of abstract concepts, events, processes, routines, experiences, or systems. The materials used here are symbolic elements such as arrows, regular and irregular shapes, and some distinctive icons or words. These tools should help the participants express the flow in a system or process alluding to both negative and positive aspects (Naranjo-Bock, 2012).

**Visual tools (community mapping, problem trees)**

During community mapping participants draw a map of their local community and mark important features, something that helps them discuss and analyze different topics. Problem trees, list the causes of a problem at the roots, and the effects of the problem as the branches. This tool helps participants to break big problems down into smaller issues that can be more easily understood and addressed (Newman, 2001).

**Storytelling**

Storytelling is used to describe a series of events or steps in a journey. It is a good collaborative tool to imagine future or ideal experiences from start to finish. Some materials for storytelling in co-design sessions include drawing supplies and storyboard templates that guide the participant without being prescriptive. Other materials include additional collections of icons, images, and symbols. Depending on the stage of the project and the research questions, some storyboards are presented to the participants with some pre-defined elements. For example, the designers might have illustrated some steps already but the participants need to add conversations and text explanations on each slot, or vice versa (Naranjo-Bock, 2012).

**Inspiration Cards**

Future scenarios and personas can be co-designed in the form of stories with the use of inspiration cards. These are sets of cards that can be made by the design and research

| |
|---|
| team or purchased as a predefined deck. They contain a variety of images, words and / or complete sentences. The participants construct a story with the cards by positioning them on a large a wall in the order they prefer. The cards can be divided by themes, such as people, places, vehicles, animals, etc., and should be big enough to be easy to see from a normal distance when posted on a wall (Moon, 2012) |
| **Illustrators** |
| Illustrators could play a significant role and be responsible for some of the biggest creative breakthroughs in a co-creation. Illustrators capture visually any ideas that come up, which can be as simple as making sketches of the things people are talking about at the beginning of the day. However these little sketches can trigger other, bigger thoughts and ideas around the subject and help a concept take shape quickly. As the day goes on and ideas are worked up in more and more detail, so the illustrations become more detailed and elaborate until by the end of the day you have fully illustrated examples of packaging designs and even potential press adverts day (Moon, 2012) |
| **Role playing games** |
| Role-playing games require that designers of workshops set up games to simulate contexts and events while participants role-play within the context of the game to envision services and technologies appropriate for the situations formed (Vavoula & Sharples, 2007). |
| **SPES (Situated and Participative Enactment of Scenarios)** |
| SPES involves the designer of the workshop 'shadowing' a participant for one to two days, with the participant carrying a mock-up device which they use to enact scenarios created on the fly, based on real-life situations that either the designer or the participant considers interesting (Vavoula & Sharples, 2007). |

***Composition of participants of co-creation workshops***

One of the main elements of the co-creation / co-design workshops is the composition of its participants. It is critical to identify the appropriate people, involve them in appropriate stages and give them appropriate roles in the project. Selecting the right criteria to target the right co-creators (participants) is a major task in the process of constructing effective co-creation partnerships with users and other stakeholders. The assessment of the co-creators' competencies can be made based on their knowledge, skills, expertise and their enthusiastic attitudes towards the co-creation process (Romero & Molina, 2009).

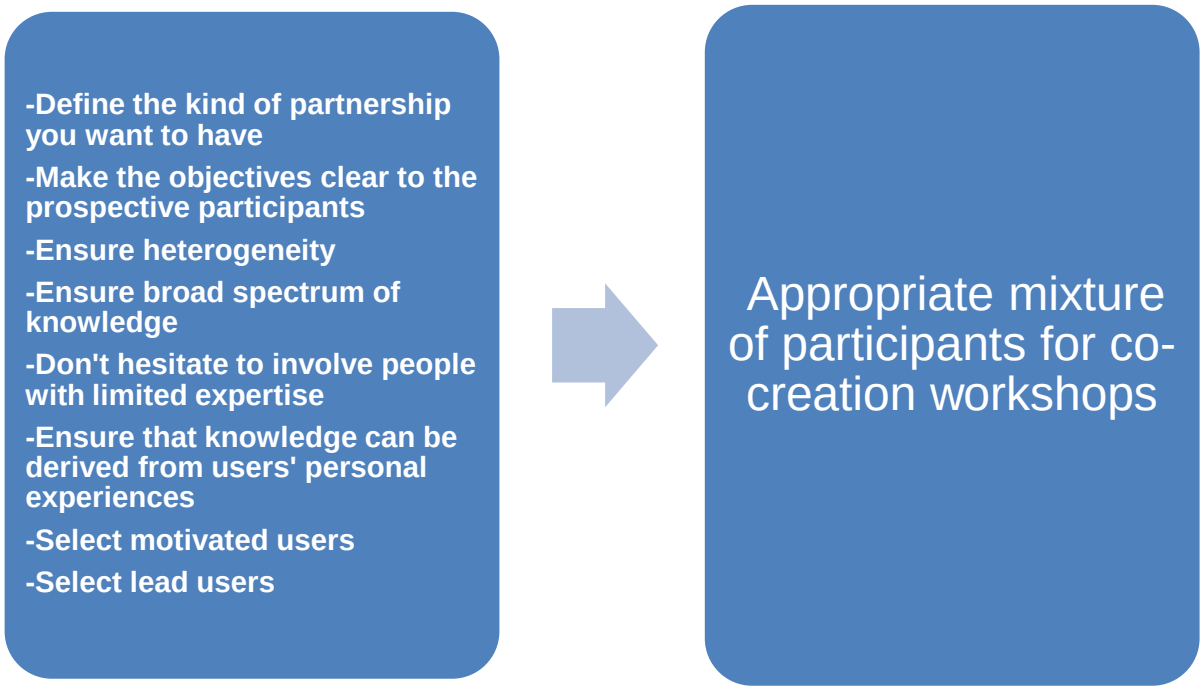


**Figure 18: Successful recruitment of participants in co-creation / co-design workshops**

Source: [*Kristensson et al., 2008*]

As shown in Figure 18, the first action that must be made during the participant targeting process, is to define the kind of partnership to be established and to make clear the objectives of each particular co-creation/co-design workshop, to the people that you to try recruit. This way the risk of non-attendance or the risk of participants' indifference during the workshop can be reduced (Romero & Molina, 2009).

Perhaps the most important characteristic that a co-creation workshop must have, in order to be successful, is the **heterogeneity** of its participants. It has to be ensured that the composition of the participants will be of variant background, including people coming from creative jobs who can provide disruptive ideas. In contrast to the heterogeneous participants and the diversity of their needs and ideas, a classic product/service development team is likely to consist of people who have become accustomed to the services that the company provides, making it difficult for them to foresee and appreciate the variety of situations in which the heterogeneous users of their services experience real value. So, it is apparent that the mixture of participants in co-creation/co-design requires the involvement of users and stakeholders who represent **a broad spectrum of knowledge**, ensuring that a diversity of ideas for future services is generated. If this is not done, companies will run the risk of creating services/products that are valued by only a segment of users, leaving the problems of other customer segments completely unaddressed.

Although, co-creation/co-design is a collaborative approach that is seeking ideas from a group of individuals with specialized skills and talents, research has shown that not all participants have to be experts in the subject matter of each particular workshop. **Limited expertise in not a barrier to creative thinking**, even when participants are aware of their own lack of knowledge in the co-creation workshop's field of interest. Indeed, sometimes expertise can have its drawbacks in the form of predictable thinking which follows well-established patterns. This is obvious through the example of product developers who often come up with ideas, which their expertise kills, as they take into consideration all the problems that are associated with the development of these ideas.

Successful user involvement during innovative new service development requires **information that is derived from user situation**. As users experience

various situations in which they encounter difficulties (their own and those of others), they earn knowledge about their own needs and certain emotions and cognitions are triggered. These needs then stimulate ideas that stem directly from reality.

Another thing that designers have to keep in mind when selecting participants is that, there must be some apparent benefits for them, either in the form of intrinsic or extrinsic benefits. For example people that have a keen interest in the field of study either because they are researchers or end users are good prospective participants. In general, **motivated users** tend to outperform unmotivated users in innovative tasks[26]. Additionally, it is suggested that **lead users** should be part of co-creation workshops. Lead users are those users of existing products and services who currently face needs that will eventually become general in the marketplace and also expect to benefit significantly from a solution to those needs. Meeting these two criteria makes lead users good candidates for drawing the attention of designers and developers to potentially important needs that existing solutions do not satisfy, and for suggesting preliminary solutions by reflecting on how they presently overcome these problems (Vavoula & Sharples, 2007).

Of course, involving participants besides users is of key importance as well. **Designers of the particular services/products, professionals with expertise in the field, employees from the organizations that are conducting this co-creation process and other relevant stakeholders** are necessary for the success of co-creation workshops, as their participation guarantees an element of feasibility in the resulting concepts and gives the team a better and more complete perspective of the subject matter (Vavoula & Sharples, 2007).

***Moderators of co-creation workshops***

Apart from the participants, co-creation workshops require an expert on site who will have the role of the moderator. It is of key importance that co-creation workshops should always be well prepared and well organized. Thus, it is recommended to have an experienced moderator to lead the workshops. The moderator guides participants through the process of creating, developing and testing new ideas for products or service concepts, by collecting and processing their input in various stages of the process. Facilitation is particularly important when bringing together diverse groups of people. A good moderator will have an understanding of design methods and approaches, and will excel at managing group dynamics to make the most of everyone involved (Bertini & Plumpley, 2014) .

Additionally, the moderator should accommodate a safe, creative environment for lively interaction between participating end users, the project management and other stakeholders, while at the same time ensure that the initial goals stay within reach (S3C Project, n.d.). Creating a hospitable space involves a social atmosphere, where everyone must feel free to be him/herself and to offer his/her most creative thinking and the physical environment which must be a warm and inviting setting (Sloccum, 2003).

It is also important that the moderator guides the sessions at all times. When working with a large group of participants it is best to break the group into subgroups of a maximum three members and monitor their work and internal discussions as best as possible (Naranjo-Bock, 2012). Many people are nervous about speaking up in an unfamiliar group. Therefore, during group exercises, the size of each group should be kept small, so people are more comfortable talking and interacting. Each subgroup can work on the same theme or variations of it, presenting their work to the rest of the group at the end of the session. In addition it is very important to mix up different types of people in each group. For example, if several departments participate in a workshop, members of the same department should be placed in different groups. By encouraging people to interact with other departments, they can learn to look at things from different perspectives (Hill n.d.). Finally, the moderator has to examine the effectiveness of the tools and materials used in the workshops and decide which of them should be eliminated and which tools should be added (Naranjo-Bock, 2012).

Some fundamental guidelines for co-creation workshop moderators are listed below (Cruickshank et al., 2013).

- Agree how the success of the project will be recognized
- Move in and beyond your normal design practice
- Involve and respect lots of people in the ideas generating parts of the process
- Use the expertise of all participants in the process
- Let everyone be creative in their own way
- Explore and challenge assumptions
- Expect to go beyond the average
- Bring the process to the best possible conclusion with the best possible design outcome
- Ask good questions
- Be transparent
- Set time limits
- Summarize what the participants are saying

***Necessary components of a successful co-creation/co-design workshop***

In addition to the method that will be followed, the tools that will be applied in the co-creativity sessions and the participants that will be involved there are some features and techniques that are likely to assist in the generation of innovative ideas and have to be basic characteristics of a co-creation workshop (Moon, 2012). These features are listed below:

- **Creative venues**. It is better to run workshops in interesting and inspiring places. For example, an expansive studio with natural daylight and views of a city will inspire creativity much more than a conference room in a hotel.
- **Breaks**. Co-creation workshops should include regular breaks in order to prevent participants' fatigue.
- **Rewarding mechanisms.** It might be useful to incentivize the participants of the co-creation workshops, mainly the users, for their contributions, particularly for those that serve the predefined objectives and represent a real benefit for the organization/project. Rewarding participants (e.g. free trials, samples of products, prizes for the best customer innovations, sharing of intellectual property), is one of the best mechanisms to stimulate proactive behavior and to keep ideas flowing (Romero & Molina, 2009).
- **Evaluation of co-created concepts.** The ideas that are generated through the process of a co-creation workshop have to be assessed in terms of feasibility and suitability
- **Documentation**. The findings from the co-creation workshop and the developed innovative concepts should be documented and disseminated within the organizations and participants involved, in ways that engage relevant people in order to improve the adoption and application of these (Steen et al., 2011).
- **Recording**. There can be so many ideas and suggestions during a co-creation workshop that it would be easy to lose something, which is why it's so important to capture everything. Effective recording will make the participants feel confident that all ideas generated are being documented, but it will also help when it comes to examining and working on the

outputs afterwards. It's easy to forget where exactly an idea came from or what the thought behind it was, so going back to the notes made in workshops is a very useful way of documenting the journey.

Some common recording methods for co-creation workshops is the **use of a voice or video recorder**, **taking notes when people are speaking and photographing any outputs**. Recording methods that can be used during the co-creation process also include the following (Sloccum, 2003):

1. **Post of insights**. Participants can place large notepapers on which a single key insight is written, on a blackboard, wall, etc. so that everyone can review the ideas during a break.
2. **Graphic Recorder**. In workshops the whole group conversation is captured by a graphic recorder who draws the group's ideas on flipcharts or a wall mural using text and graphics to illustrate the patterns of the conversation.
3. **Idea Clusters**. Group insights transferred to affinity clusters so that related ideas are visible and available for planning the group's next steps.
4. **Gallery Tour**. At times, people will place the paper from their tables on the wall so members can take a tour of the group's ideas during a break.

***Summary of activities for setting up and holding a co-creation workshop***

The practices of co-creation / co-design workshops have been presented in the previous sections. In this subsection we aim to summarize this knowledge and present a digest of the various sub-components. Arguably the workshop organizer has to go through certain phases from the time of decision to hold the co-creation workshop until the time that this workshop is delivered. These phases include Pre-workshop planning, Workshop's goal setting, Visualization of unmet needs, Idea co-creation and finally Evaluation of the created ideas. The activities in these stages range from the early decisions that the organization has to make until the actions that must be made after the end of the co-creation workshop and are displayed in Figure 19.

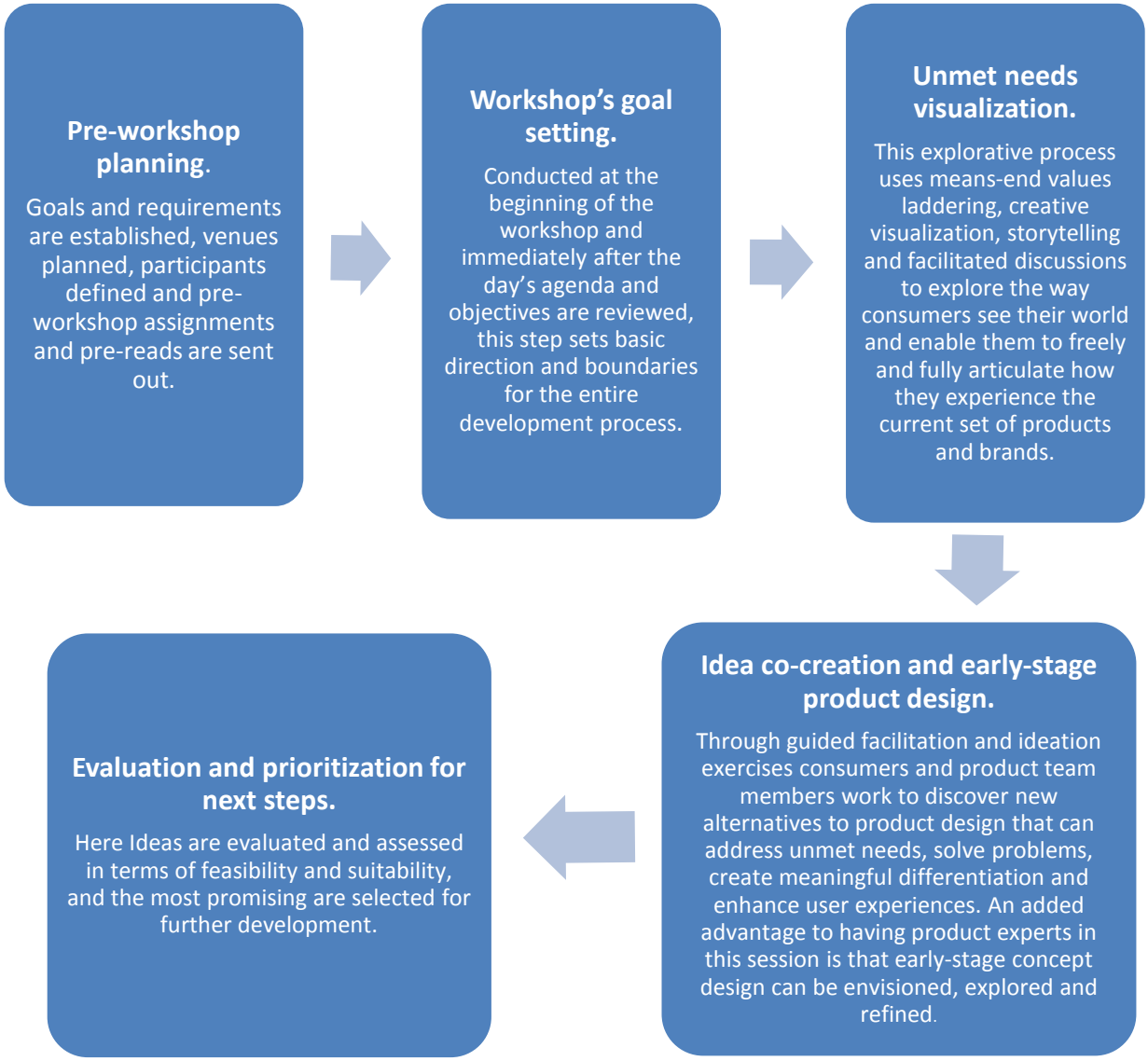


**Figure 19: Phases of co-creation workshops**

Source: [*Daye, 2014*]

### 3.2.2 Generic co-creation / co-design workshops examples

Co-creation workshops have their roots in the Scandinavian countries. By actively involving the key stakeholders (customers, citizens, end users) in the design process, the resulting design is usable and meets the real needs of the beneficiaries. The core objective is to move from merely consulting with citizens to co-designing with them. The approach has been employed in a wide range of contexts including among others software design, urban design, product design, and public policy planning. Some successful examples of co-creation/co-design workshops are mentioned in this section, in order to offer a better perspective of their process models, tools, activities and practices.

***Finland's Living Lab project***

Finland's Living Lab project, was initiated in 2000 by a group of retired women in Finland who wanted an alternative for senior housing. The project involved the design and construction of a senior housing arrangement based on neighbourliness and self-help. The citizen group (Active Seniors Association) managed to negotiate with the city of Helsinki the assignment of

a price-regulated lot that permitted more concrete planning. While professional design consultants assisted the group, the design work was largely conducted as a collaborative (or collective) work, driven by the future inhabitants of the senior housing. The group employed several co-design tools and material including concept scenario work, paper and functional prototypes, etc. Through a series of co-design workshops, the concept scenarios and ideas were translated into specific features and architectural elements. In addition, following an ideation workshop, the group came up with a design to implement a digital community calendar. Overall, the participatory approach resulted in a design that addressed the citizen group's needs and also in the identification and design of several more elements (e.g., digital community calendar) (Nambisa & Nambisan, 2013).

***Planmeca Oy***

A private company that used co-creation workshops is the Finnish dental equipment company Planmeca Oy. At the beginning of 2007 and because of the increased global competition, Planmeca Oy decided that it needed new services to strengthen its 3D X-ray imaging business. Through market research and literature surveys, a possibility to create a service which was unique to X-ray imaging business was identified. A project team was established in order to further develop this new service concept. The team invited a group of professionals that consisted of users with advanced knowledge in the field, such as dentists, dental technicians, and X-ray and imaging experts, in order to co-create an innovative service. The users together with Planmeca's research team participated in a creativity workshop, where after attending brainstorming sessions and exercises with prototyped models, they co-created several innovative concepts within the area of digital X-rays. The outcome of the workshop was a new online ordering service that allowed dentists to send a 3D X-ray image of the patient directly to Planmeca Oy by using a certain imaging software. The group of users was invited to another workshop where the prototypes were tested. The tests turned out successful, and the service entered the company's product portfolio (Bisgaard & Hogenhaven, 2010)

***Power Matching City project***

A successful co-creation project that lasted from 2010 until mid-2014, was the Dutch Power Matching City (PMC) project, which included workshops that aimed to discover end users' needs and priorities and co-create innovative concepts for energy services. PMC was set-up by a consortium of complementary stakeholders: end users, energy retailers, a technology company, an ICT company and educational institutes. The project was built up in three phases. In the first workshop participants were introduced to the projects objectives and were informed about its progress. In the second phase the process became much more participatory and aimed at identifying the products and services that were of interest to participants. In a workshop setting, a card game was used to elicit the participants' worries, priorities and future perspectives on energy and energy use. The framework of the game offered participants a safe environment, where they felt free to speak honestly about their real experiences. The first session of the workshop was organized to explore and imagine the future energy supply. Metaphors (such as peak hour rates at trains) were used to grasp new concepts of matching supply and demand and working with variable rates. For each metaphor, participants were asked to reflect upon hopes, worries and solutions concerning the future energy supply. The next session of the workshop included a card game that intended to play out possible options. The cards had four categories: energy generation and storage (e.g. 'sharing a wind turbine'), managing energy streams (e.g. 'smart appliances reacting to energy price'), monitoring and advice (e.g. 'advice about energy investments'), and services (e.g. 'leasing smart appliances'). The full set of options was developed by the project team, based on the input from the previous session. Each option was attributed a price and participants had to decide in groups which options they would like to buy, given their limited allocated budget. The outcome of the co-creation workshops was the identification of two prototypical innovative energy services (S3C Project, n.d.; Mourik, 2014).

### *InovCity project in Portugal*

The InovCity in Portugal started in 2011 and organized multi-stakeholder co-creation workshops in order to bring down the differences and communication gaps between technology developers and customers. In a workshop setting, the project management of InovCity established direct contact between end users, local officials, IT-experts, communication experts and the project marketing and customer service staff. These workshops served as an informal information exchange in which end users could address concerns directly to the responsible parties. It resulted in a win-win situation that not only took end user needs into account, but also offered experts and technical staff direct access to the end user, enabling them to collect community feedback on the design and operation of technologies and interfaces (S3C Project, n.d.).

### *"Assessment of sustainable consumption in Latvia" research project*

The research project "Assessment of sustainable consumption in Latvia" started in 2011 and was carried out within the EU 7th framework and aimed to strengthen cooperation between scientific institutions and NGOs for achieving new contribution to research, concerning sustainable consumption. In order to assess the main driving forces behind consumption patterns in Latvia, their environmental pressures and the policy responses to them, a series of three co-creation workshops were held, including experts from NGOs and scientific institutions working on sustainable consumption issues. During the first workshop, participants created cognitive maps of their shared understanding of important driving forces that affect consumption patterns of food, housing and mobility. The second workshop was built on the results of the first one and focused on policy instruments, identified from the participants in order to deal with drivers of sustainable and unsustainable consumption. In the last workshop, participants categorized these main instruments based the different role of each stakeholder (government, business, households, mediators). The workshop also made recommendations for each of the stakeholder groups regarding sustainable consumption governance (Schrader et al., 2013).

### *CIRCO Business Design Track*

In 2015, the Dutch company Circle Economy, organized a co-creation project, by the name CIRCO Business Design Track, where companies and multiple stakeholders joined forces to explore new opportunities for products, services and business models that fit within a circular economy. The structure that they followed consisted of three phases (Initiate, Ideate, Implement) and each phase included one workshop. During the first workshop participants were introduced to the concept of circular economy, and to how they can apply circular design to create desirable products and services. Equipped with this knowledge the participants worked together to explore how the different circular design strategies can be deployed. At the end of the workshop each participant would be able to select the most promising design strategies. These strategies would be used as a starting point for the following workshop. The ideation's phase goal was the development of concepts relative to the circular design strategies and business models. The opportunities that were identified during the previous workshop were investigated in this phase. In a number of interactive sessions, knowledge, skills and creativity were combined to translate the insights that were gained earlier into circular products and services as well as business models that have circular potential. This resulted in a range of possible adaptations that could be developed into viable concepts within a short term, opening the door for more circular services in the future. Finally, the Implementation phase, investigated the feasibility and requirements for potential implementation of the concepts that were developed in the previous stages. The final workshop started by identifying the best concept(s) created during the ideation workshop, based on its circular impact and technical and commercial feasibility. A roadmap was then created, containing practical subsequent steps on the road to implementing these concepts (Circle Economy, 2015).

### 3.2.3 Co-creation / co-design workshops in transport

Today, marketing of public transport (PT) offers many well-known solutions, such as advertising, distribution, promotion, branding and others. All these solutions derive from the application of conventional marketing science, based on concepts like marketing mix, segmentation, targeting, positioning, etc. Public transport operators have been using these methods since a long time ago, because they are familiar with them, they have already tested their results and consider them trusted and certified (Suminaite & Fragidis, 2011) . Traditionally, transport authorities conceptualize users as passive consumers, who extract the value-in-exchange by requesting a variety of ticket services, by demanding punctuality of traffic services and by emphasizing travel comfort (Vargo & Lusch, 2004).

However, conventional marketing approaches are today under criticism. With the development of new approaches towards market orientation in marketing and business management, it becomes clear that traditional marketing tends to overlook these new aspects of market orientation. New approaches to marketing science focus more genuinely on customers and the satisfaction of their needs in the best way, by encouraging value co-creation with them (Suminaite & Fragidis, 2011). They consider customers to be active and instead of emphasizing value-in-exchange, they focus on value-in-use in the customers' own context, where the individual consumer is central to the co-creation of experience (Vargo & Lusch, 2004).

Public transport systems have operated for a long time with little or inaccurate knowledge for the needs of their users. However, many operators are noticing that it is not enough to simply supply transport services, but it is also necessary to see each of their users as a single individual. PT operators have to be transformed from simple providers of transport services to forward looking service providers that empower and increase benefit and added value for their users. Successful marketing solutions, like co-creation / co-design workshops, can contribute to the sustainability and further development of public transport, by identifying innovative concepts that will increase its attractiveness and will create a competitive advantage for it (Suminaite & Fragidis, 2011).

Co-creation has been identified as a process that creates value when applied in the public transport sector. Some examples of co-creation / co-design workshops that refer directly or indirectly to public transport are mentioned in this section. Such examples come from the railway sector, the automotive industry, the aviation sector and transport policy makers, and mention cases where users and relevant stakeholders became part of the new product/service development processes, in sectors similar to the public transport sector. Error! Reference source not found.Table 6 contains a short description of these cases, which are then described more extensively.

**Table 6. Description of transport related co-creation workshops: a CIPTEC selection**

| Project | Approach | Description |
|---|---|---|
| SBB Railway (SUI) | Co-designing new services with users | SBB integrated customers into their new product development (NPD) process. Their user-centered approach led to the creation of the innovative service "Travel Card Finder" and to the overall improvement of their travel card services and it also enhanced customer engagement. |
| Inclusive Bus Travel in London (UK) | Co-creation workshop aimed to assess and improve the accessibility of public buses | This research project included a co-creation workshop with participants from various user groups. The research project identified the key issues that impose challenges to passengers with mobility restrictions and developed 9 principles for |

| Project | Approach | Description |
|---|---|---|
| | | improving mobility challenged passengers' experience of public bus travel. |
| ZVV Transport Association (SUI) | Co-designing with users for creating new service ideas | ZVV used customer insights in the idea generation process. The participation of users in the service development process gave ZVV the chance to identify customer needs that it would have otherwise overlooked. The result was that after realizing that passengers are worried about safety during night time network, ZVV introduced inspectors patrolling trains at night. |
| NS Railway Operator (NL) | Co-creation workshop method with stakeholders | NS conducted a co-creation workshop process in order to optimize the boarding and alighting procedure of passengers. NS held two workshops in which multiple stakeholders participated. The first one was a creative workshop where possible solutions were conceived. The second was an implementation workshop were the concepts of the former workshop were evaluated and one final solution was proposed |
| Prorail Railway Operator (NL) | Three-phase co-creation model with multiple stakeholders | In a workshop setting, Prorail tried to find solutions to the problem of "extreme users". The participants involved transport operators, doctors, university institutes and end users. The structure they followed included an initial, an ideation and an implementation workshop. Three solutions were developed into scenarios that could be implemented to address the need of dealing with "extreme users". |
| Volvo Cars (USA) | Multi-phase user-centered co-creation workshop model | Volvo Cars held a three year co-creation process in order to assist their NPD process. Women from USA participated, after Volvo identified this target group as an indicative target group for their new car. Several co-creation workshops were conducted which offered the chance to Volvo not only to successfully launch their new car model but also to enhance their future NPD decision making process. |
| Science and Technology Options Assessment (STOA) (EU) | One co-creation workshop with multiple stakeholders | STOA explored the potential of integrated e-ticketing solutions combining public transport and touristic features. After one workshop, that involved relevant stakeholders and end users, several concepts were co-created that could facilitate the development of an integrated e-ticket for transport and tourism. |
| SAS (SE) | Co-creation workshop with the participation of the company's employees | After understanding the entire process of the glass handling, SAS invited its staff to participate in a co-creation workshop in order to benefit from their user-experiences and co-create with them a new glass holder. The generated concept led to an innovative product and substantial cost savings from less breakages |

### *Inclusive Bus Travel in London*

Commissioned by Transport for London and the borough of Hillingdon, this research project was conducted in order to address issues associated with bus travel in London. The aim of the project was to produce recommendations for improving the accessibility of bus travel through investigating (i) the barriers that a diverse range of users face and (ii) what makes a journey either pleasant or unpleasant. A variety of approaches and techniques were used in order to understand the barriers to accessibility and inclusivity and how these could be overcome. These included desk research, focus groups, access audits, observation, interviews and finally a co-creation workshop. The project defined three major stakeholders: 1) Service user - mobility challenged people, 2) Service provider - bus drivers, 3) Service operator - bus companies. The project until the implementation of the co-creation workshop had identified 8 key stages of a bus journey that should be examined.

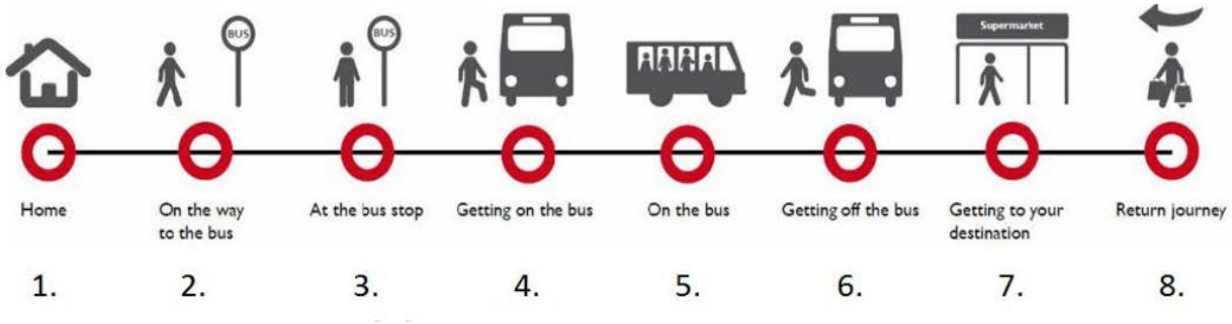


**Figure 20. Key stages of a bus journey**

Source: [*Nickpour, 2011*]

The co-creation workshop ensured its heterogeneity by taking into account different user groups. In particular, in the workshop the following groups were represented: caretakers with buggies, blind or visually-impaired people, wheelchair users, older people, bus drivers, pregnant women, teenagers, people with learning difficulties, bus maintenance workers and non-users. All groups have their own special needs and mobility restrictions that make it difficult to use public transport. The co-creation workshop used storytelling and different scenarios (a bad scenario, a scenario in which all users respond in a good way to the challenges they face) to elicit user' insights. The project identified 3 categories that impose challenges to users: (i) physical, (ii) psychological (e.g. overcrowding, negative behaviour of other passengers, etc.) and operational issues. Overall, after the end of the research process, the following nine recommendations were proposed as key principles for improving mobility challenged passengers' experience of public bus travel: 1. Create an inviting and friendly experience of the bus service, 2. Make bus stops reachable and fully accessible, 3. Promote and facilitate positive behaviour amongst passengers, 4. Ensure that key aspects of the bus are fully operational, 5. Ensure that all users have a safe and comfortable space, 6. Welcome mobility challenged people aboard, 7. Set off and drive smoothly, 8. Provide information clearly through multiple channels throughout the journey (Nickpour et al., 2012; Nickpour, 2011).

### *SBB Railway & ZVV Transport Association*

According to a study (Gebauer et al., 2010) which involved three railway operators from Switzerland (SBB), Germany (Deutsche Bahn (DB)) and Sweden (SJ) and a transport association in the region of Zurich (ZVV), value creation opportunities evolve when public transport operators co-design services together with users. Co-design implies either to use customer's better align services and customer needs during the market introduction, or involving customer already in the creation of new service ideas.

SBB has been integrating users into the creation of new service ideas for several years. In 2010, in a joint effort with its customers, SBB developed an innovative service called the Travel card Finder, which helped the company improve its breadth and customization of its travel card services. For example, the high numbers of customers using only one specific route has led to the point-to-point travel card which can be valid for a period of seven days, one month or twelve months. Moreover, co-designing the Travel card Finder with them, produced an interesting side effect. During co-designing, users explicitly engaged with the project and communicated their underlying rationales in their buying behaviour.

Zurich's transport association ZVV, applies co-designing with users at the phase of creating new service ideas in order to create services more appropriate to the customer's needs and wishes. In 2010, during the idea generation for extending the night-time network, public transport users mentioned risks involved in using the public transport at night, despite the obvious benefits of not using the car. At the beginning, ZVV was not really aware of the perceived risks because the general customer satisfaction about the safety and security on board was very high. However, considering the night-time network, users thought they would get in contact with drunk people, they might miss the last train and have to take an expensive taxi or even considered personnel attacks as possible. The ZVV reacted to this situation by creating a dialogue with customers on these potential risks. An outcome of this dialogue was the introduction of inspectors patrolling S-Bahn trains after 21:00 and creating a specific hotline for any problems in the evening, which has given passengers a much better feeling of safety and security (Gebauer et al., 2010)

***NS***

In 2012, the Dutch railway operator NS, held a co-creation workshop process in order to develop concepts that would result in a faster, safer and more comfortable boarding and alighting procedure. The desired benefits included less congestion when the train doors open, less dangerous situations, shorter waiting times, a better passenger experience with regard to comfort and information provision, the capacity to process more passengers per hour and, finally, the capacity to schedule more trains due to less time needed at the platform.

The co-creation project was assigned to STBY, a team specialized in consumer research during the early stages of innovative service design projects. The first stage of the process included a detailed description of the passengers' experiences with regard to incidental and frequent journeys, in an attempt to identify when and why passengers have negative experiences related to train travel. Using a specially developed 'train journey diary', the participants in the research (a selection of ten frequent and incidental passengers) recorded their train journeys during a period of three to four weeks. The diaries were then discussed together with the participant during contextual interviews. The observations of the passengers' behaviour and the results of the interviews provided the researchers with a detailed picture of the key problems experienced by passengers related to boarding and alighting from trains. The outcome of the research was that passengers mostly wanted to see improvements in information provision, on the position of the train on the platform, the configuration of the carriages and the locations of unoccupied seats. During a workshop with the passengers, designers, and NS employees, the next step was to consider possible solutions to the bottlenecks revealed. Twelve highly diverse innovative solutions were conceived. In a following workshop with stakeholders, the twelve concepts were discussed and evaluated for their added value and innovativeness, as well as organizational and technical feasibility. The final concept was an app that aimed to provide passengers with better information on certain details (congestion and the location of quiet zones, first class compartments and bicycle entrances) about their specific train. Later on, a mock-up which visualized the potential outcome was developed and the two railway organizations gave their backing for a pilot of the final concept to be implemented in one railway station (Enninga et al., 2013).

***Prorail***

Prorail, a Dutch government organisation responsible for the function, maintenance and extensions of the national railway network infrastructure, applied a co-creation process which started in November 2011 and lasted until October 2012. Prorail assigned the task to 31 Volts, a service design company which acted as a moderator. The organization held a series of co-creation workshops in order to gain insights and find a solution to the problem of "extreme users" ( i.e. passengers that display obviously abnormal behaviour on the platform and in so doing disrupt other passengers). After identifying and dividing extreme users into 5 separate categories and profiles, Prorail conducted 3 workshops with stakeholders and professionals (including other transport operators, an environmental psychologist, HU University of Applied Sciences Utrecht and users). The aim was put the participants of the workshops to work closely together, in order to find promising interventions to influence the behaviour of passengers, and in particular the "extreme users". During the first workshop participants were introduced to the basic concept of the problem and to the 5 identified personas. During the second workshop, the participants got together in smaller groups to find potential solutions by using self-reflection and thus, putting themselves in the personas' shoes. They then regrouped and selected nine solutions to develop further. During the third workshop, the participants chose three of these nine solutions on the basis of feasibility and chance of success, that were then developed into scenarios that could potentially be implemented. These scenarios were interventions tailored to the needs and requirements of extreme users (Enninga et al., 2013).

***Volvo Cars***

Volvo Cars, involved users' opinions in the New Product Development (NPD) process, through a co-creation process which started in 1999 and finished in 2002. Particularly, while planning for the new XC90 SUV model, the project team realised that knowledge was lacking about the model's potential customer. Women were driving SUVs in increasing numbers in the USA and the project team decided to involve them in a co-creation workshops in order to gain insights about their needs and preferences. A facilitator with expert knowledge in the processes of the automotive industry was involved. The mixture of the participants of the co-creation workshops was very carefully decided and included women in highly professional fields, who were likely to make independent decisions regarding the purchase of a vehicle. The heterogeneity of the mixture was ensured by the spread in age and professions. The first co-creation workshop aimed at making an initial contact between the participants and the project management team. Sessions were organized in an informal dinner setting and the general purpose was to elicit opinions and expectations regarding SUVs to be fed into the next, concept development, workshop. In the second workshop participants studied videos and renderings of the XC90, while the project team observed in an adjacent room behind mirrors. An open discussion then followed between the groups in order to develop users' concepts and capture their views. The third workshop, was held in a hotel ballroom, since a full-scale plastic model of the XC90 was to be displayed. The emphasis at this meeting was on exterior and interior design, pricing and options and the two sessions were held over lunch and dinner.

The female customer had valuable effects on the idea generation process of Volvo. The participants, offered a new context for NPD decision-making and offer their insight that was used to create improved value for the target customer. Even though there was no substantial monetary incentives, the participants enjoyed the social value of the sessions and were glad to be heard. Another factor that led to the successful participation of end users, was the subject matter that was interesting to them (Dahlsten, 2004)

***STOA***

In October 2013, the Science and Technology Options Assessment (STOA), part of the European Parliamentary Research Service, conducted one workshop in order to present a comprehensive picture of integrated e-ticketing solutions that combine public transport and touristic features and to discuss the potential of these schemes for the transport and tourism sectors and for end users, as well. Approximately 30 people participated in the workshop and

among them there were end users and representatives from public transport operators, financial service providers, telecommunication operators, the tourism sector, government and other administrative authorities. The focus was on the different actors that are important for a successful implementation and on their views regarding future developments. The workshop included five presentations and every presentation focussed the specific views on the future development of an integrated ticketing scheme of each specific actor (Public transport operators and authorities, financial service providers, telecommunications operators, tourism sector) and was followed by an open round table discussion. The outcome of the workshop were several conclusions that potentially could assist in the development of integrated e-ticketing solutions (Puhe, 2014)

***SAS***

In 2000, the Scandinavian airline carrier SAS got a new corporate identity which meant that a lot of the old equipment had to be replaced. One of the things being replaced were the drinking glasses used during flights and thereby also the glass holders. Focus was placed on developing a new glass holder that would help in reducing the amount of glasses that were broken.. The old glass holders were designed solely for handling by in-flight personnel, which meant that when the glasses were to be washed they would be placed in another glass holder designed only for washing the glasses. In addition, because the plastic material which was used in the old glass holders was not suitable for that usage, the glass holders became brittle and broke after only a short period of time. As a result, SAS incurred large costs due to glass holders breakages, in addition to the glasses that got broken. CHP Design, a Danish company was invited to lead the innovation process. In order to understand the entire process of the glass handling, from the ground to the passenger in the cabin, they involved SAS staff from the beginning of the innovation process by using several different tools. They observed the different types of users of the glass holder, they interviewed them in order to understand their work processes and they invited them to participate in a workshop setting environment, in order to co-create innovative ideas for developing a new glass holder. The outcome of the workshop was the creation of a new glass holder that could be used throughout all the different stages (storage, washing and in the air). The participants of the workshop co-created an innovative concept about a different type of plastic that could be used, which would be supple and thus, result in less breakages. The costs spent on developing the new glass holder for the SAS Group were recuperated within 6 months due to a reduction on broken glasses and glass holders (Bisgaard & Hogenhaven, 2010).

***Lessons learned from the presented co-creation workshops***

The findings of the case studies presented here and in section 3.2, suggest that co-creation/co-design workshops can lead to new innovative ideas, and offer the opportunity to public transport to increase its attractiveness and eventually its market share. After examining the above mentioned co-creation workshops, some main findings stand out and points of parity are identified. Table 7 summarizes these findings and common parts.

**Table 7. Main findings from presented co-creation workshops: results of CIPTEC review**

| Findings | Case Studies |
|---|---|
| **Focus on users**. All presented co-creation workshops were user-centered and relied either partially or entirely on the users' input and experiences in order to achieve their objectives. | All |
| **Heterogeneity of participants.** A common feature of most of the presented workshops is that they ensured their heterogeneity by including participants who represented a broad spectrum of expertise, knowledge and experiences. | NS, Prorail, Volvo Cars, STOA, Power Matching City, InovCity, CIRCO Business |

| Findings | Case Studies |
|---|---|
| | Design Track, Inclusive Bus Travel |
| **Intrinsic motivation of users.** All presented cases involved participants with intrinsic motivation and strong interest in the objectives of the workshops. This feature ensured the participants' engagement throughout the entire co-creation processes, thus, greatly contributing in their final success. | All |
| **They come down to more or less the same line of activities.** Most of the co-creation workshop process models that were displayed, adopted a three-phase structure and included an Initiation, an Ideation and an Implementations phase. In the first phase, participants get introduced to the workshop's objectives. In the second phase, creativity exercises are conducted and innovative concepts are generated. Finally, in the last phase, concepts are assessed in terms of feasibility and suitability. | NS, Prorail, Volvo Cars, Power Matching City, "Assessment of sustainable consumption in Latvia", Finland's Living Lab, CIRCO Business Design Track |
| **Moderators.** It was identified that the inclusion of strong facilitators can significantly contribute to the success of the co-creation process. | Volvo Cars, SAS, Finland's Living Lab, NS, Prorail |
| **Better fit to users' needs.** Evidence from the case studies suggests that co-creation workshops lead to concepts/services/products that better address users' needs. | SBB, ZVV, NS, Prorail, Volvo Cars, Finland's Living Lab, InovCity, Power Matching City, Assessment of sustainable consumption in Latvia", Inclusive Bus Travel |
| **They facilitate decision making**. Co-creation workshops facilitate the decision or policy making process of an organization, but they can also offer a new context for future NPD decision making | STOA, Volvo Cars, Power Matching City, "Assessment of sustainable consumption in Latvia" |
| **Better idea generation.** Co-creation workshops offer a better idea generation process and improved creativity. | All |
| **Successful new product development.** It was identified that co-creation workshops often lead to development of concepts/products/services that are successfully implemented and introduced to the markets and do not just remain unexploited ideas. | SBB, ZVV, Volvo Cars, SAS, Planmeca Oy, Finland's Living Lab |
| **Cost savings.** Co-created concepts can lead to cost savings | SAS |
| **Increased user engagement.** Co-creation workshops apply a process that engages users and increases their satisfaction and loyalty towards an organization | SBB, Volvo Cars, Inclusive Bus Travel |
| **They can be used for a variety of objectives and in many different fields.** Presented co-creation workshops had several different objectives like product/service design, better customer understanding, problem solving, public and energy policy planning. In addition, co-creation projects were applied in a broad spectrum of fields (e.g. housing design, energy services, policy recommendations, car industry, railway, aviation, etc.) thus, proving their interdisciplinary nature. | All |

***Other relevant initiatives in transport***

Three case studies are presented separately in the present subsection. The reason for this is because, even though they constitute co-creation initiatives, these cases do not apply the co-creation process in the same way as demonstrated in the previous case studies. However, they are worth mentioning as they are transport related co-creation processes that could offer useful insights in the CIPTEC project.

***The Digital Gate***

A similar co-creation process that comes from the aviation industry, is the collaborative competition "The Digital Gate". The competition started in April 2015 and will last until November 2015. It is a digital innovation and entrepreneurship competition that aims to recognize and develop new business models and innovative e-services that will offer useful services to travelers and improve the airport's and generally the whole airline community's operation. Proposals can include services that enhance the experience of the airport's community (passengers, employees, visitors, companies, etc.), service customization, effective use of social networks, etc.

The competition consists of three stages. During the first stage, the participants, which must be either members of the Greek academic community (e.g. professors, PhD candidates, researchers, graduate and undergraduate university students) or young entrepreneurs of the IT sector, must submit their business ideas. A selection committee assesses and selects the best business ideas, based upon certain criteria (solutions that the ideas offer to certain problems, level of innovation, maturity of the suggested idea, feasibility, suitability, sustainability, target market, social impact). During the second stage, the teams that advanced from stage 1 will participate in a workshop. This workshop includes ideation techniques, that will help the participants conceive innovative ideas and prototype development exercises during which the participants will develop prototypes based on their innovative ideas. A three day event will follow, in which the participating teams will evolve their prototypes with the help of experts and mentors. At the end of this event the teams will present their innovative business ideas to a committee that will include experts from the IT, transport and tourism sectors. The winning teams that will advance in stage three will have to finalize their ideas until the day of the last presentation, where the winner will be decided. The prizes include, funding and administrative support to the best idea, from the Athens International Airport, for its implementation and exploitation (The Digital Gate, n.d).

***Startup Weekend Piraeus - Blue Growth, Shipping and Logistics***

Another similar initiative with possible applications in the transport sector was the "Startup Weekend Piraeus - Blue Growth, Shipping and Logistics" event, that aimed to identify technological innovation that could be used in the shipping industry. During this three-day event, that was held in May 2015, participants in close collaboration with mentors and experienced stakeholders of the shipping industry (owners of shipping companies, shipping consultancies, start-ups related to shipping, etc.) engaged in activities that targeted the development of innovative ideas and services with possible application in the particular industry. A facilitator coming from a shipping consultancy guided the participants through the whole process. The whole experience was a very useful for all participants, shipping companies involved, as it aimed to help in the exploitation and implementation of innovative services and products in the shipping sector (Startup Weekend, n.d.)

***Auto-rickshaws***

One of India's characteristics is the poor air quality in its large cities. Amongst the different sources of $CO_2$ typically found in a city, transportation is a large contributor. In India there are millions of 20 to 30-year-old auto-rickshaws with very inefficient combustion engines. Auto-rickshaws are three-wheel vehicles typically offering taxi services and each one of them generates as much pollution as dozens of Western European cars together. In 2007, inspired

by the success of hybrid cars, Enviu, an international non-profit organization, decided to launch an international co-creation competition, named “Hybrid Auto-Rickshaw Battle”. Participants of the project sought to cut $CO_2$ emissions by 40%, while improving the economic positions of drivers.

During the co-creation competition, which involved participants coming from 7 different technical universities (from Netherlands and India), mobility experts, representatives from the auto-rickshaw driver union, local Indian organizations, designers, and volunteers, co-created solutions for more clean and also fuel-efficient vehicles where proposed. The winning solution saves up to 26% of energy and 53% on fuel costs compared to a regular petrol auto-rickshaw and only costs around $200. Upon finishing the competition, Enviu partnered with Indian social entrepreneurs to start-up a company in India, called Three Wheels United (TWU), which has developed a new business model based on three principles: access to financial and social services, alternate sources of revenue and clean-tech for auto-rickshaw engines. TWU aims for financial inclusion for drivers, social security, driver ownership of auto-rickshaws, higher incomes and positive environmental impact. Within a few years TWU wants to have 50,000 auto-rickshaws on the road and thereby indirectly improve the lives of 200,000 people (Enviu[a], n.d.; Enviu[b], n.d.; Helder, 2012; 3Wheeled Cheese, 2011).

## 3.3 Guidelines for the CIPTEC co-creation / co-design workshops

This section aims to provide preliminary guidelines about the implementation of the co-creation workshops in the framework of CIPTEC. It includes an indicative planning for setting up the co-creation workshops that will be applied in the CIPTEC project and suggestions concerning their structure, process model, tools and material. Additionally, a table is included that lists all open issues and major points on which decisions have to be made.

The identified open issues will be discussed and the workshops' structure will be decided in close collaboration with the CIPTEC partners who will implement such a co-creation workshop in their countries. This will be done in order to take into account each country's special features concerning public transport operators and authorities, public transport infrastructure, legal framework and local stakeholders. The final plan for the co-creation workshops will be included in D3.3: "Plan for co-creation /co-design workshops".

### 3.3.1 How to implement co-creation / co-design workshops in CIPTEC

***Setting up the CIPTEC co-creation / co-design workshops***

The CIPTEC project will organise and carry out two co-creation / co-design workshops at the following areas:

- Germany (coordinated by partner traffiQ),
- Netherlands (coordinated by partner MRDH),
- Italy (coordinated by partner TIEMME),
- Greece (coordinated by partner AUTh).

**It has to be emphasised that the two collective intelligence processes that CIPTEC will apply are closely connected, as the most promising ideas from the crowdsourcing platform will be used as input in the co-creation workshops where their potential will be further investigated. In particular, section 2.3.2, defines the procedure by which the concepts from the crowdsourcing platform will feed the co-creation workshops**. The overall role of the co-creation workshops in the framework of CIPTEC and their connection with other work packages is portrayed in Figure 21.

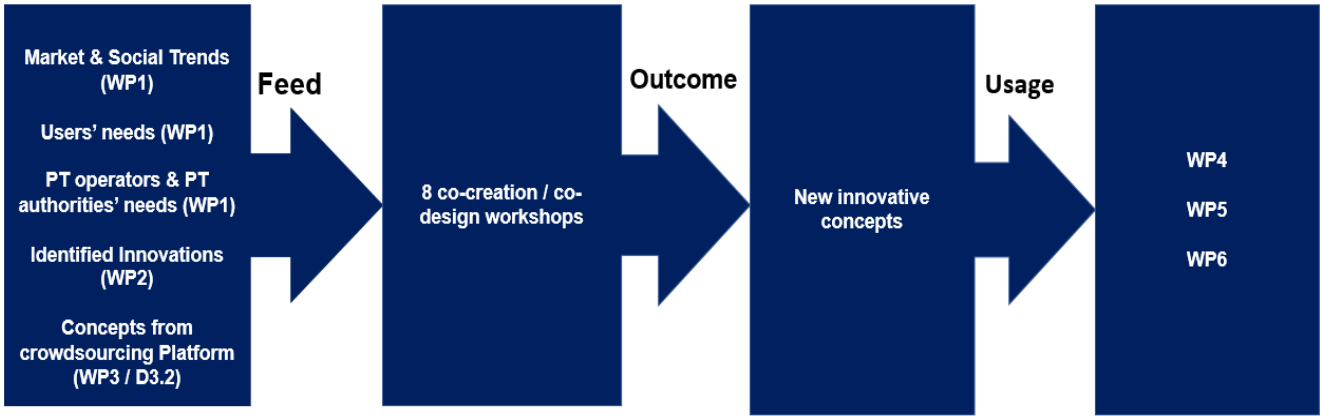


**Figure 21. The role of co-creation workshops in the framework of CIPTEC and their connection with other work packages**

The undertaking of creativity processes that use co-creation workshops, starts with the definition of the workshop's scope, objective and goals and continues with the preparation phase, where the process model and tools for the creativity sessions will be selected, participants will be defined and invited and decisions about the rest of the co-creation workshop's important components will be made (e.g. venue, facilitator, recording methods,

evaluation of co-created concepts, thematic topics of focus, documentation of workshop's results, etc.).

***Scope and objectives of CIPTEC co-creation workshops***

The overall scope of CIPTEC's co-creation process is the development of concrete and innovative concepts (services and products) that can build on public transport and ensure the increase of its attractiveness and market share. The co-created concepts, should be tailored on the identified needs (users', PT operators' and PT authorities' needs) and the market and social trends that will have been identified in WP1. Special focus will be given in developing new concepts that exploit (i) new technologies (mobile computing, smart phones, tablets, GPS, cameras, internet access, WIFI, mobile applications, social media, cloud computing, virtualization, nanotechnology, QR codes, etc.) and (ii) new business models (open data management, marketplaces/virtual platforms to match users and providers, etc.).

Even though the overall scope of the co-creation workshops will be the development of innovative ideas, each workshop could have differentiated objectives, tailored to suit each location's, partner's and participants' needs. Some possible objectives for the CIPTEC's co-creation process are listed below:

1. Development of new innovative concepts from the participants.
2. Further investigation of the most promising ideas that will emerge through the crowdsourcing platform.
3. Further investigation of the potential of the existing PT services.
4. Innovative concepts focused on specific modes of public transport.
5. Innovative concepts tailored to suit users' needs.
6. Innovative concepts tailored to suit PT operators' and PT authorities' needs.

***Participants of CIPTEC co-creation workshops***

The mixture of the co-creation workshops' participants will be of **various backgrounds**, thus, ensuring its heterogeneity and the generation of a diversity of ideas. The successful utilisation of participants, requires the involvement of stakeholders who represent **a broad spectrum of knowledge and experience**, including people **coming from creative jobs that can offer disruptive ideas** (designers, marketers, gamers' creators and specialists, social media and social games' specialists, hackers, etc.).

Users (current and prospective) of the public transport services should be involved, as the development of innovative services **requires information that is derived from their experiences**. Special focus should be given on attracting **potential / prospective users of public transport**. Engaging prospective users in the co-creation process and better understanding their needs could lead to better service offers and finally to a substantial increase in the market share of public transport, which is the basic goal of the CIPTEC project. Additionally, representatives of people with mobility restrictions, elderly people and commonly socially excluded groups could offer valuable insights.

Even though the priority is the creation and maintenance of customer value, the interests of other stakeholders have to be considered as well. Representatives from **public transport operators, public transport authorities**, **infrastructure providers, policymakers, market experts** and **social entrepreneurs** have to be involved in the co-creation workshops. This will also guarantee an element of feasibility in the resulting concepts, as these groups can help in the assessment of the generated ideas and in addition, they can offer a better, more complete perspective of the subject. **Error! Reference source not found.** summarises the stakeholders' groups that could participate in CIPTEC's co-creation workshops.

**Table 8. Groups of participants for the co-creation workshops**

| | Groups of Participants |
|---|---|
| **1** | Citizens & Community Groups (current & prospective users) |
| **2** | Passengers & travellers associations/ networks |
| **3** | Socially excluded groups & people with mobility restrictions (e.g. minorities, elderly, etc.) |
| **4** | Authorities & Transport policy makers |
| **5** | Mobility providers & PT operators |
| **6** | Trade Unions |
| **7** | Marketing and Innovation Agencies |
| **8** | Industry: Manufacturers & Supporting Technology Suppliers (e.g. PT infrastructure providers) |
| **9** | Experts in the field of PT |
| **10** | Other stakeholders (social entrepreneurs, tourism sector, etc.) |

A satisfactory number of participants would be 20 to 30 people, for each workshop. It is crucial that the project invests in a **thorough recruitment process,** in order to ensure the participation of the multiple groups and the mixture's heterogeneity as well as to eliminate any selection biases that can emerge if a specific group of users is selected more often than other groups included in the workshops. A preparatory background memo providing food for thought for the sessions that will follow could be sent with the invitation. **Information brochures and posters** about the co-creation workshops could be placed in public transport vehicles and bus/metro stations in order to disseminate information on the events and attract the interest of public transport users.

The chance of offering some monetary or nonmonetary incentives to prospective' participants should also be investigated, as it would be a good way to motivate them and get them engaged in the co-creation process. These incentives could be offered by the local public transport authorities (free public transport tickets, free monthly/annual tickets, ticket discounts, etc.). The participants could also be motivated by the moral reward of contributing to an undertaking that has significant social value. Therefore, it could be effective to clearly communicate to them the potential benefits that their participation will have to society. Furthermore, with respect to incentivisation, CIPTEC should, above all, select participants based on their intrinsic motivation. Involving users and other stakeholders of public transport that would benefit from the co-created concepts could be efficient, as their interest on the subject matter itself, could be an effective incentive that would ensure their engagement in CIPTEC's creativity processes.

Finally, it should be underlined that partners of the consortium will act as "umbrella organisations" by exploiting their wide networks of members, in order to ensure the involvement of key participants in the process.

***Process model and thematic topics of focus***

A process model must be selected for the co-creation workshops. The workshops' structure, following the structure of many of the aforementioned case studies, could be separated in three stages and involve **an Initiation, an Ideation and an Implementation/Evaluation** phase. The **first session** could include some presentations and activities aiming to introduce the participants to the scope of the project and the goals of the workshop. During the **second phase** collaborative creativity exercises will be carried out, aiming at generating new innovative concepts (e.g. services and business models) that will increase the perceived value of the public transport users. The result of this phase will be a range of possible innovative ideas that could be developed into viable concepts within a short term. Finally, there will be **an**

**evaluation phase**, where the proposed concepts will be assessed in terms of feasibility, suitability and requirements for potential implementation. Modifications and additions could be made in the abovementioned process model. For instance, it is possible to add a **Trigger phase**, in which possible technological or non-technological solutions will be demonstrated to aid the participants to imagine what might be possible and further enhance their creativity.

Except for the process model, the partners of the CIPTEC project should decide whether or not, the workshops will be homogeneous in terms of their thematic topics of focus. The workshops' topics of focus could be differentiated in order to take into consideration each location's unique features or each partner's expertise. For instance, in cities like Thessaloniki, Greece that depend only in public bus services for public transport, the co-creation workshops could be focused on this particular mode of transport in order to be tailored to accommodate the needs of this city's commuters and public transport operator.

The moderators that will carry out the co-creativity sessions are also a very important part of the workshops. Strong moderators, should carry out the co-creativity sessions. It is important that the moderators will be native speakers of the language of the hosting country in order to accommodate the participation of local people. A checklist could be created in order to help the moderators to keep track of the important steps that they have to follow.

***Co-creation Tools***

The co-creation workshops will be "hands on" working sessions. As mentioned in a previous section, during the workshops' creativity sessions the participants should be divided in small groups (no more than 10 members) where several tools and material, can be used in order to unlock their creativity. An option would be the co-creativity sessions to be based on specific methods (Lego serious Play, World Café). The **Lego Serious Play** technique unlocks the full potential of a team, by using LEGO bricks as a medium to build and to express complex ideas. The **World Café** technique is a structured conversational process intended to facilitate open and intimate discussion. After reviewing the available tools and their use within the presented co-creation workshop case studies, a selection could be made between the following: **games, modelling, paper prototyping, sketching, cognitive mapping, storytelling, role playing, problem trees** and **presentations**.

***Evaluation of co-created concepts***

The generated ideas could be assessed in terms of feasibility (cost and time needed for their implementation) and suitability. Their suitability could be measured by the potential they have to increase public transport's attractiveness and market share. In particular, the developed concepts have to address the needs and the identified trends that will emerge from WP1. Other parameters could also be considered, such as the level of technology that these concepts will exploit and the innovative nature of the business models that they propose. Some evaluation methods that could be used are listed below:

1. Participants could place the co-created concepts on a two-dimensional axis that will represent their feasibility and their potential. This tool would also enable the visualization of the innovative concepts in terms of feasibility and suitability.
2. A ranking system where the participants can grade each concept in terms of feasibility, potential, exploitation of technology and business model innovation, using a 10 level Likert scale.
3. Assessment of the innovative ideas by specific groups of participants. This could enable the identification of the concepts that specific stakeholders value the most.
4. A voting system in which each participant will be able to vote up to 5 ideas as the most suitable concepts for the workshop's objectives.

5. Assessment by an evaluation panel comprised of people with relevant business and market expertise and representatives of passengers organisations (e.g. public transport authorities, public transport operators, passengers' organisations, social enterprises, etc.)

***Venues and logistics***

The workshops' venues could be a non-conventional meeting room; special places and arrangements could be preferred, as it might have a better effect on creativity. In such an arrangement, the participants could work together freely in improbable skunk work settings (e.g. an actual place of public transport delivery like a train station, a bus stop, "on board" using a train car or a bus vehicle, etc.).

***Languages, recording methods & documentation***

The sessions of each workshop will have to be carried out in the language of the country that it is being organised. However, an English-speaking translator could be based on site and special arrangements (e.g. material of the workshop translated in other language) could be made if such a demand is made from the participants.

Another important element of the co-creation workshops are the **recording methods**. During the workshop there can be many innovative concepts and it is very important to capture everything. Effective recording will make the participants feel confident that all ideas generated are being documented, but it will also help when it comes to examining and working on the outputs afterwards. **Voice and video recording** all sessions could be very useful. Other recording techniques are **photographing any outputs, keeping notes of what participants are saying and post of participants' insights on a board. Idea clustering** could be useful as it organizes and categorizes the ideas into themes**.**

Finally, each workshop will lead to a **document output** with its findings, that will be disseminated within the partners of CIPTEC and the stakeholders involved. Something that could also prove helpful would be the categorisation of each co-created concept, according to the participants' group that developed it. By doing this, CIPTEC can better identify the needs of specific target groups (e.g. people with disabilities, elder people, tourists, non-users of public transport, etc.) and thus, offer customized the services.

### 3.3.2 Open issues for the implementation of CIPTEC's co-creation workshops

This sub-section summarises the open issues and key points on which decisions have to be made for the implementation of CIPTEC workshops. These open issues and the final structure of the workshops will be decided in close collaboration with the CIPTEC's partners who will implement them in their country. This will be done in order to account for each country's special features concerning the users' needs, PT operators and authorities, legal framework and local stakeholders.

**Table 9. Open issues and decision to be made for the implementation of CIPTEC's co-creation workshops**

| Open Issues | Options, Decisions to be taken |
|---|---|
| **Scope** | Development of innovative concepts and services that will increase PT attractiveness and market share |
| **Objectives** | Each workshop could have different objectives. For instance:<br>1. Development of new innovative concepts from the participants<br>2. Further investigation of the ideas that will emerge from crowdsourcing |

| Open Issues | Options, Decisions to be taken |
|---|---|
| | 3. Innovative concepts focused on specific modes of public transport<br>4. Innovative concepts tailored to suit users' needs<br>5. Innovative concepts tailored to PT operators' and PT authorities' needs |
| **Participants** | a. Invite participants from the following groups<br>1. Citizens & Community Groups<br>2. Passengers & travellers associations/ networks<br>3. Socially excluded groups & people with mobility restrictions<br>4. Authorities & Transport policy makers<br>5. Mobility providers & PT operators<br>6. Trade Unions<br>7. Marketing and Innovation Agencies<br>8. Industry: Manufacturers & Supporting Technology Suppliers<br>9. Experts in the field of PT<br>10. Other stakeholders (social entrepreneurs, tourism sector, etc.)<br>b. Each workshop could focus more on a particular group (e.g. prospective users, tourism sector, socially excluded people, etc.)<br>c. The mixture of participants should be heterogeneous<br>d. Involve users with intrinsic motivation and strong interest on the subject matter of the workshops, in order to ensure their engagement in the process<br>e. Offer monetary or non-monetary incentives<br>f. Target of 20 to 30 participants in each workshop<br>g. Partners acting as "umbrella" organisations ensuring the involvement of key participants |
| **Process Model** | a. The following process model structure could be used:<br>1. Initiation: Participants are introduced to the basic concepts and goals of the workshop<br>2. Ideation: It is the main co-creativity phase where participants take part in individual or collaborative creative exercises, and generate innovative concepts.<br>3. Evaluation: The generated concepts are assessed, mainly in terms of feasibility and potential<br>A Trigger phase could be added to act as an enhancement to the Ideation phase, by using material to trigger participants' creativity.<br>b. A strong moderator/facilitator and native speaker of the hosting country could carry out the co-creativity sessions.<br>c. Workshops could be homogeneous in their thematic topic of focus. However, they could be tailored to suit each workshop's hosting partners, participants and location (focused on bus, metro, tram, etc.) |

| Open Issues | Options, Decisions to be taken |
|---|---|
| **Co-creation tools** | The working sessions will be “hands on” including several tools to unlock participants’ creativity. There is no fixed order of how tools could be applied. However, there is a wide range of tools to use. Indicatively:<br>1. The entire sessions could be Lego Serious Play or World Café based. The Lego Serious Play thinking technique unlocks the full potential of a team, by using Lego bricks as a medium to build and express complex ideas. The World Café technique is a structured conversational process intended to facilitate open and intimate discussion.<br>2. Several other tools could be used in the co-creativity sessions. These include: games, modeling, paper prototyping, sketching, cognitive mapping, storytelling, role playing, problem trees and presentations. |
| **Evaluation of ideas** | The generated ideas could be assessed in terms of feasibility and potential to increase public transport’s attractiveness and market share. The developed concepts will have to address the identified needs and trends that will emerge from WP1. Some proposed assessment methods are the following:<br>1. Use of a 2-dimensionsal axis where concepts would be placed based on their feasibility and potential<br>2. Ranking system where the participants can grade concepts in terms of feasibility, potential and exploitation of technology<br>3. A voting system in which each participant will be able to vote up to 5 ideas as the most suitable concepts for the workshop’s objectives.<br>4. Assessment by an evaluation panel comprised of experts<br>5. Assessment by specific groups of participants. This could enable the identification of the concepts that specific stakeholders value the most |
| **Venues and Logistics** | The workshops’ venues could be a non-conventional meeting room (e.g. an actual place of public transport delivery like a train station, a bus stop, “on board” using a train car or a bus vehicle, etc.). |
| **Languages, Recording and Documentation** | a. All sessions of each workshop will have to be carried out in the language of the country that it is being organized<br>b. Voice and video recording all sessions could be very useful. Other recording techniques are photographing outputs, keeping notes of participants’ opinions, post of insights on a board and idea clustering<br>c. A document output with each workshop’s findings and generated concepts, could be disseminated within the partners of CIPTEC<br>d. Categorization of each co-created concept, according to the specific participants’ group that developed it |

# 4 Conclusions

In order to gather innovative public transport ideas, CIPTEC will be using two forms of collective intelligence namely crowdsourcing and co-creation / co-design. This document presents the conceptual guidelines and the plan for successfully utilising these two types of collective intelligence in CIPTEC. Though they are discussed separately, the two types of collective intelligence are interconnected since the ideas that will arise from crowdsourcing will be forwarded to the co-creation / co-design workshops for further evaluation.

The document is divided in two main parts: Section 2 where the crowdsourcing in CIPTEC is being presented and Section 3 where the co-creation / co-design workshops are being discussed. Both sections start with a literature review in order to introduce the terms, continue with successful implemented paradigms and finish with a conceptual plan on how to deploy these two forms of collective intelligence with the primary objective of identifying innovative public transport ideas in the four areas that the collective intelligence activities will be implemented:

- Germany (coordinated by partner traffiQ),
- Netherlands (coordinated by partner MRDH),
- Italy (coordinated by partner TIEMME),
- Greece (coordinated by partner AUTh).

For successfully running the collective intelligence activities in these areas, it is important to understand the objectives of each activity, to discuss the points that need attention and to present the steps for successfully running crowdsourcing and co-creation / co-design. The following tables tries to summarise the main outcomes of this document.

| **Crowdsourcing in CIPTEC** | | |
|---|---|---|
| **Objectives** | **Attention points** | **Process and steps** |
| - Stimulate dialogue and discussion<br>- Generate innovative ideas | - Advertising the campaign<br>- Motivating users to participate and gather a large number of contributions (incentives)<br>- Evaluating the ideas | 1. Description of the campaign<br>2. Definition of the rules of the campaign<br>3. Releasing the campaign online<br>4. Advertising the campaign<br>5. Gathering contributions<br>6. Evaluation process and rewards |

| **Co-creation / co-design workshops in CIPTEC** | | |
|---|---|---|
| **Objectives** | **Attention points** | **Process and steps** |
| - Develop new innovative concepts in the field of public transport and further investigate the potential of the most promising ideas that will emerge from the | - Set the objectives of each co-creation workshop<br>- Select of the most appropriate process model, co-creation tools and moderator<br>- Define the mixture of participants and ensure its heterogeneity | 1. Scope and objectives<br>2. Process models and thematic topics of focus<br>3. Participants<br>4. Co-creation tools<br>5. Evaluation of co-creation concepts<br>6. Venues and logistics<br>7. Languages, recording methods, documentation |

| | | |
|---|---|---|
| crowdsourcing platform | - Select participants with intrinsic motivation and strong interest in the subject and objectives of the workshops<br>- Possibly offer monetary or non-monetary incentives<br>- Evaluation of ideas | |

| **Users of crowdsourcing and co-creation/co-design** | |
|---|---|
| 1 | Authorities & Transport policy makers |
| 2 | Mobility providers & PT operators |
| 3 | Passengers & travellers associations/ networks |
| 4 | Citizens & Community Groups |
| 5 | Trade Unions |
| 6 | Marketing and Innovation Agencies |
| 7 | Industry: Manufacturers & Supporting Technology Suppliers |
| 8 | Experts |
| 9 | Other stakeholders (please specify in the Comments column) |

## References

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