

Creative Technology
Graduation Project Thesis

'Co-Creation for Crowdfunded Startups'

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1. INTRODUCTION	5
1.1. Problem description	5
1.2. Research question	6
1.3. Thesis outline	6
2. STATE OF THE ART	7
2.1 Literature Review	7
2.1.1. Definition of co-creation	7
2.1.2. Benefits of co-creation	8
2.1.3. Different forms of co-creation	8
2.1.4. The DART framework for co-creation	11
2.2. Expert Interview	14
2.2.1. Who is Osama Malik?	14
2.2.2. Interview Structure	14
2.2.3. Key learnings	15
2.3. Examples of co-creation	16
2.3.1. LEGO IDEAS	16
2.3.2. GoPro Awards	18
3. METHODS AND TECHNIQUES	20
3.1. Definitions and Terminology	20
3.1.1. Definitions	20
3.1.2. Roles within the co-creation process	20
3.2. Stakeholder Identification & Analysis	21
3.3. CreaTe Design Process	22
3.4. Requirements	24
3.4.1. Requirement Elicitation Techniques	24
3.4.1.1. Literature Review	24
3.4.1.2. Interview	25
3.4.1.3. Observations	25
3.4.2. Categorization of Requirements	25
3.4.3. MoSCoW	26
4. IDEATION	27
4.1. Stakeholder Identification & Analysis	27
4.2. Requirements for the co-creation process	29
4.2.1. DART framework as a basis for requirements	29
4.2.2. Additional requirements from the expert interview	31

4.2.2. Additional requirements from observations	31
4.2. Categorisation of Requirements using MoSCoW	33
4.4. Co-creation approaches for crowdfunded startups	34
4.4.1. Physical co-creation	34
4.4.2. Open co-creation	35
4.4.3. Remote co-creation	36
5. SPECIFICATION	37
5.1. Selection of a co-creation approach	37
5.2. (Non)functional requirements	38
5.3. Functions of remote co-creation	40
6. REALIZATION	43
6.1. Selection of co-creation participants	43
6.1.1. Finding the right co-creators	43
6.1.2. Questionnaire	44
6.1.3. Final list of selected co-creators	44
6.2. Co-conception of ideas	48
6.2.1. Introduction	48
6.2.2. Design question	49
6.2.3. Goals	49
6.2.4. Tools	49
6.2.5. Process	51
6.3. Rewarding the co-creators	54
7. EVALUATION	55
7.1. Evaluation Methods	55
7.2. Evaluation of the final selection of co-creators	55
7.3. Evaluation of used tools	56
7.3.1. Webjets	56
7.3.2. Appear.in	57
7.3.3. Slack	57
7.3.4. Google Drive	57
7.4. Organizational challenges	58
7.5. Group dynamics	58
7.6. Engagement of co-creators	58
7.7. Co-conception of ideas	59
7.8. Evaluation of requirements	60
7.9. Feedback from co-creators	62

8. CONCLUSION	63
8.1. Key Findings	63
8.2. Limitations	64
8.3. Future Work	65
9. APPENDIX	66
9.1. Osama Malik Interview Transcript	66
9.2. Co-Creation Invite Document	70
9.3. Questionnaire for participants	72
9.4. Voucher for co-creators	75
9.5. References	76

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1. INTRODUCTION

Over the last few years there have been several successful crowdfunded startups coming out of the University of Twente, from a smart home system to color-changing swim shorts and camera-throwing devices. A crowdfunding campaign is a great way for a startup to raise the funds that are necessary to get started with the business. All while staying independent from investors and validating the launching product or service at the same time. However, such a crowdfunding campaign should only be considered the beginning and not the final goal for a startup. Whether it can grow into a sustainable business is decided in the months and years after the initial campaign. This phase is often challenging for young entrepreneurs.

1.1. Problem description

Typically, crowdfunding campaigns are based around one launching product. This product is tested on the market and the demand for it is validated by the success of the crowdfunding campaign. At this point, the entrepreneurs know that the launching product is accepted by the market. But it's the entrepreneur's challenge is to expand the business further than that launching product. Making the right decisions regarding the future product roadmap can be challenging.

All these crowdfunded startups have one resource in common that sets them apart from a traditional firm. Their launching customers can be considered innovators or early adopters [14] and they have backed the project from the very beginning. They are a lot more engaged and interested in the firm's activities than it is typically the case, because they have decided to pay upfront and trusted the creators to produce and ship the product. Throughout this process the entrepreneurs typically post regular updates to report on the progress that was made. Thus, a relationship is being built and a community starts to grow. By the time the launching products are finally shipped to the customers, an active community has been built. This community of innovators and early adopters can be a valuable resource, if used correctly.

The business strategy of 'co-creation' has been rising in popularity as it promises several benefits for both the company and all of its stakeholders, in particular the customers. Specifically when deciding on the future product roadmap, co-creation is a promising approach. The community members can be part of the process, giving input throughout the design process and providing feedback on concepts early on. Even though co-creation's recent rise in popularity, the scientific research on the topic at an early stage. The opportunities of co-creation for crowdfunded startups are unexplored so far.

1.2. Research question

One of the main objectives of this project is to identify the opportunities of co-creation for crowdfunded startups. The implementation of co-creation as a business strategy for a crowdfunded startup requires detailed knowledge of the domain and a good understanding of available tools and techniques. Consequently, the following research questions are posed:

- (1) How to organize an effective co-creation process between crowdfunded startups and their customer community after a successful crowdfunding campaign?
- (2) What are the required features when designing a tool (framework) for organizing co-creation between a crowdfunded startup and its community, or a subset thereof?

1.3. Thesis outline

To begin with, a state of the art review (Chapter 2) will be done to analyse the current state of co-creation. Next to a literature review, an interview with an expert will be conducted and examples of co-creation campaigns will be analysed and compared. The intention is to build up the required knowledge base to identify promising strategies for crowdfunded startups. After defining the used methods and techniques (Chapter 3), the outcomes of the first chapters will act as the basis for the ideation phase (Chapter 4). In this phase, preliminary requirements will be generated and several co-creation approaches will be explored. The requirements will be finalised and transformed into an actionable plan during the specification phase (Chapter 5). In the realization phase (Chapter 6) a first prototype of the co-creation process will be built. It will then be tested and evaluated in the evaluation phase (Chapter 7). In the final chapter of this thesis (Chapter 8) we will analyse and summarise our work and make recommendations for future research.

2. STATE OF THE ART

In order to get a better understanding of the topic of co-creation, we will look at it from different perspectives. First, a literature review will be conducted. In this literature review scientific papers from the last two decades will be analysed to get a deeper understanding of co-creation and its aspects. Secondly, an interview with an expert in co-creation will be conducted. And lastly, we will look at two examples of firms which have successfully used co-creation as a business strategy.

2.1 Literature Review

This literature review is split into three parts: We will begin by discussing different definitions of co-creation and conclude on the definition that will be used in this thesis. Afterwards the benefits of co-creation will be summarised and the different forms of co-creations will be compared. Finally, the DART framework of co-creation will be analysed and reviewed and its suitability as a mean of organizing a co-creation process will be evaluated.

2.1.1. Definition of co-creation

The first mention of co-creation in a business context seems to be by C.K. Prahalad and Venkatram Ramaswamy in their Harvard Business Review article 'Co-opting Customer Competence' from the year 2000. In this article, the authors lay the foundation for many of today's research papers on co-creation. Generally, it should be mentioned that the term 'co-creation' is used by researchers and managers in various ways, with different definitions and contexts. Frow, Nenonen, Payne, and Storbacka (2015) adopt the definition of co-creation advanced by Perks, Gruber and Edvardsson (2012): "Co-creation involves the joint creation of value by the firm and its network of various entities (such as customers, suppliers and distributors) termed here actors. Innovations are thus the outcomes of behaviors and interactions between individuals and organizations" (p. 935). Sanders and Stappers (2018) on the other hand, define co-creation more broadly as 'any act of collective creativity, i.e. creativity that is shared by two or more people' (p.6). M. Galvagno and D. Dalli (2014) discuss several different definitions and summarise co-creation as 'the joint, collaborative, concurrent, peer-like process of producing new value, both materially and symbolically.' (p.644)

Because the goal of this project is to organize a co-creation process of a physical product between a startup and its customers, we see Frow et al.'s (2015) definition as most fitting and will continue to use it for the remains of this thesis: "Co-creation involves the joint creation of value by the firm and its network of various entities (such as customers,

suppliers and distributors) termed here actors. Innovations are thus the outcomes of behaviours and interactions between individuals and organizations.” In chapter 3 this definition will be further narrowed down to best describe the form of co-creation that is planned for the practical implementation of this project.

2.1.2. Benefits of co-creation

Researchers and economists generally agree on the benefits of co-creation as a business strategy. Consequently, the interest in tools and techniques for co-designing are growing rapidly (Sanders & Stappers, 2008). Benefits of co-creation include: enhanced engagement of employees (Hatch & Schultz, 2010) and a better supply chain integration (Jüttner, Christopher and Godsell, as cited in Frow et al., 2015). Madden, Fehle and Fournier (as cited in Frow et al., 2015) add improved shareholder commitment as a further benefit of co-creation. Lee, Trimi and Olson (2012) claim that co-creation is not only beneficial but necessary to stay ahead of competition. The authors elaborate that the closed innovation based on self-reliance of R&D simply is too slow and also costly. Thus, innovation has gone through evolutionary steps to collaborative innovation and to open-innovation during the past three decades. Furthermore, Payne, Storbacka and Frow (2008) state that co-creation can also improve consumption and usage experiences of customers and stimulate product and service innovation. Which benefits a specific firm and its stakeholders can profit from is highly dependent on the form of co-creation that’s being practised. In the following sub section different forms of co-creation will be described and compared.

2.1.3. Different forms of co-creation

Co-creation can be implemented between various stakeholders of a business and for various reasons. There are twelve different forms of co-creation, which include:

- (1) co-conception of ideas
- (2) co-design
- (3) co-production
- (4) co-promotion
- (5) co-pricing
- (6) co-distribution
- (7) co-consumption
- (8) co-maintenance
- (9) co-outsourcing
- (10) co-disposal
- (11) co-experience

(12) co-meaning creation
(Frow et al., 2015)

Although this list encompasses a substantive set of potential co-creation forms, Frow et al. (2015) acknowledge that, in the future, new forms of co-creation may emerge; these authors also point out that one form of co-creation may exist alongside others. Which form of co-creation is used by a firm is dependent on the co-creation motive. Those motives include:

- (1) Access to resources
- (2) Enhance customer experience
- (3) Create customer commitment
- (4) Enable self-service
- (5) Create more competitive offerings
- (6) Decrease cost
- (7) Faster time to market
- (8) Emergent strategy
- (9) Build brand.

Furthermore, the authors list five broad categories of actors within co-creation, which consist of:

- (1) customers
- (2) suppliers
- (3) partners
- (4) competitors
- (5) influencers.

Frow et al. (2015) combine all those into a co-creation design framework:

Dimensions						
Co-creation motive	Co-creation form	Engaging actor	Engagement platform	Level of engagement	Duration of engagement	
Categories	Access to resources	Co-conception of ideas	Focal firm	Digital application	Cognitive	One-off
	Enhance customer experience	Co-design	Customer	Tool or product	Emotional	Recurring
	Create customer commitment	Co-production	Supplier	Physical resources, spaces/events	Behavioural	Continuous
	Enable self-service	Co-promotion	Partner	Joint processes		
	Create more competitive offerings	Co-pricing	Competitor	Personnel groups		
	Decrease cost	Co-distribution	Influencer			
	Faster time to market	Co-consumption				
	Emergent strategy	Co-maintenance				
	Build brand awareness	Co-outsourcing				
		Co-disposal				
		Co-experience				
		Co-meaning creation				

Fig. 1 - Co-creation design framework (Frow et al., 2015)

This design framework is the result of a nine-month long study with senior executives of nine companies. The study consisted of three phases and included a series of facilitated workshops designed to engage the senior executive participants in a focused exploration of co-creation and its key components. As shown in the table, Frow et al. (2015) differentiate between the motives and connect each motive with a respective co-creation form and engaging actor.

We inspect the different forms, motivations and actors of co-creation, and identify those, which have the biggest relevance in answering our research questions. We remind ourselves that the startup has successfully launched their first product with the help of a crowdfunding campaign and is now facing the challenge of deciding on the future product roadmap. Therefore, the co-creation motive (1) *Access to resources* is most fitting. In this

scenario the creative input of the early adopters (initial backers of the crowdfunding campaign) are considered the resource. The startup wants to gain access to this resource through co-creation. Other motives like (2) *Enhance customer experience*, (5) *Create more competitive offerings* and (9) *Build brand* can also be of interest for the crowdfunded startup, but they are not the focal point of this thesis. However, they could be considered positive side effects when implementing co-creation as a business strategy.

Consequently, the co-creation form we will focus on in this project is (1) *co-conception of ideas*. As described above, the crowdfunded startup wants to identify ideas and opportunities for upcoming products. As already hinted in the research question, the engaging actors are (1) *customers*. Moreover, a certain subset of all customers will be defined. The early adopters who have been supporting the startup already during the crowdfunding campaign seem to be most fitting. This will be explored further in chapter 3 of this thesis.

To conclude, co-creation is a widely useful strategy that can be used to achieve a number of different motives. Each motive requires another form of co-creation. For the specific use case of a startup after an initial crowdfunding campaign and the posed research questions, the focal point of this thesis will lay on the co-creation form (1) *co-conception of ideas*.

2.1.4. The DART framework for co-creation

When implementing co-creation in business, the so-called DART framework is often used. DART is an acronym and stands for Dialogue, Access, Risk assessment, and Transparency. The DART framework is one of the most appreciated theoretical arguments about the co-creation of new products and services by firms with the support of customers (Schiavone, Metallo, & Agrifoglio, 2014). It was first introduced by Prahalad and Ramaswamy (2004) and remains the most popular framework to conceptualise and guide implementation of customer co-creation (Mazur & Zaborek, 2015). Prahalad and Ramaswamy (2004) define the four building blocks of the DART framework like this:

1. Dialogue represents interactivity between two equal problem solvers, eager to act and to learn.

2. Access implies facilitating co-creation by offering the right tools for communication between customers and suppliers; it also entails those marketing solutions that result in increased freedom of choice for customers.

3. Risk assessment is referring to the customers' right to be fully informed about the risks they face from accepting the value proposition.

4. Transparency represents resigning from information asymmetry between the customer and supplier and practicing the openness of information.

These four building blocks are necessary to be developed by firms in order to effectively engage in value co-creation with customers.

Mazur and Zaborek's (2015) objective was to quantitatively test the DART framework. The scholars first define elaborate scales of the four building blocks which encapsulate all relevant aspects of each component. Using these scales, the data was collected via interviews with 440 business managers. The managers who participated in the study work for firms from several different industries, but all based in Poland. The outcome of this research highlight possible shortcomings of the DART framework. Mazur and Zaborek (2015) imply that "DART is too simplistic in that it assumes unidimensional structure with only four factors." (p.123) The authors critique that the building blocks of DART had too much of conceptual overlap to be an effective framework for quantitative analysis. Furthermore, they suggest that "the DART model, to closer mesh with actual practice, should be enhanced with an additional layer of hidden variables to form a three-level factor structure." (p.124)

Despite the flaws in the DART framework, it can act as a helpful guidance when organizing a co-creation process. It's commonly used also due to a lack of alternatives. With the exception of the DART framework there's a surprising lack of work directed at providing frameworks to help organizations manage the co-creation process. (Payne et al., 2007)

Aarikka-Stenroos and Jaakkola (2012) have analysed the joint problem solving process within co-creation in knowledge intensive business services (KIBS). Even though firms within the KIBS industries are typically not crowdfunded and therefore have a different relationship with their customers, there are interesting insights that also apply to our situation. The authors identify five collaborative activities constituting the process of value co-creation of complex offerings: 1) diagnosing needs, 2) designing and producing the solution, 3) organizing the process and resources, 4) managing value conflicts, and 5) implementing the solution. In addition to the collaborative activities, Aarikka-Stenroos and Jaakkola (2012) also identify the roles suppliers and customers take on during the problem solving process:

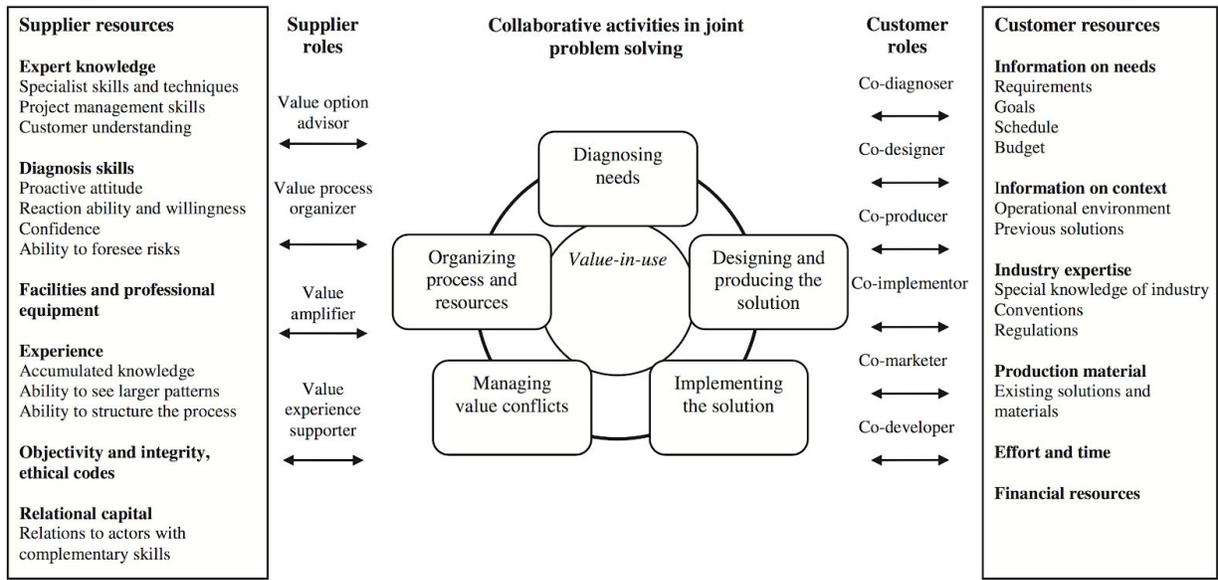


Fig. 2 - Joint problem solving as value co-creation in knowledge intensive services. (Aarikka-Stenroos & Jaakkola, 2012)

The collaborative activity of 'diagnosing needs' is one that can easily be adopted by crowd-funded startups. The first step is to identify the needs and goals for the next product. "Inexperienced customers in particular are not sufficiently knowledgeable to identify and determine their problems and needs in depth, which makes it important for the supplier to propose the diagnosis, in other words to assist the customer in articulating their problem." claim Aarikka-Stenroos and Jaakkola (2012). This means the supplier (startup) takes on the role of the 'value option advisor'. In the specific case of a co-creation process to develop a product, the startup is advised to actively engage with the crowdfunding community to identify the needs for the new product. The successful implementation of this is especially valuable for a startup after a successful crowdfunding campaign. At that point in time the startup typically only has one product. This phase is often challenging for young entrepreneurs and co-creation can be a valuable tool to identify the needs for the new product.

Furthermore, Aarikka-Stenroos and Jaakkola (2012) claim that achieving a mutual understanding of what generates optimal value for the customers is pivotal and thus suggest that "parties should develop platforms and procedures that invoke dialogue concerning the objectives of collaboration, facilitate the identification of misunderstandings, and avert the development of unwanted or inadvisable solutions" (p. 23). In order to increase customers' attraction and willingness to invest sufficient

resources, the startup is advised to "make the effort to illustrate and tangibilize the potential value-in-use of their offering" (p. 24)

Both of these points correlate with the first building block of the DART-framework: Dialogue. The literature suggests that a qualitative and efficient communication between the startup and the customers are essential to organizing a successful co-creation process.

2.2. Expert Interview

Next to the scientific literature, there's lots to be learned about co-creation from the people and businesses implementing it as a business strategy. One example of that is Osama Malik, who's using different forms of co-creation in both his professional and personal life. In the following section we summarise the conducted interview with Malik, in which he shared his view on co-creation and gave insights into useful techniques and tactics. Afterwards, In section 2.3., two businesses using co-creation will be introduced and analyzed.

2.2.1. Who is Osama Malik?

Osama Malik is a leader, technologist, strategist, writer and musician from the United States. He graduated from James Madison University and works for the business management consultancy Booz Allen [29] as a 'Digital Strategy and Management - Principal'. There he helps business leaders strategically navigate emerging digital technologies (e.g. Cloud, immersive AR/VR, IoT, Machine Intelligence) to transform into modern, open, and agile digital enterprises. He builds and leads diverse teams of talented people including strategists, architects, software engineers, creatives, and agile project managers. Next to his professional career, he's a passionate musician and family man.

I became aware of Malik's work when seeing his TEDx talk 'The Art of Science of Co-creation' [30]. In this talk he brings parallels from a successful business executive and an overly passionate musician together to give an informative talk about how we all have a creative element to what we do (professionally and personally) and that the new world we live in requires a new set of skills – that is different than what we tend to think - when it comes to co-creating with others. This includes a start-up business idea, a killer app, a hit song, or even non-profit fundraising event.

2.2.2. Interview Structure

I reached out to Malik with a request for an interview via Skype. For this, the semi-structured interview form was chosen. I (the interviewer) prepared a list of topics/issues to be discussed during the interview instead of preparing a list of specific questions. This had the advantage of guiding the interviewer, to ensure all relative topics

were discussed, while still giving the interviewee (Malik) the freedom to express his own thoughts on the matter. An elaborate transcript of the conducted interview can be found in the appendix.

2.2.3. Key learnings

A variety of different aspects of co-creation have been discussed during the interview. Malik turned out to be quite knowledgeable and experienced in the field and was open to share his insights. In the following paragraphs, the key learnings from the interview will be summarised.

Diversity stimulates creativity

When the selection of the co-creation participants was discussed, Malik emphasised the importance of diversity in the group of co-creators. He described the benefits of having people with a wide range of skills, backgrounds, interests and cultures. Situations where people have different views on things are most stimulating and result in the most creative output, particular in brainstorm sessions.

Engagement and Rewards for co-creators

Furthermore, he talked about the importance of focusing on those people who are actively looking to co-create. It's important to have engaged co-creators who are willing to contribute. This contribution can be time, skills or even monetary. It's important to avoid co-creating people who are unmotivated as they can drag others down with them. Alongside this, Malik also stressed the importance of rewarding the participants of the co-creation process. He named different examples how this could be arranged, like giving them early access to the product or rewarding them with recognition.

Diverging and Converging

In the interview we also discussed the diverging and converging phases we know from the CreaTe design process [8] and how well those can be implemented in a co-creation process. In the converging phase of generating different ideas it's almost essential to do that collaboratively. When many people come together to brainstorm about a solution, it's almost always more effective than one person doing so alone. But also during the diverging phase of the process, co-creation can be very fruitful, claims Malik. Getting several different perspectives on a list of ideas or concepts helps to rate them and filter out the best ones, which are worth pursuing further. One can think of that as a democratic approach, if the co-creation group is big enough.

Dialogue, Access and Transparency

Finally, Malik gave his input regarding the organization of a co-creation process. In accordance to the scientific literature, Malik stressed the importance of an open

communication and full transparency during the process. Furthermore, he describes how important it is to keep track of all the input. One should make sure that every piece of information can be found back and used as a reference, if needed. He proposed Slack [19] as a suitable tool but acknowledged that this could be organized in a variety of ways, depending on the specific situation.

2.3. Examples of co-creation

In order to get more practical insights into co-creation two examples of firms using co-creation will be analysed. The motives, forms and engaging actors of these real world examples of co-creation will be categorised into Frow et al.'s (2015) co-creation design framework (as seen in figure 1). Furthermore, the suitability of these strategies for crowdfunded startups will be evaluated.

2.3.1. LEGO IDEAS



Fig. 3 - LEGO IDEAS [24]

This famous Danish toy manufacturer is using co-creation to come up with new products together with their community of customers. Under the name 'LEGO IDEAS', they have created an online platform through which users can submit their ideas for new LEGO sets. The entire community of users can then vote on the submitted ideas. Once an idea has reached 10.000 votes, it gets reviewed by LEGO employees and might be developed into a real product. In that case, the creator of the idea gets rewarded financially via a royalty programme.

LEGO's motive for co-creation is the *access to resources* and *enhance customer experience*. The firm is using the co-creation form *co-conception of ideas*, as it is described in section

2.1.3. In contrast to Frow et al.'s (2015) co-creation design framework, the engaging actor in this case, is the *customer*, and not the *focal firm*. LEGO is providing the framework for the idea with their existing bricks and is asking the customer to come up with a new way of combining them. Because of the nature of the LEGO brick system, the generated ideas could already be considered a finished product. Therefore the form of co-creation can also be considered to be *co-design*. Furthermore, LEGO is using a democratic voting process to decide which of the proposed ideas is worth considering for a future product. This co-creation process is actively used by their customer community. On average 10 new ideas are submitted every single day and so far 23 products have been realised.

The online platform [24] which facilitates the LEGO IDEAS co-creation is especially interesting, when considering a similar co-creation strategy for crowdfunded startups. The platform allows the co-creators to publicly share their ideas and talk about them with each other. Through that, it incorporates one of the four building blocks of co-creation, *dialogue*. The co-creators also have the opportunity to use LEGO's Digital Designer [25] to conceptualise the ideas, without needing all the necessary bricks. Once the idea has been posted within the LEGO IDEAS platform, the co-creators can always see the current number of votes and know which part of the co-creation process they're currently in. By doing so, two more building blocks of co-creation, *access* and *transparency* are incorporated. Furthermore, all relevant information regarding the risks and possible rewards of participation can be found on the platform. Hence, also the fourth building block of co-creation, *risk assessment* is incorporated into this co-creation approach, making it perfectly align with the DART framework of co-creation, described in section 2.1.4. It should also be noted, that LEGO managed to put a system in place that is theoretically self-sustaining and does not require organization or moderation by any LEGO employees.

While this example speaks for the feasibility of using this form of co-creation to come up with product ideas, it should be noted that there are a number of things that clearly distinguishes the LEGO Group from a crowdfunded startup. With over 600 billion bricks sold [26], LEGO has built a widely known brand and huge pool of customers since they first launched the LEGO brick in 1949. They therefore have a seemingly endless number of potential co-creators. Additionally, the co-conception of new product ideas is limited to use bricks from the LEGO system. This simplifies the potential implementation of the co-created product idea. Lastly, LEGO was already a financially successful business before the launch of the 'LEGO IDEAS' program, which allowed them to put resources into building an online platform for this co-creation process.

2.3.2. GoPro Awards



Fig. 4 - GoPro Awards [27]

The US-based camera manufacturer GoPro has been using co-creation for a long time to promote their products. In 2015 the firm launched the 'GoPro Awards' program as a way for their customers to be part of the firm's marketing campaigns. Customers are encouraged to use the GoPro product and share their best photos and videos, using the upload function on the GoPro Awards website. GoPro then "examines submissions and evaluates the image and story quality of submissions to determine which ones deserve a GoPro Award" [28]. The winning submissions are then used by GoPro for marketing purposes. This typically means they're being shared on one of the firm's many social media channels but can also be featured on the website or in offline marketing campaigns. The creators of the winning content are rewarded with cash prizes up to \$5000. The firm's annual budget for this program is five million US Dollars.

With the launch of the newest product in September 2018, GoPro decided to double down on this co-creation strategy. The firm typically launches each of their new products with a 'Highlight Launch Video'. These videos are highly anticipated by the GoPro community and are the foundation of the product's marketing campaign. For the launch of their new flagship camera, the 'HERO 7 Black', GoPro decided to create the launch video with only customer generated content. Under the project name 'GoPro Million Dollar Challenge', they encouraged their customer community to buy the newest camera model and participate in the creation of the famous launch video. In exchange, GoPro offered \$1 million to be shared equally amongst the featured content creators. GoPro has received over 25.000 submissions for this video, and premiered the final result in December featuring 56 content

creators from around the world. The video has since then been viewed 2.7 million times, which makes it the most viewed GoPro video of the year. Next to the marketing and brand awareness benefits this entails, the firm says it's meant to celebrate their community. GoPro's Creative Director Josh Currie said: "That was my vision for this from the very beginning—an immense amount of gratitude toward the people who buy GoPro cameras." [32]

GoPro's strategy of using user generated content is a typical example of the co-creation forms *co-promotion* and *co-distribution*. The motives behind it are to *decrease costs*. This marketing strategy helped the firm to grow rapidly without having a huge budget for advertising. The company more than doubled its net income from 2010 to 2011 to \$24.6 million but only spent \$50,000 more in marketing costs to do it, according to Wall St. Daily. [33] Additionally, the company's loyal customers feel appreciated and even more connected to the brand.

Using user-generated content is particularly practical for GoPro as their product is literally a content-production machine. But nevertheless, this example of using co-creation as a marketing strategy can also be relevant for crowdfunded startups. Even if the mainly intended co-creation form is *co-conception of ideas* or *co-design*, *co-promotion* and *co-distribution* can be additional benefits that come along with it. After having collaboratively created a product, the participants of the co-creation process are assumably proud of the result (and their participation) and are excited to share and promote it. Depending on the amount of participants and their social influence, this can be very beneficial for the crowdfunded startup.

3. METHODS AND TECHNIQUES

In the following chapter, the foundation of the ideation and specification phase will be established. All relevant terminology will be defined. Furthermore, all the methods used in this thesis will be introduced and explained.

3.1. Definitions and Terminology

3.1.1. Definitions

As described in section 2.1.1., the definition of **co-creation** formed by Frow et al. (2015) will act as a basis for our own definition. However, to sharpen the definition, it will be further narrowed down to best describe the co-creation that is intended for crowdfunded startups. The chosen form of co-creation for this cause is *co-conception of ideas*. We therefore will use the following definition of co-creation for the remainder of the thesis:

Co-creation involves the joint creation of ideas by the crowdfunded startup and its network of customers. Innovations are thus the outcomes of behaviours and interactions between the crowdfunded startup and its customers.

Furthermore we define the **co-creation process** as: *A set timeframe in which the crowdfunded startup organizes co-creation sessions with the selected group of co-creators.*

3.1.2. Roles within the co-creation process

Within the co-creation process, there are several different roles. Depending on the specifics of the co-creation process, the tasks and responsibilities, as well as the number of people in each role, may change slightly. These are the general descriptions of the roles:

Co-creators: *A subset of customers of the crowdfunded startup, who have been selected to participate in the co-creation process.*

Note: Depending on the final design of the co-creation process, the co-creators might be restricted to a certain type of customer.

Moderator: *"A team member of the crowdfunded startup, who is responsible for the moderation and coordination during the co-creation process"*

3.2. Stakeholder Identification & Analysis

The first part of a stakeholder analysis is to identify all stakeholders of the project. This is achieved by a combination of an identification and an analysis of who plays a role during the development and who will use and benefit from the end result. A stakeholder is defined as: “any group or individual who can affect or is affected by the achievement of the organization’s objectives” (Freeman, 1984). In regards to this thesis, the organization’s objectives can be substituted with *project thesis*. To assess the impact of the stakeholders, a matrix is utilized to plot the stakeholders against two variables: influence and importance (figure 5). The matrix is set up from a development standpoint, meaning that each stakeholder is ranked on their influence and importance on the development process. The influence and importance of the stakeholders might vary depending on the stage of the development process. However, we will consider the average when ranking the stakeholders on this matrix. The significance of each stakeholder can then be determined by their place on the matrix (A being most significant, D being least significant).

		Importance of Stakeholder			
		No Importance	Little Importance	Some Importance	Significant Importance
Influence of Stakeholder	Significant Influence	C		A	
	Some Influence				
	Little Influence	D		B	
	No Influence				

Fig. 5 - Stakeholder matrix used for plotting "importance" against "influence".

3.3. CreaTe Design Process

The CreaTe Design Process [8] defines the fundamental design approach of this Graduation Project. Moreover, the CreaTe Design Process is also used as a general guideline within the co-creation process, which is what I will address in the following paragraphs.

The CreaTe Design Process [8] is based on a combination of Divergence-Convergence and Spiral models of design practice and is divided into four phases: Ideation, Specification, Realization and Evaluation. These phases help to structure the process of going from a design question to the evaluation of the envisioned prototype.

As described in section 2.1.3. and 3.1.1., the chosen co-creation form for this project is *co-conception of ideas*. Hence, the main objective of the envisioned co-creation process lies within the Ideation phase of the CreaTe Design Process. The design question, which acts as a starting point for the Ideation phase is, in our case, presented by the moderator of the co-creation process. The co-creators will brainstorm and develop concepts of a product idea for the crowdfunded startup. For the remaining three phases (specification, realisation, evaluation) a separate co-creation process need to be organized, which might have similarities, but also key differences in both the selection of the co-creators, as well as the organization of the process. Due to the scope of this thesis, these will not be elaborated upon. It should also be noted that the CreaTe design process is a dynamic process, when new insights are gained it is possible and often wise to revisit a previous phase.

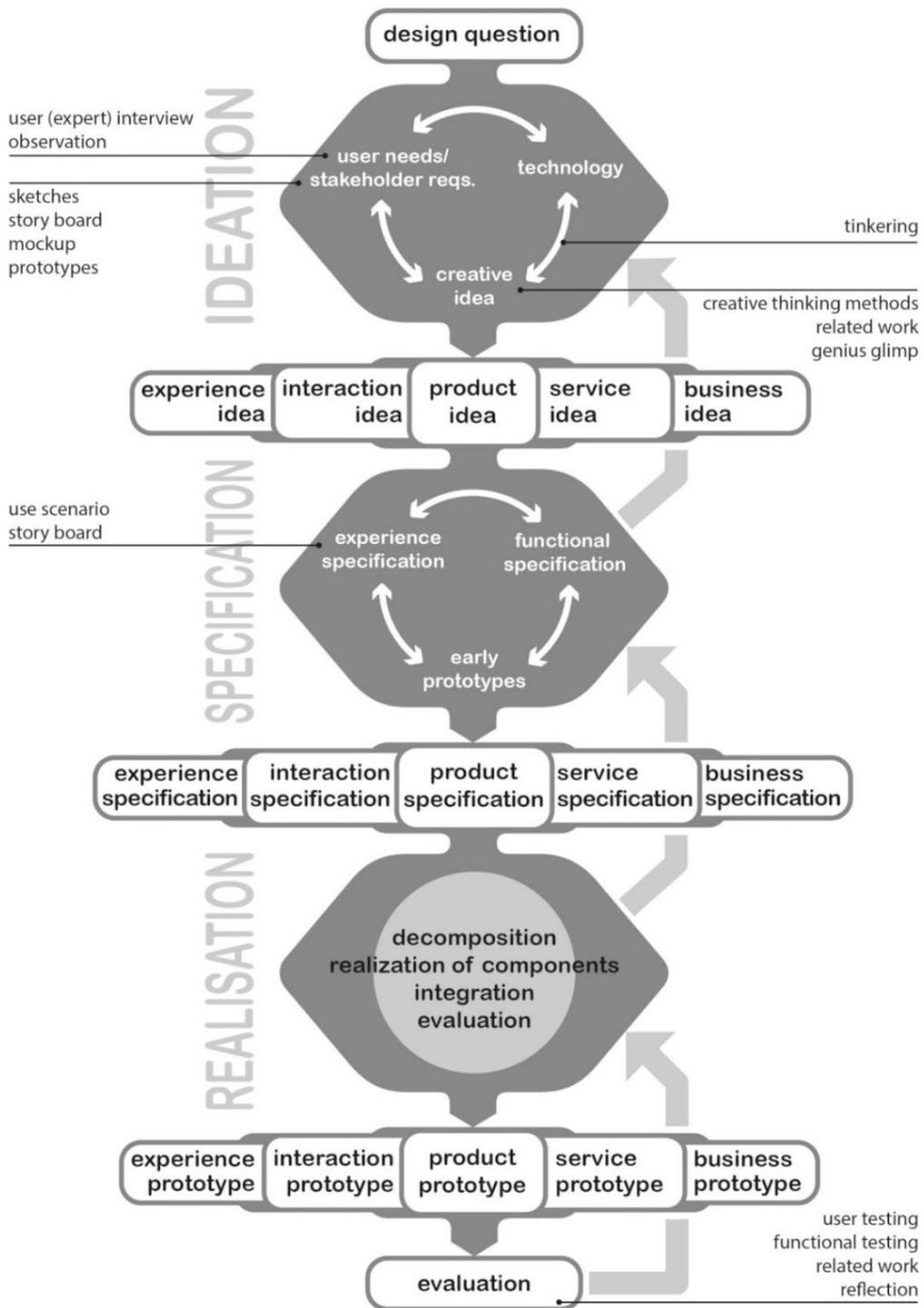


Fig. 6 - CreaTe Design Process [8]

3.4. Requirements

There are two separate instances within this project in which requirements will be listed and categorized. In order to avoid any misunderstanding, we distinguish between (1) the requirements for the envisioned co-creation process, and (2) the requirements for the crowdfunded startup's new product. The focus of this thesis lies on the envisioned co-creation process, we therefore address those requirements (1) in detail. The requirements for the crowdfunded startup's new product (2) are established within the co-creation process itself. After the initial *co-conception of ideas*, the co-creators discuss and make decisions regarding these requirements. This, however, exceeds the scope of this project and will not be addressed in detail.

3.4.1. Requirement Elicitation Techniques

Requirement elicitation is the practice of obtaining requirements of a system or project. Setting up a list of requirements is a necessary step for the developer, because the requirements directly influence the design and realization of the envisioned co-creation process. While there are many different approaches to this, for this project a combination of a literature review, an interview and observations were used.

3.4.1.1. Literature Review

In section 2.1. several scientific papers on the topic of co-creation have been reviewed. Different forms of co-creation were analyzed and reviewed. These insights are the foundation for obtaining requirements for the envisioned co-creation process. Furthermore, the DART framework for co-creation, as described in section 2.1.4, will be used as a general guideline when defining the requirements for the co-creation process. DART is an acronym and stands for Dialogue, Access, Risk assessment, and Transparency. These four building blocks of successful co-creation will be kept in mind when making decisions regarding the way the co-creation process is organized. By defining the structures and individual cooperation mechanisms, the moderator has the ability to facilitate dialogue, grant access, communicate risks and demonstrate transparency. The moderator of the design process is also responsible to make sure the DART framework is adhered during the process.

3.4.1.2. Interview

In section 2.1. several scientific papers on the topic of co-creation have been reviewed. The expert interview with Osama Malik, described in section 2.2. acts as another requirement elicitation technique. The key learnings listed under 2.2.3. will be transformed into concrete requirements for the envisioned co-creation process.

3.4.1.3. Observations

Lastly, there are two types of observations that will also be helpful for defining appropriate requirements: The examples of other firms using co-creation as a business strategy, described in section 2.3, will be closely observed. Questions like 'What worked for them?', 'Why did it work?' and 'What could be improved?' will be used to gain insights from these real-world examples. Next to that, my personal hands-on experience with crowdfunded startups will be used to define further requirements. Having run a crowdfunded startup for the past two and a half years, many observations can be made regarding the most suitable interaction and communication strategies towards the customers.

3.4.2. Categorization of Requirements

After listing the requirements, they will be split into the following two types: functional and non-functional requirements. The functional requirements specify the features or behaviour of the envisioned product. Their successful implementation can easily be checked, because the question whether the functional requirements have been met can always be answered with "yes" or "no". The non-functional requirements, on the other hand describe less tangible aspects like quality and are therefore more difficult to verify. An example of a non-functional requirement could be that the envisioned process should be 'fun'. The best way of validating whether such a requirement has been met, is to test it and evaluate it with the co-creators.

3.4.3. MoSCoW

MoSCoW [2] is a technique that is used to prioritize requirements. It is used in order to determine the importance of certain requirements or aspects of a project. MoSCoW stands for:

- **Must have** - the features that are absolutely necessary to include into the envisioned product. Can also be viewed as the bare minimum required to complete the envisioned product.
- **Should have** - the features that aren't critical for the envisioned product but are viewed as very important. Adding these features would significantly improve the quality of the envisioned product.
- **Could have** - the features that are nice to include into the envisioned product, but do not have a significant impact on the result. Will usually only be added if the addition doesn't cost too much time or resources.
- **Won't have** - the features of the envisioned product that have explicitly been excluded.

4. IDEATION

The goal of the ideation phase is to obtain different approaches to organize a co-creation process for crowdfunded startups, alongside a list of (non)functional requirements. The first step of the ideation phase is to identify and analyse the stakeholders involved. Once the stakeholders are identified and their roles have been examined, the next step is to obtain the requirements for the envisioned co-creation process. This will be done via the requirement elicitation techniques described in section 3.4.1. Finally, two different approaches will be shortly introduced and a decision will be made. The decided upon approach will then be specified in detail in the fifth chapter of this thesis.

4.1. Stakeholder Identification & Analysis

The first step is to identify the stakeholders, who are relevant to consider for the development of the co-creation process. A list of stakeholders, their role and their main interest in the project can be found in the following table:

Stakeholder	Role	Main interest
Crowdfunded startup	End user (Host and Moderator of the co-creation process)	Using the co-creation process
Customers of the crowdfunded startup (innovators and/or early adopters)	End user (Co-creators)	Using the co-creation process
UT / Novel-T	Client	Insights / strategy
UT / CreaTe	Internal Supervisor	Organization of the project / thesis
Pablo	Developer	Development of the co-creation tool/framework

Fig. 7 - Stakeholder identification table

The next step is to evaluate the stakeholders and place them in the matrix discussed in chapter 3.2. The justification for the placement of the stakeholders in the matrix is given below.

Crowdfunded startup

It's the crowdfunded startup's challenge to develop a second product or service after the successful launch of the first one via crowdfunding. The startup is the facilitator of the co-creation process and therefore the most significant stakeholder. Because the future of the business partly depends on the outcome of this co-creation process, it's of great importance for the startup. Vice versa, the crowdfunded startup is also considered a very important stakeholder. Because the process will be developed with the crowdfunded startup's interests and goals in mind, it also has a significant influence on the development.

Customers of the crowdfunded startup

A certain subset of the crowdfunded startup's customers, typically the innovators and/or early adopters, will be the co-creators and therefore, next to the startup itself, the main users of the envisioned co-creation process. Co-creation can only be successfully executed if all parties are able to efficiently collaborate and gain value from the process and the output. The co-creators are equally as important as the startup and have even higher influence on the development of the co-creation process, because they will be the main users.

UT / Novel-T

The University of Twente's organization Novel-T, represented through Mike Verkouter and Sven Degener, is the client and contracted the development of the envisioned co-creation process. They're interested in the development of a general strategic approach that can be used to assist many crowdfunded startups in the challenging period after the initial campaign. They only have a small influence in the development but are an important stakeholder.

UT / CreaTe:

The CreaTe program's main concern lies with the process of this project, including setting the final deadline for the completion of the co-creation process. Therefore, they have a significant influence but their importance is low.

Pablo:

As the developer of the co-creation process, Pablo has the greatest influence on the project. However, he's not as important as the client or the startup and its customers.

		Importance of Stakeholder			
		No Importance	Little Importance	Some Importance	Significant Importance
Influence of Stakeholder	Significant Influence	CreaTe	Pablo		Customers of crowdfunded startup
	Some Influence				Crowdfunded startup
	Little Influence			Novel-T	
	No Influence				

Fig. 8 - Influence and importance matrix of the stakeholders

4.2. Requirements for the co-creation process

In the following section the requirement elicitation techniques described in 3.4.1. will be applied in order to identify functional and non-functional requirements for the organization of the envisioned co-creation process for crowdfunded startups.

4.2.1. DART framework as a basis for requirements

Before addressing the less tangible elicitation techniques *interviews* (3.4.1.2.) and *observations* (3.4.1.3.), we begin by using the four building blocks of the DART framework as a basis to define our requirements. After a brief repetition of each of the blocks, the derived requirements are listed.

Dialogue

To facilitate a successful co-creation process we must enable all co-creators to share, interact and communicate with each other. A platform must be created that allows this

dialogue on several levels. Next to direct one-on-one communication, participants also need to be able to share and interact with the entire co-creation group. A thoughtful organization into several topics would be ideal. Furthermore, the communication should exceed written texts and also involve video calls and file-sharing.

Derived requirements:

- co-creators can communicate one-to-one
- co-creators can communicate with the entire group
- co-creators can communicate easily
- co-creators can communicate via video calls
- the communication is categorized into topics.

Access

All participants in the co-creation process should have access to as many resources as possible to actively contribute to the co-creation process. The co-creation platform must allow the co-creators to modify and extend things, versus just using them. How this is organized specifically depends on the industry the crowdfunded startup is active in. A software-based startup should make the code available to the participants, while a startup working with physical products might want to share the 3D files or even send out samples of materials or prototypes.

Derived requirements:

- co-creators can easily access all relevant information and resources
- co-creators can share their own files and resources
- multiple co-creators can work on the same design simultaneously.

Risk Assessment

The co-creators need to be fully aware of what their responsibilities and risks are, before accepting to be part of the co-creation process. The moderator and moderator need to clearly define and communicate how the co-creation process will be managed and how the end-result is treated. Questions regarding legal or financial responsibility for all hypothetical cases need to be answered. Moreover, the intellectual property rights regarding the outcome of the co-creation process need to be defined.

Derived requirements:

- co-creators are aware of their risks and responsibilities
- co-creators trust each other and the moderator

Transparency

The entire process needs to be organized and communicated in a transparent way. A feedback mechanism between the moderator and co-creators builds up the necessary trust. The co-creators need to always be able to access all relevant information and comprehend why certain decisions have been made.

Derived requirements:

- co-creators are able to look up what was said and in what context
- co-creators have a clear overview of the current status at all times

4.2.2. Additional requirements from the expert interview

During the interview with co-creation expert Osama Malik, he shared a few insights regarding the successful organization of co-creation. The key learnings are summarized in section 2.2.3. There is a certain overlap between those learnings and the DART framework. The following are the additional requirements that were derived from those learnings:

- co-creators are diverse in terms of skills, backgrounds, interests and cultures
- co-creators get stimulated to actively participate
- co-creators get an appropriate reward for their participation

4.2.2. Additional requirements from observations

As described in section 3.4.1.3., more requirements can be derived from looking at other examples of successful co-creation and my personal experience with crowdfunded startups:

- the moderator is able to keep an overview of the participation of each co-creator
- the moderator is able to adjust the process in real time

To summarize, we list all the above mentioned requirements and separate them into functional requirements and non-functional requirements:

functional requirements	non-functional requirements
co-creators can communicate one-to-one	co-creators can communicate easily
co-creators can communicate with the entire group	co-creators can easily access all relevant information and resources
co-creators can communicate via video calls	co-creators trust each other and the moderator
the communication is categorized into topics.	co-creators get stimulated to actively participate
co-creators can share their own files and resources	co-creators are diverse in terms of skills, backgrounds, interests and cultures
multiple co-creators can work on the same design simultaneously.	co-creators get an appropriate reward for their participation
the moderator is able to keep an overview of the participation of each co-creator	
co-creators have a clear overview of the current status at all times	
co-creators are able to look up what was said and in what context	
co-creators are aware of their risks and responsibilities	
the moderator is able to adjust the process in realtime	

Fig. 9 - Table of (non)functional requirements

4.2. Categorisation of Requirements using MoSCoW

In section 4.2 an initial set of requirements was established. These requirements are now prioritized using the MoSCoW technique (as discussed in Section 3.4.). The decisions on the importance of each requirement, and consequently which category it belongs to, are made based on the insights gained in the previous chapters and personal judgement.

MoSCoW	functional requirements
Must	co-creators can communicate with the entire group
Must	co-creators are able to look up what was said and in what context
Should	the moderator is able to keep an overview of the participation of each co-creator
Should	co-creators have a clear overview of the current status at all times
Should	co-creators are aware of their risks and responsibilities
Could	co-creators can communicate one-to-one
Could	the communication is categorized into topics.
Could	co-creators can communicate via video calls
Could	co-creators can share their own files and resources
Could	the moderator is able to adjust the process in realtime
Won't	multiple co-creators can work on the same design simultaneously.

Fig. 10 - Table of categorized functional requirements

MoSCoW	non-functional requirements
Must	co-creators can easily access all relevant information and resources
Must	co-creators trust each other and the moderator
Must	co-creators get an appropriate reward for their participation
Should	co-creators can communicate easily
Should	co-creators are diverse in terms of skills, backgrounds, interests and cultures
Should	co-creators get stimulated to actively participate

Fig. 11 - Table of categorized non-functional requirements

4.4. Co-creation approaches for crowdfunded startups

The stakeholder analysis and the categorization of the (non)functional requirements are a good foundation to ideate on different co-creation approaches for crowdfunded startups. We remind ourselves that the co-creation motive is the *co-conception of ideas* and the goal is to involve the crowdfunded startup’s customers into the process of deciding what the next product should be. Three different approaches for the envisioned co-creation process will be formulated and possible opportunities and challenges identified. Finally, a decision for one of them will be made. The chosen approach will then be specified in detail in chapter five of this thesis.

4.4.1. Physical co-creation

The first approach is to host physical co-creation sessions in which the co-creators meet up with the moderator to collaboratively work on new product ideas for the crowdfunded startup. The idea is to organize brainstorm sessions and workshops to facilitate and stimulate the *co-conception of ideas*. This approach is inspired by the typical project group work, as it’s often done within the Creative Technology curriculum. The scope of these

sessions could range from a single workshop to several days or multiple separate events, depending on the specific needs of the crowdfunded startup. In this scenario it would be the crowdfunded startup's responsibility to organize and host this event.

Opportunities

- Physical presence of all co-creators could lead to higher engagement and motivation
- Communication within the sessions is straightforward and uncomplicated
- Allows for collaborative tinkering and prototyping
- The startups has control over selection of co-creators

Challenges

- Limited in group size
- Possible limits in the diversity of the group
- Big organizational effort
- Big budget/resources needed

4.4.2. Open co-creation

Another approach is to facilitate a “free for all” co-creation process, meaning that it's open for all customers of the crowdfunded startups to join. This would entail an online platform that gives the co-creators the chance to pitch ideas. Furthermore it should facilitate conversations about them to further stimulate the *co-conception of ideas*. Danish toy manufacturer LEGO has chosen a similar co-creation approach, as described in section 2.3.1. An even more radical approach would be to not only allow the crowdfunded startup's customer to join, but open it to the public.

Opportunities

- Infinitely many co-creators can join
- Could lead to big diversity within the co-creators
- Democratic decision making
- Possibly a good tool for additional publicity

Challenges

- Difficult to stimulate high engagement between co-creators
- No personal relationship between co-creators and crowdfunded startup
- Large number of ideas, which results in big organizational effort

4.4.3. Remote co-creation

The final approach is to organize a remote co-creation process with a selected group of co-creators. In this case, the crowdfunded startup or moderator has to select a group of candidates from the crowdfunded startup's customers and invite them to participate. The assembled co-creation group would then be stimulated to collaboratively, but remotely, work on the *co-conception of ideas*. This could be done via video calls, and other communication principles from the world of remote work.

Opportunities

- Co-creators can be international and diverse
- High engagement due to small group of co-creators
- Feeling of exclusivity among co-creators could lead to additional motivation
- The startup has control over selection of co-creators
- Small budget/resources needed

Challenges

- Difficult to establish human connection between co-creators
- Organization and scheduling is difficult if co-creators are in different time zones.

5. SPECIFICATION

The Specification chapter is kicked off by deciding on one of the approaches discussed in section 4.4. and listing the (non)functional requirements. Afterwards, the approach is specified by defining the different functions and the relationship between them, all while keeping the (non)functional requirements in mind. The goal of this chapter is an abstract specification that could be handed off to an external developer, who should then be able to independently build the framework for the envisioned co-creation process.

5.1. Selection of a co-creation approach

In section 4.4. three co-creation approaches for crowdfunded startups were defined. *Physical co-creation*, *Open co-creation* and *remote co-creation*, are different in the way the process is organized but have the same goal, which is the co-conception of ideas in order to come up with new products for the crowdfunded startup. After contemplating the opportunities and challenges of each approach, and keeping in mind the typically limited resources of a crowdfunded startup, it was decided to go with *remote co-creation*, as it's introduced in section 4.4.3. In today's world, a crowdfunded startup typically has a worldwide customer base. The remote principles of the chosen approach allow us to make use of this international customer base while keeping the necessary resources low.

5.2. (Non)functional requirements

As a reminder, here are once again the (non)functional requirements for the envisioned co-creation process of remote co-creation

MoSCoW	functional requirements
Must	co-creators can communicate with the entire group
Must	co-creators are able to look up what was said and in what context
Should	the moderator is able to keep an overview of the participation of each co-creator
Should	co-creators have a clear overview of the current status at all times
Should	co-creators are aware of their risks and responsibilities
Could	co-creators can communicate one-to-one
Could	the communication is categorized into topics.
Could	co-creators can communicate via video calls
Could	co-creators can share their own files and resources
Could	the moderator is able to adjust the process in realtime
Won't	multiple co-creators can work on the same design simultaneously.

Fig. 12 - Table of functional requirements

MoSCoW	non-functional requirements
Must	co-creators can easily access all relevant information and resources
Must	co-creators trust each other and the moderator
Must	co-creators get an appropriate reward for their participation
Should	co-creators can communicate easily
Should	co-creators are diverse in terms of skills, backgrounds, interests and cultures
Should	co-creators get stimulated to actively participate

Fig. 13 - Table of non-functional requirements

5.3. Functions of remote co-creation

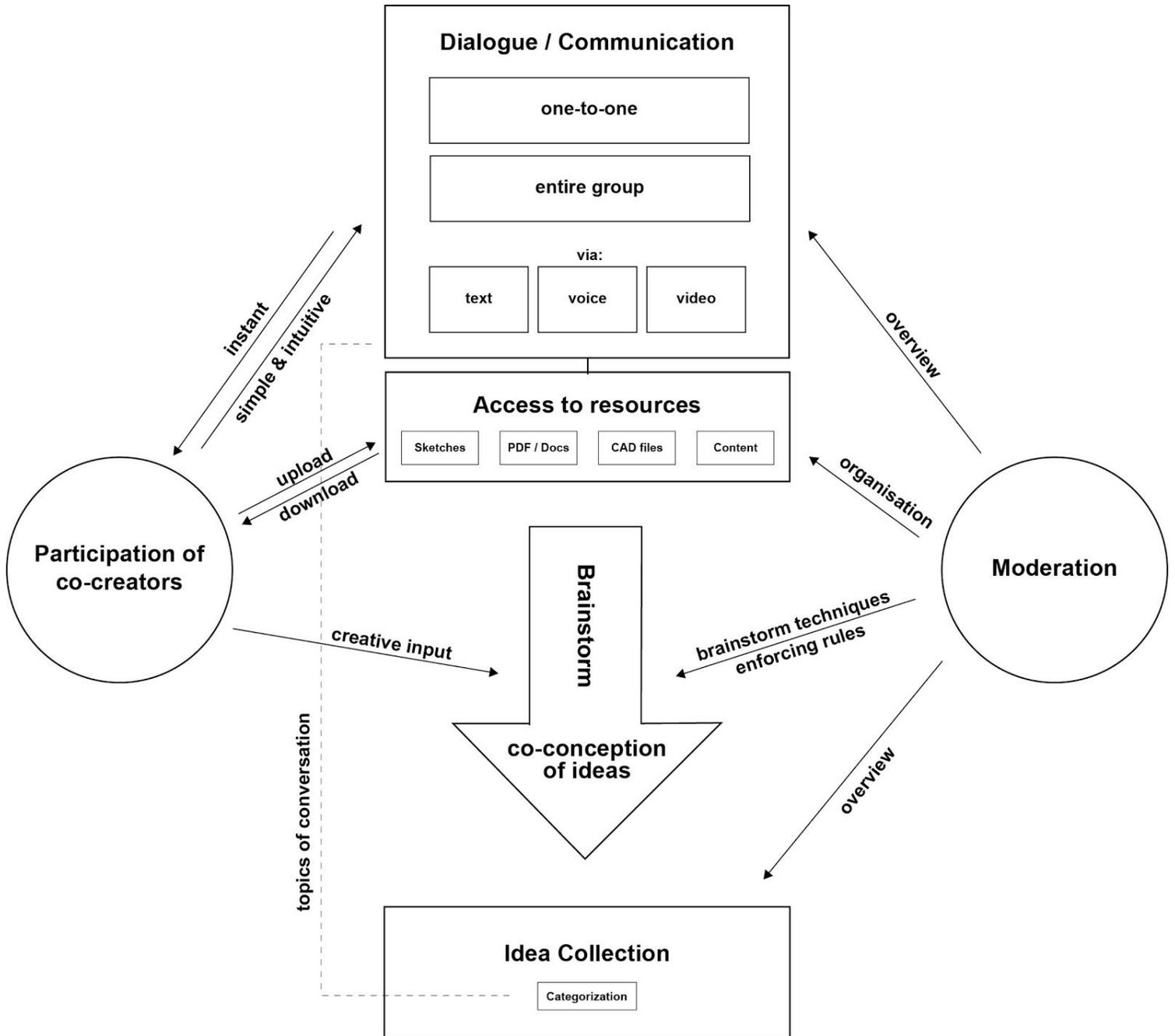


Fig. 14 - Block Diagram with the envisioned functions

Dialogue / Communication

One of the essential functions of the co-creation approach is *Dialogue / Communication*. This corresponds to the first building block of the DART framework, as it is discussed in section 2.1.4 and section 4.2.1. As it can be seen in Fig. 12, it entails both one-to-one communication between the co-creators, as well as conversations within the entire co-creation group. The envisioned framework needs to work in such a way that this function is simple and intuitive for the co-creators to use. The communication also needs to be instant and it must facilitate different forms of communication such as text, voice and video. Additionally, the communication needs to be able to be categorized into different topics of conversation. This specifically comes into play when the generated ideas are categorized. The *Moderation* function must have an overview of the *Dialogue / Communication* at all times.

Access to resources

Closely related is the *Access to resources* function, which corresponds to the second building block of the DART framework. Relevant resources can be of various types, such as hand-drawn sketches, documents, 3D CAD files or photos and videos. The *Moderation* function needs to be able to organize the resources and the participating co-creators can upload to and download from the resources easily.

Brainstorm

The communication and resources enable the *Brainstorm* function, which is shown in the shape of an arrow in figure 12. The *co-conception of ideas*, which is the main goal of the co-creation process, is realized. The moderation suggests and introduces the brainstorm technique and enforces the according rules, while the co-creators give their creative input.

Idea Collection

The results of the brainstorms are collected in the final function *Idea Collection*. This function allows the co-creators to list the ideas that were generated during the co-creation process. The ideas might come in different forms, from loose bullet points to refined sketches or 3D files. All of them are collected in this function and categorized accordingly. The Moderation keeps an overview of this and is able to report back to the crowdfunded startup.

Moderation

The Moderation is a crucial function that enables a smooth organization of this process, without being intrusive. In the beginning it has an informative function towards the co-creators regarding their tasks, responsibilities and opportunities. Another responsibility of this function is to keep an overview of the communications and shared files. This is a merely passive endeavour and mainly involves monitoring the conversations and

interactions of the co-creators. Furthermore, it also includes the enforcing of brainstorming rules. If the co-creators break those rules, the moderation function has the opportunity to politely intervene and remind the co-creators of the rules and reasons behind them. During the co-creation process, the moderation has no active participation in the brainstorm itself. As function is typically occupied by an employee of the crowdfunded startup, this might be challenging, as this person might have opinions and ideas regarding future product, as well.

6. REALIZATION

In chapter 5 we have specified the functions of the framework. In the Realization chapter, the framework is built and the envisioned co-creation process is prepared.

The crowdfunded startup 'AER'[17] will act as a case study for this test. The following sections of the Realization chapter will be written in general terms that can be applied to all crowdfunded startups. Nevertheless, certain decisions will be made in the context of the chosen case study. Whenever this is the case, it will be disclosed.

6.1. Selection of co-creation participants

6.1.1. Finding the right co-creators

A crowdfunded startup typically has an engaged customer community that is used to and appreciates being involved in the shaping of the business and/or product. It's the startups responsibility to select a fitting selection of people from that community. During the state of the art research in chapter 2, a few key points were addressed when choosing the right people to co-create with. One of the important points was to only include those customers who are highly motivated and willing to contribute to the process. An active participation from all co-creators is an essential ingredient for a fruitful ideation phase.

Furthermore, it's important to select a diverse group of people, with a wide range of skills, backgrounds, interests and cultures. Interactions between people with different views on things are most stimulating and result in the most creative output, particular in brainstorm sessions. The fact that most crowdfunded startups are initiated through an international campaign enables them to choose from a pool of customers with a wide range of cultures and backgrounds.

There are several different ways of approaching and reaching out to those customers. Typically, the members of the startup have a good overview of the customer community and can judge which (sub)groups are highly engaged and could be potential co-creators. In the particular example of AER, I know many of the customers quite well and was able to generate a list of fitting candidates. The community members on this list were then individually approached. When approaching the customers on this list, it's important to communicate clearly what the goal and the conditions of their participation are. They need to understand what is expected from them, when it is expected and in what form. Besides this, it should be made clear what they get in return for their participation. To streamline

this process a document was created that outlines the envisioned co-creation process and addresses all relevant points. It can be found in the appendix 9.2.

After reading this document and showing interest in participating, the potential co-creators are asked to participate in a video call with the moderator. In the example of AER, that's me. The goal of this conversation is to clarify any possible misunderstandings and making sure the co-creator is aware of his rights and responsibilities. In our case, we're working with a group of 5-10 co-creators, so the expenditure for these individual video calls is justifiable. For larger co-creation sessions with more co-creators, I recommend pre-recording and sending out a video message, instead.

6.1.2. Questionnaire

The next step is a small questionnaire that the co-creators are asked to fill out. One of the goals of this, is to get all relevant information like contact details and available time-slots from the co-creators. Additionally, the moderator has a chance to find out how much experience the co-creators have with certain tools and methods that will be used during the process. This allows the moderator to prepare introductions to those tools and methods accordingly. The questionnaire that was used in the example of AER can be found in the appendix 9.3.

6.1.3. Final list of selected co-creators

In section 6.1.1. , the process of choosing the co-creators was specified. In order to get started, I, the moderator, came up with an initial list of potential co-creators, all of which I knew from previous encounters and because they were backers of our crowdfunding campaign or became customers later on. This selection was based on the insights gained in the previous chapters of this thesis. The list initially consisted of 17 candidates who I approached individually. Some of them were not interested or didn't have the needed time. This was fine, as we have limited the co-creation group to 5-10 co-creators, so a selection of promising and willing candidates was made. The candidates were then invited to a video call, as described in section 6.1.1. In the following, I will briefly introduce the final selection of co-creators and name the key arguments why this particular co-creator was invited to join.

Co-Creator 1

He's a professional director and camera operator from London, UK. His long professional career ranges from commercial productions to Music videos. In the early 2000s he was one of the first advocates of 360 degree video. During that time, there were no 360 cameras on the market, so achieving this effect meant recording with up to 16 cameras simultaneously and stitching together the footage in post processing. He's a creative early adopter and backed the AER Kickstarter campaign. He also pushed the boundaries of what's possible with our first product, by using several AER products simultaneously in an attempt to achieve unique results that leave the viewer wondering how the shots were obtained.

Arguments for selection:

- professional background in video
- creative and out-of-the-box thinking
- early adopter of new technology and forward-thinking
- not afraid to take risks
- between 35-50 years old -> diversity in age

Co-Creator 2

He is a freelance videographer and graphic designer. Originally from the Ukraine, he lives in Italy since many years where he works for many different clients, such as video festivals and clothing brands. On the side, he also works for GoPro and manages the Italian community of content creators, named 'GoSoul Community'[22]. They organize different events, with the overarching theme of creative content production.

Arguments for selection:

- very good understanding of our target group
- big social influence and network of potential customers
- high engagement
- interesting cultural background

Co-Creator 3

She lives in California (US) and works for an advertising agency, where she manages the social media ads for different clients. She's a multifaceted creative, who excels in many disciplines. Next to photography she's done illustrations, paintings, graphic design, animations, and more. She has gained the attention of the AER team early on by posting unique content captured by AER.

Arguments for selection:

- diverse creative skillset
- business oriented view on things
- female perspective

Co-Creator 4

He is an engineer and hobby photographer from Mexico. In his professional life, he manages the supply chain of industrial companies and therefore has a good understanding of the life cycle of a physical product. Next to photography, he spends his free time doing action sports like skydiving. The initial contact between him and the AER team started, when he reached out because he made adjustments to his AER product, in order to use it during skydiving.

Arguments for selection:

- understanding of supply chain
- hands-on experience with modifying the AER product
- perspective of an athlete
- South American -> diversity in cultural backgrounds

Co-Creator 5

He lives in the US and is employed at Adobe [23], where he works on the video editing software Adobe Rush. Prior to that, he was working at GoPro. Because of that, he has a very detailed understanding of the videography business and the action cams in particular. Next to his outstanding video editing skills, he's a great musician and loves the outdoors.

Arguments for selection:

- insights into the action cam market
- experience with software products
- understanding of the technical aspects of video production
- musician -> diversity in personal interests

Co-Creator 6

The youngest member of the co-creation group lives in Germany and goes to High School. Despite his young age, he has substantial video- and photography experience. He is a true innovator, as he was the number 2 backer of the AER crowdfunding campaign. Since this, he has already reached out to us with ideas for future AER products and even made his own CAD models and 3D prints.

Arguments for selection:

- high engagement
- technical skills
- insights into our future market group, the new generation of content creators
- less than 20 years old -> diversity in age

Co-Creator 7

He is a freelance videographer from Germany. He's specialized in Winter sports and manages to stand out in this very competitive field of filmmaking by thinking outside the box and capturing unique content. He was not a backer of the AER crowdfunding campaign but worked together with AER for a marketing project in 2018. During that project, he displayed his creativity and understanding of the filmmaking world.

Arguments for selection:

- perspective of a professional filmmaker
- insights of a sports photographer
- passionate creative content and unique perspectives
- reliable

Co-Creator 8

He's an industrial engineer from the UK and longtime supporter of AER. He's one of the very few supporters of the AER crowdfunding campaign that met the AER team personally. During a visit in Stuttgart, several ideas for future products were discussed and he convinced me with his out-of-the-box thinking and technical know-how.

Arguments for selection:

- technical skills, i.e. CAD design
- understanding of materials
- creative mindset

6.2. Co-conception of ideas

6.2.1. Introduction

Before the co-creation process itself is kicked off, there is an initial introduction. During this time, the co-creators introduce themselves and get to know each other. This is crucial, as it will help the co-creators to make a positive human connection with each other, by building a sense of trust, inclusion and representation. Next to this, there will be an introduction and quick guide into all the tools that will be used during the co-creation process.

Icebreakers and team-building

Besides the formal introduction, team-building activities are organized to stimulate interaction and a good working atmosphere among the co-creators. This can be done with different methods, in the specific case of 'AER', the following methods were chosen:

"A picture of my day"

Each co-creator is asked to submit a photo they have taken during a typical day in their lives. This photo should contain some information about themselves, without revealing them. The goal is then to match the photo to the co-creator. This can get a bit abstract, but is a great way to stimulate conversations and openness.

"A themed trivia"

A small quiz is organized to further break the ice between the co-creators. The theme of the trivia is related to the overall topic of the co-creation session and hints towards the design questions which will be presented during the next phase of the co-creation process. For the case study with 'AER' the theme is videography and photography. Organizing such a trivia is a fun way to further stimulate interaction between the co-creators get them into the topic of the co-creation.

Both of these methods are prepared by the moderator beforehand and carried out during the first group video call.

6.2.2. Design question

The co-conception of ideas begins with the design questions, which is proposed by the moderator. While the overarching goal of the co-creation process is to come up with a product idea for the crowdfunded startup, the design question limits the scope to the industry the startup is in and the direction it wants to go into with the next product. In the example of 'AER', the design question is the following:

'Creating a new method of capturing unique video and/or photo content'

Creating a new - not improving or copying existing things

method - could be anything, not necessarily a physical product

capturing unique - goal is to stand out / capture something extraordinary

video and/or photo content - not limited to either of them

This design question is purposely kept broad to give a maximum freedom to the co-creators. An expected problem is the preoccupation the co-creators might have because of the initial product of the startup. It's natural for people to adjust their expectations towards the future based on the past. In the example of 'AER', the customers might limit their expectations for the next product to something that is thrown for aerial photos and videos. So in this phase it's advised to remind the co-creators about the openness of the design question and ask them to start fresh.

6.2.3. Goals

The goal of the co-creation process is the co-conception of ideas. These ideas must be fitting to the design question and help the crowdfunded startup to decide on future products or services. The co-creators should be stimulated to inspire each other and think outside the box. By using brainstorming techniques and other idea generating methods within the diverse group of co-creators, the creativity of multiple people doesn't just get added up, but multiplied. The ideal outcome of the ideation phase are therefore one or multiple ideas, that none of the co-creators would have been able to generate by themselves.

6.2.4. Tools

For the organization, facilitation and managing of the ideation phase, multiple existing tools will be used.

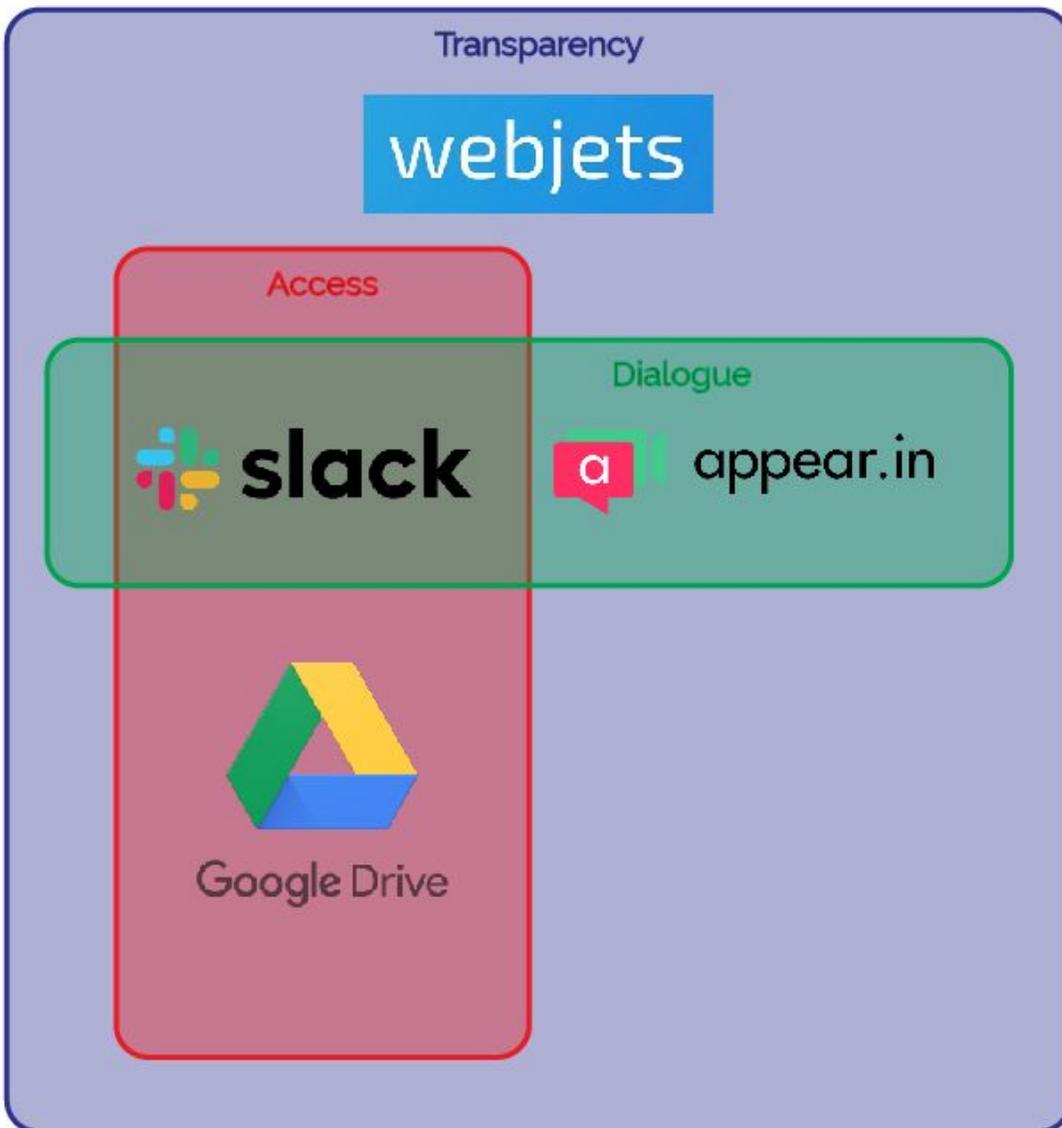


Fig.15 - Tools used in the ideation phase, organized into the three pillars from the DART framework: Dialogue, Access Transparency.

All of the tools are free for the co-creators to use, and work within the web browser.

The **Webjets** [18] platform acts as a meeting point for the collaboration and combines all other tools in one place. The developers of Webjets define it like this: 'At the heart of Webjets lays a new paradigm of User Interface. Information-centric. User-friendly. Boundary-breaking.' [18] On the Webjets platform, an overview of the current stage of the process is given and all other relevant tools and files can be accessed.

Slack [19] is the main tool of communication for the co-creators. It allows one-to-one conversations, group chats and sorting conversations into 'channels', i.e. topics.

In addition to slack, **Appear.in** [20] is used for video calls. It allows hassle-free group video communication without some of the downfalls other software solutions tends to have.

Google Drive [21] is used for cloud storing all relevant resources. It's integrated within Webjets and Slack and allows easy access to materials.

6.2.5. Process

In the case of 'AER', the entire process of the ideation phase spans over 15 days. The co-creators are putting in a bit of time every day and meet for a group video call on day 1, day 8 and day 15.

There are certain program points that are planned during that time. Besides those program points, the plan is deliberately kept rather undefined. It's the moderator's task to closely follow along the process and make adjustments if necessary.

Day	Date	Weekday	Program	Task for Moderator
-5	23.4.	Tue		<ul style="list-style-type: none"> ● Setup Slack ● Setup Google Drive ● Setup Webjets
-4	24.4.	Wed		<ul style="list-style-type: none"> ● ask co-creators to take photo for photo game ● prepare trivia game
-3	25.4.	Thu		
-2	26.4.	Fri		
-1	27.4.	Sat		
1	28.4.	Sun	<p>Group Video Call</p> <ul style="list-style-type: none"> ● Introduction of Co-Creators ● Photo Game ● Trivia Game ● Design Question ● Kickoff Brainstorm 	<ul style="list-style-type: none"> ● Hosting and Moderation ● Photo Game ● Trivia Game ● Pitch the Design Question ● Kickoff Brainstorm
2	29.4.	Mon	Brainstorm	<i>Moderation</i>
3	30.4.	Tue	Brainstorm	<i>Moderation</i>
4	1.5.	Wed	Brainstorm	<i>Moderation</i>
5	2.5.	Thu	Brainstorm	<i>Moderation</i>
6	3.5.	Fri	Brainstorm	<i>Moderation</i>
7	4.5.	Sat		

8	5.5.	Sun	Group Video Call <ul style="list-style-type: none"> ● Recap Brainstorm Session ● Collect & groups ideas ● Vote on most promising ideas 	<ul style="list-style-type: none"> ● Hosting and Moderation ● Recap of last week ● Host brainstorm session ● create slack channels per concept
9	6.5.	Mon	Conceptualize ideas	<i>Moderation</i>
10	7.5.	Tue	Conceptualize ideas	<i>Moderation</i>
11	8.5.	Wed	List requirements	<i>Moderation</i>
12	9.5.	Thu	List requirements and qualify using MoSCoW	<i>Moderation</i>
13	10.5.	Fri	Qualify requirements using MoSCoW	<i>Moderation</i>
14	11.5.	Sat		
15	12.5.	Sun	Group Video Call <ul style="list-style-type: none"> ● Summary of Ideas / Concepts ● Prices for Co-Creators ● Wrap-up and Recap ● Feedback 	<ul style="list-style-type: none"> ● Hosting and Moderation ● Election for price winners ● Thank you and Gifts for everyone ● Teaser: What's next

Fig. 16 - Planning of envisioned co-creation process

6.3. Rewarding the co-creators

As we've learned, rewarding the co-creators appropriately for their participation in the co-creation process is essential. This was one of the key learnings from the expert interview, as discussed in section 2.2.3. In section 4.4.2., we've defined the requirement as *co-creators get an appropriate reward for their participation*.

In the specific test with the crowdfunded startup AER, the reward consists of several things. The co-creation process was communicated openly towards all customers and followers of AER, mainly through social media. In these social media campaigns, big emphasis is put on giving credit to the co-creators for their input and thanking them publicly for their participation. Even though this is of no monetary value, this public and transparent appreciation gives the co-creators the feeling of being appreciated and hopefully makes them proud to be a part of this project. A well-managed community and brand that people are proud to be associated with, is crucial for this type of reward system. Furthermore, all co-creators get the guarantee that they will be among the first people to test out AERs next product and receive it for free. Whether this product stems from one of the ideas generated during the co-creation process is no determining factor. This guarantee is given in the form of a voucher, that is signed by the CEO. It can be found in appendix 9.4. Lastly, all co-creators also get gifts for their participation. They get the first AER product in a special color that isn't available to the public yet, along with AER merchandise such as a limited edition T-shirt.

7. EVALUATION

Between the April 28th and May 12th, the envisioned co-creation process was tested. The crowdfunded startup AER was used as a case study for this test. I, founder and CEO of AER, took on the role of the moderator. In the following chapter this test will be evaluated.

7.1. Evaluation Methods

In order to enable a meaningful evaluation, different evaluation methods and techniques will be used. One essential method for evaluating this co-creation test are the observations of the moderator (myself). As the founder and CEO of the crowdfunded startup, I have a good understanding of what's beneficial for the startup and can make judgements regarding the success of the co-creation process. Furthermore, learning about the views and opinions of the co-creators is another important way of evaluation the tested co-creation process. This is done with questionnaires and interviews. Lastly, the (non)functional requirements that were listed in section 5.2. are the basis for another method of evaluation. Each requirement will be looked at individually and it will be evaluated whether it has been met in the tested co-creation process.

7.2. Evaluation of the final selection of co-creators

We're looking back at section 6.1.1., where we have named several important aspects when choosing the co-creators. The engagement and willingness to contribute were one of the key points. We can be quite satisfied with our final selection of co-creators regarding this aspect, as all of them were very engaged and motivated until the end of the two week long process. Another important aspect was the diversity within the co-creation group. We were able to get a big variety of skills, backgrounds, interests and cultures within the final group of co-creators. However, a more basic measurement of diversity is the gender. Unfortunately, only 1 out of the 8 co-creators was female. There's definitely room for improvement regarding this male to female ratio.

Furthermore, it should be noted that even though we conclude with a positive outcome of the final selection of co-creators, this is difficult to assess as there is no comparison to another selection.

7.3. Evaluation of used tools

7.3.1. Webjets

The Webjets platform was a valuable tool during the co-creation process and was welcomed by the co-creators, for the most part. As planned, it functioned as a meeting point for the collaboration and allowed the co-creators to get a quick overview of the current stage of the process. The co-creators were able to quickly add content, such as images or notes, to the Webjets canvas. Without any guidance by the moderator, the co-creators quickly adapted these features and started to assemble a big mind map that contained all relevant information from the brainstorm sessions.

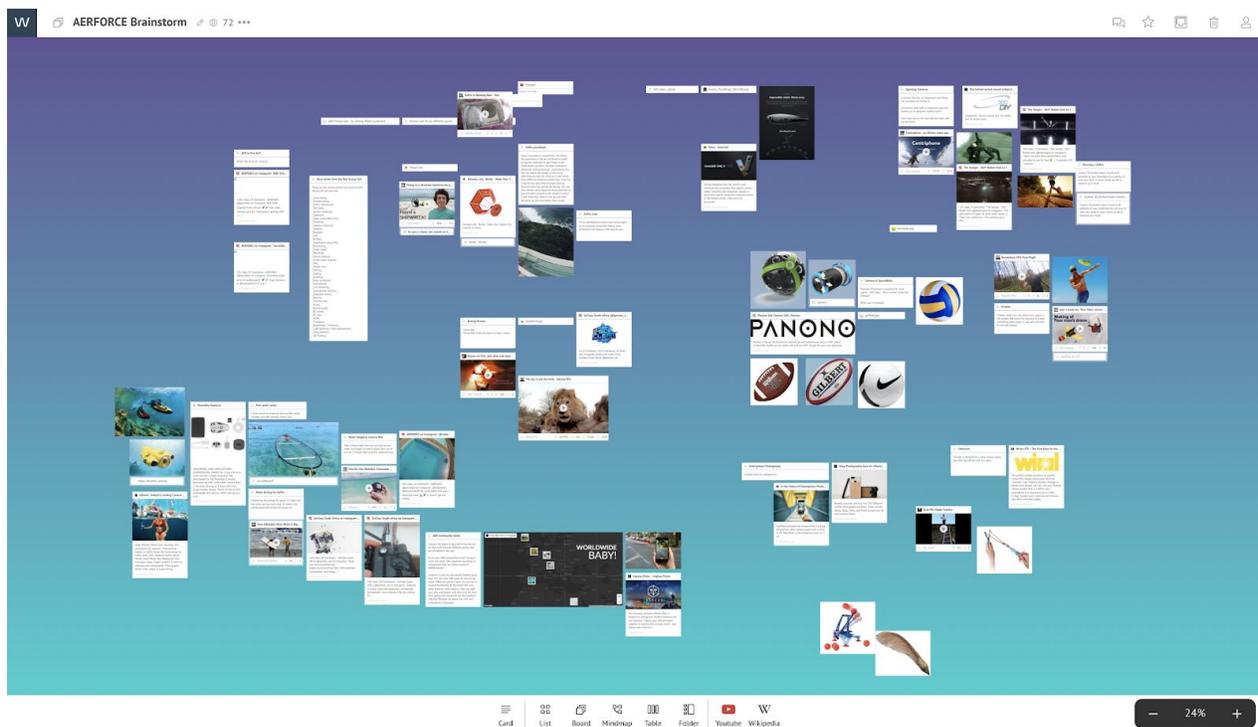


Fig. 17 - Screenshot of Webjets mindmap

But the more content was uploaded to the Webjets canvas, the worse the performance became, resulting in long loading times for some of the co-creators. Another downside of Webjets was the limited accessibility on mobile devices. Even though it theoretically also works on mobile devices, a lot of the core features are lost.

7.3.2. Appear.in

The appear.in platform enabled the group video calls and performed well. Thanks to the fact that no account or registration is needed, it was easy to setup and simple for the co-creators to use. They were able to join via desktop or mobile, without needing to install any software. Naturally, the conversations between 9 parties sometimes became a bit chaotic, but always remained manageable.

7.3.3. Slack

During the first two days of the co-creation process, some of the co-creators had small problems with Slack, as they were not getting notified of new messages. This initial problem was quickly resolved by downloading the Slack app instead of using it in browser. Slack quickly became the most used tool during the co-creation process. In total, 890 messages were sent during the co-creation process.

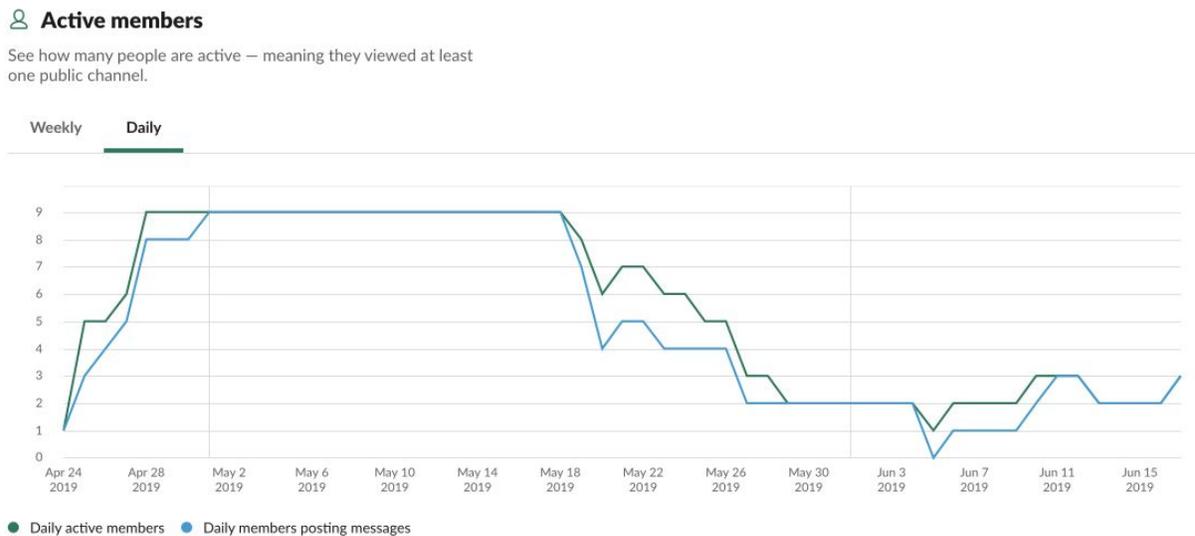


Fig. 18 - Daily active members in Slack. [31]

7.3.4. Google Drive

Google Drive worked as expected, but quickly became obsolete as the co-creators preferred to share files via Webjets or Slack. Because they were spending time on these platforms already, this was more convenient than switching to Google Drive.

7.4. Organizational challenges

Because the co-creators were from all over the world, hence living in different timezones, the organization of the co-creation process was one of the biggest challenges. For the most part, the principles of remote work, such as asynchronous communication, were applied and the co-creators were able to communicate and collaborate seamlessly via Slack and Webjets. However, finding suitable time slots for the group video calls was rather difficult. Because most of the co-creators work during the week, Saturdays and Sundays were the only possible days. As most of the co-creators preferred Sunday, all three group video calls were scheduled on Sundays. In order to make it work for the co-creators from the US and Mexico as well, the calls were scheduled for 8pm CET. This meant that the co-creators living in Europe had to sacrifice their Sunday evenings for these calls. This is not an ideal time slot as people tend to be rather tired and unfocused during that time.

7.5. Group dynamics

As none of the co-creators knew each other beforehand, there was justified concern how the group dynamic would be. After all, it was a diverse mix of cultures, ages and interests. But ever since the kickoff in the first video call, this concern disappeared completely. The co-creators were very interested in each other and showed curiosity about each other's professional backgrounds and previous experiences with filmmaking and photography. They were excited about getting to know each other and having the collective goal of coming up with product ideas. Lots of conversations erupted, up to a point when the moderator had to intervene in order not to lose too much time and point the focus back onto the scheduled program. The ice was already broken, so the photo and Trivia games would not have been necessary. Still, it was fun for the group and a good segway into the design question.

7.6. Engagement of co-creators

All co-creators were very engaged during the first group video call. Afterwards, the main communication happened within Slack. This slowed down the engagement a bit, because of the initial difficulties described in 7.2.3. Once this was resolved, all co-creators were active

on a daily basis, as it can be seen in figure 18. Especially during the brainstorming phase, the co-creators seemed to inspire each other and enjoy coming up with ideas for new products. During the second week, one of the goals was to take the list of generated ideas and narrow it down, by selecting the most promising ones and eliminating the least feasible. This transition into a different style of working decreased the overall engagement of the co-creators. Making decisions about the generated ideas and whether they're worth pursuing further was less fun and therefore less engaging than the brainstorming. It was also not clearly defined how these decisions will be made. This vagueness had the effect that none of the co-creators felt responsible for making them and further decreased the engagement.

7.7. Co-conception of ideas

The co-conception of ideas during the co-creation process worked out very well. The co-creators collectively came up with a total of over 20 product ideas for the crowdfunded startup. (It should be noted that the total number of ideas is hard to quantify, as many of them are slight variations of the same core idea). One of the observations is that the generated ideas are quite diverse in nature. All of them fall into the scope of the Design Question (see section 6.2.2.), but go into different directions. This corresponds directly to the diversity within the co-creators. Some of the co-creators look at the world of videography from a professional standpoint and see this potential new product as a tool for work, while others view it as a fun toy and therefore have very different demands and wishes. These different perspectives stimulate the brainstorm and result in more creative ideas. In this specific test with the crowdfunded startup AER, it was beneficial, as the startup has not yet decided who precisely the target customers are. In other cases, the crowdfunded startup might already have a more clear vision of its target group. Then it might be better to consider these different perspectives already during the selection of the co-creators, in order to make sure that the group of co-creators properly represents the target customers for the new product. Another observation was that the co-concepted ideas outgrew the expectations of the moderator and crowdfunded startup. As most entrepreneurs, I had plenty of ideas for future products already. While many of these ideas also appeared during the co-creation sessions, the co-creators also came up with many ideas that I had never considered before. Next to physical products like underwater devices and skydiving gadgets there were also concepts for software products. This is a direction that the crowdfunded startup has not explored at all, thus far.

7.8. Evaluation of requirements

In the following section, the functional requirements, as listed in section 5.2., will be revisited and it will be evaluated whether they have been met during the testing of the co-creation process.

MoSCoW	functional requirements	Requirement fulfilled?	Notes
Must	co-creators can communicate with the entire group	Yes	Slack enabled all co-creators to do this. Additionally, this was also done in the group video calls.
Must	co-creators are able to look up what was said and in what context	Yes	Slack keeps track of all public conversations and this archive was accessible to all co-creators.
Should	the moderator is able to keep an overview of the participation of each co-creator	Yes	Thanks for the Slack archive, see above.
Should	co-creators have a clear overview of the current status at all times	No	Even though this was given for most co-creators at most times, there was one co-creator who missed the second group video call and “fell out of the loop” because of it.
Should	co-creators are aware of their risks and responsibilities	Yes	All co-creators were elaborately informed beforehand.
Could	co-creators can communicate one-to-one	Yes	in Slack and Appear.in
Could	the communication is categorized into topics.	Yes	Slack allowed for easy categorization and Webjets helped to show relations between the topics.

Could	co-creators can communicate via video calls	Yes	Appear.in
Could	co-creators can share their own files and resources	Yes	Slack, Webjets and GoogleDrive
Could	the moderator is able to adjust the process in realtime	Somewhat	This was theoretically possible. However, during this test, it was not done. If yes, it would have meant big organizational and communicative effort.
Won't	multiple co-creators can work on the same design simultaneously.	No	During this test, no real design work has been done. It were merely discussions and simple drawings.

Fig. 19 - Table of evaluated requirements

In order to evaluate the non-functional requirements, a short survey was sent out to the co-creators, asking them to give their feedback regarding these requirements. They were asked to rate their experience, from 0=Totally disagree to 5=Totally agree. These are the average results from the feedback of the 8 co-creators.

I was able to access all relevant information and resources easily

Average result: 4.5

I trusted the other co-creators and the moderator

Average result: 4.125

I got an appropriate reward for my participation in this co-creation experiment

Average result: 4.5

It was easy for me to communicate with the group of other co-creators

Average result: 4.625

I was stimulated to actively participate in this co-creation experiment

Average result: 4.125

Lastly, we look at the following non-functional requirement:

co-creators are diverse in terms of skills, backgrounds, interests and cultures

Within the group of co-creators there was a variety of different skills represented, such as video editing, filming, animation, photography, graphic design, 3D design, engineering etc. The backgrounds and cultures were diverse as well, as we had Americans, Brits, Germans, a Mexican and an Italian co-creator. The interests ranged from design and photography to finance and action sports. All in all, the above mentioned requirement can be noted as met.

7.9. Feedback from co-creators

To get more insights and feedback from the co-creators, individual video calls were scheduled with each of the co-creators. This was done between 1-3 weeks after the co-creation test. In the following section, these insights will be elaborated upon. Specifically those, which have not been addressed before in this chapter.

- Several co-creators reported that they found it interesting and inspiring to get to know the other co-creators, regardless of the co-creation. As it's rather unusual to get in such close contact with strangers, who you have nothing in common, besides backing the same crowdfunding campaign, this was a special experience for them.
- One of the co-creators, who has a rather professional relationship with the world of filmmaking, mentioned that most of the ideas that came up during the co-creation process did not fit his needs. He therefore did not get very excited during the brainstorm. For him, it was frustrating that he wasn't allowed to critique the other ideas, as this is one of the core principles of brainstorming.
- One of the co-creators unfortunately missed the second group video call, which was in the middle of the two week long co-creation test. During this call, the results of the brainstorm of the previous week were summarized and discussed. The co-creators talked about the most promising ideas and continued brainstorming during the call. Furthermore, the next steps were mentioned by the moderator and the co-creators got motivated to start off the second half of the process. The co-creator who wasn't participating in this call, missed this information and reported that he felt like he lost the connection to the rest of the group. Hence, his engagement dropped during that time.

8. CONCLUSION

After scientifically researching the principles of co-creation, ideating how co-creation can be used by crowdfunded startups, designing a co-creation process, testing this co-creation process with a crowdfunded startup, and evaluating that test, we now reflect on the completed project in this chapter. An important part of this conclusion is to look back at the research questions posed in section 1.2 and summarize the key findings. Another part of the conclusion is to reflect on the tested co-creation process and discuss which additions or alterations could be made in the future to improve the quality or usefulness for crowdfunded startups.

8.1. Key Findings

(1) How to organize an effective co-creation process between crowdfunded startups and their customer community after a successful crowdfunding campaign?

In order to properly answer this question, one should start off by differentiating between the different motives, types and goals of co-creation. These characteristics are crucial for the organisation of the co-creation process. Within this project, we have specialized on the co-conception of ideas. We have found that the four building blocks of the DART framework (Dialogue, Access, Risk Management, Transparency) form a good basis for the successful organization of a co-creation process. Furthermore, we have found that the right selection of co-creators is crucial. Diversity and engagement are important aspects when choosing who to co-create with.

During the testing we observed that the organisation of a global co-creation process involves some organisational challenges, such as the time differences between the co-creators. These challenges can be overcome by techniques such as asynchronous communication. Overall, the co-conception of ideas worked quite well in the tested co-creation process. A number of promising ideas were generated, some of which were novel and hadn't been considered by the crowdfunded startup before. This allows to startup to make grounded decisions on the future product roadmap, while simultaneously involving its customer community.

(2) *What are the required features of a tool (framework) for organizing co-creation between a crowdfunded startup and its community, or a subset thereof?*

The required features of a tool (framework) for organizing co-creation can also be categorized by the DART framework. The framework needs to allow the co-creators to communicate easily on several layers, as well as access all relevant information and resources. Besides this, the risks and responsibilities need to be communicated clearly and the entire process should be designed and organized in a transparent way. The crowdfunded startup AER, which functioned as a case study for this project, had decided to organise the co-creation process globally. This meant, the above mentioned features have to be implemented online and allow co-creators to participate, regardless of their physical location. This was achieved by making use of a combination of available software tools.

In conclusion, it can be noted that the business strategy of co-creation offers many possibilities for businesses and especially for crowdfunded startups. The engaged crowdfunding communities are typically very open for close interactions with the firms and appreciate having a say about the future of the business.

8.2. Limitations

Due to the limited scope and resources of this project, there were several limitations. Most notably, only one very specific type of co-creation was researched and tested in detail, while other forms of co-creations also contain promising opportunities for crowdfunded startups. The period after successfully launching the first product via a crowdfunding campaign, entails several challenges for young startups. By focusing on the *co-conception of ideas*, we have successfully identified a promising approach for deciding what the next products should be. However, naturally there are many other challenges for the startup in order to bring these next products to market. Also for these challenges, co-creation could be a promising strategy. But every stage in the design process, from *ideation* to *specification*, *realisation* and *evaluation* requires a different form of co-creation. These different forms of co-creation also entail other co-creators and another organizational approach.

Furthermore, the envisioned and tested co-creation process was limited in scope. It was only two weeks long and limited to 8 co-creators. Maybe more useful results could've been achieved if these limitations did not exist. This would mean a significant increase in the organizational effort of the moderator and require more resources from the startup.

Additionally, the reward for the co-creators should stay appropriate, meaning it would also have to be increased if their participatory effort grows.

Lastly, the test of the co-creation process was limited, as it was only done with one crowdfunded startup. Each crowdfunded startup has a different relationship to its customers, different products and a different set of challenges and opportunities. Therefore, the results of the tested co-creation process might also differ significantly.

8.3. Future Work

As covered in the previous section (8.2.), there are a number of limitations to this project. I recommend future researchers to further explore the possibilities of co-creation for crowdfunded startups. We've learned that the topic of co-creation involves many different techniques and strategies, all of which can be advantageous for businesses. Thanks to their engaged customer communities, crowdfunded startups are very fitting businesses for this kind of business strategy. We've seen that co-conception of ideas can work well, so there's reason to believe that also other forms of co-creation are worth exploring.

Also, not all crowdfunded startups are equal. Hence, I recommend to broaden the research and investigate other crowdfunded startups to find out what their needs and wishes are. Depending on the specific business situation, other insights and possibilities within co-creation can be found.

Furthermore, more research is needed on the fundamental psychological aspects of human collaboration. Questions like 'how do we collaborate?', 'how do we build trust among collaborators?' and 'what are ideal circumstances for collaboration?' should be answered. These insights can help us to get a better understanding of the conditions needed for a successful co-creation process.

9. APPENDIX

9.1. Osama Malik Interview Transcript

In order to make this transcript concise and digestible, the verbatim way of transcribing an interview has been chosen. This means that all “ehms” and pauses, or to the topic irrelevant parts have been left out of the transcription.

Pablo:

Hi Osama, thank you very much for taking the time. I've seen your TED talk on co-creation. You are especially interesting to me, not only because you seem to be an expert in the field of co-creation, but because of your day job as a business consultant. I'm researching how co-creation can be used as a business strategy, which is of course very different from two artist collaborating on, for example, a piece of music. [...]

I want to start with your definition of co-creation. I'm going to paraphrase here - Co-creation is the art and science of creating something that didn't exist before by working with somebody else. - roughly that's what you said in your TED talk. There's a lot of information in that one sentence and I'm particularly interested in the last part - somebody else. Now, how do you find that somebody and can it be several people? What should I look for and what not? [...] How do I find the right people to co-create with?

Osama Malik:

I think that's an awesome question. A couple of things - the first thing I would look for is the willingness to co-create with you. There's a lot of value that you can get inn bringing really diverse people together, right? So I don't think that having somebody who is an expert in the same thing you're an expert in or who's interested in the same things you're interested is kind of a key driver for finding that somebody else to co-create with. But I do think that there being a willingness [...] to create something also - that has to be a shared desire for co-creation to be really successful. You know, obviously, there's plenty of times when people contribute to something when they're not particularly interested in it [...] - and that's not about co-creation, but ends up becoming requirements gathering or some other portion of a creation process but they're not a fellow creator at that point and not interested in creating something themselves. [...] The willingness to have shared ownership in the thing that gets created is important.

And then, after that, I think that having a unique perspective or having some sort of element that's different from what you have that they bring to it [is important]. The good thing about

humans is that we're all so different that that becomes much easier to do. [...] The art of it being somebody else will bring that diversity of thought, background, upbringing, interests, preference - all those things come together [...]

To your point of - how many people should it be? - I think the world is changing such that you can co-create on a scale that was impossible before, due to technology and the fact that you can be on the other side of the world from somebody and co-create with them. And even crowd-sourcing, Kickstarter is a great example of people who're contributing to a creation process globally. You can do that at a huge scale as well. So I don't think there's major boundaries, but the level of input that you can change. It's probably inversely proportional to the amount of creators that you have. So if there's a thousand people that are co-creating then they'll all have a smaller impact in the overall piece than when a few people co-create. But I don't think that it's limited.

To your specific company, not to limit it to that, but I think it's really cool that you're thinking about it in the context of a community. While you have a common interest in terms of the previous product that you had and using that and wanting to do something creative with new ways of capturing video footage and things like that. There's bound to be some [...] value that's common across that community that you can tap into. [...] Being really close to your customers is super critical in product creation.

[...]

Pablo:

One of the things you said, and I agree to 100%, is that in this digital world we live in today, it's much easier and it's actually possible to co-create all over the world. [...] I'm constantly thinking about the organization behind this and the tools and the software to use: Whether it's surveys, video calls, conferences, Whatsapp groups, Slack groups or Facebook groups - all of these more practical things. Any thoughts on the software, the tools to use?

Osama Malik:

Definitely use all of them. I'm a big fan of Slack, I like the persistence, which I think is important, because during that creative process when things get thrown out there, it's important to keep that persistence - what was said, what was thought of. Because it may go in a holding back now, but later you might say "Hey i think we talked about this before" [...] and then being able to go back and keep that is really good. And Facebook groups have that as well, but I personally like the way Slack works.

One thing Slack doesn't do is real-time collaboration. Like Google Docs [...] where you can have multiple people in the same document or file, that makes a big difference in working remotely. [...]

Pablo:

Now, I'd like to get back to some of the things you said in your TED talk. You mention the three things that you shouldn't do [in co-creation], one of them, the first one actually, is 'don't prepare'. And you explain the concept that you can't create something if you already have your hands full and you already have your ideas set. When you said that, that was something that directly hit me, because I think this will be the most difficult part for me. Because, obviously, since two years I'm already collecting ideas and thinking about the next product. [...] I still want to take your advice very serious, of course; and start this co-creation process without any pre-occupations and with an "empty sheet". So my question would be, how can I achieve that? Do you have any tips on how I can empty my sheet even though it's already full of sketches and ideas?

Osama Malik:

That's a great question. I think there's a couple of things. One is, don't think that all the different ideas that you've had already - those don't go away, right? I would think of it that way; that's a list of things that you already got going, ideas, creations and works-in-progress. And I would recommend to put those aside - and it's not that you're bringing somebody else in to work on those, but the goal is to creating something else that's new with your community or somebody else. [...] You should think of your ideas as assets. You have a your set of assets at whatever level of completion that they are. But when you go into the co-creation session, you're going to create a new asset - and that will help you create a level of separation between the existing ideas you already have and what you go into in the new session. [...]

Pablo:

One more point; again regarding the topic we talked about earlier - the selection of the people to co-create with. I'm still not sure whether I want to make it completely open, where everybody who wants to join in can join in. But then I'd have the fear that people will join just because it's free and then eventually it might get cluttered with people who are not actively engaged. Of if I should have some kind of selection procedure where you could doublecheck if they're actually interested; so you could have a kind of application procedure to be part of the co-creation process. Any thoughts on that?

Osama Malik:

You could think of it as a 'buy in', like poker almost, so there's a certain buy in to be part of the process. That could be time, it could be some sort of skills, or expertise, or commitment to

action; it could be a monetary thing, where you say “hey you have to pay a certain amount to get into the creator’s club” [...] And that that could even start to seed some of the initial capitol. But it also makes sure that the people are active enough, because you got some capitol from them. There are probably a few ways to not make the barrier of entry so low that you get people who are just going to show up and that’s it.

And also, it’s important to think about what they are going to get back in return. Is it equal ownership? Probably not in your case, so what is it that they get? What is the value that they get for whatever their contribution is? Maybe they get first access to the beta product, maybe they get some sort of special edition of it, where you brand it differently; there’s all sorts of thing that you can do. [...]

I would also think about your community - who are the real influencers? Who are the people who are really passionate about what you do? Who are your super customers? And I would actively target them as well and bring them into that group of co-creators. Because those are the folks of which you know you will get the most value out of their contribution.

[...]

9.2. Co-Creation Invite Document



UNIVERSITY
OF TWENTE.

A CO-CREATION EXPERIMENT

Hey everyone,

I appreciate you taking the time to read this, and I hope I can convince you to take part in this experiment. Let me explain:

Next to me being the inventor and founder of AER, I'm also still a student. Currently, I'm working on my Graduation Project for the study 'Creative Technology'. With this project I'm able to combine my study with my business.

With AER, we have built an inspiring community of people who are motivated to try out new things and are interested in new ways of capturing the world. This community is a super valuable resource that I want to use for our next step:
Designing the next AER product.

That's why the overall theme of my Graduation Project is 'Co-Creation'. So what I have in mind, is teaming up with a small group of customers (that's you) and going through a Co-Creation process together to come up with ideas for the next product.

What this means: We will be talking / texting / skyping a lot with each other over a two week timespan. Through that, we will brainstorm and collect a lot of different ideas. Towards the end of the process, the goal is to select a few of the most promising ideas.

Because you guys are spread all over the world and have busy lives, the organisation of this will be difficult. I'll do my best to make it go smooth, but I'm sure there will be hick-ups and challenges throughout, so please consider this an experiment.

Thank you for being a part of this community and for trying something new with me.

Cheers,

Pablo

co-creation:
the art and science of creating something that didn't exist before by working with somebody else

Source:



Osama Malik | TEDxJMU

WHO?

4-8 'co-creators' (AER customers)
& me (Pablo) as the moderator.

WHAT?

We're exploring the possibilities of creative filmmaking and photography together and are working together to find out what the next AER product should be.

HOW?

We will work together to come up with ideas using different brainstorming- and idea generating techniques. We will be in touch via a software called 'Slack' and Video Calls.

WHEN?

The process will be begin on April 28th
and will be wrapped up on May 12th

HOW MUCH TIME?

I expect this process to take a total of about 8 hours of your time during those two weeks.

WHAT FOR?

To take part in a completely new way of designing things and support the making of a new AER product from day 1. You'll get a gift (AER gear) for your participation and the chance to try prototypes before anyone else. Also, of course, you'll get appropriate credit when the finished product hits the market.

THE PLAN

KICKOFF CALL: Sunday, April 28th
BRAINSTORM CALL: Sunday, May 5th
WRAP UP CALL: Sunday, May 12th

During the two weeks, you're expected to invest a total of circa 8 hours of your time. Next to the 3 x 1 hour for each of the calls, I estimate circa half an hour each day, from Monday to Friday. During that time we will communicate mostly via Slack.

To ensure an effective collaboration we will use techniques from the world of 'remote work' such as 'asynchronous communication.

Next to appear.in and Slack, we might use Webjets, Google Docs, Google Forms or OnShape, if needed. If you have other recommendations for tools or workflows to use, let me know!

I have a few fun things planned like trivia games to get to know each other or brainstorm techniques to force us to think outside the box. There's a plan for the two weeks that I want to follow, but we'll keep it flexible. If we need more or less time than planned for certain phases, we'll be able to adjust appropriately.

video calls:

We'll be using the awesome tool 'appear.in' for our video calls. No sign up or installation needed.

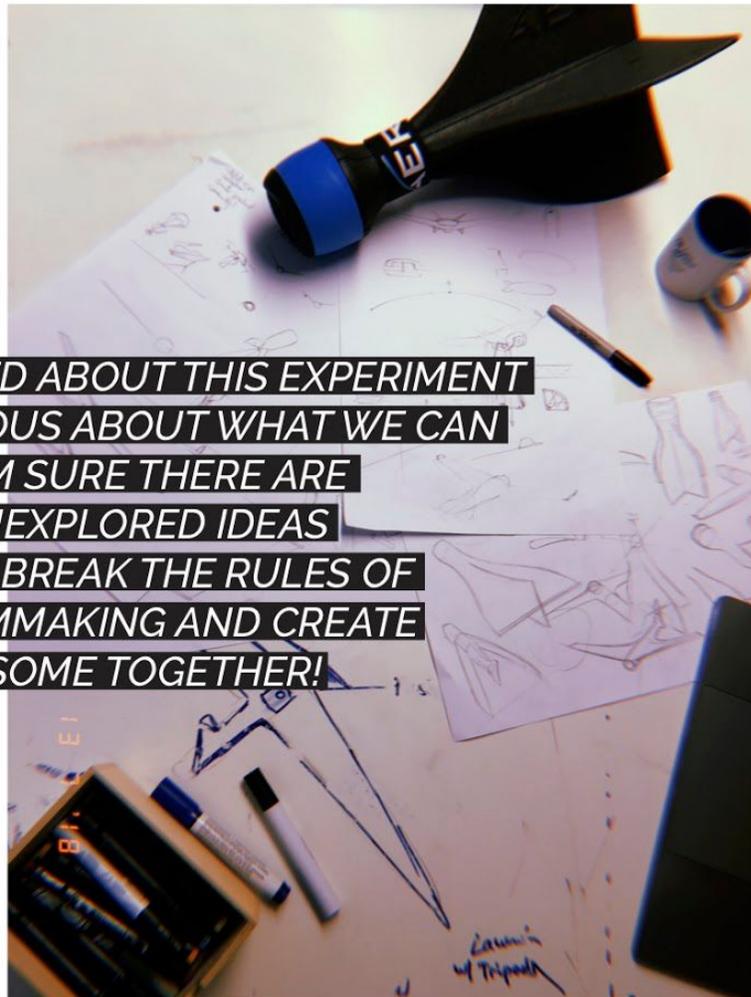


slack:

This will be our main point of contact. Within Slack we can message each other, separate our conversations into different channels, keep track of things, and send over files and funny GIFs.



I'M REALLY EXCITED ABOUT THIS EXPERIMENT AND SUPER CURIOUS ABOUT WHAT WE CAN COME UP WITH. I'M SURE THERE ARE HUNDREDS OF UNEXPLORED IDEAS OUT THERE. LET'S BREAK THE RULES OF TRADITIONAL FILMMAKING AND CREATE SOMETHING AWESOME TOGETHER!



9.3. Questionnaire for participants

13/04/2019

AER Co-Creation Sign-Up

AER Co-Creation Sign-Up

Before filling out this form, please make sure to read the 'Co-Creation Invite' PDF I've sent you.

I'm excited to have you part of this and I can't wait to see what we can come up with together.

Cheers,
Pablo

* Required

1. What's your name? *

2. What's your email? *

3. Why do you want to take part in this?

No worries, I don't expect a long motivation letter from you. Just a sentence or two are enough, so I know what your intentions are.

4. Are you willing and able to put in circa 8 hours of your time (from April 28th to May 12th) for this experiment? *

My estimation: One hour on each of the three Sundays, and circa 30 minutes Monday to Friday
Mark only one oval.

Yes

Other: _____

Group Video Calls on Sundays

Three group video calls are planned on these Sundays: April 28th, May 5th, May 12th

Our Co-Creation group might be scattered across the globe, and we need to find a timeslot that works for all of us.

5. Which timezone are you in? *

To quickly find out your timezone, just google: UTC to [your city] time
Mark only one oval.

- UTC/GMT +12
- UTC/GMT +11
- UTC/GMT +10
- UTC/GMT +9
- UTC/GMT +8
- UTC/GMT +7
- UTC/GMT +6
- UTC/GMT +5
- UTC/GMT +4
- UTC/GMT +3
- UTC/GMT +2
- UTC/GMT +1
- UTC/GMT
- UTC/GMT -1
- UTC/GMT -2
- UTC/GMT -3
- UTC/GMT -4
- UTC/GMT -5
- UTC/GMT -6
- UTC/GMT -7
- UTC/GMT -8
- UTC/GMT -9
- UTC/GMT -10
- UTC/GMT -11
- UTC/GMT -12

6. Which timeslots on Sundays work best for you? (in your local time) *

I'll try to find a time everyone is happy with.

Workflow & Tools

It's quite the challenge to organize a process like this. But luckily we have awesome tools that will help us make it work. If you haven't heard of them before, don't worry. They're all easy to get a hang of.

7. Have you used 'Slack' before?

Mark only one oval.

- Yes
- No
- No, but I've heard of it.

8. Have you used 'Appear.In' before?

Mark only one oval.

- Yes
- No
- No, but I've heard of it.

9. Have you used 'Google Drive' before?

Mark only one oval.

- Yes
- No
- No, but I've heard of it.

10. Have you used 'Webjets' before?

Mark only one oval.

- Yes
- No
- No, but I've heard of it.

Thank you for being a part of this!

It truly means a lot to me.

11. Let me know if you have any recommendations, tips or questions before we get started:



9.4. Voucher for co-creators



Thank you for your participation in the AERFORCE co-creation session.
I look forward to exploring more ideas and developing new products
together with your help. As reward for your input so far, I hereby guarantee to
send you one of the new AER products, once it's ready. I'm not sure what
exactly that will be, but you'll be the first to find out.

DATE

LEVIN PABLO

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