

## Ethical Issues of Health Technology Co-Creation

Short paper

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**Abstract.** In healthcare, co-creation has become the de facto method for creating new products and services. In practice, every major city in Finland offers services where new products can be created together with the domain specialists and end-users. While co-creations as an ideal, fits to the Scandinavian mindset of low-threshold co-operation where everyone can participate regardless of the “file and rank”, there are – primarily ethical – issues that need to be taken into consideration. More so when the approach is applied to the field of healthcare where moral values, such as benevolence and beneficence, typically supersede the more business-oriented ones. In this article, we identify some of these challenges and discuss their implications from different practical perspectives: who should take part in co-creation and why, who can represent the whole group, what should be taking into consideration when deciding co-creation communication methods, and who is responsible if co-creation processes fail.

**Keywords:** co-creation, health technology, ethics

### 1 Introduction

In the core, the idea of co-creation is to integrate the end-users to the product or service development. In other words, to take their views into account during the development process, and eventually to make products that have better “fit” in terms of the end-users’ work. From the business perspective, the idea of co-creation is to make products that are more “likeable” – products meet the end-users’ expectations and are what they want when decisions on acquisitions are made.

Healthcare is a demanding sector from business perspective. The regulatory landscape, user needs, and the overall nature of the work and business create a demanding work and business environment. Especially start-ups, and small companies new to the domain, often think twice before they introduce their products to the healthcare markets. Prior to entering this demanding market, the companies want to ensure that their products are what the end-users want and need. In this, co-creation

comes into play as a way of minimizing market-entry risks associated with the end-users' preferences.

In the following, we focus on the end-user perspective, and investigate what kinds of ethical challenges emerge when the insider, or emic, views of the healthcare personnel are taken account, and the personnel are integrated into the co-development process as a partner.

## **2 Review of co-creation in healthcare context**

We explain co-creation in general, and then define what this means in the context of healthcare. The term co-creation was introduced in business context (Nájera-Sánchez et al. 2020), and it is good to understand the term in general business perspective in order to interpret it to specific fields, such as healthcare.

When speaking of co-creation in general, a customer is seen as the end-user of the product. In healthcare field, a customer usually can cover either a patient or a healthcare worker. In this article, however, we focus only on the healthcare personnel. Thus, when addressing the health technology co-creation, healthcare personnel is the customer and the end-user of the co-created product. Participants are people that take part in co-creation.

### **2.1 Co-creation in general**

There are several terms and definitions for an active customer and their participation in the product developing processes; for example, co-creation, value-creation, and customer co-production are all aiming to the similar conceptualization of an active customer (McColl-Kennedy et al. 2012). Customer co-creation process is active, creative, and social (Piller & Ihl, 2009) and it sees customers actively contributing and selecting the content of the developed product (O'Hern & Rindfleisch, 2010), sometimes right from the start of development (Haukipuro et al. 2018).

Co-creation practices can improve the current work ecosystem. Frow et al. (2016) suggest that resource sharing practices "affect the dynamic ecosystem, changing and shaping the relationships between actors and their perspective resources". There are three types of relationships: bonding, bridging and linking relationships. Bonding happens when actors have close relationship, while bridging happens, when the actors does not have close relationship, but it is vital to share information and resources between them. Linking relationships are those when an actor outside the immediate ecosystem is linked to the closer relationship. Co-creation practices shape the ecosystem so that the actors are attracted to share their knowledge in different ways. However, if the actors do not share similar mental models, collaboration may be difficult, or even get worse outcomes. (Ibid.)

To comprehend customers' needs and ways of work a company should understand, how their customers use their products, and integrate them to their day-to-day work. Customer feedback can bring up issues that developers might not detect

(Haukipuro et al. 2018). Payne et al. (2008) have identified three ways of customer learning: Remembering, Internalization and Proportioning. Remembering is mostly about customer attention. Aim of the Internalization is to “build consistent and memorable customer associations with a product or brand identity”. Lastly, Proportioning means that the customer tries to reflect on their own processes. (Ibid.) Therefore, the company needs to understand, how to get attention of the end-users, what impressions they have when seeing their products, and how customers could include products into their work so that they really see the importance of it.

There are three ways to use and generate customer information in new product development. First way is to *listen into*, when the company use existing customer information that comes from, for example, analysing the sales data or third-party research reports that explains, what customers may need in the field in general. The second way is to *ask from customers* via e.g., questionnaires and interviews, or use so called pilot customers. The third way to use and generate customer information is to *build with them*, when the company actively involve customers in the design or development processes. The last one, building with customers, is basically a co-creation practice. (Piller et al. 2010.)

## 2.2 Co-creation in health technology and healthcare

The nature of healthcare, and the patient work in itself, can be regarded as a constraint or a limiting factor in creation of new services or products. The patient work – i.e., care – is more essential to the domain, than industry-driven development of new products or services. However, co-creation can be regarded as a balancing factor between the patient work and product development, as it serves in the longer run the clinical work. Co-creation is a way for ensuring that the insights of the healthcare personnel are taken into account, and the future products meet the actual clinical need. However, in order to succeed in co-creation, companies should define, what they can and cannot co-create (Ramawamy & Gouillart, 2010), and the development processes should be planned carefully (Wei et al. 2019).

As mentioned before, co-creation practices shape the ecosystem. Frow et al. (2016) define ecosystem well-being in the context of healthcare “enabling the whole healthcare ecosystem to collaborate to improve efficiency and effectiveness”. The healthcare ecosystem is efficient when the information and resources flow smoothly between different actors. Any actor can help with their actions, and thus shape the ecosystem. (Ibid.)

Frow et al. (ibid) have also defined a typology for different co-creation practices for healthcare context. There are eight practices in total: sharing the social capital; sharing the same symbols, signs, and languages to the ecosystem; practices that shape actors’ mental models and practices that are formed or limited by institutions and structures (e.g. how to share knowledge); practices that shape existing value propositions and inspire to make new ones; access to the resources of the ecosystem; practices that create new relationships and generate new opportunities; and practices that mean to be co-destructive and create imbalance within the ecosystem. Practices can be made to shape existing value propositions, or they can affect how to access to

ecosystem resources, or the practices can be chosen so that they form new relationships – or, in some cases, ecosystem imbalance is needed, and co-destructive practices are intentional. It is vital to choose those practices that are suitable for the situation in hand, because the practices can have both positive and negative outcomes to the ecosystem. The practices may affect different levels of the ecosystem, and it is also possible that when the co-creation practices are suitable for the patient, they can still result in negative outcomes in bigger levels of ecosystem, for example in regulatory bodies. (Ibid.)

When approaching healthcare from a business perspective, co-creation is seen to improve companies' knowledge of healthcare industry so that they identify the needs of healthcare. Healthcare sector presumes product development bases on "real, carefully described needs that emerge directly from the healthcare sector". (Hyrkäs et al. 2020.)

Iandolo et al. (2013) have identified five steps that enable healthcare system to emerge. These steps are belonging, sharing, motivation, implication, and action. This means that, basing on value co-creation, the participants should belong to the same environment even though they may have different aspects, share, and start 'common' activities together, have motivation and shared goals to achieve, and feel that they belong to a 'strong community'. In addition, they should identify common development paths so that in the process, different actors' different capabilities can be utilized. (Ibid.)

Usually, healthcare service development focuses on technical quality, and only then on functionality (Elg et al. 2012). This can be improved by using co-creation. Living laboratories and testbeds work well in healthcare sector, and some of them are maintained by hospitals. When developing products for healthcare providers, it is important to understand that people with different work tasks might be going to use it. For example, the doctors, nurses, and administration staff may use the same product. In these cases, it should be considered, who takes part in co-creation processes, and why. (Hyrkäs et al. 2020.)

Healthcare field has been using testbeds a way to organize co-creation processes. Testbeds are units that support the development of innovative services and products so that stakeholders can take part in participation of it (Ailisto et al. 2016, 14). They are manageable and efficient ways to advance co-creation of different types of products and services – and they are utilized particularly well in health technology and healthcare field.

### **3 Ethical considerations of co-creation practice**

Even though co-creation is praised to be a great way to develop products and services, it is not always the best way of developing things. As mentioned before, co-creation and collaboration does not mean value production. If co-creation methods are not defined and planned in a proper way, it can lead to poor solutions and new problems (Le Pennec & Raufflet, 2018).

**Who can take part in co-creation?** This is a vital question, because the collection of participants will impact on the results. The simplified answer would be to select those, who are willing to participate, and who are affected by the co-created products and services: not everyone is willing to participate in co-creation processes (see e.g., McColl-Kennedy et al. 2012; Osei-Frimpong et al. 2018). However, if there are more candidates to possibly to take along, the company needs to decide, how to value the opinions of the individual participants. What if the best feedback comes from someone, who is very difficult to co-create with; or vice versa, the most appealing co-creator has the weakest feedback that does not really help developing? Could the participant be the same person who is in charge of company procurements so that they can affect decision-making of the product that they were co-creating? In addition, in eHealth development in particular, it is essential to remember to co-create with those users, who are in a vulnerable position. Usually, the most willing participants are those younger and healthier people who are more highly educated, so there is a risk that the products and services will be made for them – but not for those, who are uncomfortable using technology (van der Kleij et al. 2019). In addition, pressure to adapt technology can be seen as a risk for autonomy (Sundgren et al. 2020).

In healthcare, co-creation is usually done in testbeds or living laboratories where the healthcare personnel and other product end-users are taking part in co-creation processes. In this context, it is vital to address, whether all co-creators can use their work time in co-creation. Usually, it is not part of their main tasks, and they do not have time for both working and co-creating: how the expenses should be shared and covered? The current workforce situation in the healthcare industry is in a difficult state, and labour shortage impacts even the core work tasks (WHO, 2020). The healthcare employees do not have time to co-creation processes. On the other hand, the co-created technology solutions can ease their workload and optimize their work in the future. This situation leads to the problem of prioritisation: should we focus only on patient work, which is the most important core task, or should we also create possibilities for better work conditions with co-creation?

**Who can represent the whole group?** Co-creation might not be efficient enough if there are too many people taking part in it. However, if only one or two is representing the whole group, there might be a two-table problem in which “these stakeholders must seek consensus within their organization as well as the stakeholder table” (Gray & Stites, 2013). Asymmetric dependence should also be avoided: this means that there should not be in imbalance of power in co-creation processes (ibid). It is important to define the suitable persons: should the group’s spokesperson be someone, whose main task includes the nursing and other healthcare operations but has less experience in co-creation practices; or someone, who mainly concentrates on the co-creation practices and knows what to do, but does not have that much experience in treatment and patient work? This problem is also connected to the issue of labour shortage, in which clinicians already have a lack of resources, as mentioned above. It also can lead to another issues of who is responsible for what. Should the experienced healthcare worker prioritise the patient work, or share their knowledge in co-creation? This could lead to worse care, however the co-creation practice could have better change to success, leading to better work conditions in the future. The second alternative could

be letting the experienced one work only with patients, and leave a less experienced worker to be responsible for participating in co-creation. In that situation, patients can get better care, but the co-creation processes can fail due to the inadequate knowledge of the inexperienced participant. On the other hand, the situation can also be worse, when there is nobody to assign to the patient work: when the healthcare worker takes part in co-creation practices, there are even less personnel doing patient work.

**How the communication of the co-creation processes should be implemented?** To get a successful outcome, all participants should manage their expectations, communications and promises between each other (Payne et al. 2008; Hsieh et al. 2018). Everyone has their own thoughts and judgements that base on their already adopted standards and expectations (Wei et al. 2019). What also should be taken into consideration is the differences of online and offline communication. Online settings have a bigger chance of unethical conduct when compared to face-to-face communication settings (see e.g., Nadeem & Al-Imamy, 2020). In addition, online interaction might be more adjustable and make it easier to participate, at least for some people. However, this might also mean that those who cannot use online methods would be left out of co-creation, and only the people, who are comfortable with different technologies, participate. Thus, if the communication techniques and used technology are not accessible enough, it might confine some end-users out of the co-creation.

**Who is responsible if the co-creation processes fail?** This has been researched by Wei et al. (2019) who addressed the co-created service failures and especially how the company could recover from them. However, the ethical view is very under-researched. If the co-creation fails, the customers' motivation to co-creation in the future will drop, and their opinions of the company will change negatively: in the worst-case scenario, they won't see the company to be competent, just nor ethical. (Ibid.) Even though the product or the service is created together, customers will blame the company if co-creation fails: consumers simply expect positive value from their co-creation participation (Nadeem et al. 2020). It is studied that customer feedback is the best evaluation tool for indicating the success or failure of the practices (Lin & Lin, 2006). Therefore Wei et al. (2019) suggest that companies should consider carefully how much effort they expect from their customers, "particularly during the initial service delivery". And even more importantly, companies should establish solid ways to cope ethically sustainable with all aspects of co-creation.

## 4 Conclusions

Existing literature addresses co-creation quite broadly, and several studies consider customer feedback vital for innovation processes. However, co-creation requires comprehensive planning: who is involved and why, how many people can represent the whole group, which innovation processes can be co-created, and how co-creation is executed. Sometimes end-users should be involved from the very beginning, whereas in some cases it is necessary to develop the product in certain degree before co-creation.

In healthcare, some ethical aspects are more important than in other industries. Health technology solutions really can ease the workload of the healthcare field, where labour shortage is constantly impacting the working conditions and patient work. In order to really enhance work, it can be vital to involve healthcare personnel into the development, and hear their thoughts of appropriate solutions that could ease their workload. If the development is done wrong, there is a chance that the offered products and solutions could complicate work, instead of making it easier. Whereas ensuring that patient care and its outcomes are good, the same engagement processes are also part of functional healthcare technology innovations and development. It is not trivial how co-creation is defined, implemented and how different stakeholders are heard, and ethical issues are sustainably covered.

Co-creation is stated to be a suitable way to create services and products, and studies show that it is very appropriate for health technology development. However, it does require ethical perspectives in order to succeed. They make the co-creation processes more mature. For example, testbed procedures are more approachable, if they take the work prioritisation issues seriously, and take the different participation options into consideration.

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