

# When firms commercialize user innovations: Determinants of users' emotional fairness reaction

*Working paper*

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## **Introduction**

The topic of this research are the consequences of companies commercializing user innovations. It is a well established fact that very many (end-) users innovate. An estimation, based on recently conducted nationally representative surveys, indicates that there are millions of user innovators across the globe (de Jong 2016). Some of these innovations hold great commercial potential. Successful examples of user innovations are the dishwasher (Shah and Tripsas 2007), new sports such as snowboarding and canyoneering (Franke and Shah 2003), and the Open Source Software Linux (Lakhani and Panetta 2007).

Generally, most users are willing to freely reveal their innovations. Studies in the US, UK, Finland and Japan indicate that only a fraction of all innovators (<10%) legally protect their inventions, whereas the majority (>80%) is open to freely reveal to at least some people (de Jong et al. 2015; von Hippel et al. 2012; Ogawa and Pongtanaalert 2011).

User innovations have proven to be a valuable source of open innovation for firms (Shah and Nagle 2019). There are many examples of firms picking up these user innovations to integrate them in future products, which are then sold to all users (Jeppesen and Frederiksen 2006). Users freely reveal their knowledge in communities, lead-user workshops, crowdsourcing contests or other user innovation methods; firms use this knowledge to develop, produce and distribute new goods. By this users benefit of the broader range of products and the possibility to realize their ideas. Well-known examples are Lego with its firm-hosted community "Lego Ideas", or Linux, which kernel is used by several companies as the foundation for their products. Google for example uses Linux to program the operating system Android.

However, we also observe many cases where companies attempts to commercialize user innovations led to conflicts and had major negative consequences. MakerBot outraged their Thingiverse community, when the company apparently patented community designs and by this infringed upon the open source philosophy. This led to a decrease of engagement. When Oracle acquired MySQL, users left the community and founded a new one to stay independent. The company was harshly criticized as "the anathema to open software"(Hacker News).

So, why are some commercializations of user innovations harmonious, whilst others result in conflicts?

## **Fairness as an antecedent for user behavior**

Franke et al. (2013) were the first to address fairness theory as a complementary theory to the free innovation paradigm. They examined users' initial decision to contribute to firm innovation and concluded that fairness is a crucial factor, affecting users' decision to participate in

crowdsourcing contests. This study clearly indicated the importance of a fair distribution of benefits between all stakeholders, referring to different benefits firms would gain through commercializing users' ideas in crowdsourcing contests.

Faullant et al. (2017) explored the influence of fairness on the customer relationship with companies hosting crowdsourcing contests. Their study indicates that fairness significantly influences evoked product interest and perceived innovativeness.

This paper aims to extend these findings, by investigating the role of fairness when firms commercialize user innovations. We argue that user innovators' fairness perception of the commercialization of their innovation has emotional and behavioral consequences; which in some cases are not in favor for the firm.

The research question is thus:

*Why are some commercializations of user innovations perceived as fair and others not?*

I build a framework that distinguishes the institutions involved and distills factors that may influence fairness and therefore decide over harmonious or conflictious commercialization activities. This framework will be complemented and detailed in an extensive literature review and case studies. The aim of this framework is to identify which elements of the commercialization process are most discriminating in regard to fairness and to induce propositions.

### **Fairness theory in general**

There are three types of fairness, which have been shown to be distinct from one another: distributional fairness, procedural fairness and interactional fairness (Colquitt 2001). Distributional fairness describes the perceived fairness of (allocation) outcomes (Adams 1965). Adams' equity theory is the dominant theory of distributional fairness.

$$\frac{\text{outcome (individual)}}{\text{input (individual)}} = \frac{\text{outcome (reference)}}{\text{input (reference)}}$$

Equity theory states that "people compare the ratio of their inputs and outcomes to the ration of inputs and outcomes of referent others" (Ambrose and Arnaud, 2005). There are two more allocation norms besides equity: equality and need. According to equality norms, a fair allocation gives all recipients the same. According to need norms, a fair allocation is achieved, when recipients with a greater need receive more (Leventhal, 1976).

Procedural fairness describes the perceived fairness of the allocation processes, which led to certain outcomes, basically the fairness of how decisions are made (Thibaut and Walker, 1975; Leventhal, 1980; Lind and Tyler 1988). There are six characteristics defining a fair procedure: consistency, bias suppression, accuracy, correctability, representativeness and ethicality.

Interactional fairness describes the way how decision-makers behave towards those affected (Bies & Moag, 1986). Interactional fairness particularly plays an important role if – in our case – the user innovator has to accept the decision of a third party, in this regard the firm's decision to commercialize the innovation (Klendauer et al. 2006 193). Interpersonal fairness focusses on respectful, polite and correct behavior of decision-makers towards the affected. Informational

fairness in turn focusses on adequate explanations justifying a particular decision (e.g. a standardized job rejection vs. an individualized answer).

### The commercialization process

The central element of the commercialization process is (1) the user innovation that is supposed to be commercialized. The innovation was developed by (2) a user innovator. Many users innovate jointly in (3) a community and subsequently freely reveal the innovation within this group. User innovators seek assistance among peers, in return the innovation is shared for everyone free to further develop or use (Franke and Shah 2003). By participating in, or hosting communities, lead-user workshops, crowdsourcing contests or other user innovation methods, (4) firms get access to the revealed innovation. They start (5) the commercialization process and reward the user innovator. Figure 1 depicts the whole process.

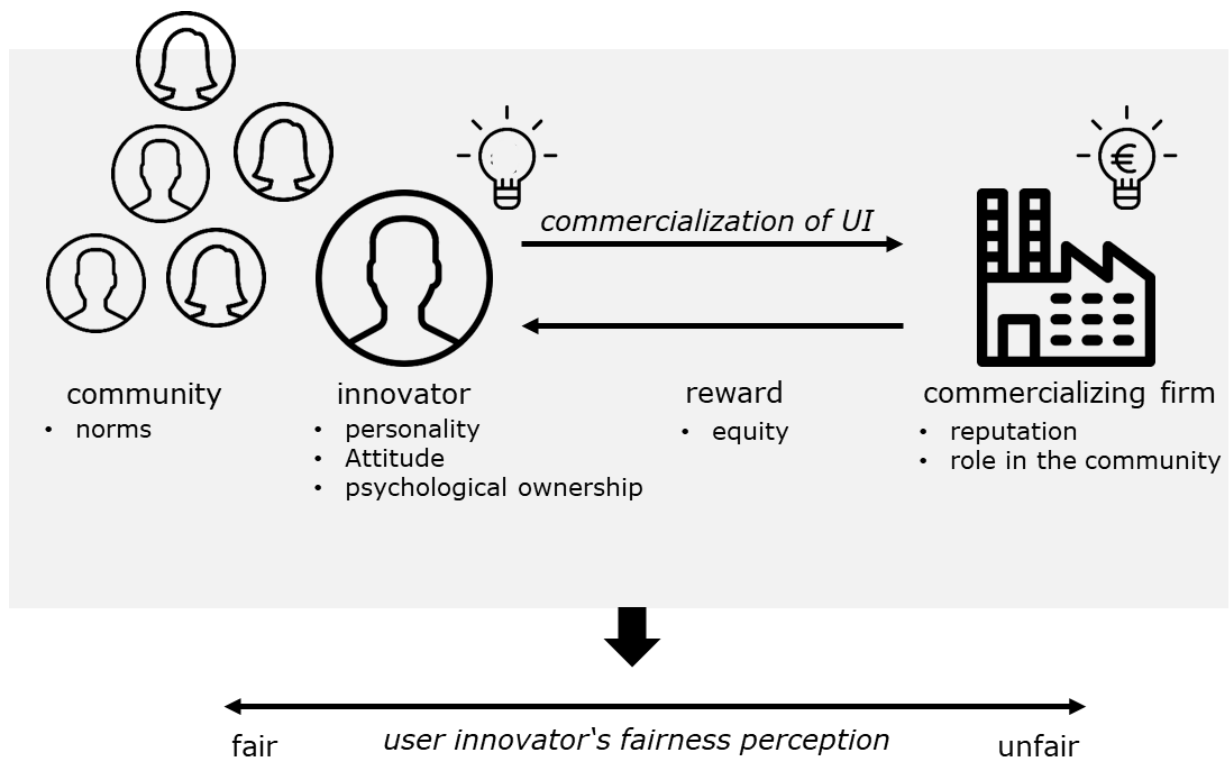


Figure 1: Factors that influence user's perception of fairness, when firms commercialize user innovations

To illustrate the framework, the commercialization process in the community "LEGO Ideas" is explained in the following. LEGO can be regarded as a pioneer in incorporating user innovation, as the firm has build a highly vivid producer-user ecosystem (Hienerth et al. 2013). LEGO Ideas is their firm-hosted community. User innovators (2) have the possibility to submit their ideas or innovations (1) to the website, which then are freely revealed to the community (3). The community then decides which innovations they want to support. Community members engage with the innovator, give feedback and show their support by following. As soon as the innovation has gained 10.000 followers, experts from LEGO review it (4). Reaching this step can take up to several years. Successful reviewed innovations go into production and get

commercialized (5). User innovators get a reward in form of 1% of the total net sales of the product; moreover, they are credited as the LEGO Ideas set creator.

### **User innovators' fairness perception of the commercialization**

In the following, we examine each of the framework's elements to illustrate their influence on user innovators' fairness perception. We extract the discriminant characteristics per element, which – under *ceteris paribus* conditions – would decide over the fair or unfair perception of the whole commercialization process.

#### **(1) Characteristics of the user innovator**

A user innovator's personality is critical for fairness perception. Research shows that “individuals perceive their environments differently depending on their personality and these perceptions can lead individuals to react and behave differently” (Törnroos et al. 2018). A recent study indicated that three of the Big Five personality traits influence fairness perception. Neuroticism is associated with perceptions of lower distributive, procedural and interactional fairness. Agreeableness, on the contrary, is associated with perceptions of higher procedural and interactional fairness. Openness is associated with perceptions of higher distributive fairness (*ibid.*).

*Proposition 1a: Neuroticism, agreeableness and openness affect perceptions of fairness. User innovators with high neuroticism are more likely to perceive the commercialization of a user innovation as unfair, while innovators with high agreeableness and high openness are more likely to perceive fairness, c.p.*

Whilst personality traits are quite stable, attitudes are enduring, but more likely to change. Attitudes are often the result of past experiences or upbringing. There are two critical attitudes in this model: the attitude towards fairness and the attitude towards commercialization.

The attitude towards fairness is coined as “justice orientation” (in the literature the terms justice and fairness are used interchangeably). This term refers to how strongly individuals value fairness. It is shown that individuals with high justice orientation are more vulnerable to evaluate a situation as unjust, than individuals with low justice orientation (Sasaki & Hayashi, 2014).

*Proposition 1b: User innovators with high justice orientation are more likely to perceive the commercialization of a user innovation as unfair, c.p.*

The attitude towards commercialization in general can be either rather positive or negative. Some individuals might equalize commercialization with simply making profit and therefore associate e.g. capitalism, greed and exploitation. Hence, their perception is quite negative.

*Proposition 1c: User innovators with a negative attitude towards commercialization are more likely to perceive the commercialization of a user innovation as unfair, c.p.*

During their innovation processes, user innovators can develop feelings of psychological ownership. In the LEGO Ideas community, the innovator has spent several years to develop the innovation and gain supporters within the community. The stronger the feelings of psychological ownership, the higher the perception of loss aversion, when the innovation gets commercialized.

*Proposition 1d: User innovators with strong feelings of psychological ownership are more likely to perceive the commercialization of a user innovation as unfair, c.p.*

## **(2) Characteristics of the user community**

A user community's norms and values are critical in regard to fairness perception. When Oracle acquired the Open Source database management system MySQL, there was an outrage within the developer community. Oracle was named "the anathema to open software" (Hacker News 2012), because Oracle's norms did not comply to the community's norms. BrickArms LLC is a business initiative, based in and targeted to the LEGO community. The company produces LEGO-compatible weapons and war minifigures, which sparked controversy, within the community (Hienerth et al. 2014). Although commercialization is accepted in the LEGO community, BrickArms LLC commercial products violated the community's ethics and moral values.

*Proposition 2a: The more similar the company's norms are to the community's norms, the more likely the innovator will perceive the commercialization as fair, c.p.*

## **(3) Characteristics of the innovation**

A simple innovation, such as a t-shirt design, has another value than a highly complex technology, such as NASA's Lunar Lander Challenge (Gustetic et al. 2015). This value depends on the costs to produce the innovation and in addition to this, its perceived usefulness. Throughout the commercialization process, the innovation gains an economic value.

In the LEGO Ideas community, the value of the innovation is pretty low, as it is only an idea at the time of submission. Through commercialization the idea is manufactured, advertised and distributed and eventually gains economic value.

*Proposition 3a: The higher the economic value of the user innovation, the more likely the innovator will perceive the commercialization as unfair, c.p.*

Further factors are the characteristics of the commercializing company as well as characteristics of the process and reward. These factors will be examined during the further research.

## **Discussion and next steps**

Already the first theoretical analyses show that fairness reactions are not "given" but are the consequence of structural factors. The next step is obviously, to investigate these factors more in-depth, assess their relative importance and interactions, and thereby develop propositions that make clear predictions. These propositions allow companies considering to commercialize user innovations to proceed in a way that the likelihood of negative reactions is minimized .

From a research perspective, the next step is to empirically test the propositions.

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