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Crowdsourcing Business Model Innovation

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Abstract

Successfully adapting existing business models or developing new ones significantly influences a firm's ability to generate profits and develop competitive advantages. However, business model innovation is perceived as a complex, risky and uncertain process and its success strongly depends on whether or not firms are capable of understanding and addressing their customers' needs. This study explores how crowdsourcing-based search approaches can contribute to the process of business model innovation. Drawing on data from a crowdsourcing initiative designed to develop ideas for new business models in the podcast industry, we provide first exploratory insights into the value of crowdsourcing for innovating a firm's business model, and discuss which characteristics of crowd-contributors increase the quantity and quality of the outcome.

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Keywords: business model innovation, crowdsourcing, open innovation, distant search, complex problem solving

1. Introduction

Successfully creating value for customers, delivering it to them and capturing value from doing so, i.e., innovating business models, is increasingly considered as a main driver of performance and competitiveness of firms (e.g., Chesbrough, 2010; Teece, 2010, Zott, Amit and Massa 2011). However, developing new business models or changing existing ones is a complex, risky and highly uncertain process (e.g., Im and Cho, 2013, Sosna et al. 2010), not least because business model innovation requires experimentation (McGrath, 2010), a specific leadership agenda (Smith, Binns, and Tushman, 2010) and boundary-spanning capabilities (Zott and Amit, 2010). Finding ways of alleviating the process of developing new business models and reducing the risk of failure is thus essential for the success of business model innovation (Chesbrough, 2010).

Recent discussions and practical applications related to reducing the complexity of business model innovation focus on rigorously structuring business model innovation efforts at the expense of missing out on addressing the dynamics and interdependencies inherent to a business model (e.g., Massa and Tucci, 2013). Since one of the most important aspects of successful business model innovation is that firms understand and address the needs of their current (and future) customers (e.g., Chesbrough, 2007, Teece, 2010, Zott and Amit 2011), this article takes a different approach to contributing to the agenda of alleviating business model innovation. Building on recent insights related to the value of crowdsourcing for problem solving in general and product innovation in particular (e.g., Afuah and Tucci, 2012, Jeppesen and Lakhani, 2010), and the increasing role of crowdsourcing as a way of opening up a firm's business model towards external partners (e.g., Bogers, Afuah and Bastian 2010; Boudreau and Lakhani, 2013) the aim of this paper is to investigate how crowdsourcing-based search mechanisms can contribute to the process of developing business model innovation.

We argue that activating self-selection among crowds of users may provide similar results for business model innovation as existing research shows for product innovation (e.g. Poetz and Schreier, 2012, Nishikawa, Schreier and Ogawa, 2013) for two reasons. First, crowdsourcing user ideas for business model innovation may overcome the sticky-information problem (von Hippel, 1998) involved in firms' traditional attempts of accessing need-based information of existing and/or future customers as an input to business model innovation. Second, it is expected that the knowledge-related benefits from drawing on a large and diverse crowd of users (e.g., Jeppesen and Lakhani, 2010) are not limited to need- and solution-based information relevant for generating novel value propositions. Based on, for example, users' professional backgrounds it is likely that at least some users within a crowd also hold knowledge about how to innovate the way a firm delivers or captures value. While it might appear almost contradictory to directly ask users about how a firm can generate or increase its profit while most of them might prefer to pay as little as possible for as long as possible, we furthermore argue that aspects related to the users' motivation, attachment to the product or brand, prior knowledge and characteristics (e.g., Füller, Matzler, and Hoppe, 2008; Poetz and Schreier, 2012; Franke, Keinz, and Klausberger, 2012; Villarroel and Tucci, 2010) as well as factors connected to the problem's modularizability (Afuah and Tucci, 2012) influence whether (or not) crowds are willing and able to contribute their knowledge to business model innovation.

To explore our research question related to the value of crowdsourcing for business model innovation we conducted an empirical study in which we crowdsources and evaluated business model ideas for Sweden's most popular podcast, Filip and Frederik's podcast (www.filipandfrederik.com). The podcast industry is an appropriate field for studying the value of crowdsourcing for business model innovation since it has generally experienced a rapid growth over the past years, both in terms of listeners and podcasts, and podcast

producers including Filip and Frederik have already started experimenting with new forms of creating, delivering and capturing value.

Our findings demonstrate that crowdsourcing business model innovation produces a considerable number of novel and valuable ideas with respect to all major dimensions of business model innovation, i.e. value creation, value delivery and value capture. More than 20 percent of the submitted ideas include novel component ideas for four or more elements of the business model canvas, i.e. display a high degree of change and can be considered radical business innovation (Hartmann, Oriani, and Bateman, 2013; Mitchell and Coles, 2003). The degree of change strongly correlates with the quality of ideas, i.e. those users who submit business model ideas comprising of several different component ideas tend to provide inputs with higher levels of novelty and value. Investigating the drivers of idea submission and idea quality reveals that users who display high levels of lead usersness and personal creativity are specifically qualified to contribute to business model innovation. Interestingly, we furthermore find that while perceived fairness of the crowdsourcing initiative positively influences the likelihood of submitting ideas as well as the ideas' degree of change, attachment to the podcast in terms of how much users perceive themselves to be fans has a negative effect on both, the quantity and the quality of the outcome. Finally, our findings also indicate a number of prior knowledge assets such as experience with business model innovation to impact both the qualitative and quantitative outcome of business model innovation. We present these in more detail as part of the findings section of this paper.

2. The value of business model innovation

Business model innovation is increasingly recognized as one of the most important sources of creating competitive advantage in rapidly changing environments driven by new technologies, changes in customer preferences, and new regulations (Chesbrough, 2010;

Teece, 2007; Teece, 2010; Zott, Amit, and Massa, 2011). Successfully adapting existing business models or developing new ones significantly influences a firm's ability to generate profits (Chesbrough, 2010; Hartmann *et al.*, 2013; Sosna, Trevinyo-Rodriguez, and Velamuri, 2010; Teece, 2010) and is thus considered to be the most sustainable form of innovation (Johnson, Christensen, and Kagermann, 2008; Teece, 2007; Teece, 2010; Wirtz, Schilke, and Ullrich, 2010).

Although widely used in recent strategy literature (e.g., Baden-Fuller and Mangematin, 2013; Casadesus-Masanell and Zhu, 2013; Zott *et al.*, 2011) and practitioner discussions (e.g., Chesbrough, 2007; Pohle and Chapman, 2006), the business model concept itself is criticized for lacking clarity (Saebi and Foss, 2014). Not least, this is due to a number of different approaches and definitions that have been presented over the last decade (e.g., Baden-Fuller and Morgan, 2010; Chesbrough and Rosenbloom, 2002; Johnson *et al.*, 2008; Morris, Schindehutte, and Allen, 2005). However, there seems to be growing consensus that business models specify firms' value-creation and value-capture mechanisms (Massa and Tucci, 2013; Zott *et al.*, 2011). By enabling new forms of value creation, value delivery, and value capture, business models can be a subject of innovation in itself (Sako, 2012; Zott *et al.*, 2011). Examples such as Dell, Xerox, E-Bay or Apple are often used to outline the positive effects of successful business model innovation on firm performance and competitiveness (e.g., Chesbrough, 2003; Johnson *et al.*, 2008). However, successfully developing a new business model is perceived as a highly uncertain and risky process (Sosna *et al.*, 2010). With business model innovation firms cannot hold on to analytical approaches, business model innovation demands a "discovery driven approach" (McGrath, 2010). Especially incumbents need to overcome organizational inertia (Sosna *et al.*, 2010) and find ways to manage conflicts with existing business models (Chesbrough, 2010; Christensen, 2006) in order to be successful with business model innovation. However, this is a complex

task and managers often find it difficult to identify, evaluate and select qualified new business models (Im and Cho, 2013). Beyond the uncertainty involved in experimenting with new business models, many firms simply cannot risk to get business model innovation wrong (Chesbrough, 2010; McGrath, 2010). Sosna et al. (2010), for example, argue that firms are usually neither able to bear the costs of failing with business model experimentation nor willing to risk losing market share as a result of unsuccessful attempts. Chesbrough (2010) thus emphasizes how important it is for firms to develop capabilities for alleviating the process of successful business model innovation.

One factor that is discussed as being most important for successful business model innovation is that firms understand their current (or potential) customers' needs, i.e., firms need to know what their users want, how they want it and how they can organize themselves to meet those needs, while capturing value from doing so (Chesbrough, 2007; Im and Cho, 2013; McGrath, 2010; Sosna *et al.*, 2010; Teece, 2010; Zott and Amit, 2010). However, due to the sticky nature of need-based information (von Hippel, 1998) it is often difficult to obtain the knowledge that is required for fuelling the design of successful new business models (Teece, 2007; Teece, 2010).

3. The role of crowdsourcing in business model innovation

Involving users more directly by allowing them to contribute solution-based information to innovation processes has turned out to be a successful way of overcoming the sticky information problem in the development of new products or services (e.g., von Hippel, 2005). One of the most recent ways of opening up innovation processes and involving users is known as crowdsourcing, defined as the act of outsourcing a task to a large and potentially unknown "crowd", rather than to a designated "agent" (an organization, informal or formal team, or individual), such as a contractor, in the form of an open call (Afuah and Tucci,

2012). In spite of crowdsourcing as a formal term being relatively new, much research has already started to touch upon the potential benefits of involving crowds in the process of developing new products and services (e.g., Jeppesen and Lakhani, 2010; Poetz and Schreier, 2012; Nishikawa *et al.*, 2013). These include knowledge-related benefits suggesting that drawing on a large and diverse base of knowledge, skills, and pre-existing solutions can increase the likelihood that a given problem is solved, reduce the time required to solve the problem, and generally lead to more novel and valuable outcomes.

While crowds can be engaged in many ways, one of the most straightforward and popular approach is through contests, typically made available to a large and diverse group of potential problem solvers or contributors (e.g., Boudreau and Lakhani, 2013). These contests are performed in a tournament-based setting where each agent from the crowd (individual solver/contributor) self-selects to work on its own solution to a problem, and the best solution is then chosen as the winner (Afuah and Tucci, 2012). When a competitive setting is more (or less) appropriate than a collaborative one is discussed by Boudreau and Lakhani (2009). The authors identify the type of innovation, the motivations of the innovators, and the business model of its platform as critical issues that have to be addressed when making the decision between collaborative communities or competitive markets.

In the context of business model innovation the concept of crowdsourcing has so far been discussed as enabling new forms of business models in relation to the value-creating part, notably the generation of new product ideas and user involvement. Threadless, for example, succeeded with designing a business model in which a large community of platform users continuously submits novel t-shirt designs and additionally selects the best ones for mass production (e.g., Ogawa and Piller, 2006). While crowdsourcing is increasingly considered to be a way of opening up a firm's business model towards external partners,

particularly users (e.g., Bogers, Afuah, and Bastian, 2010), little research has investigated the role of crowdsourcing in the actual process of business model innovation.

That crowdsourcing contributes to the value-creating part of business models (e.g., Poetz and Schreier, 2012; Nishikawa *et al.*, 2013) is not surprising since there are good arguments for why users are capable of contributing novel value propositions to firms' innovation activities (cf. von Hippel, 2005), motivated to do so (cf. Jeppesen and Frederiksen, 2006), and specifically qualified to respond to crowdsourcing-based search approaches (e.g., Poetz and Schreier, 2012). However, crowdsourcing may theoretically impact all business model components including customer value proposition, market segments, revenue model, growth model and capabilities (Afuah, 2014). In particular, activating self-selection among a large and diverse group of potential contributors, and by doing so transforming what is a distant search for the problem owner into a local search for the problem solvers (Afuah and Tucci, 2012), is not limited to accessing knowledge on novel value propositions related to specific market offerings. Crowdsourcing-based search approaches have successfully also been applied to, for example, gaining scientific insight (Jeppesen and Lakhani 2010; Franzoni and Sauermann, 2014; Guinan, Boudreau, and Lakhani, 2013), selecting promising new ventures via crowdfunding (Mollick, 2013), identifying markets for existing technologies (e.g., marblar.com) or developing marketing campaigns (e.g., tongal.com). Specifically the latter applications indicate that a large and diverse crowd may also possess knowledge, skills, and pre-existing solutions with respect to delivering and capturing value in business model innovation. Some users within the crowd likely even know about how to innovate an existing revenue model because they, for example, have prior experience in founding their own businesses within and outside the industry of the firm that is searching for business model innovation (Cliff, Jennings, and Greenwood, 2006).

While it is likely that crowds possess relevant knowledge for business model innovation, it is, however, less clear whether or not (at least some) users within the crowd are also willing and able to contribute their knowledge, specifically with respect to ideas for delivering and capturing value. For product or service innovation it has been shown that users often freely contribute to firm-hosted crowdsourcing initiatives because eventually, they might get a product or service they need and want themselves (cf. von Hippel, 2005). For business model innovation other intrinsic and extrinsic motivational factors including monetary incentives in tournament-based crowdsourcing initiatives and non-monetary incentives related to, for example, building a reputation and potentially inducing future collaborations with the hosting firm (e.g., Villaroel and Tucci, 2010; Afuah and Tucci 2012) may be more effective in activating contributions. Another factor that reportedly influences whether or not users are willing to contribute their knowledge is the extent to which they perceive the crowdsourcing initiative to be fair (Franke, Keinz and Klausberger, 2013). Related to the fairness argument it is important to consider how participation is solicited since any co-creation project carries risks for conflicts, may create frustration among participants and evoke angry reactions such as negative word-of-mouth in social media from contest participants if expectations are not met or the spirit of the process is violated (Gebauer, Füller and Pezzeri, 2013). Paying attention to fairness aspects may specifically be important in the process of crowdsourcing business model innovation since the incentives of providers and users related to capturing value can clearly diverge.

Furthermore, crowd members' willingness to contribute to business model innovation may be influenced by how much they are attached to the product or brand of the firm. A strong passion for the product or brand usually facilitates users' willingness to share their ideas and participate in firm-hosted innovation efforts (e.g., Sawhney, Verona, and Prandelli, 2005; Füller, Jawecki, and Mühlbacher, 2007). In a more recent study, however, Füller,

Matzler and Hoppe (2008) find that brand identification is less a driver for engaging in crowdsourcing processes than brand community members' general interest in (open) innovation activities and their creative personalities. With respect to the quality of brand community member's contributions there is some evidence that those with a strong attachment to the product or brand ("fans") are capable of making specifically valuable contributions to firm-hosted innovation projects (e.g., Kozinets, 2002) because of their extensive experience with the existing product or brand. However, the innovativeness of their contributions may be constrained by the negative effects of path dependency and functional fixedness (e.g., Duncker, 1945; Chrysikou and Weisberg, 2005) to a higher degree than those of non-fans. In addition, stronger attachment to the existing product or brand may also entail a higher resistance to change in general (cf. Muniz and Schau, 2005) and thus either limit users willingness to contribute ideas to business model innovation at all or constrain the novelty of their contributions. Related to this and in line with what Christensen (1997) describes as the innovators dilemma crowdsourcing business model innovation may have limited potential for radical change if the crowd involved consists of existing customers or users only.

Finally, applying crowdsourcing-based search mechanisms for business model innovation may be constrained by the complexity of the problem itself. Though (at least) some users within a crowd are likely to possess knowledge for business model innovation and willing to share it, they may not be able to understand the problem and thus cannot transfer their knowledge without interacting with the focal firm (Afuah and Tucci, 2012). Its boundary spanning nature (Zott and Amit, 2010), the need for experimentation (McGrath, 2010), and the specific leadership agenda required (Smith *et al.*, 2010), make business model innovation, without doubt, a complex and tacit problem that cannot easily be articulated or codified for being broadcasted to a crowd. Afuah and Tucci (2012) suggest that in order to

solve complex problems with crowdsourcing, the problems have to be simplified to make them easier to understand for potential problem solvers, which involves the risk of misrepresenting the problem. However, if the problem is modularizable, problem complexity can be reduced, specifically if there are not a lot of interdependencies between the subtasks (Afuah and Tucci, 2012). In business model innovation, modularizing the problem may be addressed by using graphical business model frameworks. Graphical frameworks of the business model, which are a conceptualization and formalization of the business model obtained by enumerating, clarifying and representing its essential components (Massa and Tucci, 2013) offer a rigorous approach to structuring business model innovation efforts. Massa and Tucci (2013) assume the power and popularity of these frameworks stem from their simplicity and parsimony, which in turn comes at cost of the descriptive depth and their inability to represent the dynamics inherent to a business model. A popular example among managers and practitioners of such a graphical framework is the Business Model Canvas (Osterwalder and Pigneur, 2010), which decomposes a business model into nine components.

3. Method

We use a quantitative explorative approach to investigate the potential role of users in the generation of ideas for business model innovation. Similar to other studies in the field (e.g., Poetz and Schreier, 2012) we first collected user ideas for a specific real-world problem (in our case business model innovation), then measured the characteristics of the contributing users, and finally had the outcome of the idea generation process evaluated by independent industry experts.

In order to address our research question on the value of crowdsourcing for business model innovation an appropriate research context had to meet the following criteria related to both, the user perspective and the firm perspective. Starting from the user perspective, first,

users needed to have strong commitment to share their ideas. Else, it would not be possible to get enough useful inputs for both the users themselves and the firm. Second, users needed to have a basic understanding of the current business model of the firm in order to contribute. If the problems posed to users are too complex and demand a high level of expertise, average users will be constrained in their ability to contribute meaningful ideas (Nishikawa et al., 2013). From the firm perspective, the criteria to be met were that there is an intention to change the current business model, and that the firm is willing to open up its business model innovation process and launch a crowdsourcing initiative. Additionally, the firm needed to have a large enough user community to ensure a sufficient sample size.

To meet these criteria, our data was collected in cooperation with Sweden's most popular (audio) podcast, Filip & Frederik's podcast (www.filipandfrederik.com). The podcast industry in Sweden has experienced rapid growth in terms of numbers of listeners and podcasts in recent years (Svenska Dagbladet, 2012). Due to the recent appearance of the podcast industry, podcast producers show frequent experiments with different business models. The hosts of the podcast, Filip Hammar and Fredrik Wikingsson, have both a background as journalists and TV-hosts, and are among Sweden's most popular TV-hosts. In 2010 they started the Filip & Fredrik's podcast, and since then, have produced more than 200 episodes. With more than 250,000 listeners, it is one of Sweden's most listened podcast

Filip and Fredrik's weekly podcast is an entertaining, fun and thoughtful conversation between two best friends. The topics revolve around their personalities, celebrities and their daily lives. The recording is done without manuscript to create a spontaneous feeling. The podcast is targeted at men and women between 25-45 years old and is distributed through Spotify, iTunes, the podcast's own website, and a Swedish podcast aggregator. Revenues are derived from sponsored segments where Filip and Fredrik describe a product, service or organization. Costs mainly relate to the salaries of Filip and Fredrik and the audio production

editor. Sales of sponsored segments are done by SBS Discovery Media, a European media group.

Filip and Fredrik's podcast has a highly engaged fan community. Listeners have already been contributing jingles, posters and fan-websites over the past years. Since Filip and Fredrik's podcast has been active for more than three years, listeners are already familiar with its business model. At the time of the study, the current business model did not involve any further technical components than needed to download a podcast, and was comparable to other radio or media offerings in the Swedish market.

Barriers to business model experimentation might emerge as a result of the initial business model due to expectations from existing podcast followers and the success of the established business model. There is an obvious risk of losing listeners with unsuccessful business model experiments that do not meet the expectations of existing podcast followers. Additionally, the success of established business models may lead firms to miss out potentially valuable ideas when they do not fit with their current business model (Chesbrough and Rosenbloom, 2002; Chesbrough, 2010).

Hammar and Wikingsson have stated in the podcast and in a personal interview that they are trying to improve the podcast's business model, but are not certain about the direction they should take. Due to the large coverage of the podcast with 60 min playing time each episode, they believe that there is more potential value in the podcast, both to them and the listeners, than currently captured. As a result, Hammar and Wikingsson were highly interested in launching a crowdsourcing initiative for generating business model ideas among their large base of listeners.

3.1. Data collection

Podcast users were invited to submit proposals of how to innovate the business model around Filip and Frederik's podcast using Osterwalder and Pigneur's (2010) business model canvas. In pre-tests comparing different graphical frameworks, the business model canvas was selected as the most appropriate framework for modularizing the complex task of business model innovation in this project, as its level of detail is high enough to describe useful business model ideas, yet it is still simple enough for being communicated to non-professionals. Contributors had the opportunity to submit their ideas to every building block of the canvas but were not obliged to do so. To alleviate the users' process of contributing business model proposals we provided a short description of how each of the building blocks is designed in the current business model. Contributors had the choice to either submit a new idea for each of the building blocks, state that they are not satisfied with how this building block is currently designed but don't have an idea, or actively indicate that they wanted this building block to remain as it is right now. To stimulate participation, the crowdsourcing initiative was introduced in episode 146 of Filip and Fredrik's podcast. Hammar and Wikingsson briefly described the purpose of the crowdsourcing initiative and provided the website where users could locate it. The link to the online participation form was also posted on the podcast's website, in social media and at the fan-pages of Filip and Fredrik's podcast.

Following the contingency arguments put forward by Boudreau and Lakhani (2009) we opted for a competitive setting in the design of the crowdsourcing process since business model innovation demands experimentation and high levels of heterogeneity in the pool of solvers. Furthermore, the level of intrinsic motivations might be limited because of a potential conflict of interest between users and Filip and Frederik with respect to aspects of value delivery and capture. Additionally, in early stages of business model innovation the

community aspects of learning and knowledge sharing might not be as important as in later stages. Finally, there was a need for control of the environment and the study procedure.

In a second step, contributing users automatically received a questionnaire they had to fill in for completing their participation in the crowdsourcing process and winning a meeting with Filip and Fredrik during the production of a new episode of their podcast. The questionnaire included measures on the users' characteristics, experiences and knowledge assets relevant for explaining the likelihood of submitting novel and valuable ideas for Filip and Fredrik's future business model.

Overall, 422 users contributed a business model proposal and completed the survey. Consistent with the target group of Filip and Fredrik's podcast, participants were predominantly male (83%) and the mean age was 26.18 years (SD = 6.91). The majority of the sample reported to either be employed (55%) or study (33%). With regards to their educational background, 62% reported to have an academic degree, most of them within another subject than business (74%). Four ideas clearly had a humorous intention only and were excluded from further analysis, resulting in a final sample of 418 users.

3.2. Measurement of dependent variables

Degree of change

The measure for the degree of business model innovation is a count variable for the number of individual business canvas components for which users suggested new ideas as part of their overall business model idea. The number of modified business model components is used as an indicator for the radicalness of a business model innovation in several studies in the field, e.g., by Hartmann *et al.*, 2013; Mitchell and Coles, 2003. Whereas a small number of modified components is referred to as business model modification, a high number indicates business model innovation. Our main interest here is to understand whether users

are able to propose radical business model innovations rather than just small modifications of existing business models. We modified the original business model canvas in that we combined the components "Key Activities" and "Key Resources". The distinction between these two components is often difficult to draw, compared to other components, and therefore difficult to achieve for users. Combining the two components reduced the maximum amount of components for which users could submit individual ideas from nine to eight, resulting in a range from 0-8 for this measure.

Novelty and value of ideas

In order to identify viable business models recent entrepreneurship techniques such as the lean startup approach (Blank, 2013) or effectuation (Sarasvathy, 2001) put high emphasis on experimentation, early customer feedback and iterative design approaches. Following these approaches, the only way to ultimately assess the value of a business model idea is through real-life experimentation. Since it is not feasible to real-life experiment with all the business model ideas generated by the crowd, we apply expert ratings to obtain an indicator for whether or not an idea is worth experimenting with. We adopted an expert rating process in which independent industry experts were asked to evaluate the outcome of the crowdsourcing process. We first identified two experts on business models in the digital entertainment industry and then asked them to individually rate the business model ideas using an online tool specifically built for this purpose. Both experts are senior managers in Swedish media companies and are active management consultants in the field of digital entertainment. Following a procedure proposed by Krippendorff (2004), the experts received an evaluation manual prior to starting the rating process. The manual provided comprehensive information on the source, type and nature of the ideas, the business model concept and the definition used in our study, the evaluation criteria and the rating scales. This was done in order to

ensure that all participating experts had a similar understanding of the task and apply the rating criteria in a similar way.

The experts were asked to assess the novelty of the resulting business model ideas compared to (a) existing business models in the podcast industry, and (b) existing business models in the digital entertainment industry on a five-point rating scale (where 1 = not very novel and 5 = very novel). We merged the five-point rating scales into a single novelty index (Cronbach's alpha = 0.98). Furthermore, experts were asked to assess the value of the business model ideas in terms of (a) how much value the resulting business model would provide to listeners of the podcast, and (b) to Filip and Fredrik on a similar five-point rating scale (where 1 = not much value and 5 = a lot of value). Again, we merged the five-point rating scales into a single value index (Cronbach's alpha = 0.90). As a control, a final question asked experts whether or not they would suggest implementing the resulting business model as a whole or, if not, certain components of it.

The ideas were presented for evaluation in random order. Interrater reliability was assessed with Krippendorff's alpha for the two novelty and value items (values of .67 and greater are generally considered to be satisfactory; Krippendorff, 2004). The agreement coefficients for the two novelty dimensions are 0.67 and 0.65, for the value dimensions 0.72 and 0.67 respectively. Given the inherent difficulty in rating business model ideas, the results seem to be satisfactory (Krippendorff, 2004)

3.3. Measurement of independent variables

Lead userness

We measured participants' "lead userness", which has often been documented as a robust predictor of an idea's novelty (Franke *et al.* 2006), using an eight-item measure ("LU1: In my opinion, there are still potential opportunities not being passed up by entertainment podcasts

offered today, “LU2: I have needs related to entertainment podcasts that are not covered by what is currently offered on the market, “LU3: I am dissatisfied with some aspects of entertainment podcasts that are currently available on the market”, “LU4: I usually try out new digital entertainment products such as podcasts as soon as they are offered”, “LU5: I have significantly benefited from early adopting and using new digital entertainment products”, “LU6: I have been involved in testing prototype versions of new digital entertainment products”, “LU7: I am considered as being on the cutting-edge when it comes to new digital entertainment products”, “LU8: I already developed ideas for new digital entertainment products myself”; items adapted from Franke and Shah 2003 and Franke et al. 2006; Cronbach’s alpha = 0.76).

Personal creativity

Users’ likelihood of being creative and able to innovate is also driven by personality traits (Im, Bayus, and Mason, 2003; Kirton, 1976). We apply the Buffalo Creativity Process Inventory (Puccio, 1999) to measure personal creativity as adapted by Franke, Poetz, and Schreier, 2013), items used are “ PC1: I enjoy spending time looking beyond the initial view of the problem”, PC2: eI enjoy working on ill-defined, novel problems”, “PC3: I enjoy stretching my imagination to produce many ideas”, “I like to work with unique ideas”; Cronbach’s alpha = 0.79.

Perceived fairness

Franke *et al.*, 2012 identified perceived fairness as being central for users’ willingness to contribute ideas to firm-hosted idea generation processes. We use a five-item measure (“PF1: This idea generation contest gives both, participants and Filip & Fredrik a fair stake in the process of developing the podcast’s business model”, “PF2: Regarding what Filip & Fredrik

and the participants get from this process, there is justice”, “PF3: For those submitting an idea, the benefit offered for participating in the idea generation contest exceeds the effort required”, “PF4: Submitting a proposal to this idea generation contest might be a good deal for anybody submitting an idea”, “PF5: If your proposal of the new business model would be turned into practice, do you think that in this model both the listeners and Filip & Fredrik get a fair share?”; items adapted from Franke *et al.* (2013); Cronbach’s alpha = 0.77)

Users’ experience and knowledge assets

Following Lüthje (2004) we divide a user's expertise into knowledge and experience. We measured business knowledge using a self-constructed three-item measure ("BK1: I've received education on how to construct a business and manage the implications of it", "BK2: I have thorough knowledge of how to seize a business opportunity", "BK3: I always try to keep up to date with regard to the new business models concepts and news regarding firms with new business models"; Cronbach's alpha = 0.74).

Whether or not users received business education was captured with a dummy variable ("What type of education do you have? 0 = Without business background 1= With business background"). We used the number of years someone was working in a management position as a measure for business experience ("Are you working in role where you have to make business decisions? If yes – How many years have you possessed that kind of role?"). To capture experience with business model development we asked for how many times users have been involved in the process of developing business models ("Do you have experience from developing or being involved in developing a business model? How many times?"). In a similar way we captured founding experience with the number of firms founded ("Have you experience from founding your own or been involved in starting a firm? If yes how many have you started?"). We used a dummy variable for product knowledge ("I have thorough

knowledge of what goes into a production of a podcast”; 1: Yes, 0: No). Whether or not users have industry experience was captured with a dummy variable (“In which industry are you currently working in?” 0 = Other 1 = Digital entertainment industry).

Users’ relationship to Filip and Frederik’s podcast

To what extent users consider themselves fans of Filip & Fredrik was measured on a 5-point scale (“I am a fan of Filip & Fredrik”, 1 = No fan, 5 = Huge fan). Additionally we used a dummy variable to account for users’ listening frequency related to Filip & Fredrik's podcast (0 = Less than every week, 1 = Every week).

Control variables

We included dummy variables for the current occupation (Student; Employed; Unemployed; Entrepreneur; Other), and for education (Elementary school; High school; College; PhD or similar). Finally, we also controlled for age and gender.

5. Findings

We first provide analyses related to the quantitative outcome of crowdsourcing business model innovation and present patterns related to how many ideas were actually submitted and how these submitted ideas relate to different components of the business model canvas. We furthermore explore the relationships between different characteristics of crowd contributors and the likelihood of providing ideas for business model innovation subject to different business model components. Second, we investigate the outcome quality of crowdsourcing business model innovation in relation to both, different business model components and characteristics of the crowd-contributors.

5.1. Analysis of outcome quantity

5.1.1. Descriptive statistics

Does crowdsourcing business model innovation work at all? In order to provide an answer to this question, we descriptively explore quantitative contribution patterns subject to components of the business model canvas. We find that out of the 418 users who participated in the crowdsourcing initiative 64.4 percent (269 users) submitted ideas for business model innovation. Out of the 149 users who did not submit proposals, 91 stated that they are satisfied with all components of the current business models. The 51 remaining users who did not submit an idea indicated that they were not satisfied with all components of the current business model, but did not have ideas for improvement.

The participants who submitted ideas for business model innovation provided suggestions for improving or changing a total of 777 individual business model components, which amounts to 2.9 component ideas per contributor on average. Based on prior work by Mitchell and Coles (2003) we divided the contributors into three distinct groups according to how many different business model components they newly suggested (Table 1).

Table 1. Degree of business model change in submissions

Number of updated business model components (0-8)	Frequency	Percent	Type of contribution
0	149	35.64	Group 1: Status quo (149)
1	77	18.42	Group 2: Improvement (181)
2	52	12.44	
3	52	12.44	
4	33	7.89	Group 3: Innovation (88)
5	31	7.42	
6	17	4.07	
7	5	1.20	
8	2	0.48	
Total	418	100	

Group 1 consists of 149 contributors who were satisfied with all components of the current business model and, hence, did not propose to change any of the components. Group 2 relates to 149 users who provided one to three component ideas, and group 3 comprises 88 contributors who proposed changing four or more business model components.

Of the 777 individual component ideas 200 belong to aspects of customer relationship, 139 are concerned with the product, 239 with business model infrastructure and 199 with the revenue model (Table 2, see Appendix 1 for sample ideas). Contributions thus interestingly span all basic dimensions of a business model, namely value creation (48.6 percent), value delivery (25.7 percent), and value capture (25.6 percent). We did not find any dominant combinations of individual business model components within groups 2 and 3, i.e., among those users who submitted more than one component idea.

Table 2. Distribution of submissions among business model components

Components	N	Percent	Group	Dimension
Value proposition	139	17.89	Product (139)	Value creation (378)
Key resources/activities	119	15.32	Infrastructure (239)	
Key partnerships	120	15.44		
Customer relationship	95	12.23	Customer Relationship (200)	Value delivery (200)
Customer segments	43	5.53		
Channels	62	7.98		
Revenue streams	97	12.48	Revenue Model (199)	Value capture (199)
Cost structure	102	13.13		
Total	777	100		

While the majority of users who contributed only one component idea for innovating Filip and Frederik’s business model provided this idea to the value-creating part of the business model (62.3 percent), individual component ideas are more equally distributed among the main dimensions of business model innovation (value creation, value delivery and value capture) for users who provided two or more component ideas (see Table 3). For

example, out of 52 users who provided a business model idea comprised of three individual component ideas already 28.7 percent include ideas for capturing value and 23.7 percent provide component ideas for delivering value.

Table 3. Degree of change related to main business model dimensions

Degree of change	Number of business model ideas	Number of individual component ideas	Value creation	Value delivery	Value capture
1	77	77	48 (62.3%)	21 (27.3%)	8 (10.4%)
2	52	104	56 (53.8%)	31 (29.8%)	17 (16.3%)
3	52	156	75 (48.1%)	37 (23.7%)	44 (28.2%)
4	33	132	59 (44.7%)	35 (26.5%)	38 (28.8%)
5	31	155	74 (47.7%)	34 (21.9%)	47 (30.3%)
6	17	102	45 (44.1%)	26 (25.5%)	31 (30.4%)
7	5	35	15 (42.9%)	10 (28.6%)	10 (28.6%)
8	2	16	6 (37.5%)	6 (37.5%)	4 (25.0%)
Total	269	777			

5.1.2. Drivers of idea quantity

In this section we investigate which characteristics of crowd-contributors' influence whether or not they submit ideas for business model innovation. Table 4 shows that participants who submitted an idea for innovating Filip and Frederik's business model (i.e., provided one or more individual component ideas) significantly differ from non-submitters in terms of how fair they perceive the crowdsourcing initiative to be ($p = 0.01$) and with respect to their prior business experience ($p = 0.07$).

Table 4. Characteristics of submitters vs. non-submitters

Contributor characteristics	Mean (Submitters)	Mean (Non-submitters)	<i>p</i> ^a
Lead userness	2.79	2.91	0.14
Personal creativity	4.11	4.05	0.26
Perceived fairness	3.84	4.04	0.01
Being a fan	4.52	4.43	0.32
Business knowledge	2.41	2.60	0.12
Product knowledge	2.31	2.37	0.63
Business experience	0.79	1.40	0.07
Business model experience	0.56	0.55	0.97
Founding experience	0.22	0.30	0.26
Business education	0.25	0.26	0.73 ^d
Listening frequency	0.93	0.94	0.88 ^d
Industry experience	0.03	0.05	0.48 ^d
Age	25.56	26.45	0.20

N = 418, ^a two-sample t-test, ^d Chi-square test

Exploring the characteristics of contributors broken down by their submissions of component ideas for value creation, value delivery and value capture (Table 5) reveals that ideas to any of the three main business model dimensions are submitted by users with significantly higher levels of lead userness ($p = 0.09$ for value creation, $p = 0.02$ for value delivery, and $p = 0.00$ for value capture) and personal creativity ($p = 0.01$ for value creation and capture, and $p = 0.10$ for value delivery). To which extent a contributor perceives the crowdsourcing initiative to be fair influences the submission of component ideas for value creation and value capture ($p = 0.00$). Business knowledge increases the likelihood that users submit component ideas for delivering and capturing value ($p < 0.05$). Prior experience with developing business models ($p < 0.10$) and founding a firm ($p = 0.00$) affects whether or not users submit component ideas for capturing value in business model innovation.

Exploring user characteristics with respect to the likelihood of submitting ideas to individual business model components provides further interesting findings (Appendix 2). Component ideas for innovating the cost structure of a business model are submitted by

contributors who score significantly lower with respect to being a fan of Filip and Frederik’s podcast as compared to those who do not submit an idea for this component ($p = 0.07$).

Furthermore we find that knowledge about the product positively influences the likelihood of submitting component ideas for the components “customer relationship” ($p = 0.04$), “channels” ($p = 0.10$), and “cost structure” ($p = 0.02$).

Table 5. Contributor characteristics subject to main business model dimensions

Variables	Value creation			Value delivery			Value capture		
	0 ^a	1 ^b	p^c	0	1	p	0	1	p
Lead_userness	2.80	2.92	0.09	2.80	2.98	0.02	2.77	3.05	0.00
Personal creativity	4.06	4.26	0.01	4.12	4.25	0.10	4.10	4.30	0.01
Perceived fairness	3.86	4.07	0.00	3.96	4.00	0.55	3.89	4.14	0.00
Being a fan	4.52	4.40	0.18	4.45	4.48	0.70	4.50	4.39	0.23
Business knowledge	2.45	2.61	0.15	2.44	2.70	0.03	2.43	2.74	0.01
Product knowledge	2.30	2.39	0.49	2.28	2.47	0.14	2.28	2.49	0.11
Business experience	0.90	1.43	0.11	1.16	1.23	0.83	1.01	1.52	0.14
Business model experience	0.54	0.57	0.85	0.52	0.62	0.55	0.45	0.76	0.07
Founding experience	0.22	0.31	0.14	0.26	0.29	0.56	0.20	0.41	0.00
Business education	0.23	0.28	0.30 ^d	0.26	0.26	0.94 ^d	0.26	0.25	0.87 ^d
Listening frequency	0.93	0.94	0.52 ^d	0.95	0.92	0.23 ^d	0.93	0.94	0.94 ^d
Industry experience	0.04	0.05	0.54 ^d	0.04	0.05	0.89 ^d	0.04	0.06	0.34 ^d

$N = 418$, two-sample t-test

^a mean value if no idea was submitted to this business model dimension

^b mean value if an idea was submitted to this business model dimension

^c t-Test.

^d Chi-square test

Regression analyses for exploring how contributors’ characteristics influence whether or not they provide ideas for business model innovation (Table 6) show that perceived fairness of the crowdsourcing initiative significantly increases both the likelihood of contributing an idea at all (Model 1) and the degree of change in business model innovation, i.e., the number of individual business model components that were newly suggested as part of a user’s business model idea (Models 2 and 3). While contributors’ lead userness and personal creativity furthermore have a positive effect on the degree of change in crowdsourcing

business model innovation, being a fan decreases the likelihood of both contributing at all and submitting more than one component idea. Finally, we find that having experience with business model innovation generally decreases the likelihood of contributing an idea.

Table 6. Contributor characteristics' influence on idea submission

VARIABLES	(1)	(2)	(3)
	Submission of idea Logit	Degree of change OLS	Degree of change Ordered Probit
Lead usersness	0.183 (0.170)	0.367** (0.146)	0.186** (0.083)
Personal creativity	0.103 (0.156)	0.355** (0.137)	0.185** (0.079)
Perceived fairness	0.468*** (0.156)	0.300** (0.133)	0.211*** (0.077)
Being a fan	-0.268* (0.140)	-0.261** (0.116)	-0.163** (0.066)
Business knowledge	0.127 (0.125)	0.142 (0.109)	0.094 (0.062)
Business education (d)	-0.033 (0.292)	-0.021 (0.248)	-0.029 (0.140)
Product knowledge (d)	-0.037 (0.098)	0.039 (0.085)	0.018 (0.049)
Business experience	0.060 (0.055)	0.004 (0.036)	0.004 (0.020)
Business model experience	-0.181** (0.088)	-0.007 (0.072)	-0.019 (0.041)
Founding experience	0.179 (0.229)	0.192 (0.184)	0.093 (0.103)
Listening frequency	-0.013 (0.454)	-0.069 (0.394)	-0.044 (0.224)
Industry experience	0.554 (0.596)	0.013 (0.482)	0.045 (0.271)
Age	0.040* (0.024)	0.006 (0.020)	0.008 (0.011)
Gender	-0.101 (0.288)	-0.039 (0.253)	-0.031 (0.145)
Occupation dummies	YES	YES	YES
Education dummies	YES	YES	YES
Constant	-1.634 (1.462)	-0.964 (1.241)	
Observations	418	418	418
R-squared		0.124	
Chi ² Test	0.063	0.000	0.000
Log-likelihood	-256.419	-845.608	-727.344

Standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.10

5.2. Analysis of outcome quality

So far, we have seen that a crowdsourcing business model innovation generates a substantial number of contributions whose individual component ideas are surprisingly spread among all of the three major dimensions of business model innovation, i.e., among value creation, delivery, and capture. Contributing ideas is mainly driven by users' lead userness, personal creativity and perceived fairness of the crowdsourcing initiative while being a fan negatively influences contributions to crowdsourcing business model innovation. In this section we investigate whether or not these patterns hold when taking into account the quality of the submitted ideas. After providing some basic descriptive insights into the quality of crowd-sourced ideas for business model innovation, we explore how the quality of ideas relates to outcome quantity and relates to different business model components. Like we did with idea quantity, we finally investigate how different crowd-contributor characteristics influence the quality of ideas in business model innovation.

5.2.1. Description of outcome quality and its relation to outcome quantity

The outcome of ideation processes usually does not follow a normal distribution. Only few ideas are truly good, while the bulk will be mediocre or even poor (Singh and Fleming 2010). This pattern, which Fleming (2007) termed the "long tail of innovation," was to a certain extent also visible in our data. With respect to the novelty of ideas we find that 13 (4.83 percent) / 45 (16.73 percent) ideas range in the top 10 / 20 percent of the novelty distribution. Related to the value dimension 24 (8.92 percent) / 49 (18.22 percent) ideas can be assigned to the top 10 / 20 percent of the value distribution.

For 25 business model ideas both experts agree that Filip and Frederik should fully implement them. Of these ideas, 60 percent include component ideas for value creation, 63 percent comprise suggestions for new ways of delivering value and 72 percent relate to ideas for capturing value in business model innovation. Ideas suggested for implementation significantly differ from the rest in terms of their novelty ($M_{\text{novelty_implement}} = 2.35$, $M_{\text{novelty_not_implement}} = 1.55$, $p = 0.00$) and value ($M_{\text{value_implement}} = 3.81$, $M_{\text{value_not_implement}} = 2.49$, $p = 0.00$). In addition to 25 ideas for which both experts recommend implementation, they agreed on 53 ideas that include individual components Filip and Frederik should definitely consider implementing. Of these, 88.7 percent include component ideas for value creation, 77.4 percent provide ideas for value delivery and 71.7 percent refer to novel ways of capturing value. Again, the novelty and value ratings for these ideas are significantly higher ($p = 0.00$) than for the rest.

Investigating the ideas for which both experts recommend implementation ($n = 25$) in more detail shows that more than half of the ideas in this group (16 ideas) comprise component ideas related to capturing value only or combine them with component ideas for creating or delivering value. Ten business model ideas were selected on the basis of single-component ideas (three related to value creation, four related to value delivery and 3 related to value capture) while the rest is a combination of up to seven different component ideas. Taking into account the entire sample, we generally find that the degree of change, i.e., the number of different component ideas included in a business model idea strongly correlates with both the novelty of business model ideas ($r = 0.42$, $p = 0.00$) and their value ($r = 0.50$, $p = 0.00$).

5.2.3. Drives of Idea Quality

Table 7 presents four regression analysis models related to the novelty and value of crowdsourced business model ideas that take into account the same contributors characteristics as used for investigating the drivers of outcome quantity.

Table 7. Contributor characteristics' influence on idea quality

VARIABLES	(1) Novelty OLS	(2) Value OLS	(3) Top novelty ^a Logit	(4) Top value ^a Logit
Lead userness	0.122** (0.061)	0.220** (0.102)	0.638** (0.295)	-0.120 (0.287)
Personal creativity	0.099* (0.056)	0.202** (0.093)	0.371 (0.296)	0.542* (0.280)
Perceived fairness	0.043 (0.056)	0.011 (0.094)	-0.110 (0.259)	-0.443* (0.250)
Being a fan	-0.079* (0.046)	-0.056 (0.076)	-0.411** (0.199)	0.082 (0.211)
Business knowledge	0.044 (0.046)	-0.007 (0.077)	0.031 (0.216)	0.144 (0.205)
Business education (d)	-0.151 (0.101)	0.022 (0.168)	-0.549 (0.504)	-0.978* (0.537)
Product knowledge (d)	-0.038 (0.037)	-0.077 (0.061)	0.050 (0.166)	-0.054 (0.165)
Business experience	-0.015 (0.013)	-0.013 (0.022)	-0.080 (0.078)	-0.305** (0.131)
Business model experience	0.028 (0.032)	0.029 (0.053)	0.077 (0.140)	0.349** (0.164)
Founding experience	0.015 (0.074)	-0.104 (0.123)	0.108 (0.324)	-0.325 (0.371)
Listening frequency	-0.058 (0.165)	0.016 (0.273)	-0.442 (0.677)	0.025 (0.790)
Industry experience	0.142 (0.192)	0.234 (0.319)	0.353 (0.814)	0.348 (0.831)
Age	-0.003 (0.008)	-0.008 (0.013)	-0.026 (0.036)	0.000 (0.035)
Gender	0.061 (0.108)	0.105 (0.180)	0.078 (0.527)	-0.602 (0.563)
Occupation dummies	YES	YES	YES	YES
Education dummies	YES	YES	YES	YES
Constant	1.084** (0.519)	1.341 (0.862)	-1.010 (2.627)	-0.052 (2.562)
Observations	269	269	258	258
R-squared	0.111	0.099		
Chi ² Test	0.087	0.176	0.044	0.036
Log-likelihood	-239.378	-375.642	-103.425	-109.051

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.10

^a Top 20 percent of the novelty/value distribution

Like with outcome quantity, lead users and personal creativity are important drivers for novelty and value of crowdsourced business model innovation. In contrast to what we find in relation to outcome quantity, perceived fairness of the crowdsourcing initiative does not affect the average quality of ideas but surprisingly has a negative effect on the value of top ideas (model 4). While being a fan negatively affects the novelty of ideas, business education and business experience of contributors decrease the value of business model ideas. Prior experience with business model development, however, positively influences the development of top valuable business model ideas.

6. Discussion

Is crowdsourcing able to alleviate the process of business model innovation and provide novel and valuable ideas for developing or changing a firm's business model? Using data from a crowdsourcing process for generating a new podcast business model we find that, although at first glance it appears contradictory to ask users for ideas about how a firm can generate or increase its profit, crowdsourcing-based search mechanisms may indeed be capable of providing useful inputs to a firm's business model innovation process.

Contributions interestingly span all basic business model dimensions, namely value creation, value delivery and value capture. Particularly interesting are the ideas submitted to innovate the value-capture aspect of the business model since there might be conflicts of interests between providers and users. In our case, several users proposed to produce two versions of the podcast, one for free including advertising, and a paid one without advertising but with bonus content. Another popular idea was to set up live recordings of the podcast where tickets could be sold. Also mentioned by several users was the possibility to create a paid mobile app that includes additional bonus material to the podcast. Other suggestions ranged

from incorporating a dating service to including different versions of product placement or to enabling direct donations by listeners.

Furthermore, we find that a substantial number of contributions provide novel ideas to four or more components of the business model, indicating that a high degree of change (vs. suggestions for new value propositions only) may be possible when applying crowdsourcing-based search processes for business model innovation. We identify lead users and personal creativity to mainly drive the degree of change in business model ideas as well as their quality in terms of novelty and value. Being a fan negatively influences both the quantity and quality of contributions. Whether or not the crowdsourcing initiative is perceived to be fair, however, has a significant positive effect on submitting business model ideas comprising of at least one, or more, suggestions for innovating individual business model components.

Our findings have important implications for managers since they may encourage them to consider opening up the business model innovation process and leverage diverse knowledge assets of crowds for reducing the uncertainties and risks involved in business model innovation. A qualitative inspection of the submitted ideas reveals that some ideas are suggested repeatedly, i.e. managers may get an indication of what many users consider novel and appropriate. Like in the case of crowdfunding (e.g. Mollick, 2013), crowdsourcing business model innovation may thus additionally contribute relevant market information and reduce the risk of losing customers with unsuccessful business model experiments. Moreover, firms who involve users in their business model innovation processes may capture the positive effects of customer empowerment on the way they are perceived in the marketplace (Fuchs and Schreier, 2011) to a substantially higher extent as compared to involving users into their new product development activities only. On the other hand, it is important that managers take into account the risks involved in soliciting participation for

business model innovation, i.e. inviting crowds to redefine the entire way a firm creates, delivers and captures value. Sufficiently addressing the expectations of the crowd in terms of fairness, selection procedures and implementation may entail considerably more serious challenges for the initiating firm as compared to what has been reported for crowdsourcing processes of product innovation (cf. Gebauer et al. 2013).

Although we could not experimentally manipulate the crowdsourcing process with respect to modularizing the problem (using the business model canvas or not) in this study, feedback from the pre-tests indicate that the business model canvas worked well for facilitating the process of crowdsourcing business model innovation. However, managers will need to take into account the lack of possibilities for displaying and addressing the dynamics and interdependencies inherent to business model innovation when processing the outcome.

Overall, our study contributes to extending existing knowledge on Open Innovation and Open Business Models (e.g., Chesbrough, 2003; Laursen and Salter, 2006), and the role and value of using crowdsourcing as a search mechanism for accessing and leveraging knowledge inputs to innovation processes (e.g., Jeppesen and Lakhani, 2010). It specifically provides first insights into how crowds can support the process of business model innovation, and may reduce the risks involved with business model experimentation. More generally, our study also provides first insights into a case in which crowdsourcing was used for solving a highly complex problem. Further research may address this more explicitly and e.g., study how, why and under which conditions crowdsourcing may be used for complex problem solving. One particularly fruitful area for further research may be to study how the outcome of competitive settings for crowdsourcing business model innovation as selected on the basis of the contingency arguments put forward by Boudreau and Lakhani (2009) for this study differs from the outcome of a collaborative community approach in which contributors could see and build upon each other's inputs for business model innovation. Along these lines it

may also be interesting to investigate the effects of involving existing vs. potential new user or customer groups in the crowdsourcing process for business model innovation on the potential to derive radical business model change (cf. Christensen 1997). In our case we found that for example, one user suggested running the podcast in English, a suggestion that was clearly not expected to emerge from the existing user group of Swedish listeners. It is interesting to note that exactly this idea was implemented – Filip and Frederik now speak English and have less focus on Sweden with regards to their topics.

Related to the generalizability of our findings it is clear that our results are based on only one case study. Thus, future research is encouraged to conduct similar tests in different settings in order to gain a deeper understanding of the merits of crowdsourcing business model innovation, or more generally, complex problem solving. Of course, it is not expected that crowdsourcing will produce novel and valuable outcome for any business model innovation effort. The generalizability of our results may furthermore be limited by the small size of the organization behind Filip and Fredrik's podcast and the lack of technology investments necessary to produce a podcast. Many barriers to business model experimentation found in other industries are not present in the podcast industry. However, the results of this case study suggest that involving crowds in the processes of business model innovation and, maybe even more generally, strategy making may be useful as a complementary means of generating inputs, and that it might be valuable to study relevant contingency factors in future research. Finally, it is worth noting that some of the ideas that emerged in the crowdsourcing process for a new podcast business model have already been implemented by Filip and Frederik. Amongst others, the implemented changes include several improvements to the customer relationship component, as for example an official Twitter hashtag for the podcast and more social media activity by Filip and Fredrik.

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Supplementary Appendix

Appendix 1: Sample ideas (preliminarily translated from Swedish to English)

Sample idea 1
Value proposition: An interactive segment where listeners are allowed to be part of the experience through a mix of reactive and proactive discussions based on user-generated content.
Activities & resources: The creation and the administration of a forum or a channel for the exchange and processing of interesting ideas, topics or concepts for the podcast.
Customer segments: I am satisfied with the current approach
Key partnerships: Depending on the above, sponsorships and new ideas lead to live podcasts recorded out there perhaps at companies or other events.
Customer relationship: See above
Channels: See above
Cost structure: A "producer-cost"
Revenue mechanism: Through multiple and dynamic channels a larger portion of the revenue source could come from project sponsorship contracts, product placement and commercial spots adjacent to the new distribution channels.

Sample idea 2:
Value proposition: I am satisfied with the current approach
Activities & resources: I am satisfied with the current approach
Customer segments: I am satisfied with the current approach
Key partnerships: I think they should sell each section via an app. 1-5kr per episode. The sections could then be released only two or three days later through the existing channels. If you are not prepared to pay 1-5kr for an episode, you deserve not to listen!
Customer relationship: I am satisfied with the current approach
Channels: I think also the crowd who choose to subscribe / pay to get to feel a little exclusive and that they are "close" Filip and Fredrik show through unique offers just for them.
Cost structure: Cost to anyone who programs the App. A certain % to Apple / App store Continued cost for cutting and editing.
Revenue mechanism: They can continue with funding from advertisers but also by charging for sections. Let's say 25,000 listeners want to listen to the program immediately released and 3kr pay for it. It would give 75000: - a week.

Appendix 2. Contributor characteristics subject to individual business model components

Variables	Value proposition			Customer relationship			Customer segments			Channels			Resources/ Activities			Key partnerships			Revenue streams			Cost structure		
	0 ^a	1 ^b	<i>p</i> ^c	0	1	<i>p</i>	0	1	<i>p</i>	0	1	<i>p</i>	0	1	<i>p</i>	0	1	<i>p</i>	0	1	<i>p</i>	0	1	<i>p</i>
Lead usersness	2.80	2.99	0.01	2.79	3.11	0.00	2.86	2.97	0.35	2.85	2.95	0.35	2.80	3.04	0.00	2.80	3.04	0.00	2.80	3.08	0.00	2.78	3.12	0.00
Personal creativity	4.10	4.31	0.01	4.11	4.37	0.00	4.16	4.26	0.39	4.16	4.20	0.74	4.08	4.40	0.00	4.12	4.30	0.02	4.12	4.34	0.01	4.11	4.35	0.00
Perceived fairness	3.91	4.09	0.02	3.95	4.05	0.29	3.99	3.80	0.12	3.97	4.01	0.66	3.94	4.06	0.16	3.92	4.10	0.03	3.94	4.10	0.06	3.93	4.12	0.02
Being a fan	4.47	4.44	0.74	4.45	4.49	0.65	4.47	4.33	0.29	4.46	4.45	0.94	4.49	4.38	0.23	4.47	4.44	0.79	4.49	4.37	0.26	4.50	4.32	0.07
Business knowledge	2.46	2.69	0.07	2.43	2.89	0.00	2.51	2.71	0.30	2.50	2.72	0.20	2.42	2.82	0.00	2.45	2.76	0.02	2.44	2.85	0.00	2.45	2.80	0.01
Product knowledge	2.32	2.41	0.49	2.28	2.59	0.04	2.32	2.63	0.13	2.31	2.60	0.10	2.30	2.46	0.25	2.29	2.50	0.13	2.30	2.41	0.17	2.27	2.60	0.02
Business experience	0.93	1.69	0.03	1.24	0.98	0.50	1.05	2.38	0.01	1.25	0.83	0.36	1.00	1.65	0.07	1.09	1.43	0.33	1.08	1.52	0.26	1.04	1.64	0.11
Business model experience	0.50	0.66	0.34	0.50	0.72	0.27	0.53	0.72	0.48	0.53	0.71	0.42	0.48	0.73	0.16	0.45	0.80	0.05	0.42	0.98	0.00	0.46	0.82	0.06
Founding experience	0.22	0.38	0.01	0.26	0.32	0.44	0.25	0.42	0.12	0.27	0.29	0.80	0.23	0.36	0.07	0.23	0.37	0.06	0.21	0.45	0.00	0.23	0.40	0.02
Business education	0.25	0.27	0.80 ^d	0.26	0.26	0.90 ^d	0.26	0.23	0.68 ^d	0.25	0.29	0.53 ^d	0.23	0.34	0.02 ^d	0.25	0.28	0.46 ^d	0.26	0.26	0.99 ^d	0.25	0.29	0.34 ^d
Listening frequency	0.94	0.94	0.99 ^d	0.94	0.92	0.38 ^d	0.94	0.93	0.88 ^d	0.94	0.89	0.09 ^d	0.94	0.92	0.56 ^d	0.94	0.93	0.58 ^d	0.93	0.94	0.90 ^d	0.94	0.93	0.85 ^d
Industry experience	0.04	0.06	0.30 ^d	0.04	0.05	0.60 ^d	0.05	0.02	0.50 ^d	0.05	0.02	0.26 ^d	0.04	0.05	0.64 ^d	0.04	0.06	0.33 ^d	0.04	0.05	0.64 ^d	0.04	0.06	0.37 ^d

N = 418, two-sample t-test

^a mean value if no idea was submitted to this business model dimension

^b mean value if an idea was submitted to this business model dimension

^c t-Test.

^d Chi-square test

Appendix 3. Correlations (N = 418)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1 Proposal (d)	1.00															
2 Degree of change	0.71***	1.00														
3 Lead usersness	0.07	0.23***	1.00													
4 Personal creativity	0.06	0.20***	0.29***	1.00												
5 Perceived fairness	0.13**	0.12*	0.09	0.15**	1.00											
6 Being a fan	-0.05	-0.06	0.13**	0.08	0.31***	1.00										
7 Business knowledge	0.08	0.20***	0.34***	0.26***	0.06	-0.01	1.00									
8 Business education (d)	0.02	0.05	0.03	-0.03	0.02	-0.04	0.43***	1.00								
9 Product knowledge (d)	0.02	0.13*	0.38***	0.13*	0.07	0.09	0.33***	-0.00	1.00							
10 Business experience	0.09	0.09	0.12*	0.00	-0.02	-0.07	0.26***	0.13*	0.03	1.00						
11 BM experience	-0.00	0.12*	0.23***	0.15**	0.03	-0.05	0.34***	0.16***	0.05	0.39***	1.00					
12 Founding experience	0.06	0.15**	0.23***	0.14**	-0.06	-0.15**	0.34***	0.06	0.10*	0.30***	0.51***	1.00				
13 Listening frequency	0.01	-0.04	-0.11*	-0.07	0.09	0.12*	-0.07	-0.04	0.03	-0.04	-0.15**	-0.07	1.00			
14 Industry experience	0.03	0.03	0.10*	-0.00	0.00	0.04	0.12*	-0.07	0.15**	0.16**	0.13**	0.15**	0.06	1.00		
15 Age	0.06	0.05	0.04	-0.07	-0.19***	-0.20***	0.02	-0.03	-0.11*	0.51***	0.27***	0.27***	-0.02	0.08	1.00	
16 Gender (d)	-0.04	-0.04	-0.08	-0.02	-0.00	0.07	-0.15**	-0.04	-0.14**	0.02	-0.02	-0.02	-0.14**	-0.00	-0.03	1.00

N = 418; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ (two-sided)