
Unfreezing Open Innovation: A conceptual approach from the gamification lense.

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Abstract: When organizations implement open innovation, they need to shift from a close to an open innovation model, requiring an organizational change that usually faces the organizational inertia. Since Gamification is said to change behaviours in non-game contexts, the aim of this research is to build a theoretical framework on how gamification might be an efficient tool to overcome the organizational inertia in open innovation implementation. From the lense of an organizational change perspective, we posit that gamification might be an effective tool at the unfreezing stage of open innovation implementation. This research sheds light on the dark side of open innovation, and contributes to the theoretical literature on gamification. From a managerial perspective, organisations may take advantage of the arising opportunities of gamification to deal with the challenges of implementing open innovation processes.

Keywords: Open innovation; implementation; gamification; organizational change; organizational inertia; unfreezing; theoretical framework; organizational culture; open innovation barriers

1 Introduction

Today's business environment has pushed firms to shift from a close to an open model of innovation. Nonetheless, the implementation of an open innovation process is not easily manageable, and it requires a change in firms' behaviour. Chiaroni et al. (2011) proposed a model of open innovation implementation process from an organizational change perspective, consisting of three phases: unfreezing, moving, and institutionalizing. In this study we focus on the first stage of that implementation process since this stage is focused on recognizing the need for change. Companies frequently fail in managing those changes as they suffer from organizational inertia. Organizational inertia has become one of the

main challenges when implementing open innovation strategies, requiring an organizational change in the firm's routines and culture. A mechanism that has been evidenced to change behaviours, develop skills, or engage people in innovation is gamification, understood as the use of game mechanisms and game design techniques in non-game contexts (Deterding et al., 2011).

Gamification has recently been getting attention from innovation scholars. Numerous studies have pointed out the advantages of using gamification on different aspects of the innovation process, such as to promote creativity, motivation, engagement, teamwork and collaboration (Stieglitz et al., 2017). However, studies related to open innovation and gamification are scarce. The few studies dealing with open innovation and gamification are mainly related to the involvement of stakeholders in crowdsourcing activities dealing with common case studies. Concerning open innovation literature, most of it focuses on explaining the drivers and consequences of successful implementation of open innovation processes, but there is an under-researched dark side in open innovation. There is a need to focus on new methods that overcome these innovation problems to draw effective and practical conclusions.

Our objective is to contribute to this gap by building a theoretical framework that helps firms in dealing with the change process. In particular, we propose the use of gamification techniques to deal with the implementation process of open innovation in organizations and we explain how gamification outcomes can help to the 'unfreezing' behaviours in firms that are expected from a close innovation model.

We firstly conduct a literature review on open innovation, gamification and inertia; and then we discuss that literature, making propositions on how gamification may unfreeze the implementation process of open innovation. We conclude with the theoretical and practical contributions of this paper, and present limitations and future research lines.

2 Research method

In order to know the state-of-art on the subjects, we performed a literature review on the topics, gamification and open innovation (search query 'TS=(gamif* AND "open innovation")'); followed by a second search on inertia and open innovation (search query 'title-abstract-keyword (inertia AND "open innovation")'). The objective was to analyse the mechanisms that firms use to face the open innovation implementation challenges related to inertia.

Consistent with management reviews, we used two comprehensive citation databases: Web of Science (WoS) –main WoS Collection- and Scopus. Since gamification is a relatively novel topic in management, a, we did not restrict the search to publication journals, rather including conference papers and book chapters published until the end of 2019. The first search query resulted in 20 hits in WoS and 20 hits in Scopus, and after merging the two databases and eliminating any duplicated, the search resulted in 25 articles. The second search query resulted in 14 hits in WoS and 13 hits in Scopus. We merged the information of the two databases, and eliminated any duplicated and retracted article, resulting in 17 articles. None of the mentioned articles were included in both articles search, so we analysed 42 articles in total.

After a comprehensive understanding of the literature, articles were classified, cross-compared and analysed following an exploratory analysis. Then, we used the VOSviewer software to build a bibliometric mapping since VOSviewer pays special attention to the

graphical representation of bibliometric maps (van Eck and Waltman, 2010). In particular, we constructed maps of keywords based on co-occurrence data.

3 Findings

From the analysis of literature, we found that the link between gamification and open innovation is still an emerging topic of analysis. From the published articles, 8 articles are in journals, 3 are book chapters, 1 is a book, and 13 are conference papers, dating the first paper from 2013 (conference paper). Furthermore, the literature review about gamification and open innovation is mainly composed of case studies -14 papers, one of them is referred to an experiment, and another paper also adds a quantitative methodology-, 7 articles are of a conceptual nature, 3 articles employ quantitative methodologies, with one of them performing an experiment; and one work employs a qualitative empirical methodology.

The reviewed body of literature uses the gamification concept in different ways. Most of the articles position gamification in the firm innovation context as a tool for idea creation through the crowd (e.g. Armisen and Majchrzak, 2015; Zimmerling et al., 2019); but gamification has also been applied to other contexts than firm innovation, for example, in the public sector to engage citizens to participate in projects (e.g. Sandoval-Almazan et al., 2017); or in education to co-design teaching resources (e.g. Botha and Herselman, 2018).

Regarding the literature analysis of inertia and open innovation, we found 14 articles in journals, 2 book chapters and 1 conference paper. The nature of the articles is mainly quantitative (8 articles), followed by case study (5 articles), and conceptual nature articles (4), where one of them also employs a qualitative methodology.

These articles highlight the detrimental role of organizational inertia for innovation, and they posit different interrelations between open innovation and organizational inertia (e.g. Dąbrowska et al., 2019; Lindman et al., 2013). Another series of articles discuss about the implementation process of open innovation and how organizational inertia can be overcome, for example through open innovation intermediaries (Aquilani et al., 2017); or how open innovation practices help to overcome inertia and face innovation challenges (e.g. Gupta et al., 2017) improving firm performance (e.g. Cenamor et al., 2019).

The next stage in our systematic literature review process was the building of a bibliometric map based on term co-occurrence text data (including title and abstract). 922 terms co-occurred in the analysis, so we fixed the minimum number of occurrence of a term to 3 times to have a legible network size. The software identified 48 relevant terms, and from that list of keywords, we manually reviewed it and crossed out some irrelevant words for the analysis (e.g. company, organization, use). The final list included 33 terms (see Figure 1). The lines between the terms represent links, so they indicate the articles that name both words. The size of the label and the circle of an item is determined by the weight of the item –co-occurrence-.

This bibliometric map shows four clusters, the red cluster refers to the literature related to gamification and open innovation, linking it to the terms challenge, case study and practice; the green cluster refers to the literature review about inertia and open innovation; the software identifies a blue cluster dominated by the terms platform, problem and student; and a yellow cluster for technology, information and solution. Note the relationships between clusters, there is no link between gamification and inertia.

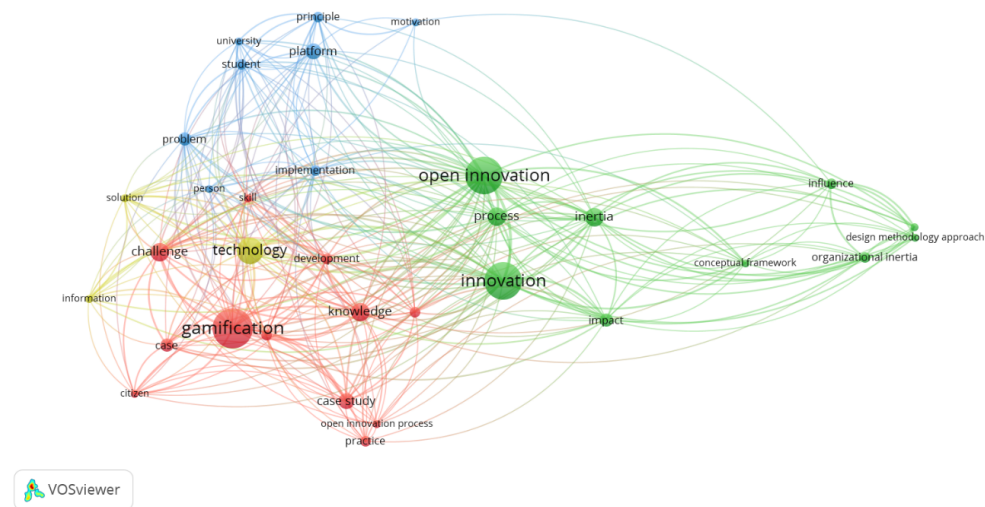


Figure 1. Bibliometric map

4 Discussion and propositions

As we have seen in our literature review, scholars have barely focused on the mechanisms to overcome organizational inertia through gamification. In this section, we propose that gamification can lever the unfreezing process of implementing open innovation, for several reasons. First, gamification contributes to gather information about the environment in terms of customers' interests and needs (Stieglitz et al., 2017), letting organizations to quickly sense external opportunities. Second, gamification helps to leverage the communication processes in organizations, keeps players intrinsically motivated to continuously engage in fulfilling a goal, enhances collaboration, and promote commitment (Stieglitz et al., 2017), which helps to overcome the Not-Invented-Here (NIH) syndrome (Chesbrough and Crowther, 2006) in organizations. Third, gamification generates creativity in a short-term spam (Stieglitz et al., 2017), generating new ideas for outbound open innovation and overcoming the Not-Sold-Here (NSH) syndrome (Chesbrough, 2003).

Proposition 1: Gamification through the participation of the crowd can help the firm to gather information about a business opportunity.

Proposition 2: Gamification through communication flow and engagement can help the firm to overcome the not-invented-here syndrome.

Proposition 3: Gamification through creativity and short term spam can help the firm to overcome the not-sold-here syndrome.

5 Conclusion

Research contributions and managerial implications

This study has relevant theoretical contributions. First, the paper sheds light on the dark side of open innovation. We develop the literature on implementation barriers of open innovation from an organizational change perspective, and argue how gamification can help to face the unfreezing of the organization. Second, we contribute to advance on the scarce literature on gamification on open innovation, as well as on theoretical literature on gamification, proposing a theoretical framework on how gamification mechanisms can help to overcome the organizational inertia in an open innovation process. Open innovation requires new methods that ease the shift from a close to an open innovation model.

From a managerial point of view, understanding the organizational barriers to open innovation, such as organizational inertia, and accomplishing mechanisms to overcome them is vital for innovation success. Managers should pay more attention to mechanisms that overcome those barriers. In particular, introducing game elements in the innovation process is an effective tool to overcome those barriers. In addition, the gamification method should be designed for the specific type of open innovation practice. It requires time and development efforts. Although there are several challenges when implementing game elements on the open innovation process, the positive effects seem to outweigh the drawbacks of gamification, becoming a useful tool for open innovation processes.

Limitations and future research lines

The main limitation of this paper is the lack of empirical validation of the proposed framework. The next step would be to validate this framework through multiple case studies by implementing a gamification approach on organizations with organizational inertia on the implementation of open innovation processes. Another caveat is the inclusion of a limited number of papers due to the restrictive terms in our search query, carrying out a strict systematic literature review. Our goal was to create a theoretical framework on how gamification can boost the implementation process of open innovation rather than an extensive literature review. Future research could develop a more comprehensive framework of the organisational barriers and synthesize how gamification can help to overcome different cultural and organizational barriers. Finally, we have analysed gamification as a tool to facilitate the open innovation process that helps to remove organizational inertia. However, gamification could be considered not only as a tool, but as an element of the business innovation model. Future research could analyse how firms align gamification and their innovation strategy.

Areas for feedback and development

The goal of our research is to explain how gamification can be a useful tool for open innovation, so our aim is theory building, making theoretical propositions. However, we need to follow a research method. What is the best method in these cases?

We did a systematic literature review and a bibliometric analysis. Following the reviewers' recommendations we included more papers, not restricting the research area in our searches. However, the number of papers is still low since it is a new and underexplored

topic. Do we need to extend our search? In that case, what words should we include in our search? Note that the literature review is not the main purpose of the paper.

The next step for our research would be to test the propositions. How can we pre-test them? How can we measure open innovation? Should we focus on some open innovation practices?

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