Enhancing design thinking approaches to innovation through gamification

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Abstract

Purpose – The paper aims to explore the relationship between gamification and design thinking approach to innovation in the context of the early stage of innovation process (ESoIP). Design thinking is conceptually appropriate to support innovative, complex and uncertain business environments. Still, its practices have demonstrated some difficulties in managing the ESoIP, such as lack of structure and clarity around goals. This paper argues that gamification can enhance and complement design thinking in the management of firms' ESoIP.

Design/methodology/approach – Given the need to achieve a deeper understanding of the linkages between gamification and design thinking, the paper follows an exploratory theory building approach for this complex reality of innovation. The case study research method was conducted in three firms (Trivalor, Novartis and Microsoft) that applied a gamification approach to the ESoIP.

Findings – The results demonstrate that gamification has the power to enhance and complement design thinking practices by getting tasks more organized and improving coordination and employees' engagement in the innovation process.

Practical implications – The paper provides critical managerial contributions on how firms can use gamification to improve design thinking approaches to ESoIP. Its consequences are also crucial to innovation, R&D, and product/service development managers interested in using gamification to support the ideation and concept development of new solutions complementing traditional design thinking approaches.

Originality/value – Merging the gamification and design thinking approaches is novel, particularly on firms' ESoIP. The paper provides a comprehensive discussion of design thinking shortcomings and the role that gamification can play in overcoming them.

Keywords Early stage of innovation, Design thinking, Gamification, Innovation management

Paper type Research paper

1. Introduction

Design thinking has attracted the interest of both scholars and practitioners because of the applicability of design methods in supporting the early stage of innovation process (ESoIP). Moreover, it has been recognized for its effectiveness in promoting innovation and solving complex problems in many industries by combining empathy for the context of a problem, creativity in the generation of insights and rationality in analyzing different solutions (Chasanidou *et al.*, 2015; Lee and Benza, 2015; Liedtka, 2015; Seidel and Fixson, 2013; Shpakova *et al.*, 2019).

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Despite the wide adoption of design thinking approach to innovation with different frameworks and practices in place, managing the early stage of innovation is still a tough job. The early stage of innovation is particularly hazardous and risky as information for decision-making is either unclear or absent. It is often associated with an iterative, uncertain and non-sequential innovation process, embracing very tough tasks (Birkinshaw and Mol, 2006; Hamel, 2006; Vaccaro *et al.*, 2012).

Many scholars have been warning for many years that the practices of integrating design into innovation, particularly at its early stage, are facing significant difficulties – e.g. lack of structure and clarity around goals (Beaudry, 2009; Deserti and Rizzo, 2014; Dunne, 2018; Meyer, 2015; Natasha Iskander, 2018). It means that managing the ESoIP is a difficult job even for firms that have a design orientation and uses design thinking methods and tools to manage the innovation process (Simoni *et al.*, 2014; Verganti, 2009). This school of thought opens new approaches that can enhance and complement design thinking in overcoming these difficulties.

Built on the existing theory of gamification of innovation (Agogué *et al.*, 2015; Kavaliova *et al.*, 2016; Patrício *et al.*, 2018; Roth *et al.*, 2015; Schulz *et al.*, 2015), this paper argues that gamification approaches enhance the efficacy of design thinking during the early stage of innovation.

Gamification can be defined as the use of game designed elements in non-gaming situations to encourage users' motivation, enjoyment and engagement, particularly in performing a challenging and complicated task or achieving a particular goal (Deterding *et al.*, 2011; Harwood and Garry, 2015; Piligrimiene *et al.*, 2015; Robson *et al.*, 2015). Given its characteristics, gamification holds power to overcome some specific shortcomings of design thinking by improving the systemic aspect, i.e. structure and goal setting, as well as the social aspect, i.e. user involvement and motivation components, both critical to create and maintain firms' sustainable advantage in the marketplace (Denham and Kaberon, 2012; Hamel, 2006).

The examination of the relation between gamification and design thinking merits pursuit. Gamification can help design thinking to improve and manage innovation, which turns it relevant in terms of theoretical motivation and managerial perspective. Despite an emergent body of literature on gamification in the wider contexts of creativity, design and innovation, there is a lack of research that examines the linkages between gamification and design thinking, particularly on firms' early stage of innovation processes.

Hence, the purpose of the paper is to explore the role gamification plays in complementing design thinking approaches to innovation, addressing the following research question: How can gamification enhance and complement design thinking approaches in the ESoIP? Given its nature, the paper follows a Straussian approach (Corbin and Strauss, 2015; Strauss and Corbin, 1998), structured, focused on interpretation and with constant a comparison with literature.

To understand the role of and how gamification can improve design thinking, a case study-based research was conducted through the deployment of a gamified method and tool (ideaChef®). This study examines the use of this gamification tool in three firms with different levels of maturity in terms of design thinking: Trivalor, Novartis and Microsoft. Instead of described in a sequential process, the cases were designed to build theory about this under-explored phenomenon through discovery from empirical data, avoiding *a priori* theorization (Shah and Corley, 2006).

This paper makes significant contributions to both innovation theory and practice. Firstly, this approach to build theory from empirical data offers valuable contributions into describing and conceptualizing the role of gamification and how it enhances and complements design thinking practices, which puts forward a concept that might open new windows of opportunities for research on design thinking. Merging gamification and design thinking cross-fertilize both concepts and provide robust insight into their usage in the ESoIP.

Secondly, it provides critical managerial contributions on how firms can use gamification to coordinate more effectively all relevant stakeholders, make work tasks more enjoyable and organized, boost team's motivation and increase employee engagement with the ESoIP.

The paper is divided into six sections. Following this introduction, section 2 frames the research by positioning design thinking as an approach used to tackle ESoIP with specific shortcomings and discussing what the gamification angle adds. Section 3 describes the methodology, including the case storyline. Next, sections 4 and 5 demonstrate how the framework emerged and evolved, present the case study findings and provide a discussion against the theory, giving meaning to the empirical data collected in the case studies. Finally, section 6 concludes the paper by offering avenues for future research and addressing study limitations.

2. Theoretical background

2.1 Design thinking approach to the early stage of innovation

In fast-changing competitive environments, a growing number of firms are facing increased pressure to innovate, yet successful innovation is hard to achieve. Only a small percentage of potential new products and services succeed in the marketplace, and the early stage of innovation significantly influences the outcomes of the whole innovation process and its success rate (Riel *et al.*, 2013; Wowak *et al.*, 2016). During its early stage, the innovation process is non-sequential, volatile, informal and messy with systematic back and forward movements, making it very hard to manage and deliver positive outcomes (Hoholm and Araujo, 2011; Humble and Jones, 1989).

The main challenges identified in the literature regarding ESoIP are related to the execution of critical tasks, i.e. goals setting and alignment, coordination of functions, unstructured and unpredictable activities, informality between stakeholders, dependency on external knowledge sources and collaboration and engagement of multiple actors (Birkinshaw and Mol, 2006; Ende *et al.*, 2014; Floren and Frishammar, 2012; Huxham and Vangen, 2004; Koen *et al.*, 2001; Ollila and Yström, 2016; Ulrich and Eppinger, 2012; Vaccaro *et al.*, 2012; Zimmerling *et al.*, 2016). Creative and engaging approaches are, therefore, essential for better managing the innovative process of turning ideas into products and services, mitigating its risks and supporting the underlying decision-making process (Eling *et al.*, 2014; Zimmerling *et al.*, 2016).

Many attempts have been made to identify approaches managers can use to reduce the risk and uncertainty as they navigate throughout the innovation process. A good example is the process improvement also known as stage gate process that provides a more linear and incremental approach to innovation (Cooper, 2014; Hesmer *et al.*, 2007; Kurkkio *et al.*, 2011). Indeed, there is plenty of room for other perspectives. Still, this paper builds on the growing body of research in the field of design thinking approach to innovation that is still getting significant traction from both practitioners and scholars (Robbins, 2018).

This choice was made because of the applicability of design thinking approaches in supporting innovation, particularly as a problem-solving tool in more complex, uncertain or severe issues that require a right combination of both flexibility and structure (Chasanidou *et al.*, 2015; Lee and Benza, 2015; Liedtka, 2015; Seidel and Fixson, 2013; Shpakova *et al.*, 2016; Tidd, 2001). Design thinking is focused on a holistic view that addresses the entire innovation process with a strong focus on the early stage of innovation, which includes idea generation, idea selection and idea development (Brown, 2008). It has been increasingly applied in various organizational settings and industrial contexts that require a robust set of methods and tools for creative problem solving and intangible challenges, such as getting people to engage in innovation activities (Beaudry, 2009; Brown and Martin, 2015; Chen and Venkatesh, 2013; Meyer, 2015; Rauth *et al.*, 2014).

Design thinking brings together a creative and analytic set of tools and techniques and introduces innovation skills, such as (Lee and Benza, 2015; Liedtka, 2015): thinking, i.e. customer focused thinking and problem solving; telling, i.e., getting others on board and storytelling, and doing, i.e. learning through experimentation. These tools can be conceptualized in the following categories: (1) need-finding, e.g. ethnographic observations and customer journey mapping; (2) idea generation, e.g. brainstorming, sketching/drawing; and (3) testing, e.g. rapid prototyping and experimentation (Elsbach and Stigliani, 2018).

The firms that are applying design thinking approaches are therefore involved in the development of a responsive, flexible and people-centered organizational culture to innovation, which emphasize the following distinctive principles (Brown, 2008; Deserti and Rizzo, 2014; Kolko, 2015): creativity and identification of emerging needs; adoption of systematic and holistic approaches; fostering of involvement and collaboration; perception of failure; adoption of people first and user experience approaches; conception of prototypes. This type of culture unleashes people's full creative energies and addresses the counterproductive biases of human beings, e.g. fear of mistakes, by emphasizing engagement, dialogue and learning (Liedtka, 2018).

Despite the wider acceptance and recognition of design thinking (Dunne, 2018; Elsbach and Stigliani, 2018), the substantial differences between promoters and critics about what it is and what it can do, contribute the lack of clarity surrounding design thinking theory and practice (Micheli *et al.*, 2019). A growing number of scholars have been arguing for many years that the practices of integrating design into innovation face significant obstacles. Without being exhaustive, which is unreasonable as the discussion about design thinking limitations are still evolving, Table 1 illustrates some of the key issues.

In conclusion, although design thinking is definitively influencing the agenda of firms, the practices of integrating design thinking into innovation illustrate significant limitations with impact on the management of the ESoIP.

2.2 Gamification

Gamification, i.e. the use of game elements in non-gaming contexts, has been used to encourage engagement, enjoyment and user motivations toward specific tasks and achieve predetermined business purposes, based on foundational psychological theories, including self-determination theory and intrinsic and extrinsic motivation (Deterding *et al.*, 2011; Hamari and Koivisto, 2015; Roth *et al.*, 2015; Seaborn and Fels, 2014). Its primary purpose is to apply game elements toward existing business processes and not to create full-fledged games. This type of approach is becoming more accepted in corporate environments and raising awareness of the advantages of using game elements and mechanisms for problem solving in the workspace (Skarzauskiene and Kalinauskas, 2014; Smith and Popa, 2015).

Gamification involves employees and team's participants in enjoyable (business and innovative) experiences by influencing desirable behaviors, tapping into human desire and its natural attraction for gaming (Piligrimiene *et al.*, 2015). By providing gameful experiences with clear rules and goals and ensuring everyone stays focused on the process, firms provide users a more structured, enjoyable and gratifying experience, as well as a greater engagement in what they are doing, even in contexts that normally have more routine or boring experiences (Harwood and Garry, 2015; Koivisto and Hamari, 2014; Roth *et al.*, 2015).

Gamification is, nonetheless, still taboo in many corporations personified by senior generations that consider them a form of diversion from work tasks (Jorge and Sutton, 2017; Reeves and Wittenburg, 2015). Top management sometimes view work and play as opposites, where fun is automatically associated with waste of time and lack of productivity or efficiency (Dale, 2014; Smith and Popa, 2015). Despite all these limitations regarding the inclusion of game elements in critical business processes, many firms are consciously

Issues	Authors
Lack of structure and clarity around goals: Design thinking is sometimes used ad hoc with a disconnected set of methods and tools in a one-off workshop engagement taken out of a strategic context. On top of that, this type of approach is poorly defined with several goals to accomplish in simultaneously	Beaudry (2009), Deserti and Rizzo (2014), Dunne (2018), Iskander (2018), Meyer (2015)
Disconnection between thinking and doing: The aim of design thinking processes is to stimulate creativity for the envisioning of new solutions. Yet, the ideation (thinking) and the development (doing) processes are sometimes separated, which is quite negative in terms of managing the entire innovation life cycle. Furthermore, doing is sometimes the missing component of design thinking	Deserti and Rizzo (2014), Sena (2018)
Excessive top-down change management approach: Design thinking drives a top-down change management approach that principally affects the management rather than the entire organization. This orientation leads only managers to be committed in applying this approach	Deserti and Rizzo (2014)
Vulnerability to leadership changes: Leadership turnover can compromise the work of this type of design thinking initiative	Dunne (2018)
Perception of a simplified view of design as a process: Design thinking may be perceived simply as a framework with a very limited sticky notes approach, which can be reduced to a few-days' workshop sessions that everyone can do and follow	Rauth *et al.* (2014)
Need for legitimacy and culture fit: Design thinking introduces ambiguity, uncertainty and abstract vision into the innovation equation by challenging prevailing structures, practices. The misalignment between disruptive design thinking approaches and the dominant organizational culture that prioritize certainty and quantification requires the creation of greater engagement and demonstration of internal legitimacy among both managers and employees	Dunne (2018), Kupp *et al.* (2017), Rauth *et al.* (2014)
Limited participation of self-managed and truly diverse teams: Instead of simply asking for new products and services, firms are asking more strategic thinking and organizational change processes. It requires setting up a new type of multidisciplinary teams with diverse backgrounds and expertise. These self-managed and non-hierarchical teams go against the conventional process led by designers, where key decisions are already taken	Beaudry (2009), Iskander (2018), Kupp *et al.* (2017), Zurlo and Cautela (2014)
Cognitive obstacles: Design thinking approach challenges the human brain to work against routine patterns of thinking, requesting that old assumptions and previous beliefs be rejected, which is quite difficult for a significant number of people	Butler and Roberto (2018)
Misalignments in meaning: People perceive design thinking differently. It has a slightly different meaning depending on a person's perspective and background. Moreover, people use design thinking to mean something quite different from what others perceive	Camacho (2016)
Too much incremental approach: By focusing innovation excessively on the consumer, design thinking can anchor the solutions in an incremental territory to quickly generate success stories, rather than radical ideas	Dunne (2018), Robbins (2018)

Table 1.
Synthesis of literature

experimenting different forms of game approaches such as team-building exercises, simulation games and puzzle-solving activities, which under certain circumstances release unexploited creative thinking and get the work done better than traditional processes can (Butler *et al.*, 2011; Sorensen and Spoelstra, 2012). Although work and play appear to involve an exclusive mutual relationship in which work means productive and goal-oriented behaviors and play means unproductive behaviors, a lot of benefits emerge from this blended approach (Roos *et al.*, 2004).

Most of the contributions to the literature on gamification have been particularly focused on education and learning (Kingsley and Grabner-Hagen, 2015; Simões *et al.*, 2013), health (Koivisto and Hamari, 2014) and marketing and consumer behavior (Harwood and Garry, 2015; Robson *et al.*, 2014). Yet, a growing number of studies reveal that the relation between gamification and innovation is a promising avenue for future research (Roth *et al.*, 2015; Shpakova *et al.*, 2019).

Some of these studies investigate the way game approaches can support ideation (Agogué *et al.*, 2015), explore different purposes of using gamification during continuous innovation (Hyypiä and Parjanen, 2015), examine how workshop sessions based on game approaches can be integrated and connected to a whole innovation process (Schulz *et al.*, 2015) and explain how gamification can support the generation of ideas for developing new product concepts or entering new markets (Patricio, 2017). Others reinforce the need to create a more robust argument on the experimental value of game mechanics and participants' motivation in gamification (Brandt *et al.*, 2008; Kavaliova *et al.*, 2016; Scheiner, 2015).

Gamification of innovation incorporates game elements (dynamics, mechanics and components) and explicit goals, which are mostly used across the phases of idea generation, evaluation and idea development (Patrício *et al.*, 2018). These approaches include design games and serious playing approaches, which are implemented through digital, e.g. computer software, web-based and mobile apps and/or non-digital tools, e.g. board games, card decks, art craft materials and Lego bricks (Patrício *et al.*, 2018). The originality of gamification concerning more playful approaches is that it extends the use of games to white collar tasks, engaging knowledge workers and middle managers in innovation processes (Mollick and Rothbard, 2014; Zichermann and Cunningham, 2011). Besides having engaged employees in innovation practices, coordination is needed at senior, middle and team-level management to ensure a comprehensive game-like innovation process. Relationship between middle and senior managers plays an essential and complementary role since middle managers can provide resources and support innovation practices and first-level managers the competence to experiment innovation projects (Kuratko *et al.*, 2014).

Therefore, gamification holds the potential to enhance and complement design thinking approaches to innovation. It makes sense to examine gamification as a way to improve design thinking since this type of approach can potentially be used to enhance the efficacy of design thinking, particularly by improving the structure and goal setting, as well as the involvement and motivation of the users. The potential linkages between gamification and design thinking are more evident when mapping the limitations of design thinking to deal with critical ESoIP issues.

3. Methodology

3.1 Theoretical purpose and case selection

The purpose of the paper is to investigate how gamification enhances and complements design thinking practices. This question aims to conceptualize the contribution of gamification to design thinking approaches in the ESoIP. The main objective is to explore concepts and rich insights that can enhance design thinking practices in the ESoIP (Creswell, 2007; Gioia *et al.*, 2013).

Due the nature of this under-explored phenomenon, the exploratory theory building approach is appropriate to close the gap identified in the literature and practice of this particular and focused phenomenon, i.e. the relationship between gamification and design thinking. This method is usually adopted by researchers to understand complex issues and thus is critical to gain an in-depth understanding of the underlying reasons and motivations of the phenomenon within real-life contexts (Charmaz, 2006; Goffin *et al.*, 2019; Kindström *et al.*, 2013; Meredith, 1998; Strauss and Corbin, 1998; Yin, 2009). It is a data-driven, iterative and cyclical process guided by emerging insights from case studies (Corbin and Strauss, 2015).

The selection of the firms (Table 2) has matched the following criteria: (1) The application of design thinking practices throughout the early stage of innovation; (2) The generation and development of ideas for real business challenges with multidisciplinary teams; and finally (3) The mobilization of teams to participate in innovation workshops and follow-up interviews.

The case study firms analyzed were chosen because they exhibited contextually rich data on the management of the early stage of innovation with design thinking methods and tools, supporting empirical research in real-world settings of case studies (Eisenhardt, 1989; Meredith, 1998; Yin, 2009). Moreover, multiple case studies allow acquiring better insights, which often emphasize complementary aspects of the phenomenon (Eisenhardt, 1989; Yin, 2009).

The chosen firms (Table 2) exhibited different levels of proficiency in deploying design thinking methods and tools like brainstorming, personas and customer journey maps, which typically engage people with diverse backgrounds in convergent and divergent thinking workshop sessions (Chasanidou *et al.*, 2015). This sample made it possible to identify differences and similarities among firms (Table 3) that wanted to explore the possibility to strengthen the idea development phase of ideation with support of a gamified method and tool (ideaChef®).

These firms offered an excellent opportunity for unusual research access to valuable data and relevant theoretical insights, which means that these cases were particularly suitable for exploring the relationship between gamification and ESoIP (Eisenhardt and Graebner, 2007). Theoretical sampling started very much focused on finding rich sources of empirical data but was subsequently guided by emerging insights. In contrast to the statistical sampling, the case study approach carefully chooses the cases based on theoretical reasons (Eisenhardt, 1989; Glaser and Strauss, 1967; Meredith, 1998).

3.2 Research storyline

Appropriate conditions were established for the firms involved in the implementation of gamification tools. The process that took place in each of the firms was designed to allow examining improvements to the ESoIP and enhancements or complementarities to design thinking practices.

Usually, the standard design thinking approach to ESoIP conducted by each of the firms requires the support of different methods and tools. The number and type of methods and tools applied by each firm depend upon their particular expertise and proficiency in design thinking (Alves and Nunes, 2013). Firms 1 and 2 typically conduct one-day or half-day

Outlined key topics	Case firm 1 – Trivalor	Case firm 2 – Novartis	Case 3 firm – Microsoft
Expertise in design thinking	Beginner	Proficient	Expert
Generation of ideas	Yes	Yes	Yes
Mobilization of teams	Yes	Yes	Yes

Table 2.
Sample selection for the case study firms

Studies/Firms	Case firm 1 – Trivalor	Case firm 2 – Novartis	Case firm 3 – Microsoft
Type of business unit	European group of companies operating in the business and facility services segment with sales revenues of around € 770 million and with a workforce of more than 31.000 people	European subsidiary of one of the top five pharmaceutical companies in the world. Detail of sales turnover and staff number in this country unit is not publicly available	European subsidiary of one of the top three software companies in the world Detail of sales turnover and staff number in this country unit is not publicly available
Type of challenge(s) that were presented to each unit	Customer Loyalty (CL); Valorization of the Offer (VO); New Service Development (NSD); Corporate Image (CI) and Business Processes (BP)	People (C&P), Research (SiI) and Innovation (IbS)	Internal Service Design (ISD)
Type of team(s) involved in the study	Five multidisciplinary teams composed by 23 participants, including team leaders and members, from operations, marketing and sales, finance and IT	Three multidisciplinary teams composed by 21 participants, including people with different backgrounds and levels in the hierarchy of the organization, i.e. top and line managers	One multidisciplinary team composed by five participants, including consulting staff that usually delivers design thinking methods and tools to address concrete challenges of external customers

Table 3.
Context of the case study firms

ideation workshops running the phases of idea generation and development with a set of tools (e.g. stakeholder map and brainstorming) used almost with any participants, including employees that never participated in an ideation workshop. Firm 3 usually adopts a complete approach, over a week, covering all steps from idea generation to planning and encompassing more complex tools (e.g. customer journey, personas and blueprint) used internally by the consulting team.

At the time of the study, each of the firms was addressing different types of challenge(s) (Table 3) that were outlined by the challenge owners (board members and innovation leaders) in line with their strategic priorities. All these challenges, in the early stage of the innovation process, were related to the process of creating new solutions, either developing new products/services or redesigning internal processes.

Instead of using the standard design thinking approach described above, all firms conducted a similar half-day gamification workshop. This activity lasted three to four hours in which teams developed further an idea and drafted a more concrete plan to address the challenge outlined by the challenge owner.

Participants came into the workshops with a chosen idea and the drive of the gamification element (ideaChef®) was to develop, incubate, crystallize and plan the idea in a report format. ideaChef® uses a combination of game dynamics (e.g. participants depend on one another to achieve contributions for designing the solution, also called recipe), mechanics (e.g. feedback on how players are performing every two minutes) and components (quests that are defined ahead of time) inspired on the 6D framework (Werbach and Hunter, 2015). Throughout the workshop that was facilitated by the researcher, participants answered questions related to the chosen idea, discussed and scored each other contributions. At the end of the workshop, all contributions were assembled in a structured manner. The team drafted a report of the proposed new solution ("recipe") for the challenge, aiming to support the strategic project's

decision-making process in terms of implementing the "recipe" that emerged from the gamification experience.

Therefore, the main modification introduced in the workshop concerning the standard design thinking approach was the use of an additional gamification element, which supported the phase of developing and reporting an idea in a gameful and more relaxing atmosphere. Thus, this particular gamification approach served to observe the improvements to the innovation processes. It also allowed it to understand the way design thinking practices that could be enhanced or complemented by gamification.

3.3 Data collection

The measurement of results was based on the same activities and instruments for all case study firms, which provided research consistency (Table 4). Two semi-structured individual interviews were conducted for each case study firm immediately after the workshops, one with a team member/leader and another with the innovation or project manager.

The only exception was the case study firm three that included all members. Since they involved just one team, it was also possible to collect very rich inputs in a group interview. These interviews, which lasted between 30 minutes and 45 minutes, allowed gaining the information needed to determine the total number of unique themes used in Table 5, in the context of thematic analysis (Guest *et al.*, 2006; Locke, 2001).

To ensure validity and reliability during the research process besides semi-structured interviews with key informants that experienced this phenomenon (Table 4), the data collection process included multiple sources that complemented interview data: workshop participant observations (field notes, photographs and video recordings) and secondary data archives (three challenging briefings and four other internal projects reports and media documentation). Triangulation has been addressed to extend and validate the data collection by using these multiple information sources of evidence, not just to obtain further insights but also to look for additional corroborating or contradicting evidence from data collection and findings (Kindström *et al.*, 2013; Yin, 2009).

The whole process was driven by transparency, providing clarity about the entire data and including research instruments, such as interview questions in appendices. Both the individual-level interviews with Team Leaders (see Appendix 1) and Innovation and Project Managers (see Appendix 2) incorporated a grid that has been created based on the research goals and questions, which increased the reliability of the findings and conclusions. The aim was to check for the potential impacts of the gamification approach on the work activities, and also to trace back the actions observed during the workshop sessions. Interview questions for Team Leaders (Appendix 1) and Innovation Manager/Project Manager (Appendix 2) reinforce the investigation of the research question (how gamification enhances

Instruments	Case study firm 1	Case study firm 2	Case study firm 3
Gamification workshops	1 workshop	1 workshop	1 workshop
Semi-structured interviews	1 interview with NSD team leader 1 interview with innovation manager	1 interview with IbS team leader 1 interview with project manager	1 group interview with ISD team leader and members 1 interview with project manager
Workshop observations	Field notes, photographs and video recordings		
Secondary data archives	Three challenging briefings and four other internal projects reports and media documentation		

Table 4.
Data collection

First-order code	Second order theme	Aggregated dimension
(1) Do not disperse in the objective, which allows us to be more focused (Trivalor)	Results-driven	Organized process
(2) I believe that the outputs are better (Trivalor)		
(3) We got out of there with a more concrete idea (Novartis)		
(4) Focused on the same subject (Microsoft)		
(5) Control the time more effectively (Microsoft)		
(6) Reach the same goals but in a different way (Microsoft)		
(1) Provides a well-rounded description of the idea (Trivalor)	Structured process	
(2) Everyone generated some ideas before meeting together to discuss the chosen idea (Trivalor)		
(3) Comprehensive perspective of what we need to do to implement the idea (Novartis)		
(4) Mapping what we would have to do to implement the idea (Novartis)		
(5) Allowed establishing interesting associations (Microsoft)		
(6) Language helps in understanding the meaning of the question (Microsoft)		
(1) I definitely see benefits as regards engagement and get people involved and participated (Trivalor)	Participated process	Engaged participants
(2) It encourages people to get involved and get them actively participating (Trivalor)		
(3) Creating stimuli to people that are not obvious (Novartis)		
(4) All contributing to create a better idea (Novartis)		
(5) It is a rich process because it stimulates creativity, cooperation between people, more interaction and engagement (Novartis)		
(6) Complement with other contributions (Novartis)		
(7) It creates team-building by involving people in creating an idea (Microsoft)		
(8) It has a language and method more accessible to a greater number of people (Microsoft)		
(1) Through a relatively informal moment we were able to cook some interesting ideas (Novartis)	Relaxed mode	
(2) We can have the involvement and engagement of people through a more playful vehicle where we can interact with the other colleagues (Novartis)		
(3) People did not feel the pressure of the normal workshop (Novartis)		
(4) More fun and relaxed way of doing things (Microsoft)		
(5) The fun/game aspect does match with some people, but with others not (Microsoft)		

Table 5.
Data structure/ Coding tree

and complements design thinking approaches in the ESoIP), which implicitly highlights some of the design thinking limitations.

To facilitate the emergence of new insights and anticipate related issues, the interview protocol allowed informants to address other topics and was adjusted and enriched with a different set of open questions that had not been initially included in the grid (Agogué *et al.*, 2015; Gioia *et al.*, 2013). Furthermore, the research questions that have been investigated were not addressed directly to prevent leading questions and influence interviewees (Zomerdijk and Voss, 2009).

3.4 Data analysis

This paper adopted a theory-driven coding approach that demonstrates connections between data and theory, which is particularly relevant when the informants do not express

themselves in terms compatible with the concepts of the literature review (Agogué *et al.*, 2015; Gioia *et al.*, 2013). Textual data from semi-structured interviews were thus examined through a thematic analysis approach (Braun and Clarke, 2006; Gioia *et al.*, 2013).

The analytical procedure used to integrate data from the interviews followed a systematic process of coding that helped to determine correspondences and differences across the entire dataset as well as to describe the core themes (Braun and Clarke, 2006). These themes have been shaped based on the mapping of relevant data elements, i.e. answers, behaviors and conclusions perceived by participants throughout the study (Braun and Clarke, 2006; Gioia *et al.*, 2013). After organizing first-order (informant-centric) codes into second-order (theory-centric) themes, each theme was refined into aggregate theoretical dimensions (Braun and Clarke, 2006; Gioia *et al.*, 2013). The dynamic essence of this approach allowed to identify repeated patterns across each piece of textual data collected and iterate with the literature to refine emergent themes and other relationships (Gioia *et al.*, 2013).

Determining what aspect of the data each theme captures was not a straightforward process since some candidates for core themes collapsed into each other or broke down into separate themes. Furthermore, it was necessary to identify the essence of each theme story in relation to the research question and objectives in order to avoid too much overlap between themes and make sure the emergent themes describe and explain the phenomenon we are examining, i.e. the use of gamification approaches on firms' innovation processes (Braun and Clarke, 2006; Gioia *et al.*, 2013).

To assign significance, coherence and meaning to the data collected, each interview has been voice recorded for further analysis and precise transcriptions of recorded interviews have been made and validated by the interviewees. This procedure provided an excellent way of becoming more familiar with the data and contributed to higher transparency and rigor of the study (Braun and Clarke, 2006; Eisenhardt, 1989). Moreover, incorporating an interview protocol and organizing all of the collected transcripts makes the research method replicable (Kindström *et al.*, 2013).

Lastly, the analysis of the interviews has been complemented with written notes taken during meetings, other archives, photographs and video recordings from the workshops, which provided valuable observations of the work in progress and helped to document results (Gudiksen, 2015; van Amstel and Garde, 2016). Doing memos during interviews to jot down early impressions and insights, which facilitates subsequent analysis, reflects this iterative and cyclical process that compares and contrasts new findings to emerging codes (Locke, 2001).

3.5 Gamification tool

ideaChef® is a board game that uses a cooking metaphor to address real innovation challenges, in an open and creative thinking atmosphere. ideaChef® is designed for teams up to six participants. Unlike a regular brainstorming session where not everybody expresses themselves and it is hard to come up with a conclusion that is representative of the whole group, ideaChef® keeps everyone aligned and speaking the same language and encourages contributions from all participants, in a more balanced manner.

ideaChef® was considered an appropriate gamification method and tool to support these case studies. It is a scientific and market validated approach with a proven track-record in idea development that enables diverse teams to convert high potential ideas into minimum viable concepts or light prototypes (Patrício *et al.*, 2020). It was also chosen since it increases the willingness to take risks by simulating decisions, question assumptions and having immediate feedback.

4. Findings

4.1 Data structure

The empirical results of the study are presented using a data structure/coding tree (Table 5) that provides the data-to-theory connections in the form of linkages among the first-order codes (direct quotations or excerpts from quotations), and their connection to the emergent second-order themes (e.g. relaxed mode) related to the gamification of design thinking approach to innovation (Gioia *et al.*, 2013).

The aggregated dimensions that describe the theoretical derivations from findings were broken down into organized processes and engaged participants, both characterized by different core themes. For all these core themes, representative statements from informants of each of the case study firms are exhibited, providing essential insights into the way gamification enhances design thinking approach to innovation. The following sub-sections provide multiple pieces of evidence that support the advantages of adding gamification elements in the context of design thinking practices and compare it with the standard design thinking approach to the ESoIP already applied by case study firms.

Despite assuming clear differences when comparing the firms' different levels of expertise in design thinking, i.e. beginner, proficient and expert, interview statements and workshop observations did not provide different results in terms of the main advantages and limitations of gamification approaches among the case study firms.

4.2 Results driven

All the case study firms had the same goal, i.e. to identify potential ideas to address a particular challenge and build an action plan to support its implementation.

From the statements of informants, it seems the gamification approach effectively contributed to achieving the goals of the firms. Empirical results suggest that the development and report of ideas can be better accomplished with gamification than using the standard design thinking approach to the ESoIP.

> In ideation processes, sometimes the approach is a bit vague and could contribute to a lack of objectivity (informant from Trivalor);
>
> It was a different way to reach the same goals and even with more interesting contributions (informant from Novartis);
>
> The same goal was achieved, which was to orchestrate ideas, but somehow we ended up with a more concrete plan (informant from Novartis);
>
> For better or worse, it comes always to a result (informant from Microsoft).

Although always focused on results, using gamification for idea development requires that firms already have a real challenge and an existing idea that was chosen from the earlier phase of idea generation.

> It is a methodology to be used when the project is already defined, having an overview of the client challenge (informant from Microsoft).

This prerequisite can be considered a limitation in cases where firms did not identify a definite challenge and a concrete idea to be further developed. One informant framed potential uses of gamification, having noted that gamification is well fitted for product/service innovation.

> Based on the conclusions I reached from watching different teams, this gamification approach is more suited for complex challenges that require a concrete output (informant from Trivalor);

> This gamification approach is more suited for new product development or improving products and services because you think about the recipe. It is easier to use this analogy of the recipe when you are designing a new product or service (informant from Trivalor).

Gamification can also support firms in pursuing more specific results. For instance, positioning gamification as a method to externalize the needs and requirements of the personas, i.e. a design thinking technique used to characterize a plural view of the target users.

> Design Thinking is a method of approaching a project, resulting in specifications for the persons for which the solution is to be created. Personas are very complex to build, particularly the dimensions that will create these personas, and this process of thinking has not been well thought so far (informant from Microsoft);

> In my view, gamification may have a close fit with the design of the features that can match the needs or problems of personas, which is the specification of the characteristics of the technological solution. Therefore, we should apply gamification when having to design or conceptualize architecture for the project. It can either be in the discovery of a solution or in finding the characteristics of the solution. It was what we did (in the workshop) by identifying the needs. Perhaps there is space for this method in the definition of the specifications, which is what we call the "deep dive" of the solution (informant from Microsoft).

4.3 Structured process

The structured process theme complements the "thinking" element of design thinking, making it more "doing" oriented. Gamification element seems to provide the structure that is needed to be more effective when addressing innovation challenges. Findings support the idea that it is possible to make better choices when describing and discussing the idea in more detailed and logical manner. Gamification can help the process of choosing an idea to implement by conducting an in-depth analysis of its characteristics. This ability to develop a more well-rounded description of the idea strengthens decision-making and mitigate the risks of prototyping and to implement a bad idea.

> With the development of the idea we realized how we could implement the idea, who could help us, who our stakeholders were and how we could do it (informant from Novartis);

> A positive aspect is that it helps to develop the idea, finding its weaker and stronger points (informant from Trivalor);

> By mapping what we would have to do, what resources would be involved, what would we have to change, among many other issues, we realized that it would be a very ambitious project that we could not implement immediately (informant from Novartis).

Another vital contribution of gamification is a different type of language that can be used to communicate key innovation terms and improve collaboration among diverse teams. Mainly, the use of metaphors makes the communication more informal, structures the conversation and overcomes the difficulties of having people without the same understanding of the context and the set of tasks they are supposed to perform.

> The fact of using a cooking metaphor allows us to find the meaning of each question faster than by using our traditional method. Therefore, gamification approach is faster in closing the gap between the explanation of what is intended and its understanding by the group (informant from Microsoft).

There are also some pieces of evidence supporting the view that gamification approach makes it easier to understand what the innovation process wants to accomplish, which contrasts with more complex and comprehensive processes that always require some kind of training and facilitation.

> Our current approach requires participants to master the key methods and tools, e.g. personas and customer journeys (informant from Microsoft).

Gamification provides more structure, which in some conditions may accelerate the innovation process. Informants revealed satisfaction for getting faster results. When comparing the standard design thinking approach of case study firms with the current research setting, it was found that informants perceived great benefits for getting faster to a more comprehensive idea and report. Statements suggest that informants were able to shortcut some tasks because of the type of process provided by gamification element.

> Using the traditional methods, we would still be in an initial phase doing brainstorming with the others without any sound idea to communicate to the board of directors. This new approach allows us to progress faster (informant from Trivalor);
>
> About the methodology that we have been adopting, I would say that gamification may be faster and more fun (informant from Microsoft);
>
> With our current method, it would have been needed three sessions to get to what we achieved here thanks to gamification (informant from Microsoft).

4.4 Participated process

It was found that all gamification workshop activities have actively participated and everyone was engaged in the process. In comparison with the standard design thinking approach, gamification seems to increase participation since all people are more stimulated and have the same opportunity to contribute to the final idea no matter their job titles and hierarchy. Moreover, informants repeatedly stressed that gamification elements could enrich ideation by enabling people to build upon each other's ideas and collectively improve ideas that were generated individually. These results suggest that having all people contributing to idea development increase their engagement with the process because they feel they have their touch on the formulation of the final idea.

> Each person started by adding or deconstructing an initial idea until the time we achieve a more concrete idea, a process that was fueled by a creative flow. Getting the contribution of all the people has greatly enriched this project (informant from Novartis);
>
> It brings more value to what is built together and to what people feel that is a bit of them. Comparing to the traditional method in which the idea of a person is somehow imposed, even if in a good way, to all the others, I think that we can get more quality in the end than when it's a one-person idea (informant from Novartis);
>
> When we are doing brainstorming, which is the methodology that we mostly use in the area of innovation, we share with the others our experience, knowledge and ideas, but we are not being stimulated or put ourselves out of our comfort zone to develop a common idea (informant from Novartis);
>
> Gamification enables building upon each other's ideas, which is the improvement of the idea and I think this has more value with our brainstorming practices (informant from Novartis).

In comparison with the standard design thinking approach, it seems that gamification embeds participants in the chosen idea as all of them are more encouraged and have the same opportunity to participate. The degree of participation in gamified processes looks to be very high even from people not supposed to have direct intervention in the process. As exposed by informants, gamification can also be applied to co-creation of new solutions with inputs from external stakeholders like business partners and customers. It has more diverse and vibrant contributions to facilitate the co-creation of high-quality solutions that address the innovation challenges in a more impactful way.

> We have already had multidisciplinary contributions from different areas and internal departments. But now we can add other opinions from possible external entities and clients. I think this is the spirit of co-creation (informant from Novartis);
>
> Co-creation of an idea is also possible with gamification (informant from Microsoft.

Gamification also has the potential to engage internal stakeholders that were not involved in the research setting like other top executives with a key role on innovation. It can be the case of prompt feedback to draft proposals or work in progress or even a strategic forum to decide whether or not the proposed ideas should be kept alive.

> I think the board followed every step of the way. It is something we should learn for the future (informant from Trivalor);
>
> Some of the proposed initiatives could then be debated by the whole group (informant from Novartis).

4.5 Relaxed mode

Findings indicate that a more relaxed environment provided by gamification reduces the day-to-day pressure and increases the motivation of participants to adopt a new method. Thus, it seems that engagement is also influenced by the playful and more relaxed mode people are interacting with each other.

> Traditional methodologies were maybe a little boring and not guarantee the engagement that the game approach provides (informant from Novartis);
>
> If we can have a kind of game focused on idea generation it could be good to get everybody involved (informant from Trivalor);
>
> The gamification approach has a more playful meaning than what we have done so far. And it seems to me that having more fun is more interesting (informant from Microsoft);
>
> By introducing a game approach people felt it was a more fun thing to do" (informant from Novartis).

Despite the recognition of all the advantages of more playful approaches, it was suggested that some people in the corporate world still disbelieve in the potential of this type of approach and are questioning themselves about the possibility of having a more playful approach to critical business processes. It is important to highlight this conflicting observation, which is supported by relevant statements.

> People who are more skeptic may think this approach is not serious and therefore do not pay attention (Novartis);
>
> Gamification provides a more playful approach, which is interesting but it always depends on the profile of who will participate in the workshop. To be able to fit in Design Thinking sessions, I think we have to take into account the type of people with whom we are going to interact and run the project before using this gamified approach (informant from Microsoft).

5. Discussion

5.1 Conceptual model

After describing the empirical results, this section provides meaning to the first-order codes and the second-order themes of the overall aggregated dimensions (organized process and engaged participants). This assignment is accomplished by comparing these results with existing design thinking theory that is summarized in Table 1. For both aggregated dimensions (organized process and engaged participants), a theoretical debate is promoted,

which supports discussion of design thinking against gamification (Gioia *et al.*, 2013). Gamification seems to help mediate some of the design thinking limitations by enhancing and complementing some of its practices. But which practices are enhanced in the context of the ESoIP?

Figure 1 (conceptual model) illustrates the findings in a more meaningful manner by displaying and revealing the dynamics between aggregated dimensions and design thinking practices that support the added value of the introduction of gamification. It summarizes the gains from both aggregated dimensions (organized process and engaged participants), showing how gamification leads to enhanced design thinking practices in contrast with stand-alone design thinking methods and tools, e.g. brainstorming, customer journeys and personas. Moreover, it also highlights non-enhanced design thinking practices routed from a more participated process and relaxed mode that are so keen on gamification.

Essentially, this discussion allows not only emphasizing the possibility of theorizing the use of gamification approaches on firms' design thinking processes but also featuring a set of suggestions for future research.

5.2 Enhanced design thinking practices

5.2.1 Organized process. Findings suggest that gamification improves the lack of structure and contextualization, sometimes identified in design thinking (Beaudry, 2009; Deserti and Rizzo, 2014; Iskander, 2018; Meyer, 2015). In contrast to the standard design thinking approach, gamification seems to provide more clarity about the goals to follow and facilitate the draft of a more comprehensive plan. Gamification rules and procedures avoid the dispersion of efforts and ensure that everyone is focused on the results, which contribute to improve the setting of goals and organizational alignment (Birkinshaw and Mol, 2006; Hamel, 2006; Vaccaro *et al.*, 2012) and the engagement of multiple actors (Huxham and Vangen, 2004; Ollila and Yström, 2016).

The ability to facilitate the specification of the needs and requirements is an advantage that can address the difficulties of design thinking related to a perception of a simplified view of design as a process (Rauth *et al.*, 2014). Having better specifications provides everyone a common understanding of the design thinking process and avoids that it can be perceived as a limited framework. This characteristic of gamification contributes to overcoming the difficulty of coordinating a broad range of activities of the innovation process, such as identifying customer needs and (Ulrich and Eppinger, 2012).

Another significant benefit of gamification as compared with design thinking seems to be the muscle to develop a more structured description of the idea collaboratively. This type of approach overcomes the difficulties of design thinking associated to the lack of structure (Beaudry, 2009; Deserti and Rizzo, 2014; Iskander, 2018; Meyer, 2015) by using different complementing and overlapping tools in a more connected, strategic and consistent manner. It also promotes to a better connection between thinking and doing (Deserti and Rizzo, 2014; Sena, 2018) by anticipating and envisioning the resources that would be involved in case the idea follows for implementation. Ultimately, having a more engaging type of language may help to close the gap between what is proposed and understood to overcome misalignments in meaning (Camacho, 2016). Potentially, it can also contribute to reducing the degree of complexity and uncertainty that comes from informal relationships between stakeholders (Ende *et al.*, 2014; Florén and Frishammar, 2012; Zimmerling *et al.*, 2016).

A more structured approach addresses one of the key innovation challenges associated with the execution of activities that are typically more unpredictable and unstructured than those performed in a stage-gate process (Cooper, 2014; Koen *et al.*, 2001). It contributes to connecting the dots in ideation and bringing more visibility to the overall process.

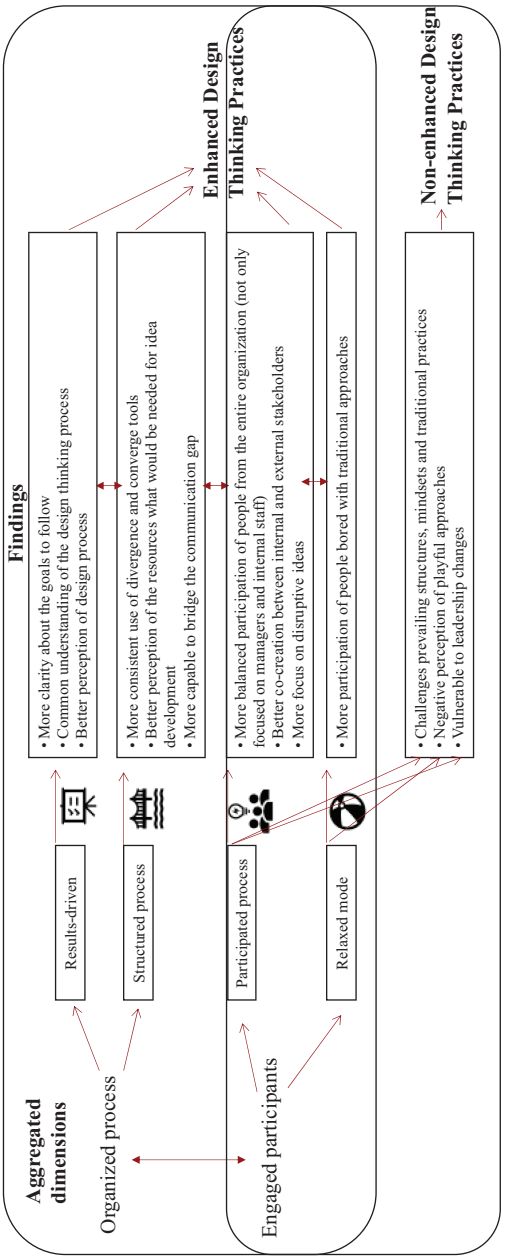

Figure 1.
Conceptual model

5.2.2 Engaged participants. By encouraging balanced and voluntary contributions of all participants, regardless their job titles and hierarchy, gamification seems to reduce the difficulties of design thinking practices related to an excessive top-down change management approach (Deserti and Rizzo, 2014) and the limited participation of self-managed and truly diverse teams (Beaudry, 2009; Brown, 2008; Kupp *et al.*, 2017; Natasha Iskander, 2018; Zurlo and Cautela, 2014).

It was observed that gamification stimulated a more open and creative experience sharing and discussion among participants from multiple functions and levels in the hierarchy of the organization in an autonomous way. This type of environment may contribute to managing multiple actors that are typically more difficult to engage (Huxham and Vangen, 2004; Ollila and Yström, 2016). At the same time, it supports higher levels of collaboration among participants and creates more knowledge from external stakeholders (Ollila and Elmquist, 2011).

Gamification seems to facilitate multidisciplinary contributions not only from different functions and internal departments but also from external partners, which also addresses the need for more active participation of diverse teams in strategic thinking and organizational change processes (Beaudry, 2009; Kupp *et al.*, 2017; Natasha Iskander, 2018; Zurlo and Cautela, 2014). This type of process requires bolder ideas, demanding firms to get away from more incremental approaches that only tackle what is known (Dunne, 2018; Robbins, 2018).

Providing a unique and distinctive environment to collaborate based in gamification elements appears to increase the participation of people that are somehow bored with repeating and non-productive design thinking practices, mostly led by designers or facilitators (Beaudry, 2009; Iskander, 2018; Kupp *et al.*, 2017; Zurlo and Cautela, 2014). This type of playful and more relaxed mode potentially contributes to higher engagement of multiple actors that are more difficult to involve (Huxham and Vangen, 2004; Ollila and Yström, 2016).

5.3 Non-enhanced design thinking practices

Significant illustrations of gamification advances to design thinking have been identified for each theme. Nevertheless, a set of limitations was acknowledged in the review of the shortcomings of design thinking approach to the ESoIP. It looks gamification can help to mediate most of these issues. However, no evidence from interviews neither from workshop observations was found to support that gamification adds value in the following cases: cognitive obstacles; the need for legitimacy and culture fit; and vulnerability to leadership changes.

When it comes to addressing the issue of legitimacy (Dunne, 2018; Kupp *et al.*, 2017; Rauth *et al.*, 2014), the gamification approach still has a lot of restrictions, particularly in the engaged participant's dimension. Like design thinking, it seems that gamification introduces some kind of ambiguity and uncertainty into the innovation equation by challenging prevailing structures, mindsets and traditional practices, which requires a considerable amount of internal legitimacy among both managers and employees.

The same applies to cognitive obstacles. Even if triggered by the concept and relaxed atmosphere of gamification, some people are more concerned with the disadvantages of using a more playful approach to a critical process. This occurrence probably happens because they do not believe in the potential of gamification to support business processes. It seems that the difficulty of adopting gamification is higher in cases where playful approaches are simply introduced to provide a fun environment to employees. Eventually, having a concrete business process to improve might turn gamification easier to embrace and overcome the negative perception of playful approaches.

Gamification is also vulnerable to leadership changes (Dunne, 2018). Just like in design thinking projects, gamification was only adopted when accepted by the top management of the firm. Thus, in case of leadership turnover, the acceptance and legitimacy of gamification may be put at risk if the new leader is not able to dive quickly into its process and expected outputs.

6. Conclusions

The paper suggests that gamification can overcome the weaknesses observed in some design thinking practices, such as lack of structure and clarity around goals and disconnection between thinking and doing. As shown in the conceptual model (Figure 1), findings support the idea that gamification can complement and enhance design thinking. Design thinking practices are enhanced by making the ESoIP more organized in terms of structure, focused on goals and having people more engaged through a more participated and open environment. Yet, some significant limitations remain, namely the suspicion that still exists among many decision-makers concerning the legitimacy and capability of gamification to improve concrete business processes, which will not enhance design thinking practices.

Gamification can be described as a game changer approach since it challenges the way a firm is usually managed and how power is distributed among the key stakeholders. During the experimentation of the gamification approach, it has been observed that power could be easily shifted from middle management to the team-level. For instance, the game elements give equal opportunities to everyone to participate, no matter the view of the manager or project leader. Teams are usually managed within a structure composed by a project manager (e.g. middle manager) and other team members with very concrete tasks and responsibilities, which contrasts with this new approach that truly empowers self-management teams.

Knowledge is built and transferred usually from a top-down approach where the experts (owners of the experience) share their knowledge with others by training or doing on the job activities. It, therefore, contrasts with gamification that promotes a bottom-up collaborative team approach where knowledge is generated by a collaborative effort of a diverse team that allows everyone to share their views. On top of that, the organization structure is usually hierarchical and non-democratic, which also contrasts with gamification that encourages peer assessment, anonymous feedback and consensus building and everyone's participation. Therefore, gamification approaches will always face a lot of resistance from people that will lose power, status and control over the others.

No matter the advantages of a more playful environment for employees, there will always be some feelings from some managers in treating work and games as opposites. This type of constraint is still difficult to overcome in many situations, particularly when having projects with profound implications in the business processes. Nevertheless, it seems that gamification approach is very suitable for innovation and in particular for idea development. Besides, that can be used in other business processes like sales, training and team-building activities.

All these findings provide important implications for both theory and practice. This paper supports and expands the view of previous studies and offers essential contributions to innovation management and design thinking theory, particularly to the way firms can successfully manage the ESoIP through gamification. In fact, by providing a more creative, structured and engaging approach, gamification can help design thinking to overcome the main difficulties and challenges of managing the innovation process in both systemic and social aspects. The latter is related to goal setting and coordination of tasks, while the former is much more about consensus building, involvement and motivation. This finding is also particularly relevant for managers that wish to successfully apply gamification to accelerate systematic innovation practices and successfully launch new services or products in the marketplace by improving employee engagement with innovation processes.

Gamification approaches were very much focused on the processes and business goals, which emphasize the management of innovation processes in a systemic perspective. Findings seem to show that gamification approach to ESoIP is more process-driven than standard design thinking methods and tools. Despite its ability to equally generate significant social outcomes, like team spirit and consensus building, gamification is fundamentally a creative engineering approach that contrasts with other, less structured methods more focused on thinking than on doing.

Another vital contribution to the literature is a more transparent and unbiased discussion about design thinking. Since design thinking may have been overhyped among scholars and practitioners, it is appropriate to acknowledge its shortcomings and discuss better ways to overcome its difficulties in managing the ESoIP.

Although efforts were employed to ensure the quality of the findings, constraints have been identified when planning and conducting the interventions. The visible participants' time constraints that the researcher had to face during the whole process have been the main difficulties affecting data collection — a consequence of having inputs from users, not in a laboratory, but a real work environment. Nevertheless, this practical aspect of the case study provides the validation that is necessary to produce a high-quality theory about the way firms are applying gamification approaches to ESoIP.

This paper opens a wide range of avenues for further research, particularly in the case of design thinking limitations, and how improved gamification approaches can overcome them. Another opportunity for future studies relates to the deployment of gamification in combination with design thinking approaches throughout the other phases of the innovation process. It makes sense to investigate how these approaches can be applied, not only to different steps of the ESoIP like idea generation but also to the subsequent stages, i.e. new product development and commercialization. Findings also lead to potential research in other areas of design thinking interventions like the co-creation of value with customers by using gamification to facilitate the incorporation of their inputs in the concept design of new products and services.

Finally, more discussion is needed to enhance design thinking practices and make sure that it would be prepared to face the next challenges of the XXI century, such as the engagement of millennials and the digital transformation of the workplace. Taking into consideration all the intrinsic potential and its value-added, it is not difficult to envision that gamification will be part of design thinking initiatives in the next years.

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Appendices

Appendix 1.
Individual-level interview questions for Team Leaders

Semi-structured interview questions
(1) What is your opinion about gamification elements and process?
(2) What do you think is the contribution of gamification to the innovation process?
(3) What do you think of the atmosphere generated by the gamification approach?
(4) Did you face frustration or openness in sharing views and opinions?
(5) How can you describe the process of knowledge transfer among the team members?
(6) What do you think of the insights produced by the team members? Did you encounter any surprises?
(7) What did you learn in the workshop? Did you learn anything new?
(8) Did the recipe/solution produced by the team make sense to you?
(9) What are your overall comments about the gamification workshop?

Appendix 2.
Individual-level interview questions for Innovation Manager / Project Manager

Semi-structured interviews questions
(1) What is your opinion about gamification and ideaChef® method and tool in particular?
(2) How do you perceive the feedback provided by participants after the workshop?
(3) How satisfied are you with the way gamification was applied to innovation process?
(4) How do you see gamification approach in relation to the design thinking methodologies and tools that you use?
(5) Do you think gamification is well suited for the innovation process?

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