Gamification in Management: analysis and research directions

Vanissa Wanick[1], Hong Bui[2]
[1]*University of Southampton, Winchester School of Art, v.w.vieira@soton.ac.uk*
[2] *University of Bath, School of Management, H.T.Bui@bath.ac.uk*

Abstract

This paper conducts a contemporary and inclusive review of initial applications of gamification to various management fields, such as finance, corporate governance, risk management, human resource management, etc. It defines and contextualizes gamification within the field of management. This allows to understand the main elements of a general gamified system and its main applications. Via a systematic review of 203 studies addressing management contexts and gamification, it develops a holistic framework for the analysis of gamification in management areas. The study concludes by setting out a list of questions to direct future research in order to increase the impacts of this innovative and strategic research area within businesses and organizations.

Keywords: *gamification, strategy, management, review, innovation;*

1 Introduction

With technological advances and the shift towards an economy of engagement, businesses dynamics are changing. Today, it is possible to create meaningful and engaging experiences through rewarding systems [1], which are part of main strategies of gamification. Gamification has been increasingly harnessed for motivating and supporting people towards various individually and collectively beneficial behaviours [2], [3]. For example, the *Zappos Face Game* was created to engage workers to promote collaboration [4]. In comparison with serious games, gamification requires a strategic view; that is gamification is a strategy, whereas serious games are games [5]. The term gamification is an emergent concept that aligns the employment of game design components within non-gaming contexts [6], [7] to support value co-creation [8]. One potential aspect related to gamification as an innovative approach is the possibility to collect data, aligning it with business strategies [5]. Since innovation is about introducing, generating and adopting new approaches inside and outside organizations [9], this situates gamification as an important player in innovative management.

In the context of Industry 4.0, innovation is at the core of the industrial and organizational operations, involving smart production, real-time data, information, automatization and human-computer interaction [10]. The Industry 4.0, which represents a new paradigm of smart technologies applied to industrial contexts, have been changing the perspective on how things are created. In this era, there are challenges related to industry-related operational aspects like using resources efficiently and fast decision making and other challenges such as intelligent and digital systems [11]. This dynamic transformation changes the way business adopt and develop intelligent systems and models. This puts disciplines like digital transformation into the centre of organizational management fields, promoting strategies for businesses to transform their traditional process through technology [12]. In fact, technological advances also allowed companies to expand applications using gamification, through tracking services and sensors [13].

So far, the discussion about the employment of gamification in organizations has been attracting attention from both practitioners and scholars around the globe. Although the inclusion of games in business contexts is not new and it has been used for business education purposes [14], [15], gamification brings novel applications to various management fields due to its interdisciplinary and dynamic features. From the academic perspective, gamification has drawn interest from various fields, including commerce, education, health, and management [16], becoming an interdisciplinary strategy. Gamification has been also researched in the domains of online communities, crowdsourcing and sustainability [17]. In the case of businesses and organizations, Mollick and Werbach [4] presented at least four applications of gamification, including performance improvement, training and recruiting, engagement and satisfaction at work. For example, the call centre company *LiveOps* utilised gamification to improve workers' performance and customer satisfaction by implementing elements such as avatars, leaderboards, points, badges and missions [4]. Following the same trend, the software company *SAP* has built at least seven game-like applications with different objectives to induce employee participation and sales improvement [18]. The common ground between those applications is the combination of game design elements with enterprise-led objectives. Although those examples could improve employee engagement and other business dynamics, there is still little understanding of management and gamification in a holistic way. Considering this, it is possible to ask: How can gamification be employed as a management strategy in a digital transformation era? What is the main purpose for the employment of gamification in management contexts? And what is the future of the employment of gamification in the era of digital transformation in business organizations?

In light of these questions, this paper analyses and maps the main applications of gamification in management contexts (e.g. human resources, marketing, finance, services, logistics and supply chain and accountability) considering its core features, strategies, motivations and purpose. It takes management as the core discipline to be analysed as a context for gamification. The main contributions of this paper are the framework developed for an integrated analysis of gamification in this field, and the future research opportunities of gamification in management in the era of digital transformations. In the next section a research background of the gamification term and its core components are provided.

2 Background

Gamification is a combination of designed parts linked to game-related experiences, situated between game-like and playful design [7]. Although gamification can be stored and processed by digital networks and computer systems [19], it is important to emphasise that gamification does not need to be digital [6], [7]. The application of gamified systems does not require to be linked to digital contexts, and it could be applied in non-digital contexts such as organizational management. Thus, gamification becomes a design strategy that borrows elements from games, rather than the technology itself. With this, gamification becomes more about psychology [20], rather than just a "piece" of technology.

The focus on game elements has led to the adoption of components like rewards, points and badges in business [21]. However, this concept still locates game elements in the centre of the gamified applications. For this reason, Huotari and Hamari [8] have defined gamification from a service design point of view, involving game-like experiences that can affect consumer behaviour, particularly through value co-creation. Consistently, Werbach [22] argued that gamification is a process that make activities more like a game. Thus, understanding gamification as a design process composed of game design elements is crucial to examine the application of gamification in management contexts.

The focus on game elements is very specific to games, and therefore, it is important to consider characteristics of games, including *game interface patterns* (e.g. badges, leaderboards, levels), *game design and mechanics* (e.g. constraints of time and resources),

game design heuristics (e.g. meaningful goals, continuous play, feedback), *game models* and *game design methods* [7]. These have become a blueprint for gamified applications. For example, *Oracle Forum* is a community that comprises game-like elements such as leaderboards, achievements, points and badges to motivate participants to engage with contributions and knowledge sharing [23].

The employment of game design elements is generally utilised through badges, points and leaderboards [24]. For example, leaderboards could drive visual comparisons between players' achievements (or scores), thereby creating social incentives that evoke competition [25]. This will work together with business goals. With this, there are many challenges ahead; one is to understand the design process behind the gamified application; two is the alignment with the business strategy, which may be related to the sector and organizational perceptions.

Gamification aims to change behaviour and attitudes through technology and systems [26]. Thus, game design elements used in gamified systems cannot be freed from the "human" factor. These components are related to a sense of purpose, combined with strategic thinking, motivation and participation [27]. If users feel engaged in something that is fun, this application will have a good potential to generate participation and engagement [28]. Engagement can be measured by the time people spend on a specific task and it could occur in different levels, considering the user interactions [25]. However, engagement is often attached to motivation, which is empowered by physical, physiological and emotional needs, like competence, autonomy and relatedness [29]. For this reason, a gamified application tends to connect with the user's motivational outcomes through elements that are designed to drive those expected results. As argued by Deterding [30], those elements could be called as *motivational affordances*. According to Deterding [30], *motivational affordances* stand for the connection between the features of the object and the ability of the object to perform the action, allowing people to interact with the application, according to their motivational needs. Hence, gamified systems involve motivation as the core of the application [26]. For this reason, the designed application should recognise and promote motivational aspects to support psychological and behavioural outcomes.

There are two general types of motivations: *intrinsic* (involving autonomy, mastery and meaning) and *extrinsic* (related to external factors like money, for example) [31]. In order to create better engagement, intrinsic rewards could be better than extrinsic rewards [32]. Thus, the main challenge of gamification in management is aligning intrinsic and extrinsic rewards with business goals, in order to keep the user engaged and motivated.

Considering this, gamification could be employed as a balance between meaningful goals and people's needs within a context. In the context of the gamification for enterprises, this characteristic includes the interaction with other individuals in the company such as stakeholders, partners and employees. This shows that gamification also depends on the context of the application. In fact, this is the main agenda of research into gamification, as Nacke and Deterding pointed out in their paper in 2017 [13]. Thus, looking at gamification from the perspective of management fields could also bring insights and merge both disciplines.

This paper outlines and reviews the published literature involving the study of gamification being applied to various management fields, including organizational studies, human resource management, marketing, finance, logistics and supply chain, and corporate governance. The systematic review affords sufficient materials to shape a list of recommendations for the application of gamification in management areas, regarding the investigated companies' processes and motivational aspects, such as increasing workers' satisfaction, increasing productivity, and engagement of stakeholders involved in the business environment.

3 Systematic review

In order to achieve a significant and relevant review, this study follows guidelines proposed by previous systematic review research [33]. It adopts three key stages for this approach. However, this study goes beyond Greenhalgh et al.'s [33] approach and proposes a general framework for the analysis of gamification in management. Stage 1 is to identify the main journals, conferences and corporate reports studying gamification and management; stage 2 is to analyse and discuss the main applications of gamification in various management fields, bringing a framework for the analysis of gamification in management; and stage 3 is to provide a list of recommendations for future research.

By following this process, this review considers the application of gamification into businesses and substantial fields of management such as human resources, marketing, finance, logistics and supply chain management, and corporate governance, in order to identify the nature of the implementation and opportunities for the transformation of businesses by design. The motives for these choices are related to the fact that: (1) the themes are human-centric; and (2) the areas comprise different segments of management that are prominent in the literature. As gamification is at an early stage of application in management, this study considers the literature published regarding management and gamification, including journals, conference proceedings and published companies' reports in this review. Although previous research has analysed the methods and results of gamified applications [26], the approach of this paper is to recognise opportunities for gamification design in different fields of management and for different stakeholders involved in the process.

The first stage of this study is to identify major papers published in conferences, journals and corporate reports. The addition of reports provided by companies offers further evidence of what has been done and applied into real business contexts. The relevance of the selected publications is filtered by (a) gamification applied within business and management contexts, and (b) examples of applications of gamification within management.

Searches were undertaken utilising databases from Google Scholar, ScienceDirect, ACM Digital Library, SciELO and Google search (including various management journals), based on title screening, proof of abstracts and keywords. Keywords' searches and full text as "gamification + management", gamification + business", gamification + marketing", "gamification + work", "gamification + HR", "gamification + L&SCM", "gamification + finance", "gamification + accountability", "gamification + corporate governance", "gamification + services" and "gamification + health" were used. From the results, research papers, conceptual papers and reports, review papers which focus on applications of gamification in management contexts are considered. In other words, this paper focuses on the use and implementation of gamification as a strategy in management fields, particularly in papers that described examples and case studies. Papers that do not relate to management areas are discarded.

In total, 203 works on the implementation of gamification in management areas are identified, including 55 works in education, nine in finance, 10 in government management, 28 in health services, 4 in L&SCM, 14 in marketing, 3 in risk management, 11 in services, 11 in sustainability and accountability, 11 in tourism and 47 in work and human resource management HRM) ; of which 89 are journal publications, 31 are books and book chapters, 3 thesis, 72 are conference papers, and 8 company reports (downloadable files and online reports). The data are derived from publications from the period between 2001 and 2018 (the year with more publications was 2013; see Figure 1). As the term "gamification" has gained in popularity since 2010 [34], this paper covers 17 years of research and applications in gamification.

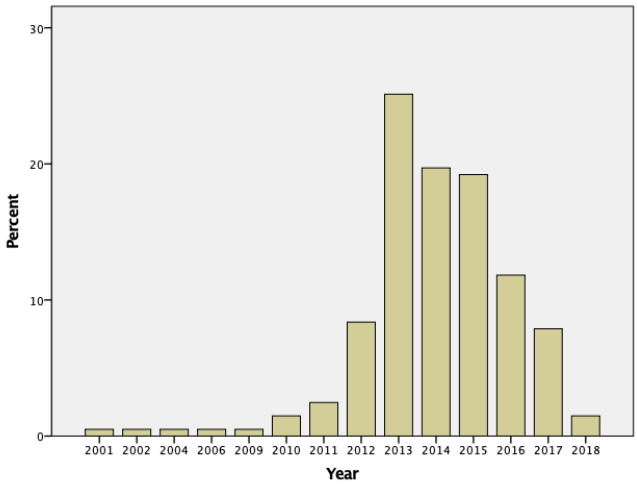

Figure 1. *Publications per year*

4 Analysis and discussion

Figure 2 shows that the application of gamification has been mostly developed to engage people, particularly employees and consumers. This systematic review indicates that the purposes of gamification application in management mainly involve community building, brand loyalty, engagement, education, motivation, monitoring, persuasion and productivity. The main purpose of the application of gamification in management areas was engagement (33.5%), followed by motivation (23.6%) and participation (10.3%) (see Table 1).

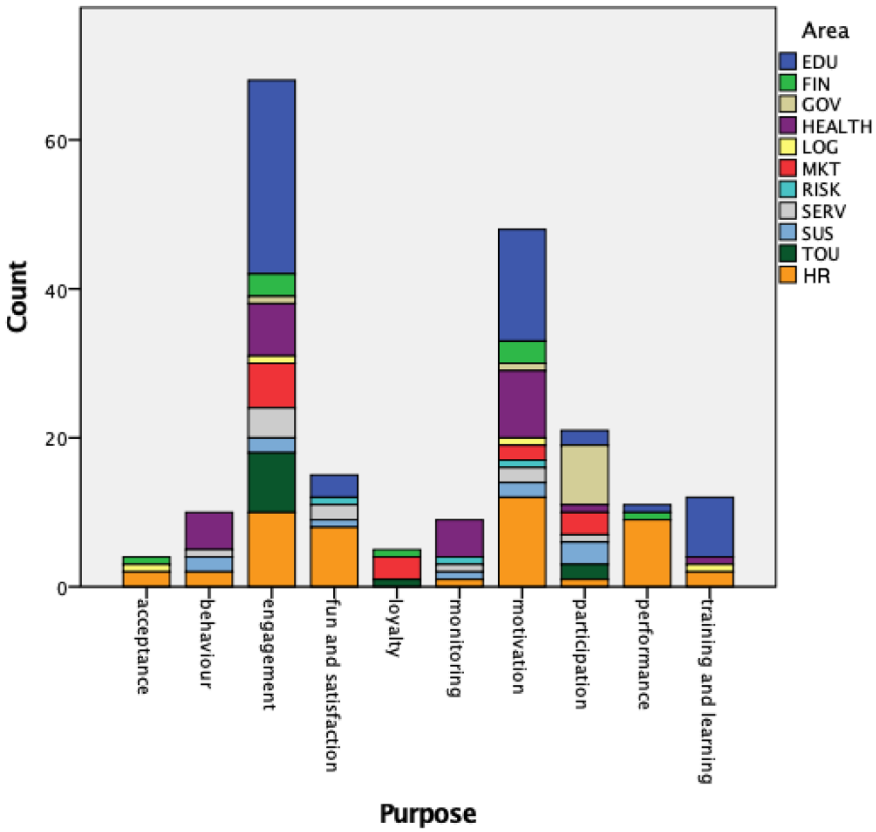

Figure 2. *Relationship between the purpose of the gamified applications and management areas*

In areas such as finance and accounting, logistics and HRM, one of the main objectives of the applied gamification is in the form of training programs. This implies that business education has a strong relationship to gamification; however, the literature has not clearly shown how the integration of the gamified educational attempts incorporates business and individual goals.

Although engagement was the most implemented practice of gamification in management, other objectives of the gamified application were related to the business goals, such as productivity, monitoring or brand loyalty. This scenario illustrates a significant consideration of business goals within gamification in management, combined with consumers, workers, partners and other stakeholders. This aspect shows that the employment of gamification could help to understand and give insights into people's behaviour and it integrates business goals with human needs and objectives.

The analysis focuses on the purpose and managerial implications of gamification in various management fields. During the review process, there is a large body of literature related to healthcare services. Therefore, in this systematic review healthcare services are added along with other management fields. Figure 3 shows the evolution of the publications in gamification within management areas. As shown in the image, there is an increasement in the application of gamification for sustainability and a decrease in the publication area only focused on education. This could be due to the interdisciplinarity of management areas.

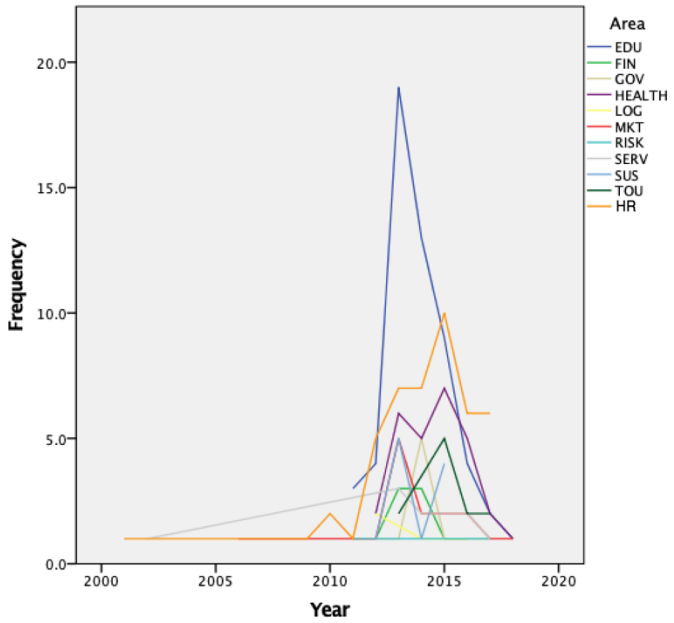

Figure 3. *Evolution of management areas publications in gamification in the last 17 years*

Table 1. *Relationship between purpose and management area*

Purpose		acceptance	behaviour	engagement	fun and satisfaction	loyalty	monitoring	motivation	participation	performance	training and learning	Total
Area	Education	0	0	26	3	0	0	15	2	1	8	55
	Finance	1	0	3	0	1	0	3	0	1	0	9
	Governance	0	0	1	0	0	0	1	8	0	0	10
	Health care	0	5	7	0	0	5	9	1	0	1	28
	Logistics	1	0	1	0	0	0	1	0	0	1	4
	Marketing	0	0	6	0	3	0	2	3	0	0	14
	Risk management	0	0	0	1	0	1	1	0	0	0	3
	Services	0	1	4	2	0	1	2	1	0	0	11
	Sustainability	0	2	2	1	0	1	2	3	0	0	11
	Tourism	0	0	8	0	1	0	0	2	0	0	11
	Human resource management	2	2	10	8	0	1	12	1	9	2	47
Total		4	10	68	15	5	9	48	21	11	12	203

4.1 Gamification, Marketing and Tourism

Gamification can be related to marketing strategies that involve advertising, persuasion and rhetorical messages [19]. Moreover, gamification has a strong relationship with service marketing, promoting an integration of gameplay through a holistic view of the service, including the customer as a co-producer [8]. This aspect positions the consumer as a co-creator of service value and actor in the gameful experience. Furthermore, in brand management, gamification could help to implement engaging activities and build an engaging and loyal relationship with the consumer [25].

Engagement is the deep emotional connection that the consumer has with the brand, with high levels of participation [35]. From the brand management side, engagement is also determined by attitudinal attachment and sense of community [36]. Gamification has also been used to increase consumer engagement and content creation in brand communities. For example, the American software company *Marketo* created the *Marketo Community*, with the participation of and collaboration with users, rewarding people with badges and improving consumer co-creation [37]. In fact, the application of rewards to enhance consumer co-creation can become a valuable practice in brand communities and could be explored further [38].

In marketing, gamification has a very close relationship to loyalty programs. For example, *Frequent Flyer Programs* could be considered as gamified loyalty as they usually offer points (or miles) to customers [39]. Loyalty programs started by giving things away for free to consumers, creating an expectation of getting free things all the time [25]. Over time, however, companies started to promote status value and virtual goods, incorporated by *Frequent Flyer Programs* [25]. In other words, a loyalty program starts to foster a deeper consumer engagement with the brand. For example, the huge American coffee brand *Starbucks* introduced a gamified mobile app, which rewarded consumers each time they purchased a product inside its stores [40]. This shows that rewards usually encourages loyal consumer behaviour [41]. However, gamification is more than a loyalty program since it

can also embed data analytics and Big Data [19]. According to Chen and Storey [42], Big Data is a term that describes the large and complex amount of data (from sensors to social media data), and should include analysis and business intelligence, in order to make this data meaningful. For this reason, gamification should have measurement tools, since it can also motivate people, driving high-value activities through users' inputs and data mining [35]. Sensors and intelligent systems are key concepts of the Industry 4.0 and this shows that gamification has a potential to mediate and generate data around user interactions. Yet many challenges might remain, since there are no clear management strategies of this type of data.

The application of gamification as a strategy allows marketers to have a history of product usage, through monitoring tools and analytics, usually related to behaviour regulation [19]. According to Zichermann and Cunningham [25], the way to measure a user's level of engagement with a gamified application is through the quantification of the user's recency, virality, rating, frequency and duration of the action. In the marketing context, this aspect might be useful to build gamification analytics. Hence, gamification emerges as a process that includes Big Data and data management [19] with meaningful interpretation of this database. Another application of gamification in marketing is seen in the tourism sector, through the implementation of crowdsourcing strategies (i.e. a process that involves the contributions of groups of people via online communities), particularly to enhance user-generated content [43]. In fact, in the tourism sector, gamification can be employed for at least four goals: tourism education, sustainable consumption, charity activities and user-generated reviews (from tourists and residents) [44]. For example, tools like *TripAdvisor* allows tourists and residents to leave reviews on places visited and get higher in rankings, getting badges and accumulating points according to their contribution to the community. A potential application of gamification is in sustainable tourism, motivating tourists to visit new areas, raising awareness of energy resources and management, reducing waste and promoting a integrative interaction between tourists and locals [44].

4.2 Gamification and Human Resource Management

Gamification applied to work management is a motivational technique derived from games, rather than just an entertainment action with the aim to promote only fun experiences [45]. This aspect involves gamification as a tool to enhance motivation and incentives at work. In other words, gamification transforms the workplace. For example, the application of elements such as mastery, connectivity, learning, training, competition, rewards, points, badges and satisfaction could be applied to improve employee engagement, or agents within activities that could promote team interaction, collaboration, stress reduction, and pleasure at work [46]. It was also found that gamification can help different audiences at the workplace. For example, in order to increase production performance, gamification can function as a tool that increases impaired workers concentration [47]. Gamification can also enhance workers collaborations, particularly in the creative industries. For example, *Scranvas* [48] is a tool developed for creatives to share their work within a community to increase collaboration and participation through a scoring system. This can help workers to gather more constructive feedback.

Gamified experiences could help to solve employee engagement issues. For example, the UK multinational company *Deloitte* created a feedback system with a rewarding mechanism, missions, clear goals and leaderboards with the aim to motivate people to take more courses and continue their training progress [49]. The results of this strategy have transformed workers' relationships with the company's training program. Over a period between three and six months, workers finished the course 50% quicker that previously, with 46% of users returning daily [50]; this shows that corporate engagement could be improved by the use of gamification.

Nonetheless, it is important to understand why gamification works in this scenario. According to a report published by *Deloitte* [51], organizations should look at objectives,

processes, solutions and people before applying badges, points and leaderboards, thus conferring value to the company's network. This implies a previous analysis of the implementation of gamified applications, including employment of a systematic behaviour model [24]. For example, if a gamified strategy is not well designed, it could have an opposite result, such as creating conflicts and low motivation among workers, particularly if the game mechanic is intertwined with rewards related to salary and bonuses [24]. This is an explanation for why gamified systems do not work just because they have badges or leaderboards. Gamification should work because it helps a company to achieve business objectives, while respecting users' needs and expectations. Another application of gamification at work is the enhancement of teamwork and collaboration. This could be extremely valuable for organizations since social interactions with stakeholders (e.g. customers, workers, suppliers, etc.) is one of the key processes that enhance creation of organizational knowledge [52]. Also, as highlighted by Vassileva [53], in the workplace there are motivational cues for group contribution. Gamification can also be applied to reduce the educational gap at work and increase engagement with corporate responsibility actions promoted by the company, thus driving positive behaviour change related to sustainability discussions, but using a different approach from merely personal efforts to drive this change [54].

Game-like activities at work seem to improve creativity and sense of community as productivity and satisfaction are related to fun activities [55]. Gamification can also improve workers' productivity in the agile design environment. According to Zichermann and Cunningham [56], agile design management involves iteration, repeated test loops, prioritisation and user-centred design, as a process that is often applied to software development and includes the software engineering team, designers and the stakeholders [57]. In this context, Zichermann and Cunningham [56] suggest that the application of gamification should be developed through the management of experience points that the system achieves before launching and the testing loops, in order to collect feedback from the users, as a way to analyse a user's engagement while testing a project. This process illustrates that gamification can be implemented in project management.

4.3 Gamification and Logistics and Supply Chain Management

Previous research including gamified applications in logistics and supply chain management has implied the challenge of teaching and training, enhancing educational benefits for students in this area [58]. This strategy was used through the combination of simulations and role-play applications like *Second Life*. The idea was to merge real-world activities with academic activities. According to Wood and Reiners [59], elements like quick feedback, leaderboards and individuality can enhance logistics and supply chain management, learning and engagement.

Logistics and supply chain strategies utilising gamification in management are related to an educational approach through simulations. However, there is no evidence of the application of gamification that could integrate all aspects of the enterprise, managing stakeholders, consumers, partners and employees involved in logistics and supply chain management. For example, in a white paper published by *Bunchball* [60], partners could lack focus and incentives, thereby putting the relationships inside the business at risk.

4.4 Gamification and Finance

The impact of gamification applied to business can include the finance department, particularly in order to measure every aspect of return on investment (ROI) and justify future work and design [61]. According to Hutton [62], the world of finance itself has become a metaphor of a game, representing actions from everyday life. For this reason, the implementation of gamification in finance has been applied as a part of people's routines from the point of view of the user. For example, personal finance applications can help the user to track expenses automatically [61].

Gamification applied to finance can be analysed in at least two ways: its application inside banks and companies, integrating the whole process of business; and the gamification of personal banking, from the perspective of the individual [61]. One example from the business perspective is the attempt from the Dutch multinational banking firm *Rabobank* to encourage customers to upload documents online for mortgages, thus reducing the company's costs [63]. Gamification also helps motivating users to accept new interface design elements in e-banking systems [64].

4.5 Gamification, Corporate Governance, Accountability and Sustainability

In the organization context, accountability has the power to influence the way people think and makes decisions [65]. According to Solomon [66], environmental, governance and social issues are related to the engagement of the company with stakeholders and institutional investors with social responsible investments and corporate social responsibility (CSR) strategies. In such contexts, gamification can be applied as a way to reduce the educational gap relating to sustainable issues, affect people's behaviour, and bring about an augmented transformation inside the corporate environment [54]. Also, gamification can be applied to motivate people to participate in volunteering experiences [67]. As an opportunity, gamification can be employed in sustainable tourism [44], which shows the applicability of gamified strategies in more than one management area. Gamification can be also employed to build online communities, fostering common goals such as sustainable behaviour. For example, *Greenify* is an online platform that allows users to facilitate sustainable activities in local communities through game dynamics [68].

One of the main issues in business, however, is engagement with and commitment to work accountability of many workers, who are inserted into a transactional model of management [69]. In such a situation, gamification can be applied in order to enhance motivation through intrinsic rewards and feedback loops. However, there is not yet any clear application of gamification in corporate governance.

4.6 Gamification and Healthcare Services

Gamified applications in services could offer hedonic experiences such as feedback, achievable goals, progress and encouragement [70], thereby enhancing the user experience. Gamification applied to healthcare has proven to be an effective combination. Platforms like *Fitbit*, *Nike+ FuelBand*, and *Jawbone Up*, for example, allow users to track their exercise activities and automate the process, to help people to exercise more [61]. Other examples of gamification are games like *SuperBetter*, created by McGonigal [27] to motivate people and regulate people's health through clear goals, progress tracking and meaningful challenges. This example shows that games could be considered as powerful tools for behaviour change, incorporating real-world rewards, goals and challenges. Another element of games such as *storyline* has also proved to be an effective persuasive action, when applied to health-related applications [71]. Overall, most of the examples of gamification applied to health involve regulation and monitoring of health-related behaviour. There is also a trend towards Augmented Reality (AR) and location-based applied to gamified services for health. For instance, gamification can be employed to reinforce rehabilitation movements through AR and games, in which individuals can visualise their next goal, mixing reality and technology with game elements [72]. Personalisation is also another aspect to consider in health applications. For instance, training and exercises could be tailored to fit one's abilities and needs, transforming health services [73].

From this systematic review, it is possible to spot differences and similarities regarding the employment of gamification in several management fields. For example, health applications tend to focus on self-management and self-monitoring in order to motivate people to change their behaviour, while at work, there is a focus on productivity, time

management and competition. This indicates that different management areas might require a particular implementation of gamification, suggesting that the same strategy in one company might not work for all areas in the same way. Thus, considering this, as a way to discuss the results of the review, a framework for the analysis of gamification in management research is introduced in the next section.

5 A Framework for Gamification in Management

As analysed in previous sections, gamification in management has several managerial implications. First, gamification could be employed for a range of purposes but mostly related to engagement, behaviour change and motivation. In addition, the relationship between gamification and data management emerges as an opportunity for institutions to improve their services and products, shaping them according to the involved stakeholders. It is also possible that with advances in Artificial Intelligence (AI) and machine-learning, the understanding of Big Data could become simpler for companies, generating insights and value from structured data [74], [75]. In addition, the combination of sensors and geolocation data could provide even more targeted actions, which also reinforces the challenges of personalised gamified systems (mentioned by Nacke and Deterding as a research gap [13]). Emerging from the analysis above, a general framework for gamification in management is developed (see Figure 4). This framework shows that the implementation of gamification in management benefits both organizations and individuals through several touch-points in a holistic way. The employment of gamified systems in management could function at two levels: one through the interaction with the system, influencing people, and two through data management, learning from the outcomes of those interactive touch-points.

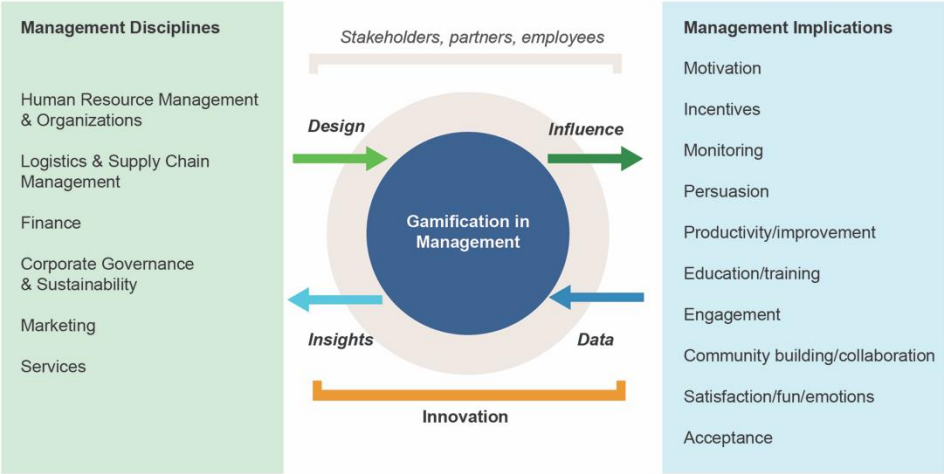

Figure 4. *Framework for the analysis of Gamification in Management*

Second, the framework shows that in order to develop gamified applications in organizations, it is necessary to deliver an effective design process, focusing on businesses' objectives, organizations' needs and individuals' motivations. As discussed before, gamification needs to be user-centred. Thus, the framework for the analysis of gamification in management represents the understanding of the design process, its influence and the data generated by the application, which could give insights to organizations and enhance their innovative potential. For example, if one wants to investigate how gamification could transform a management field, it is important to consider the elements shown in the framework as a guideline. This supports the idea that the consideration of data management while defining strategies, business plan, performance, technology choice and operations is crucial to establish a clear link between data and strategic goals [76]. This framework can

help researchers and practitioners to map the emerging interactions between gamified strategies and organizational management fields. The framework could also function as a mapping strategy for innovation management. For instance, depending on the management discipline, there would be a combination of elements from the design aspect that would evoke certain management implications. These management implications could be mapped in the system beforehand, providing insights to decision-makers and stakeholders. Thus, aspects like behavioural analysis and personalisation of services could benefit from gamification as an innovation driver [5]. This could be innovative for organizations since stakeholders and decision-makers could use data from the gamified system to make changes in processes and implement new ideas and approaches quickly.

Third, with the evolution of technology and possibilities involving gamified systems, it is possible to track users' history of product usage and intentions to behave differently. For example, quantitative analytics could help businesses to understand if the point systems are working or if the balance between goals and difficulty is not being overlooked by the application [30]. The opportunity to gather data from gamified applications (and learn from them) could help to bring tailored experiences for the people involved in the business. The proposed framework for the analysis of gamification in management illustrates this possibility.

Finally, it is also important to consider a few possible problems regarding data collection such as privacy and security. According the *BBVA* bank, one of the main issues of gamification is data ownership [77]. This aspect augments the idea of management as not only management of processes and people, but also data management. This could also reflect upon regulations such as the EU General Data Protection Regulation (GDPR). Therefore, the issues that emerge from the implementation of gamification could be amplified and require further studies, particularly if implemented in European countries. As gamified systems are created around processes, data and people, it is still not clear how to manage those elements accurately and appropriately. Thus, the next stage recommends future research directions for the study of gamification in management, with the aim to understand each of those issues and opportunities.

6 Future Research Venues

In management, gamification has been applied mainly as an engagement strategy for several activities, often being used for educational purposes, particularly in order to achieve business goals. The application of gamification in management could be further augmented to various contexts. For example, the aim of the applications could be not only related to the objectives of the company, but also to employees' needs and motivational demands. It is possible that gamification could have a more holistic approach, involving business goals with stakeholders' needs and demands. It is also possible that gamification may vary across cultures. For example, work engagement differs across European countries based on employees' economic background (e.g. the average number of working hours, paid-unpaid extra hours, GDP values and productivity) [78]. Thus, studies that reinforce gamification diversity could be encouraged in the future. In marketing, gamification could also move away from rewards and focus on a more holistic experience by considering the whole aspect of the marketing campaign, for instance [79]. In such a scenario, it is important to understand the role of the community within marketing propositions, through the integration of consumer participation to the marketing process, including marketing analytics and data management. This aspect promises to bring new possibilities for the design of gamified systems considering co-creation of value and participatory design principles between consumers and firms.

A significant opportunity for future research in gamification and management is to investigate if there is any variance in the gamified application in different business and management fields. According to Gartner [80] the application of gamified strategies at work should be clear and well defined, particularly because employees should not feel

manipulated or intimidated to participate. Consistently, the biggest problem in gamification applied to work is that once the activity is perceived as "mandatory" fun [81], the main rule of gamified applications (voluntary participation) is diminished and the employee fails to become deeply engaged in the activity concerned.

It is also important to consider that legal and ethical aspects of gamification applied to work should consider the employee's privacy and protection [82], including global and local regulations (e.g. GDPR). It should also be highlighted that in the case of gamification for employee engagement and productivity, User Centred Design (UCD) applications, with gamified user experience and people's goals and motivations, should be considered as a way to enhance success in the current application [83]. Although previous research [26] has analysed the empirical application of gamification in different contexts, such as commerce, health, knowledge sharing, sustainable consumption, work, innovation and data gathering, there is a lack of investigation about the integration and customisation of gamification into management. For example: How can scholars and practitioners interpret how people's behaviour is enhanced by the gamified application? How can they measure such behaviour? And how can they ensure that users' privacy and personal data are being respected?

Based on the gaps that this study has identified, a long list of questions for future research is proposed to focus on in order to develop and maximise the impacts of gamification applications in management. First, this study identifies a number of questions that are useful for researchers in *general management*, such as: 1) What is the effective framework for the application of gamification into each management area? What elements should be customised? 2) How does gamification in business vary across corporate cultures and countries (e.g. EU vs. non-EU countries; EU and the UK after Brexit, Western vs. Eastern, developing vs. developed, etc.)?; 3) How can all management areas be integrated into one gamified application?; and 4) What are the concerns regarding security and privacy in gamification applied to business?

Second, scholars and practitioners in *organization and human resource management* could possibly be keen to know: 1) How to integrate gamification at work into the other areas of management; 2) What are the main elements of a gamified application in work?; 3) How to sustain a gamified activity at work; 4) What are the best platforms to build a gamified application in the work environment; 5) How to incorporate social mobility or mobility metaphors into gamification at work using mobile technology; 6) How to integrate the company's culture into gamification; and 7) Does culture affect gamification in work management, and if so, how?

Third, researchers in *marketing* may be interested in investigating. 1) How to implement gamification in marketing through motivation; 2) How to integrate the consumer in the process in gamification for marketing; and 3) What is the impact of gamification analytics on the ROI of a marketing campaign?

Fourth, people working in *logistics and supply chain management* could likely be interested in 1) How to integrate the process of logistics and supply chain management in all management areas through gamification?; 2) How to measure efficiency of logistics and supply chain management through gamification?; 3) How gamification can engage and build a strong logistics and supply chain management?; or 4) How to integrate space, storage and real-world elements into logistics and supply chain management?.

Fifth, for *accountability and corporate governance*, several questions need to be addressed in the area. They are 1) How can an effective gamified application for accountability be developed, and what are the main elements? 2) How can gamification of accountability be integrated into other areas of management?; and 3) Does gamification for corporate governance vary among corporate cultures? How can this integration be managed?

Sixth, in the area of *finance*, scholars and practitioners may be interested in 1) How to boost up finance security with application of gamification? 2) How to measure the impact of gamification in finance?; 3) How to integrate the gamification of finance into other management areas?; and 4) How to build a secure gamified application for finance?.

Seventh, in the area of *healthcare service management*, scholars and practitioners may be curious to know 1) Does the gamification for health vary across fields in health? How could doctors and patients collaborate in the gamified system?; or 2) How can the health service be improved through gamification combined with service design? How can an effective health experience be built through gamification?

7 Conclusions

This paper presented a review of current studies that addressed issues regarding gamification in management fields with the aim to illustrate and explore this new research area. This systematic analysis shows that gamified strategies vary according to each management field. The areas analysed were Marketing and Tourism, Human Resource Management, Logistics and Supply Chain Management, Finance, Corporate Governance, Accountability and Sustainability and Healthcare Services. Each area has a specific gamification strategy. For example, in Marketing and Tourism, gamified applications are created to build long-term emotional links with customers, with a special focus on the use of emerging technologies such as AR and mobile apps. Gamification strategies applied in Human Resource Management focus particularly on employee motivation and engagement, with also aspects related to training and teamwork. In the area of Logistics and Supply Chain, gamification is applied in systematic training activities through simulations. In the area of Finance, gamification has a twofold application: one for management activities inside the company and another for individuals through personal banking. In Corporate Governance, Accountability and Sustainability, gamification is employed to promote and motivate sustainable behaviours of customers and company stakeholders, particularly through community building. In Healthcare Services, gamification is applied as a monitoring strategy also with the aim to motivate healthy behaviours and there is a trend towards the use of mobile apps and AR technologies.

Also, it is important to mention that most of the gamified applications are utilised for community building, brand loyalty, engagement, education, motivation, monitoring, persuasion and productivity. The strategies involve particular rewarding systems, and are enhanced by the accumulation of points, leaderboards and, in some aspects, badges. If employed successfully, gamification can be a tool for innovation and strategy. However, challenges might rise, particularly in terms of data management. As most of the applications acquired user data, there is a need for management of such data, including security and ethical issues. Thus, gamification of management requires a management of gamification itself.

The opportunities of gamification applied to management in businesses are significant for management studies and applications to real interdisciplinary contexts, particularly while providing insights for managers, staff and leaders in global contexts. Other areas could also be explored, such as management for environmental-related applications, sustainability, general education and training, team effectiveness, issues related to governmental practices and new policies, enterprise innovation and data management and protection. Also, it is possible that gamification across different nations could be employed differently, which brings another opportunity for further research in this area, particularly while looking at personalisation in gamified applications. As gamification involves fun, entertainment, engagement, learning and data-driven decision making, management issues could be studied by such systems, integrating not only all the organizational areas but also the stakeholders involved in the process in a more engaging way and promoting innovative outcomes in the era of digital transformation.

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