

GAMIFICATION: A NEW PARADIGM FOR ONLINE USER ENGAGEMENT

Research-in-Progress

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Abstract

The trend of employing game mechanisms and techniques in non-game contexts, gamification, has dramatically increased in recent years. Gamification can be viewed as a new paradigm for enhancing brand awareness and loyalty, innovation, and online user engagement. With the novelty and potential of gamification, until now there is limited understanding and research in this area. Particularly, previous literature falls short in explaining the antecedents of engagement, the mechanisms, and the impacts of gamification. Hence, in this study, we attempt to achieve three objectives. First, we provide an initial review of concepts and example cases related to gamification and summarize sample applications based on their objectives, design elements, rewards, and outcomes. Second, we articulate potential theories that can be extended to understand the motivations, design mechanisms, and impacts of gamification. Last, we provide directions for future research in this area by outlining salient research questions on various aspects of gamification.

Keywords: Gamification, Online user engagement, Research directions, Motivation, Design elements, Impacts

Introduction

In the past decade or so, online games have become hugely popular because of their entertainment value and interactivity. Organizations are now beginning to realize the potential of applying this paradigm in other contexts such as work and learning, leading to the emergence of the concept of gamification. Gamification refers to use of game elements and techniques in non-game contexts (Deterding et al. 2011a). This trend is predicted to intensify with estimates that more than 70% of Global 2000 organizations will employ at least one gamified application by 2014 (Gartner 2011a). Furthermore, over 50% of organizations that manage innovation processes are expected to gamify these processes by 2015 (Gartner 2011b). The revenue from gamification including consulting, software, and marketing is expected to grow from around \$100 million in 2011 to \$938 million by 2014 (Silverman 2011), with some vendors expecting revenue growth of nearly 200% in 2012 (M2 Research 2011). With gamification experiencing increasing demand from organizations, the market is expected to reach \$2.8 billion in the US by 2016 (M2 Research 2011).

Gamification has significant potential in turning customers to fans, work to fun, and learning to enjoyment (Burke 2011). Several anecdotal descriptions of cases suggest the benefits achievable through gamification. For example, a call center company in the US, LiveOps, began to use game elements such as virtual badges and points to motivate call center agents. Since then, sales are reported to have improved by 8-12% and call time reduced by 15% (Silverman 2011). Gamification has the potential to positively impact performance, productivity, and engagement of employees, users, or customers. However, until now, previous research lacks systematic investigations of the antecedents, mechanisms, and impacts of gamification.

The novelty and potential of gamification along with the lack of research in this area motivates this study. In this study, we attempt to achieve three objectives. First, we provide an initial description of concepts and example cases related to gamification, and summarize sample applications based on their objectives, design elements, rewards, and outcomes. Second, we discuss various theoretical perspectives that can be extended to understand the motivations, design mechanisms, and impacts of gamification. Third, we suggest directions for future IS research by outlining salient research questions in this area.

Review of Concepts and Sample Cases

Before starting to formally define and describe gamification, there is a need to define the root of it i.e. the word ‘*game*’. A game has been defined as *a system in which players engage in an artificial conflict, defined by rules, that results in a quantifiable outcome* (Zimmerman and Salen 2003). A more comprehensive definition is provided by Koster (2004), which includes the emotional reaction of players based on the idea of fun i.e., a game is a system in which players engage in an abstract challenge, defined by rules, interactivity, and feedback, that results in a quantifiable outcome often eliciting an emotional reaction.

Gamification and all its forms have an aspect in common, which is ‘fun’. Fun is one of the key reasons that people like to play games and that evokes behaviors such as engagement. Consequently, another component can be added to the description of gamification in the previous section i.e., ‘game-like player behavior’. This results in defining gamification as the use of game elements and techniques in non-game context to drive game-like player behavior (Wu 2011). This definition has three components. The first component of *game elements and techniques* includes game design principles, game dynamics, player journey, storytelling, and other aspects of games. The second component is the *non-game context* which can include work, innovation, marketing, education, health and fitness, environment and community participation. The third component refers to *game-like player behavior* e.g., competition, interaction, collaboration, learning, addiction, and engagement (Wu 2011).

Behavior change is the goal of gamification, in addition to deeper inspiration and engagement (Burke 2011). For instance, the piano staircase in the Odenplan subway station in Stockholm was an attempt to change the behavior of people by adding game elements to subway stairs. Most commuters normally use the escalator rather than the stairs, however, when the existing stairs were changed to a set of piano keys that make a similar sound, 66% more people than normal took the stairs (Kapp 2012). Foursquare, a

social networking platform, has successfully driven its users to “check-in” at their nearby locations using gamification techniques. Another example is provided by DevHub that lets users create their own blogs and web sites. Before the website was gamified, about 10% of users would finish building their sites using DevHub tools. However, after gamification in 2010, DevHub experienced a sharp increase with around 80% of users completing their sites (Takahashi 2011). Moreover, a recent US survey showed that 55% of respondents would be interested in working for a company that offered games as a way to increase productivity, with 28% of employed respondents already playing games more than 30 minutes a day while at work (IPSOS 2011).

We now review the motivations and rewards, design elements, and outcomes of gamification. Previous practitioner articles have classified the rewards obtainable in gamified applications (e.g., Burke 2011). Table 1 summarizes the reward categories, which could be inter-related, along with their descriptions and examples. Previous literature has also described principles and issues related to gamification design (e.g., Zichermann 2011; Deterding et al 2011b). Table 2 shows a list of popular design elements from gamified applications with their descriptions. These elements are typically not used separately but in combination.

Table 1. Reward Categories (Adapted from Burke, 2011)		
Reward	Description	Example
Monetary	Financial benefits for users	Voucher
Status	Recognition within a community	Recognition as expert
Achievement	Significant accomplishment	Achieving sales target or next level in the game
Learning	Gaining skills and knowledge	Learning science concepts
Other self-development	Self-development benefit	Health and wellness
Social and Community Impact	Positive impact within a community or society at large	Raising funds for charity, Solving environmental problems

Table 2. Design Elements for Gamification	
Design Element	Description
Points	Users can earn different types of points by participation and performance
Virtual badge	Users can collect badges that visually indicate their achievements as they accomplish specific tasks and missions
Leaderboard	A leaderboard enables users to compare their own performance with others and stimulates competition
Level & Status	Level typically shows progress in the game. Level may be indicated by a numeric value or a user’s status such as “novice” or “expert”
Quests & challenges	Quests and challenges guide users to perform pre-defined tasks. They help inexperienced users to learn how to move forward
Progression	A visual tool that displays the advancement of users and the remaining work to reach a goal. It motivates users to accomplish a pre-determined goal
Viral loop	The steps a user goes through between entering the site to inviting the next set of new users. In most social games, users can play better by inviting and working together with others

Additionally, we sampled gamification cases from different contexts and summarized them in terms of their objectives, design elements, rewards, and outcomes (see Table 3).

Table 3. Sample of Gamification Cases				
Case Description	Objective	Design Elements	User Rewards	Organizational Outcomes
<i>LiveOps</i> , which runs virtual call centers, uses gaming to help improve the performance of its 20,000 call agents	Work enhancement and Training	Points, Virtual Badges, Leaderboard	Monetary, Status, Achievement, Learning	Increased productivity, faster call processing, higher sales (Silverman 2011)
<i>U.K.'s Department for Work and Pensions</i> created an innovation game called Idea Street to decentralize innovation and generate ideas from its 120,000 employees	Innovation	Points, Leaderboard	Status, Achievement	More innovative ideas, increased employee engagement (Burke and Mesaglio 2010)
<i>Starbucks</i> has a gamified rewards program called My Starbucks Rewards. Stars are earned for every purchase with the Starbucks card. Progress to higher levels is rewarded with free items	Marketing	Points, Levels, Progression	Monetary	Higher sales, increased brand loyalty (Investanomics 2011)
<i>Possible Worlds</i> , a National R&D Center on Instructional Technology, created games to teach science to middle-school students	Education	Points, Levels	Achievement, Learning	Better test scores, higher sales (DegreeDirectory 2011)
<i>Nike</i> has a system called Nike Plus where a little accelerometer can be put in user shoes and can keep track of runs. When plugged into a computer, users can compete with friends	Fitness	Points, Leaderboard, Progression	Self-development, Wellness	Increased user engagement, higher sales (McClusky 2009)
<i>Recyclebank</i> uses games to educate and inspire people to use less energy and recycle more effectively	Environment	Points, Leaderboard	Social and community impact, Learning, Monetary	Savings on waste disposal, higher recycling revenue, higher diversion rate (South Florida Times 2011)

Theoretical Perspectives

The objective of gamification is to drive desired user behavior based on game mechanisms and design. Understanding the antecedents and motivations of user engagement can assist in the design of appropriate game mechanisms and techniques to enhance the impacts. We propose that theories from previous online game literature, user participation literature, as well as the non-game contexts of the specific gamified application could be integrated and extended to investigate gamification. Accordingly, various theoretical perspectives and models that have been used to explain user engagement motivations, design mechanisms, and impacts of IS and could be relevant here are discussed below.

Motivations for User Engagement

The motivation behind playing games has been widely studied (e.g., Olson 2010) and can offer insights into the motives for user's engagement in gamified applications. Essentially, motivation theories attempting to explain the drivers of individuals' behavior have distinguished two main types of motivations, intrinsic and extrinsic (Ryan and Deci 2000). *Intrinsic* motivation exists if an individual is driven to perform an activity due to satisfaction from the activity itself. Intrinsic motivation is based on the pleasure generated by the activity rather than relying on an external reward e.g., enjoying playing a game. In contrast, *extrinsic* motivation occurs when the activity is performed in order to attain an external or separable outcome e.g., working for money.

Since the act of playing a game is generally considered an enjoyable and intrinsically satisfying activity, theories that explain intrinsic motivation such as self-determination theory (SDT) (Deci and Ryan 1985) may be relevant for understanding user's engagement motives. SDT is a macro theory of human motivation concerning people's inherent growth tendencies and their innate psychological needs. SDT suggests three basic psychological needs that promote intrinsic motivation i.e., autonomy, competence, and relatedness. Accordingly, Ryan et al. (2006) proposed that people are attracted to video games to the extent that they experience autonomy, competence, and relatedness while playing. Autonomy refers to the freedom to choose the game activity to perform and the way in which to perform the activity. Competence is defined as a feeling of being capable and effective in the game, while relatedness is a sense of connection to other people through the game. Competence also relates to the concept of flow, which is important for a game experience (Chen 2007). Flow theory of motivation (Csíkszentmihályi 1990) describes a mental state of operation where a person is fully and completely immersed in an activity. To promote flow, a game challenge needs to be provided that is appropriate for the skill level of the player. If the challenge is too hard, the person may feel anxious and overwhelmed, while an easy challenge can bore a person. A flow experience in a game can lead to a feeling of competence and self-efficacy, which results in subsequent motivation to engage in the activity.

Other motivational models for online games have been proposed e.g., Yee (2006). This empirical model suggests that the motivation underlying participation in online games has three main components i.e., achievement, social, and immersion dimensions. The achievement dimension has three subcomponents of advancement, mechanics, and competition. The social dimension includes the three components of socializing, relationship, and teamwork, while the immersion dimension has four subcomponents of discovery, role-playing, customization, and escapism. The model was validated through a large scale survey of MMORPG players.

Other than motivational theories related to game-playing, we also believe that theories of online user participation used in IS research may be relevant to understand user's engagement through gamification. These include cost-benefit models such as social exchange theory (Blau 1964) and other perspectives such as social capital theory (Nahapiet and Ghoshal 1998) and the uses and gratifications theory (Blumler and Katz 1974) that have been found useful to explain participation in online communities (e.g., Wasko and Faraj 2005, Sutanto et al 2011). Additionally, theories from the specific gamification contexts such as marketing, innovation, education, health, and environment may be relevant as well. However, we expect that the motivations for user engagement in gamified applications may involve a complex combination of motives related to games, online participation, and the specific gamification context and cannot be explained by existing theories alone. For example, game techniques are often employed in order to drive customer co-innovation, while playing online games do not have such a purpose. Thus, we believe that research on gamification can provide an opportunity to generate new theoretical insights.

Design for Gamification

Design for gamification has become relatively easy with instant gamification platforms provided by vendors such as Bunchball and Badgeville. These gamification platforms provide a one size fits all approach, with a range of design elements e.g., points and monetary reward, available for enterprises that want to implement this approach. The problem with such game design, though, is that it may not cater to the objectives of the specific gamified application and the fundamentals that make games fun to play. Recent gamification research highlighted that many current gamification attempts are only copycat

applications (Burke 2011), which means they are copied from another context without customizing the design elements and considering the purpose and desired outcomes of the specific application.

Consequently, these gamified applications fail to drive participation and sustain user engagement. The behavioral mechanisms underlying gamification can help to inform game design and understand why particular game dynamics work better in certain circumstances than others (Wu 2011).

In IS research, the previous literature on online game design has mainly been confined to the HCI area (Deterding et al 2011b). Specifically, HCI research currently informs us how online game interfaces can be designed for better interaction and user satisfaction. However, as game applications started spreading to other domains such as education, researchers have begun to focus their attention on these new domains. Nevertheless, there is limited research and understanding of the design of gamified applications for the myriad of domains where this approach is being employed. Among the limited literature is the multi-factor model proposed by Fogg (2009). According to this model, three elements i.e., motivation, ability, and trigger, should be present in the game design such that engagement behavior occurs. While we have discussed the various forms of game motivation previously, ability implies that users can easily perform the target behavior. Ability refers to possessing the required skills and resources for participation. Trigger refers to the prompts, cues, and calls to action that remind or tell players to perform a behavior right then. Most importantly, the model proposes that the three factors should occur at the same time and have convergence in a gamified application such that the target behavior e.g., engagement, happens. Therefore, a game design principle suggested is to motivate players by rewarding them for their skills, imagination, intelligence, and dedication (Adams and Rollings 2007). Another principle is to increase the ability of a player to perform the desired behavior. To do so, game designers need to embed mechanisms like training or practice tutorials (Wu 2011). Although motivation and ability are important factors, triggers at the appropriate time also increase the likelihood of user engagement. Consequently, to maximize the effectiveness of the game dynamics, these three factors should be aligned (Wu 2011).

There are also frameworks related to game design in general that would need to be extended to gamification design. For instance, the mechanics, dynamics, and aesthetics (MDA) framework (Hunicke et al. 2004) has been used to analyze the building of games. Mechanics refers to the base components of the game such as its rules, player actions, and data structures and algorithms, that govern player behaviors (Hunicke et al. 2004; Wu 2011). Dynamics describes the run-time behavior of the mechanics acting on player inputs and their interactions. Aesthetics describes the desirable emotional responses evoked in the player when he or she engages with the game (Hunicke et al. 2004). Each of these components should be designed with the specific objective of the gamified application in mind.

From a broader IS research perspective, we propose that a gamified application can be considered as a new and innovative IT artifact. Hence, design-science guidelines from IS research (Hevner et al. 2004) could be extended to inform gamification design. First, gamification designers should produce a viable artifact. Second, designers need to ensure that the artifact or gamified application is important and relevant to the users' problems. Third, the quality and utility of the application should be rigorously evaluated. A well-executed evaluation of a gamified application is crucial to its success. Thus, the two main design processes of building and evaluation should be iterative. The need for evaluation leads us to the discussion of gamification impacts.

Gamification Impacts

Viewing a gamified application as an IT artifact, IS research may extend IS success models such as the DeLone and McLean model (DeLone and McLean 2003, Petter et al 2008) to explore the impacts and outcomes of gamification. In order to provide a comprehensive definition and model to explain IS success, DeLone and McLean (1992) integrated the definitions of IS success and their corresponding measures, and classified them into six major categories. Thus, they created a multidimensional model measuring the interdependencies between the different success categories. The updated IS success model (DeLone and McLean 2003) consists of six interrelated dimensions of IS success i.e., information quality, system quality, and service quality, (intention to) use, user satisfaction, and net benefits. The model relationships suggest that a system can be evaluated in terms of its information quality, system quality, and service quality, which in turn impact the subsequent use or intention to use and user's satisfaction. As a result of using the system, certain benefits would be achieved. The net benefits, whether positive or negative, will

influence user satisfaction and the further use of the system. In the context of gamified applications, the information, system, and service quality need to be conceptualized and operationalized appropriately. Also, the intermediate outcomes of user engagement and satisfaction need to be assessed and related to the user and organizational outcomes of the application.

For gamified applications, the desired outcomes may vary from one context to another. For example, if a company employs gamification for marketing purposes, it is likely to expect increased brand awareness, loyalty, and revenues from the deployment. However, the expected outcomes for a gamified Q&A website differ. For these kinds of websites, desirable outcomes could be to have more user generated content and increased rate of question answering. With the very limited academic research on the impacts and benefits of gamification till now, IS research could draw on gamification metrics from practitioner cases and articles. For example, the key outcome of *user engagement* could be assessed in terms of unique visits, page view per user, time spent on a website, frequency of visits, depth of visit, and participation. It has been suggested in the practitioner literature that higher user engagement leads to positive gamification outcomes such as enhanced influence, loyalty, generated content, and increased revenue (Gamification.org 2012) but robust investigation of such relationships is required.

Overall, various anecdotes of gamification outcomes have been reported in practitioner articles. For example, Yahoo's gamification of its web-based ethics training module is believed to have received a 99 % completion rate (Ashraf 2011). Another example is provided by DevHub, which reported that average revenue per user increased four-fold after gamification (Takahashi 2011). While such case studies and practitioner articles provide useful insights regarding gamification benefits, these results need to be rigorously tested as per academic research standards for greater credibility.

Directions for Future Research and Research Questions

In this section, we present directions for future gamification research for IS researchers based on the three themes of motivations, design, and impacts. Eight potential research directions are outlined below with the first three primarily related to motivations, the next two mainly related to design, and the remaining three mainly related to gamification impacts.

D 1. How should people be motivated to use gamified applications? How should different user characteristics be accounted for in designing incentives in these applications?

People in general have desires for monetary reward, status, achievement, self-expression, even altruism. Yet people are also different in terms of their motives and behaviors. Thus, it is important for IS research to understand the various segments of users in gamified applications in order to design appropriate incentives for motivating them and to target the incentives at different segments. Rewarding people too easily can hamper the intrinsic motivation of users who like to be challenged, yet making the reward too hard to achieve can frustrate other users. Therefore, research is needed to examine the differences among users in order to design incentives for gamified applications.

D 2. How can businesses cultivate lasting engagement of users with gamified applications? What should they do to deal with reduced engagement over time?

Although extrinsic motivations, such as points and badges, may motivate initial user participation and engagement, the induced behavior can be short-lived. To be successful in the long run, gamified applications may need to tap into users' intrinsic motivations. For instance, gamified marketing applications can initially encourage customers to buy more by allowing them to track their points and accordingly offer discounts. However, long term engagement with the application is likely to depend on how users internalize these motivations by developing loyalty and identification with the brand. Thus, a crucial question for researchers is how to design incentives in gamified applications in a way that users can transition from extrinsic to intrinsic motivations over time.

D 3. How can existing users spread word-of-mouth about gamified applications? How should loyal fans be rewarded for their active recruitment efforts? What can be done to leverage the power of social networks?

Since it is well known that peers influence each other, businesses can take advantage of this fact by proactively monitoring and motivating their most influential users of gamified applications. However, it is

unclear as to how these loyal fans should be rewarded for their recruitment efforts and how the spread of word-of-mouth can be facilitated. Thus, it is important for research to investigate if tangible rewards work or if intangible rewards, such as creating a sense of achievement, are needed to motivate the influential users. Research is also needed to examine how firms can harness the power of social networks for gamified applications because social contagion can not only spread awareness through word-of-mouth, but also save marketing costs.

D 4. What gamification designs are more effective? How do the characteristics of the application and the users change the effectiveness of different gamification designs? How should each gamification design be fine-tuned?

While many design elements for gamification are used in combination, there may be a more effective set of elements that is suitable for a specific type of gamified application and specific segment of users. Also, while certain types of design elements listed in Table 2 have been widely adopted, what other design elements can be applied to gamification? Furthermore, it is unclear how to fine-tune each gamification design. For example, how should the level of difficulty and efforts required to advance to a higher status be designed? These questions provide fertile ground for future research in this area.

D 5. How should firms prevent users from “gaming” the gamified application? What kinds of controls can be deployed to minimize opportunistic behavior?

Users can engage in activities that help them earn rewards and yet not generate any business value for the firm. For instance, members in online communities, such as brand communities or Q&A communities, can ask trivial questions or provide useless answers, just to receive a badge. Obviously, this type of engagement is not the objective of a gamified application. Therefore, it is important for researchers to examine how gamified applications can be designed to promote the desired behavior and prevent opportunistic behavior.

D 6. How can user engagement be quantified and measure? What types of metrics can be used for this purpose?

Creating a lasting engagement with users greatly depends on how their behaviors are tracked and measured in a gamified application. Since there can be different types of induced behaviors, it is also important to recognize the value of each behavior. Thus, research is needed to examine how user engagement can be tracked and assessed. Also, it is important to understand how different forms of user participation can be assessed and rewarded. For instance, asking questions and answering questions in online communities can be incentivized in different ways in a gamified application.

D 7. How can we quantify the returns from gamification? Is there any unexpected (negative) impact of gamification?

To receive continued support and deployment from organizations, it is important to prove the value of gamification. Without any proven value, gamification may end up as yet another buzzword. Research is therefore needed to assess the impacts and returns from firms' gamification efforts. An appropriate set of metrics should be defined for this purpose. The possible negative effects of gamification, such as addiction, need to be examined as well. A gamified application may also hinder effective use in some cases when it is poorly designed or distracts users. The side effects, if any, should be identified and carefully evaluated from a neutral point of view.

D 8. How can we detect and contain the improper uses of gamification? What kinds of actions can we take to avoid and deal with fraudulent intentions to society?

Since gamification techniques motivate people towards certain kinds of activities and behaviors, they can be deployed by organizations with harmful intentions to trick people into a desired behavior, such as selling products that are useless or driving people into a phony emotional state that initially feels good. Thus, research is needed to understand how society should deal with such ethical and legal issues surrounding deceptive uses of gamification. It should examine what types of mechanisms, e.g., incentive-based, compliance-based, and legal, can be put in place to prevent opportunistic conduct by firms.

Exploring the research directions and questions outlined above can lead to the generation of theoretical insights for this new phenomenon, building on and extending the perspectives described in this paper.

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