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Gamification:
How to Climb the Ladders and Avoid the Snakes

Michael G. Jacobides, London Business School (& Evolution Ltd)
M. Dalbert Ma, London Business School (& Evolution Ltd)
Konstantinos Trantopoulos, Evolution Ltd
Vasilis Vassalos, Athens University of Economics and Business (& Evolution Ltd)

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Michael G. Jacobides (mjacobides@london.edu) is the Sir Donald Gordon Professor of Entrepreneurship & Innovation and Professor of Strategy at London Business School, and also Lead Advisor at Evolution Ltd. He is the Chief Expert Advisor on the Digital Economy at the Hellenic Competition Commission, Academic Advisor at BCG, and the co-author of the World Economic Forum's White Paper on Digital Platforms & Ecosystems. **M. Dalbert Ma** (dma@london.edu) is a PhD candidate in Strategy & Entrepreneurship at London Business School, and has worked as an Analyst in Evolution Ltd. He holds a BA in Philosophy, Politics and Economics from the University of York, an LLM in Intellectual Property and Competition Law from Erasmus University Rotterdam, and a Master in Management (MiM) from IESE Business School. **Konstantinos Trantopoulos** (konstantinos.trantopoulos@evolutionltd.net) is a Senior Advisor at Evolution Ltd. He holds a PhD in Strategy from ETH Zurich (highest hons) and BSc & MSc degrees in Applied Mathematics from National Technical University of Athens. **Vasilis Vassalos** (vassalos@aueb.gr) is a Professor of Informatics at the Athens University of Economics and Business (AUEB), where he leads the Information Processing Laboratory and directs the MSc in Data Science. His research work is in the areas of big data management, medical ICT, AI and machine learning, and middleware systems. He is a Technology Advisor at Evolution Ltd.

Abstract

Gamification, originally seen as a means of motivating employees, is now being used in more and more industries to engage users, attract new customers, motivate purchases and other behaviours, and generally enrich the customer experience while yielding valuable data and insights for the firm. It is built into many firms' customer-facing apps and is sure to feature strongly in the metaverse. Despite the intense interest in gamification, however, success is far from assured, and many firms fail to realize value from their gamification initiatives. Part of the problem is a lack of research into the connection between business strategy and gamification – that is, how gamification can help firms achieve their goals, and why some initiatives succeed in this while others fail. In this paper, we aim to fill this gap through the first systematic study of gamification initiatives. First, we identify the four things that gamification can offer: Locking customers in, identifying new opportunities, gaining market share by transforming the experience, and shaping or transforming user perceptions. Second, we unpeel the onion by identifying three key features – virtualization, social comparison, and pecuniary rewards – that, through their presence or absence, causally predict whether or not gamification will succeed and enable either of the four potential benefits of gamification. We do so by deploying Qualitative Comparative Analysis (QCA) on a sample of 40 prominent gamification projects. Based on our findings, we set out a roadmap that will guide firms to prioritize their efforts and design games that truly deliver what they promise, without getting side-tracked or overcomplicating their offer, and note the potential ethical considerations of effective games, such as addiction.

Executive Summary

- Gamification brings new, playful elements to interactions or transactions that were previously purely task-focused or functional.
- So far, gamification has been mainly used within firms, as a means to motivate employees, and in the wellness sphere, to encourage healthy behaviors[1]. We are now seeing gamification being used much more extensively across industries to attract new customers, or engage more deeply with existing ones, across a range of industries.
- Gamification is a vital way to engage users, build loyalty, and ultimately drive sales. It's also sure to be a central aspect of the Metaverse. However, making it work demands strategic smarts as well as resources and technical skills.
- While previous studies have shown how to make games more popular, they rarely explore the business benefits games can bring. Our research fills this gap.
- We looked at dozens of gamification projects around the world. We found a huge variety in terms of strategies, game mechanics, and levels of success, and we employed a rigorous method (QCA) to help us see what works and what doesn't. To our knowledge, this is the first systematic study of gamification and its results.
- We find that the most successful firms aim for high-level strategic outcomes such as identifying new opportunities, transforming user perceptions, locking in users, and gaining market share.
- To achieve their goals, successful firms align benefits with aims, fit gamification elements to these aims, serve players of all ages, choose the right KPIs, iterate flexibly, and build on early wins.
- Some industries, such as gambling and retail investing, demand a careful and thoughtful approach to the use of gamification, as the behaviors that games encourage may be harmful in some contexts.
- Gamification has the potential to transform specific "spaces and places," such as shopping malls and tourist destinations, by offering users and visitors a unique new way to discover and explore. For operators and authorities, the benefit is building interest, loyalty, and engagement through a new, direct relationship with the end user, with the potential to enlist partners (such as retail outlets) in the project.
- Gamification can potentially be used to motivate suppliers, complementors, and other business partners, as well as consumers. Hence, it can form an important part of a firm's ecosystem strategy.

[1] The first major industry to adopt gamification to achieve strategic objectives was telecom, to attract and engage prepaid customers, in the early 2000s. However, this did not lead to more widespread adoption.

1. Introduction

Games are everywhere.

The value of the global gaming industry is projected to grow from $197 billion in 2002 to $285 billion in 2027, while the number of users is expected to reach 2.8 billion[2]. Our smartphones bring us instant digital entertainment anyplace, anytime. Virtual and Augmented Reality (VR/AR) are no longer science fiction, but science fact. Facebook, duly renamed as Meta, is keen to sustain interest in the development of its version of the Metaverse[3].

It seems like the whole world is escaping to new digital realms. But how can firms benefit from the boom?

One way is through gamification. In simple terms, gamification means building game-like elements into users' interactions with a brand—usually digital, but offline too. Until recently, gamification was mainly focused on turning everyday workplace tasks, such as inputting data or making sales calls, more fun and engaging for employees. This often brought mixed results, since those who enjoyed games improved their performance, while those who didn't fell behind[4]. A few industries, namely wellness and telecoms, made gamification part of their toolbox for achieving some specific strategic objective (reducing churn and/or increasing spend per customer). These days, however, we are seeing gamification evolve into an outwardly focused value proposition in its own right, built to attract customers or engage with them more deeply across a wide range of industries. For example, China's Ant Financial and Pinduoduo, despite being in the disparate industries of financial services and e-commerce, have both managed to leverage very similar layered gamification tactics to comparably huge success. The *New York Times*, on the other hand, has used much simpler yet well-designed gamification tactics to reel in impressive levels of user reading engagement—a goal that even tech giant Google dramatically failed to reach through its Google News project in 2002.

The great advantage of gamification as a means of market engagement is that the "product" sells itself. When it works, customers come for the game, but stay for the brand or product behind it. That's why it provides significant potential benefits for firms who can use it strategically—provided, that is, they know how to harness its power.

Gamification can feature in a wide range of apps, products, and services—and in the near future, it's almost certain to be bundled with AR and VR in the Metaverse. (Indeed, Microsoft CEO Satya Nadella has wryly admitted that the Metaverse replicates things that videogames have been offering "forever."[5])

However, the business end of gamification is far from a game. Making it work can be a major challenge—even for leading firms with deep pockets or well-established digital brands. If poor decisions are made up front, businesses can easily sink significant time and resources into an initiative that never gets off the ground. Or, more insidiously, a firm might build something that seems popular and engaging but does not actually return any solid business benefit.

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[2] https://www.statista.com/outlook/dmo/digital-media/video-games/worldwide.

[3] For a series of articles on the Metaverse, see our joint project with BCG at https://www.linkedin.com/pulse/non-definition-metaverse-bcg-henderson-institute/

[4] Katy Milkman, "The Power and Pitfalls of Gamification," *Wired*, n.d., https://www.wired.com/story/power-and-pitfalls-gamification/.

[5] https://www.techspot.com/news/93260-icrosoft-ceo-admits-metaverse-actually-games.html

In this article, we explore what gamification is and share key findings from our detailed research into what marks out the successes from the failures. Crucially, we adopt a strategic perspective, looking not just at the mechanics of the games themselves, but also at the broader business context to which they contribute. While existing gamification research has only looked at how various design components amplify user engagement[6], our research is the first systematic study to link user motivation, gamification design, and specific *business objectives*. In doing so, we outline the combinations of gamification design choices that *causally* lead to specific strategic goals. We demonstrate that while some objectives can be reached via several alternative routes, others have just one path to success. The same findings can also explain why the benefit of choosing all the ostensibly "right" design components can sometimes be nullified by an elementary mistake elsewhere.

Our research alludes to a turning point in the unfolding story of industry digitalization. As consumers increasingly immerse themselves in digital interfaces and virtual experiences, the number of avenues for firms to compete has increased accordingly. Gamification has become one of those critical avenues. Regardless of industry, firms that deny or ignore this development, or develop inadequate solutions to capitalize on it, will be left far behind. With the ill-fated Google News, Google fumbled its huge lead in userbase size in a misguided attempt to become a newsfeed aggregator to platforms such as Twitter. Facebook, with its poorly designed community badge system, could not make itself into a town square for online group communities and ceded the space to rival platforms such as Reddit. Spotify, failing to recognize the potential of gamification to unlock new revenue streams (unlike Tencent Music), has left microdonation revenue on the table—where it has been duly swept up by entertainment platforms such as Twitch.

The results of our research provide a roadmap and guidance for firms looking to take advantage of gamification at this critical turning point.

Virtual concert in Fortnite (left); Mock-up of a business meeting hosted in the metaverse (right)

[6] e.g., Chou Yu-kai, "Octalysis: Complete Gamification Framework," *Yu-Kai Chou: Gamification & Behavioral Design* (blog), December 1, 2020, https://yukaichou.com/gamification-examples/octalysis-complete-gamification-framework/.

2. What Gamification Is, and Who Needs It

Gamification has traditionally been defined as "the use of game design elements in non-game contexts."[7] When the term initially began taking mileage in the early 2000s, limitations in user-accessible technology resulted in gamification being constrained to facets such as airline mileage scores and store loyalty points. In today's day and age, with increased mobile adoption and corresponding improvements in technology, companies are finding themselves with greater tools to gamify much more of the customer experience[8].

Essentially, gamification brings new, playful elements to interactions or transactions that were purely task-focused or functional before. These additions can include loyalty points, badges, and scoreboards[9]; colorful characters, interfaces, or avatars[10]; and mechanics similar to those found in videogames[11]. There's often a social side too, with the chance for players to connect with friends, compete against them, or share their own achievements with the wider world.

In its early days, one of the main applications of gamification was to infuse repetitive work with excitement by applying game-oriented thinking (and, usually, a computer-based design or app) to non-game tasks within firms.[12] **Amazon** used it to motivate its warehouse workers[13]; **Uber** blended gamification with on-screen fare-opportunity displays to entice its drivers to keep accepting rides[14]; and **Wikipedia** saw that rewarding encyclopedia entries with badges and recognition, giving a game-like feel, encouraged contributors to its platform to produce more entries[15].

Gamification has also been used for loyalty programs. In the 2000s, **Proximus**, the Belgian telecom operator, offered one the first examples of gamification (Play & Gold), offering users extra benefits for topping up prepaid account credit. Many other telecom operators followed suit in the 2010s, while companies like **Coca-Cola** (in 2006, with its "my CokeRewards" program) used gamification to motivate repeat purchases[16]. Brands such as **Nike** drew more

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[7] Sebastian Deterding et al., "From Game Design Elements to Gamefulness: Defining 'Gamification,'" in *Proceedings of the 15th International Academic MindTrek Conference on Envisioning Future Media Environments - MindTrek '11* (the 15th International Academic MindTrek Conference, Tampere, Finland: ACM Press, 2011), 9, https://doi.org/10.1145/2181037.2181040.

[8] https://www.kambr.com/articles/the-gamification-of-airline-loyalty

[9] Elisa D. Mekler et al., "Disassembling Gamification: The Effects of Points and Meaning on User Motivation and Performance," in *CHI '13 Extended Abstracts on Human Factors in Computing Systems on - CHI EA '13* (CHI '13 Extended Abstracts on Human Factors in Computing Systems, Paris, France: ACM Press, 2013), 1137, https://doi.org/10.1145/2468356.2468559.

[10] Simone Borges et al., "A Systematic Mapping on Gamification Applied to Education," in *Proceedings of the 29th Annual ACM Symposium on Applied Computing* (SAC 2014: Symposium on Applied Computing, Gyeongju Republic of Korea: ACM, 2014), 216–22, https://doi.org/10.1145/2554850.2554956.

[11] Kai Huotari and Juho Hamari, "A Definition for Gamification: Anchoring Gamification in the Service Marketing Literature," *Electronic Markets* 27, no. 1 (February 2017): 21–31, https://doi.org/10.1007/s12525-015-0212-z.

[12] See, e.g., Sergey Cujba, "Examples of Gamification in the Workplace," *Raccoon Gang* (blog), April 19, 2018, https://raccoongang.com/blog/examples-gamification-workplace/.

[13] Nick Statt, "Amazon expands gamification program that encourages warehouse employees to work harder," *The Verge*, 15 March 2021. https://www.theverge.com/2021/3/15/22331502/amazon-warehouse-gamification-program-expand-fc-games

[14] Noam Scheiber, "How Uber Uses Psychological Tricks to Push Its Drivers' Buttons,' *New York Times*, 2 April 2017. https://www.nytimes.com/interactive/2017/04/02/technology/uber-drivers-psychological-tricks.html

[15] Jana Gallus, "Fostering Public Good Contributions with Symbolic Awards: A Large-Scale Natural Field Experiment at Wikipedia," *Management Science* 63, no. 12 (December 2017): 3999–4015, https://doi.org/10.1287/mnsc.2016.2540.

[16] https://www.cokesolutions.com/tools-and-resources/articles/connect-with-customers-through-my-coke-rewards.html

explicitly on psychological research to introduce elements that increase user engagement, including real-time feedback, a system of different levels, online trophies, the use of communities as a motivational tool, personalization of challenges, and the creation of user avatars[17]—thus contributing to the discussion on gamification and app design[18].

Recent developments in technology, with the growth of smartphones and the emergence of the App Economy, have led to a new generation of games that generally use virtual environments[19] to drive commercial results. It is these games that we focus on.

Rather than being imposed as motivational devices within firms, such games are discretionary activities: Only those who enjoy the game or value its rewards will play it, so users self-select. In such a context, users are motivated both by the game itself and the value that it offers, either on a standalone basis or within the business context in which the game is located. The value offered can be virtual, intangible, or financial. For example, customer-players might be gratified merely by losing themselves in an absorbing story or an immersive game-world, as in "regular" gaming. They might get a kick from reaching targets or achieving goals set within the game itself. Or they might benefit in the physical world by winning prizes or gaining rewards such as discounts or free gifts from the brand's product range, or spendable tokens such as in-game currency and NFTs.

Businesses mainly use games as a means of engaging people in ways and contexts that lie outside the traditional buying journey. Gamification can position a brand in the same space as the games that people already enjoy on their phones or consoles every day. As a result, users become more closely involved with a brand or service, so they feel a stronger connection to it, or change their perceptions of it. Once that happens, they may be more likely to become a customer, make a repeat purchase, share their data, or stay loyal.

Indeed, a compelling game can effectively lock users in, because it encourages them to invest so many hours, or make so many online friends, or generate so much personal data, that the cost of switching becomes too high. Once users are committed to a game, they become more reluctant to leave it behind, often through both design of the game (offering greater rewards for committed users) and some considerations of sunk costs.

Games also help identify new sales channels and commercial opportunities, by gathering detailed data on players. Moreover, if users enjoy their experience enough, they may spread the word about the game and/or brand on the behalf of the business, bringing effective promotion at low cost. And if the excitement over the Metaverse is well founded, games will surely play a crucial role in attracting and keeping customers in the future. For instance, gamification can be used to encourage customer retention by rewarding committed players with exclusive bundles or early access to sales before they are opened up to the general public. Similarly, gamification can encourage new customer acquisition by offering promotional coupons or referral bonuses.[20]

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[17] Eugen Eşanu, "Gamification: Rewarding Users With Points," UX Planet, October 7, 2019, https://uxplanet.org/gamification-rewarding-with-personal-stats-2e550df34af7.

[18] Gabe Zichermann and Christopher Cunningham, *Gamification by Design: Implementing Game Mechanics in Web and Mobile Apps*, First edition (Beijing Cambridge Farnham Köln Sebastopol Tokyo: O'Reilly, 2011).

[19] We use the term "virtual environment" to denote graphical interface elements that generate videogame-like simulations for users—for example, virtual avatars, virtual profile spaces, and even VR environments.

[20] Talon.One, "White Paper: How to Create a Successful Gamification Project to Drive Customer Engagement," 2022.

3. Winners and Losers

In its early days, when customer-facing gamification was confined to areas like education and wellness, it was seen as a way to encourage people to work towards long-term self-care goals[21]. It has since spread to many other industries, starting with telecoms, but more recently taking hold in financial services, retail and e-commerce, transportation, and many others.

A noteworthy observation from real-world cases of gamification, however, is that although there are many success stories, there are just as many failures, with seemingly no pattern explaining this discrepancy—as the following examples show.

Duolingo, the language learning app, uses experience points, in-game currency (in the form of "gems" or "lingots"), badges, and leaderboards to keep users engaged and learning over the long term[22]. That's a big win in the language learning space, where no single digital platform had managed to prevail before.

The ***New York Times*** sets online quizzes to test readers on what they've learned from reading the newspaper. Strong scores have become a mark of intelligence and credibility[23], and players also share them online, boosting the profile of the brand and attracting yet more users to the game. (As we shall see, the *NYT* also acquired **Wordle**, which boasts a very similar "share your score" dynamic.)

On the other hand, Google has struggled to achieve user engagement with its densely layered gamification in **Google News**, including collectable badges for reading news stories, showing that even "digital native" firms can struggle to incentivize desired behaviors in the right way. Even a seasoned digital service provider doesn't necessarily understand what makes a good game. We observed numerous instances of industry players who should have known better overloading their gamification initiatives with elements that were misaligned or simply irrelevant.

Returning to the success stories, the **Nike Run Club** app offers an enticing array of timed challenges, sports and gaming tie-ins, badges, and leaderboards, while allowing users to form groups to challenge each other to improve. The powerful mix of social connection and self-challenge has helped Nike build a thriving community of loyal brand enthusiasts[24].

In financial services, Ant Group's **Ant Forest** blends the digital and physical realms to give users incentives to care for the environment while simultaneously boosting Ant's own

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[21] Jonna Koivisto and Juho Hamari, "The Rise of Motivational Information Systems: A Review of Gamification Research," *International Journal of Information Management* 45 (April 2019): 191–210, https://doi.org/10.1016/j.ijinfomgt.2018.10.013.

[22] Duy Huynh and Hiroyuki Iida, "An Analysis of Winning Streak's Effects in Language Course of 'Duolingo,'" *Asia-Pacific Journal of Information Technology & Multimedia* 06, no. 02 (December 30, 2017): 23–29, https://doi.org/10.17576/apjitm-2017-0602-03.

[23] Ian Bogost, Simon Ferrari, and Bobby Schweizer, *Newsgames: Journalism at Play* (The MIT Press, 2010), https://doi.org/10.7551/mitpress/8854.001.0001; David Oakey Dowling, *The Gamification of Digital Journalism: Innovation in Journalistic Storytelling* (New York London: Routledge, 2021).

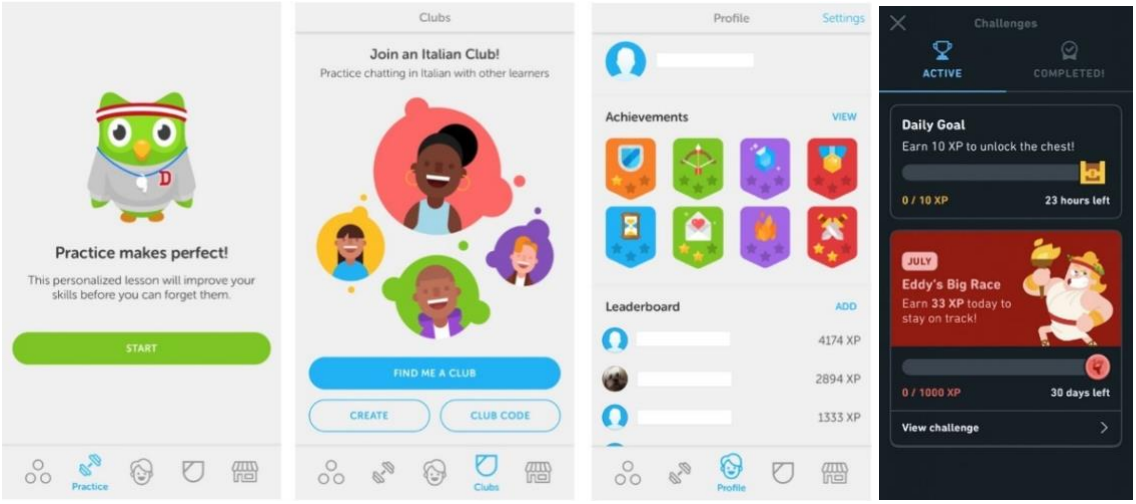
[24] Hsi-Peng Lu and Hui-Chen Ho, "Exploring the Impact of Gamification on Users' Engagement for Sustainable Development: A Case Study in Brand Applications," *Sustainability* 12, no. 10 (May 20, 2020): 4169, https://doi.org/10.3390/su12104169.

transaction volume[25]. By 2019, Ant reached the milestone of planting 122 million trees, for which it received the UN's highest environmental honor.

Gamification has even begun to make inroads into the traditional banking industry. For example, western APAC banking leader **UOB** developed a game that enabled its customers to construct their own virtual city as they reached their individual savings targets. According to UOB's own data, the initiative delivered a Net Promoter Score of +40, a 49% increase in monthly active users, 50% lower cost per acquisition, and a 60% increase in online transactions[26].

Lyft, the platform for on-demand ridesharing, attempted to use gamification to keep people engaged by handing out badges for travelling on certain days. However, as people only order taxis when they need them, the system failed to align the user's intrinsic motivation with the value of the badge, eventually causing the initiative to fail[27]. Other examples of major firms engaging in gamification include **Facebook**'s Group Badges and **LVMH**'s mobile game 200 Anecdotes (which offers NFTs as rewards). Gaming has become a mainstream form of popular entertainment, and as interest grows in VR environments such as the Metaverse—as illustrated **by Microsoft's Mesh** and Nike's recently created **Nikeland**—these two trends are clearly destined to intersect.

Within these examples, we see a huge range of design choices and promotional strategies—yet, at the same time, some apparently similar initiatives have met with very different results. Standard explanations such as time of entry, userbase size, brand popularity, and reward size seem insufficient (whether individually or collectively) to explain what separates the successes from the failures. Therefore, we ask: what sort of analysis would work instead?



Duolingo utilizes various forms of gamification elements

[25] Zhaojun Yang et al., "Switching to Green Lifestyles: Behavior Change of Ant Forest Users," *International Journal of Environmental Research and Public Health* 15, no. 9 (August 23, 2018): 1819, https://doi.org/10.3390/ijerph15091819.

[26] https://www.meniga.com/story/uob

[27] Daniel Griffin and Albert van der Meer, *Press Start: Using Gamification to Power-up Your Marketing*, 2019.

4. Where Existing Research Falters

So far, most research on gamification has focused on how to motivate and engage users[28]. It shows us how to make more popular games—mostly in the context of motivating employees within a firm, or creating loyalty programs to engage, entertain, or motivate customers. It has, in a sense, assumed a linear relationship between the effect of isolated gamification components and achieving user engagement.

We argue that there are two important concerns with existing research approaches. The first is that user engagement, most notably when it comes to games, simply does not exhibit a linear dependency on individual design components. For example, while two elements of game design might each engage users in isolation, the level of engagement will not necessarily double if both elements are combined—indeed, it might even decline. In video games, seemingly minute differences in design can make the difference between success and failure—a good example being the divide between the hugely successful mobile games **Angry Birds** and **Flappy Bird** and their numerous failed predecessors and subsequent imitators. In gamification, even firms that seem similar have found success with very different approaches. **Duo Duo Orchard**, a game created by **Pinduoduo**, a major Chinese player in ecommerce, offers tangible rewards for users' environmental engagement by providing virtual droplets to water user virtual gardens. However, Alibaba's **Ant Farm,** a similar game developed by China's key FinTech platform, **Ant Group**, offers no such rewards, and instead relies on users' intrinsic motivation. Yet both games have built committed user bases and reaped significant business benefits—perhaps because they appeal to different sorts of players, each motivated by a different set of attributes[29].

Rather than looking at the effect of X on Y, a better way to model gamification is to look at different configurational pathways (otherwise known as "equifinality")—finding different combinations of features that may lead to the same outcome.

The interface of Ant Financial's Ant Forest game as it changes throughout the day and night

[28] e.g., Ayoung Suh et al., "Gamification in the Workplace: The Central Role of the Aesthetic Experience," *Journal of Management Information Systems* 34, no. 1 (January 2, 2017): 268–305, https://doi.org/10.1080/07421222.2017.1297642.

[29] On types of players and their interests see e.g., Andrew Giles, "Gamification as a Marketing Strategy," *Smith Business Insight*, n.d., 6., https://smith.queensu.ca/insight/file/SmithInsight_whitepaper_gamification.pdf

The second issue with existing gamification research, we argue, is that if we confine the dependent variable to user engagement, we cannot tell how, or even whether, games help businesses achieve different strategic goals. Not all goals require the same level of user engagement. For example, the objective of **Starbucks**' loyalty program is not to incentivize users to engage with the application constantly, but to reach them when they are actually buying coffee. The infamous entertainment platform **TikTok**, however, does seek to maximize engagement by all its users, all the time. Our point here is that by neglecting to link user engagement with the wide range of strategic goals that businesses may pursue, existing research is severely limiting its own practicality.

5. Data and Methods

We address these two issues through Qualitative Comparative Analysis (QCA)[30], a methodology well suited to considering medium-sized samples with rich qualitative evidence. QCA uses Boolean logic to identify sufficient conditions for both success and failure, revealing the various configurational pathways (if any) that causally lead to the same outcome. Our research method is described in detail in the Supplementary Online Web Appendix.

To aid our archival analysis and theoretical coding, we limited our sample to customer-facing gamification activities that had received extensive attention in the business world and media. In doing so, we prioritized case accuracy at the cost of some selection bias. We then posed two simple questions: What works in gamification, and what doesn't? And why do some initiatives succeed, while others fail? A team of four researchers, supported by another three occasional assistants, searched through extensive archival material and press/online reports on games, and then identified and analyzed 40 prominent games. We complemented this research with 10 interviews with gamification experts and industry players, including game developers, programmers, and consultants. Global consultancies such as BCG also offered feedback as we developed our work.

Our initial set of cases covered six countries in which the gamification initiative originally launched, encompassing 11 primary industries including financial services, retail, education, food service, investment, transport, entertainment, media, and e-commerce. TABLE 1 describes some of the more noteworthy cases within our sample.

We used archival analysis based on a combination of company reports, press articles, critic blogs, app store reviews, and community feedback from discussion forums such as Reddit and Twitter, including findings from our interviews to deconstruct each case into nine individual design components (factors). These factors served as our explanatory variables, and captured binary characteristics such as whether the application was a minigame within the application or constituted the entire application in itself; whether the application had scoreboards; whether it allowed users to interact with others; whether it provided some pecuniary reward for certain tasks, etc.

[30] Charles C. Ragin, *The Comparative Method: Moving beyond Qualitative and Quantitative Strategies*, [2nd ed.] with a new introduction (Oakland: University of California press, 1987); Charles C. Ragin, *Fuzzy-Set Social Science*, Nachdr. (Chicago: Univ. of Chicago Press, 2000).

TABLE 1. Descriptions of selected analyzed gamification initiatives

Organization / Initiative	Key Game Mechanics	Description
Pinduoduo / Duo Duo Orchard	Virtual gardens, virtual water droplets, social comparison, pecuniary reward	Minigame within Pinduoduo's e-commerce application. Each user has a virtual garden, in which purchasing goods on Pinduoduo generates virtual droplets to nourish virtual fruit trees. Idle users who do not use their virtual droplets promptly may have them stolen by other community members. Fully grown virtual trees can be redeemed for real boxes of fruit delivered to the user's home address. Operational in China.
Ant Financial / Ant Forest	Virtual gardens, virtual water droplets, social comparison (with friends), altruistic reward	Minigame within Ant Financial's payment services application. Each user has a virtual garden, in which "green energy" points are generated whenever the user engages in environmentally friendly purchases including taking public transportation, renting an e-bike, etc. "Green energy" points can be used to grow virtual trees. For each full-grown virtual tree, Ant Financial plants a real tree. Operational in China.
Duolingo	Scoreboards, rankings, social comparison, timed challenges	Language-learning application that utilizes scoreboards, rankings, community interaction, minigames, and avatars to track progress and motivate engagement. Users are always presented with indicators of progress on multiple dimensions, and can observe the progress of others, most notably friends. Launched in the US and now operational in 194 countries[31].
Tencent Music / Microdonations	Scoreboards, rankings, social comparison, microdonations	Music-streaming platform that has gamified the relationship between artists and their respective fan communities. Rather than basing artist rankings on traditional metrics such as number of streams or downloads, Tencent Music also ranks artists based on the amount of donations that an artist receives from their fans (microdonations), taking commission from these donations. Operational in China.
Nike Run Club	Scoreboards, rankings, social comparison	Fitness application geared towards those wishing to improve their running. Users can track their runs and are provided with suggestions and advice for routes and technique. Users are always presented with indicators of progress and can also form communities of their friends and/or family to observe each other's progress and collectively motivate. The global Nike Run Club community spans over 250 countries[32].
Google News	Badges, social comparison	Google's news aggregator service, linked to Gmail accounts. Users are presented with a feed of links to articles gathered from thousands of publishers and magazines. The original intention was to be a destination where users would read news from a variety of sources, personalized to their respective interests. Users could engage with friends and earn badges based on volume of reading in specific domains.
Google Pay / I-Care Offer	Social collaboration, social comparison, altruistic reward	Minigame within Google's payment services application Google Pay. In return for donating to charities, supporting local businesses, or paying certain online merchants through Google Pay, users would be given virtual "heart boxes." When boxes were combined with those of friends, Google would then donate one meal per completed box. Launched in India.
Facebook / Community Badges	Badges, social comparison	Social media platform Facebook leveraged gamification to bolster online community presence within their platform. Within user-created groups, users were rewarded with different badges based on their levels of engagement, which would be displayed next to their usernames whenever they posted on that Facebook group.

[31] https://www.foreigntongues.co.uk/duolingo-releases-global-language-report#:~:text=The%20data%20is%20based%20on,courses%2C%20featuring%2039%20different%20languages.

[32] https://www.businesswire.com/news/home/20160822005972/en/NIKE-Launches-New-Nike-Run-Club-App

For our dependent variable, we went beyond the traditional approach of solely focusing on user engagement metrics and identified four separate strategic outcomes that firms may choose to pursue (individually or in combination) through gamification: locking users in, identifying new opportunities, gaining market share, and transforming user perceptions. We ran these four outcomes through QCA analysis separately, allowing us to derive configurational pathways leading to each one. Finally, we used QCA to reverse-engineer the pathways that lead to gamification failure—in other words, those that did not realize any of the four strategic objectives.

Using an iterative process, certain factors were aggregated, while others were dropped when our analysis indicated that neither their presence nor their absence formed part of any configurational pathway. Then, using QCA, we were able to simplify the nine factors down to three design features that, when combined in various ways, produced configurations that *causally* explained both the materialization of specific strategic objectives and the failure to materialize them. These three factors were virtualization (defined as the transposing of real-world elements to a virtual format), social comparison (allowing users to project and compare a desirable user identity), and offering of pecuniary rewards (those with a real-world value such as gifts).

Nike has designed gamification specifically tailored to the interests and identity of its user base

6. Findings

What makes a successful game? As Figure 1 shows, three design features—integrating virtualization, enabling social comparison, and offering rewards (financial or otherwise)—can all be beneficial, but *only* in as much as they enable strategic outcomes such as locking users in, identifying new opportunities, gaining market share by transforming the experience, and shaping or transforming user perceptions. Our framework thus allows us to consider what type of gamification can work by looking at the underlying strategic objectives, and thus KPIs, to be used. It offers prescriptive advice and yields specific predictions, which we tested against data

on both successful and failed gamification efforts, and suggests there are specific, if distinct, pathways to success (labeled L1–L3, INO1, GM1–3 and S1 in Figure 1 and discussed below).

	Locking Users in			Identifying New Opportunities	Gaining Market Share by Transforming the Experience			Shaping or Transforming User Perceptions
	L1	L2	L3	INO1	GM1	GM2	GM3	S1
Virtualization	●			●		●	⊗	●
Social Comparison		●	⊗	●	⊗		●	●
Pecuniary		⊗	●		●	●	⊗	

● = Presence of Condition ⊗ = Absence of Condition

Figure 1: QCA Causal Configurations Linked to Business Objectives

The following subsections present an overview of our framework, in which we look at the four key strategic goals, before linking them with the KPIs and corresponding design features. Section 6 explains the failed cases, and in section 7 we turn to alignment and our prescriptive advice.

Objective 1: Locking Users In

When users are securely locked into a game, businesses can generate more value from them—but achieving lock-in is a long-term endeavor. Businesses must persuade users to engage frequently, over a long period, and commit time, attention, or resources along the way. By doing so, they can turn their game into users' "go-to"— that is, an established part of their habitual daily routine, which they will turn to as a sort of behavioral "default," without very much conscious or deliberate thought.[33] Gamification can be the nectar that keeps users coming back to the flower—and the effect is even stronger when social community and comparisons are thrown into the mix.

Conventional wisdom on gamification often points to pecuniary rewards as the only way to lock users in. Frequently cited examples are the redeemable discounts and benefits offered by loyalty programs such as air miles and store cards. However, this neglects the addictive component that we see in video games, for example. In contrast to conventional wisdom, our QCA results indicate that there are actually three separate design pathways that can create user lock-in.

The first pathway (L1) is through virtualization, which we define as the transposition of real-world activity and elements into a virtual format. By converting real-world actions and goods into a virtual format, such as through virtual avatars, virtual profile spaces, and even AR/VR, gamification initiatives can achieve user lock-in regardless of other design features. This is evidenced by a variety of initiatives across a range of industries, including **IKEA**'s AR-based

[33] See Richard H. Thaler and Cass R. Sunstein, *Nudge: Improving Decisions about Health, Wealth and Happiness*, Revised edition, new international edition (London New York Toronto Dublin Camberwell New Delhi Rosedale Johannesburg: Penguin Books, 2009).

home décor app, **Tencent Music**'s virtualized profile spaces and avatars, **Duolingo**'s virtual language-learning progress space, etc. **Duolingo** constantly updates users' virtual avatars and progress bars into virtual map-like formats and virtual jewels to find the best way to keep them engaged with the app. Virtualization also allows for the closest grounds to gaming stickiness. Drawing on less noble but equally predictable facets of human interaction, some Chinese apps have identified the benefit of allowing players not only to amicably support their friends' efforts, but to *steal* others' in-game currency while jealously guarding their own (droplets in **Ant Forest** and **Pinduoduo Orchard**). Since this strategy requires a relentlessly vigilant presence on the app, such tactics elicit an obsessive level of engagement.

The second pathway (L2) is through implementing social comparison based on desirable user identities, not necessarily including extrinsic/pecuniary rewards. Behavioral economics has repeatedly shown that offering extrinsic rewards such as cash significantly reduces intrinsic motivation[34], and our second pathway illustrates a similar principle. By excluding extrinsic rewards and promoting playful competition between desirable user identities, gamification initiatives can focus user lock-in on intrinsic grounds. However, to reiterate, the user identity must be *desirable*. Consider digital fitness tracking. Fitness apps that are predominantly focused on the user tracking their own statistics have fairly weak lock-in, because users have relatively little investment in the platform and can switch to another one relatively cheaply. To combat that, **Nike Run Club** offers badges and scoreboard ranks that gain social value over time, showcasing users' commitment and dedication[35] and keeping them tightly bound to the app. This well-chosen user identity is further strengthened by the design choice to restrict comparisons to friends and family. **Google News**, on the other hand, provides an example of a poorly chosen target identity. By basing social comparison on sheer volume of news stories consumed, the tech giant's aggregate news platform achieved far less user lock-in than the ***New York Times*'** weekly news quizzes, which rewarded memory and insight rather than mere reading stamina.

Another crucial point is that there needs to be some form of existing community to whom users' desirable identity can be projected. As recent research on the use of social media and gamification has found,[36] what makes such socially based strategies appealing is large installed bases and solid brands. In contrast, unknown brands with small installed bases may find that their lock-in efforts backfire, with users feeling let down by the "ghost town" atmosphere evoked by a socially driven lock-in mechanism deployed in a setting that is too sparsely populated for it to work. There is little point bolting the door if nobody is inside.

The third pathway (L3) is based on the traditional understanding of what gamification does: provide pecuniary rewards. Initiatives such as points-based loyalty schemes align most closely with this strategy by motivating the user solely with extrinsic rewards such as cash and cash-like equivalents. This strategy is commonly used by ride-hailing firms such as **Grab**, **Gojek**, and **DiDi**; loyalty programs such as **Starbucks Points**; and also in e-commerce initiatives such as **Taobao's Packets**. The strategy inevitably works—however, as the previous two pathways demonstrate, there is far more to user lock-in than just throwing money at users, and brands

[34] Uri Gneezy, Stephan Meier, and Pedro Rey-Biel, "When and Why Incentives (Don't) Work to Modify Behavior," *Journal of Economic Perspectives* 25, no. 4 (November 1, 2011): 191–210, https://doi.org/10.1257/jep.25.4.191.

[35] Lu and Ho, "Exploring the Impact of Gamification on Users' Engagement for Sustainable Development."

[36] See Joost Rietveld and Joe N. Ploog, "On Top of the Game? The Double-edged Sword of Incorporating Social Features into Freemium Products," *Strategic Management Journal* 43, no. 6 (June 2022): 1182–1207, https://doi.org/10.1002/smj.3362.

who can bring more ingenuity and originality to their games may be able to achieve the same level of lock-in at lower cost.

Objective 2: Identifying New Opportunities

Gamification can enable companies to unlock new revenue streams by engaging users in virtual environments. Once users are there, the brand can gather data from them and offer them new opportunities that are exclusive to the game. Gamification thus becomes a proactive and interactive tool to help identify or even create customer needs, allowing users to find new ways of spending money—and it can inspire product development too.

However, creating a game that simultaneously provides an environment that will yield valuable consumer data whilst incentivizing the consumers to provide it is a complex endeavor. The same conundrum is faced by online video game developers, who may find it extremely difficult to create a game that generates data that they can translate into future game improvements.

If opportunity identification is the strategic goal, our QCA analysis shows that there is only *one* pathway to making it happen: to combine virtualization with social comparison (INO1). In other words, these two gamification features, when combined, causally explain the emergence of new opportunity identification for firms.

This is a key feature behind the meteoric rise of Chinese e-commerce phenomenon **Pinduoduo**, which rose from obscurity to become a viable challenger to Alibaba by offering a gamified and socially engaged approach to shopping. Pinduoduo puts the emphasis on shopping recommendations that are personalized to individual users, aimed at a fun browsing experience rather than focused product searches oriented towards a specific need. Users can make bigger savings through social shopping, where they buy products in bulk by teaming up with friends—potentially recruiting them to the app in the process. Simultaneously, virtualized progress bars, profile spaces, and team-based achievements collectively allow users to track their progress in teams, allowing Pinduoduo to uncover the opportunities provided by social commerce, including figuring out optimal team size, pricing, product selection, etc.

In terms of new ways to spend money, consider, for instance, how two of the most developed Metaverse-style projects, **Roblox** and **Fortnite**, collaborate with brands in business-opportunity identification by offering open-world virtual environments where users can join in team-based video games. For example, fashion house **Gucci** partnered with Roblox to create the “Gucci Garden”—an immersive experience within the online game platform that engaged 20 million Roblox visitors within two weeks. As visitors’ avatars wander through the garden, they can purchase virtual Gucci garments and accessories and share the outfit they create on social media. Beyond boosting revenues, these games help to forge brand associations across categories (such as Maserati cars and Zegna fabrics, or the exclusive co-branding between Smeg luxury appliances and Dolce & Gabbana design). Successfully associating a brand with a cool, cutting-edge activity adds new dimensions of value.

Gamification also allows firms to respond to new customer needs. For example, **IKEA’s** AR-based app allows users to experiment with different products from the comfort of their own homes. Users are able to select actually purchasable products in virtual format and simulate their movement within their own living spaces. This allows IKEA to shift its current stock, yet also grants it access to novel user data, including opportunities for new products that have yet

to be developed. Likewise, as luxury brands move to develop gamified solutions where avatars can dress in branded clothes, they facilitate sales and deepen consumer insight. The immediate feedback and opportunities for "A/B testing" (i.e., looking at the impact that different alternatives have on customer reactions) give such engagement deep strategic value.

Roblox's Gucci Garden event (left); Fortnite's upcoming virtualized London O2 Arena (right)

Objective 3: Gaining Market Share by Transforming the Experience

When games are attractive in and of themselves, they can bring in new users, who may eventually become new customers. This can benefit firms either by creating new revenue streams directly, or by boosting interest or brand equity by association. This latter goal might account for the intense interest of firms in gaming and the Metaverse—like Gucci and Nike's ventures in partnership with Roblox. However, B2B firms also want to cement their position. One such is **SpringStudios**, which is aiming to shift from "end-to-end" advertising and production into virtual events, for firms who want to take advantage of "Metaverse-as-a-Service" and establish a (limited) foothold in this virtual world.

Again, conventional wisdom would suggest that the answer to new user acquisition is through pecuniary rewards and targeted marketing. However, beyond the quality of the experience, our QCA results illustrate that again, there are three separate pathways to bring in new users to the core business. The first pathway (GM1) is to integrate pecuniary rewards while excluding social comparison. Offering tangible rewards is an important way to increase revenue and gain new customers, and omitting social comparisons allows users' motivations to concentrate on extrinsic savings and rewards. Solid rewards bring in additional sales that are directly bundled with further tangible benefits, which can become more enticing yet when they incorporate an element of chance, or even gambling. A classic example of such design is digital loyalty programs that bundle purchases with points that can be accumulated and redeemed for additional physical goods later on (e.g., **Starbucks Rewards**) and schemes that offer cash or credit-equivalent rewards through chance-based mechanics such as "Spin the Wheel" or dice rolling. An earlier example of this is **McDonalds'** highly successful (offline) Monopoly game, but the same technique has also reaped handsome rewards for digital platforms such as **Grab**, **Gojek**, and **DiDi**.

The second pathway (GM2) is more nuanced: to combine virtualization with pecuniary rewards in order to attract new users. This approach allows for a far more differentiated experience that allow users to compete with each other for real-world rewards—similar to the experience of winning rewards at a carnival. **Taobao Packets** leverages chance-based mechanisms that create virtualized eggs for users to grow through repeated interactions with the platform and eventually hatch, providing the opportunity for users to earn random rewards. **Pinduoduo's** Duo Duo Orchard similarly allows users to use virtual droplets, which are distributed randomly

and may be stolen by other players, to water their own choice of virtual fruit trees. Fully grown trees entitle users to have real fruit delivered to their homes.

Finally, the third pathway (GM3) is to focus solely on social comparison and exclude both virtualization and pecuniary rewards. The important caveat here is that such a strategy can only be pursued when the desirable user goal is closely related to self-improvement—as, for example, in fitness with **Nike Run Club** and **Strava**, and in knowledge-based learning such as the **New York Times'** quizzes.

As technologies mature, we also see (digital) games and physical experiences begin to merge. **Burberry,** for instance, has created a unique gamified experience in its Shenzhen store[37], at the epicenter of the Chinese tech scene, through a partnership with **Tencent,** WeChat's parent. The rationale here is that while Chinese customers begin their buying journeys on social media, they still want an in-store, experiential element that they can then share online. Thus, the store tries to bring these two elements together, allowing visitors to share directly to social media and unlock specific digital-only offers. Thus, the game becomes a means to engage customers in the digital and physical ("phygital") realms at the same time[38].

Objective 4: Shaping or Transforming User Perceptions

Perhaps the most fascinating observation from our research was that gamification can also help users to understand their own preferences—and allow firms to shape them. While tools such as marketing and advertising have traditionally been seen as the only way for firms to shape consumer perceptions, we find that if calibrated correctly, gamification can achieve the same result at significantly lower cost.

Our QCA findings show that the only pathway (S1) to achieving this is by combining effective virtual environments with social comparisons centered on promoting desirable user identities. If either of these elements is missing, it will prove difficult or impossible to reshape users' perceptions and beliefs—or even affect them at all.

For example, Ant Financial's **Ant Forest** game leverages virtual gardens in conjunction with a social comparison mechanism. Users can compete against each other based on the well-being of their respective gardens. In the process, they learn why Ant payments are greener and more ethical than those of its rival, **WeChat Pay**. The key to the success of these games was selecting the right KPIs to correspond with strategic goals *boosting online engagement* and *increasing user investment.* These goals were achieved through the two factors of *compelling virtual environments* and *social comparison tied to a desirable identity*—in this case, becoming (or at least appearing) more eco-conscious.

Tencent Music, China's largest music-streaming platform, has aimed to persuade its user base that the best mark of appreciation for an artist is to make a donation. It reinforces this idea by ranking artists based on donation figures rather streaming numbers, pitting fan groups against each other, and even altering the way artists engage with their fanbases. This is paired

[37] https://www.burberryplc.com/en/company/social-retail.html

[38] https://www.voguebusiness.com/consumers/burberry-tests-social-retail-in-chinas-tech-capital

with virtualized interfaces indicating user loyalty and progress based on Tencent's commission structure.

This example also shows *why* firms might want to engage in such shaping or transforming of perceptions. As Tencent discovered, such a fresh approach can allow the upside of games to be directly monetized—in its case, providing the firm with a cut of the revenues it generates for bands while promoting the value of donations. Second, a firm might benefit because of the associated boost to brand image that a game provides—as **BMW** shows with its Points program. Alternatively, a game could create goodwill that a firm can monetize through platform engagement (**Ant Forest**) or sales growth (**Duo Duo Orchard**).

7. Mistakes to Avoid

Running QCA on the failed gamification cases (i.e., those that did not achieve any of the strategic objectives) also yielded some fascinating insights. We discovered two separate configurations that causally explained our failed cases, along with some cautionary tales from cases that we excluded from our analysis, yet still warrant examination.

Mistake 1: Lacking Any of the Three Factors

Our QCA results illustrated that the first pathway to failure was failing to incorporate *any* of the three critical design features we describe. Gamification initiatives that did not include virtualization, social comparisons, or pecuniary rewards did not get off the ground. While such poorly thought-out initiatives are rare, there are a few examples. **Zalando's Lounge** attempted to gamify the online retail experience by informing users every 20 minutes that their shopping bags had "expired," and confronting them with a choice between "add more time" and "check out." By neglecting all three of the essential components of gamification, Zalando failed to achieve any form of desirable strategic outcome. A similar story of failure was illustrated by **H&M's** attempt to gamify the ad-viewing experience by rewarding users with virtual points for watching advertisements, where the company scrapped the gamification feature shortly after launch.

Mistake 2: Incorporating Undesirable Social Identities

Our QCA results also shed light on why Big Tech firms such as Google and Facebook, despite apparently having all the ingredients of a great gamification initiative, repeatedly fail to create one. The second pathway to failure is simple: incorporating undesirable social identities causally leads to gamification failure, regardless of which other features are incorporated. In other words, if a firm mistakenly identifies undesirable social identities, and attempts to promote them, the business will be unable to achieve any strategic objective—regardless of how well-designed the rest of the game may be.

The pathway illustrates the general principle that users won't buy in to social identities they don't like or can't relate to. Many gamification initiatives attempt to incorporate social comparisons. **Google News,** for example, wrongly inferred that users cared about projecting how much they *read*, when the actual desired attribute was how much they *understood*. Google's misapprehension led it to award badges based on breadth of reading rather than depth of learning. On the other hand, the ***New York Times*** made the correct distinction, and was able to successfully lock users in through weekly quizzes that *did* reward learning. In a similar way, **Facebook** badges rewarded users for how much they contributed to Facebook groups. But in reality, users do not want to be seen as people who spend hours on Facebook—to judge by the unpopularity of the badges, at least. As a result, this initiative—despite funding, support, and interesting design—did not succeed.

Beyond QCA: Outlier Rewards

The strengths of our framework are its clarity, offering predictions and prescriptions that are easy to understand and follow, and its basis in extensive research on actual gamification efforts. As noted earlier, we validated and confirmed our framework through the use of QCA. However, as with any successful real-world validation effort, while a large majority of our cases fit the framework, a few do not.

In most cases, we can find clear reasons for the divergence, which also provide further insights that may serve as a springboard for future work**. Tinder**, for instance, gamified modern dating, and gained significant market share against strong competition. Although it lacked any monetary-equivalent reward, it still transformed the experience for users. The visceral importance of dating, and the external rewards for getting it right, go beyond the motivations that our framework can address. Similarly, the stock trading platform **Robinhood**, which started out by heavily leveraging virtualized game elements within the process of stock trading, also deviated from our prediction. When users registered in the Robinhood app, they would be greeted with a virtual celebration. Each time they completed a trade, they were showered with digital confetti. Free stocks were gifted based on the turn of a mystery card (chance-based mechanics). Even though there was moderate use of virtualization through game like simulations of celebrations, however, the goal was not so much to identify new opportunities, as our framework would suggest, but rather to increase transactions from existing users by gamifying the standard stock-trading process[39].

In all, when the stakes are very high—like love and money—some of the prescriptions we have uncovered may not hold true. Also, as **Robinhood** shows, high-stakes settings are (expectedly and increasingly) affected by regulation, since games often draw on elements of human psychology that can lead to addiction, which is no different from the addictive triggers of

[39] https://www.theverge.com/2021/3/31/22360639/robinhood-confetti-ipo-removed-app-stock-market

alcohol and recreational drives[40]. So in gamification—as in many other settings—regulation may be an important driver in setting the right strategy[41].

8. Managerial Recommendations

Our research carries several implications that are relevant to practitioners who are contemplating or leading gamification initiatives. We offer some suggestions:

- **Look beyond customer engagement.** Engagement is the most widely used metric of performance, but focusing on engagement as an end in itself, or in a generic way, tends to be counter-productive. Firms that focus solely on engagement, without a clear strategy or a sense of how the game will add value, often run into difficulties. This is a critical, yet often overlooked, factor in success.

- **Define the business objective**. Different business goals (e.g., customer acquisition, market expansion, or positioning) call for different gamification design elements and mechanisms. Clearly setting the business goal is critical in order to provide managers, designers, and engineers with a clear brief and point towards the right KPIs to gauge success.

- **Align the business objective with the gamification's design and KPIs.** For instance, if your business goal is achieving user lock-in, one route to success is to design a game featuring social comparison based on desirable user and exclude extrinsic/pecuniary rewards. If your goal is to shape users' values and beliefs, your game should occupy customers' attention over the long term—for example, through VR engagement and social comparison. If rapid (if more precarious) growth is acceptable, pecuniary rewards in isolation can work instead—as we saw in ride-hailing firms Grab and Gojek. Choosing the right KPIs is also critical, so the project isn't led astray by "nice to have" achievements that are irrelevant to the organization's goal. For example, if a business wants to gain market share by increasing transactions from existing users, it shouldn't focus on the number of new users it attracts. In India, Google Pay wanted to increase transactions from existing users, but instead designed a game based on attracting new ones. As a result, it didn't achieve either goal. Conversely, Ant Forest's main goal was to shape user perceptions, and it rightly focused on measuring user interaction to drive results.

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[40] Recent research on social media by a combination of economists and neurologists has shown that they trigger similar neurophysiological responses to recreational drugs and alcohol, leading to heightened calls for regulation. See Niels J. Rosenquist, Fiona M. Scott Morton, and Samuel Weinstein, "Addictive Technology and Its Implications for Antitrust Enforcement," SSRN Scholarly Paper (Rochester, NY: Social Science Research Network, February 22, 2021), https://doi.org/10.2139/ssrn.3787822., and for a brief review, Susie Allen, "Social Media Is Addictive. Do Regulators Need to Step In?," Yale Insights, n.d., https://insights.som.yale.edu/insights/social-media-is-addictive-do-regulators-need-to-step-in.

[41] See Michael G. Jacobides, "Why Regulation of Tech Platforms Is the New Game Changer for Strategy," *Strategy+business*, n.d., https://www.strategy-business.com/article/Why-regulation-of-tech-platforms-is-the-new-game-changer-for-strategy.

9. Digital Ethics and the Future of Gamification

The results of our research, while shedding light on the specific actions that organizations can take to design or improve their gamification initiatives, also raise questions for the future. While previous research on gamification has largely rested on the assumption that specific design features individually contribute different levels of engagement, our research points to a more combinatory approach—raising a whole array of issues, from the behavioral to the regulatory.

For example, why is it that the implementation of a virtualized interface is sufficient to lock users in? How is combining this same virtualization with desirable social comparisons actually leading to the shaping and transformation of user perceptions?

Importantly, our research maintained a strict-set QCA approach, meaning that we did not consider the extent to which an initiative is virtualized. Switching to a fuzzy-set approach, where virtualization is operationalized as a continuous measure, how might we expect things to change in the future with facets such as the Metaverse—essentially virtualization on steroids?

The results we present in this paper are as alarming as they are practical. We hope to have opened a new dimension of discussions into what exactly it means to regulate not only entities such as big tech firms, but also virtualized universes such as the Metaverse.

10. Conclusion

Our research shows that gamification has exciting potential—but is not guaranteed to succeed. To succeed with gamification, businesses must carefully select and align the strategic goal of their game and the best KPIs to measure its achievement, along with the corresponding elements of gamification design. This article provides a framework for how best to increase the chances of success by revealing the *causal configuration* of choices that underpin gamification success or failure.

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