Gamification framework applied to organizational processes

Framework de gamificação aplicado a processos organizacionais

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Abstract

Purpose: This work has two objectives: 1. to present, based on theory, a Canvas framework, which helps in the analysis of elements used in the gamification of different processes, and 2. to use this framework to analyze multiple cases of sport, health, and wellness apps (fitness apps). We selected four apps for this study: My Fitness Pal, Nike Run, Nike Training, and Zombies, Run!.

Originality/value: This study contributes to the theory with the systematization and organization of gamification components in a Canvas framework. For practitioners, this framework facilitates the creation and deepening of gamification initiatives.

Design/methodology/approach: In order to support the comparison between cases, we used six gamification steps from the bibliography, divided into 1. define business objectives; 2. outline target behavior of players; 3. describe players; 4. determine activity loops; 5. entertain players; and 6. deploy appropriate tools. These steps were organized in a Canvas format. Through six propositions, we concluded that convergent and divergent factors exist between the cases studied, with no complete use of the gamification elements among the cases analyzed.

Findings: Among the similarities, the following stand out: 1. search for users' well-being, 2. use of the steps suggested for gamification, 3. factors of the player's journey, and 4. fun. Among the differences are: 1. the specificity of each app, 2. ways of rewarding, and 3. motivating users, depending on the proposed activity and type of player.

Keywords: application, case study, fitness, framework, gamification

Resumo

Objetivo: Este trabalho tem dois objetivos: 1. apresentar, a partir da teoria, um *framework* no formato Canvas, que auxilie na análise de elementos utilizados em gamificação de diferentes processos; e 2. utilizar esse *framework* para analisar múltiplos casos de aplicativos de esporte, saúde e bem-estar (apps *fitness*). Foram selecionados quatro aplicativos para estudo: My Fitness Pal, Nike Run, Nike Training e Zombies, Run!.

Originalidade/valor: Este estudo contribui para a teoria com a sistematização e a organização dos componentes de gamificação em um *framework* Canvas. Para praticantes, essa estrutura facilita a criação e o aprofundamento de iniciativas de gamificação.

Design/metodologia/abordagem: Para respaldar a comparação entre os casos, adotaram-se seis etapas de gamificação obtidas a partir da bibliografia, divididas em: 1. definir os objetivos do negócio; 2. delinear o comportamento-alvo dos jogadores; 3. descrever os jogadores; 4. determinar os *loops* de atividade; 5. divertir os jogadores; e 6. desdobrar as ferramentas apropriadas. Esses passos foram organizados em uma estrutura do formato Canvas. Conclui-se, por meio de seis proposições, que existem fatores convergentes e divergentes entre os casos estudados, não havendo a utilização completa dos elementos de gamificação entre eles.

Resultados: Entre as similaridades, destacam-se: 1. busca de bem-estar dos usuários, 2. utilização das etapas sugeridas para a gamificação, 3. fatores da jornada do jogador e 4. diversão. Entre as divergências, há: 1. especificidade de cada app, 2. modos de recompensar e 3. motivar usuários, dependendo da proposta de atividade e do tipo de jogador.

Palavras-chave: apps, estudo de caso, *fitness*, *framework*, gamificação

INTRODUCTION

Gamification can be defined as the use of game-like elements in non-gaming contexts (Deterding et al., 2011; Wünderlich et al., 2020). In marketing, it is a strategy for motivating, increasing interactions, engaging, and creating overall value for consumers with services or supporting activities (Xi & Hamari, 2020). Considering games' social and entertaining characteristics, gamification transforms data acquired through people's interactions in the system. It is supported by a creative environment where consumers can transform their actions into senses and habits. These interactions are motivated by the achievement of the company's or the consumer's objective: the latter wants to interact and achieve results, and the former wishes to keep in his memory by creating a sustainable relationship. Thus, gamification offers several tools to increase consumer motivation (Mitchell et al., 2020).

Despite several areas using gamification – whether in media, retail, or health – there is a lack of empirical evidence that gamification precedes motivation (Mitchell et al., 2020). Likewise, a framework that presents the scope and delimits a gamified action was not identified (Agra et al., 2019; Mora et al., 2015). By considering this gap, this work has two objectives: 1. to present, based on theory, a Canvas framework, which helps in the analysis of elements used in the gamification of different processes; and 2. to use this framework to analyze multiple cases of sport, health, and wellness apps (fitness apps). Using a Canvas framework contributes to the gamification theory by organizing and pacifying terms still dispersed in the theory while guiding practical apps to develop gamified actions. Modeling in Canvas format, a unified Canvas on which all the framework components are arranged, allows a high-level and simplified view of the project, facilitating its quick understanding and assimilation. Furthermore, placing all components in a single image makes project design more collaborative and interactive (Sarinho, 2017; Vargas, 2015).

The choice of fitness apps was considered appropriate because exercising demands engagement to achieve goals, not being an instant result. Thus, gamification would help change consumer habits and behavior (Werbach & Hunter, 2012) in order to benefit the sustainable practice of physical activities. Therefore, we selected four apps for this study: My Fitness Pal, Nike Run, Nike Training, and Zombies Run!.

THEORETICAL FRAMEWORK

Defining gamification

Gamification is a term derived from games, combining activities that include non-mandatory spatial and temporal participation, separate from the real world. This voluntary participation takes place in an environment where the player engages in a rule-based system with a variable and quantifiable outcome, where different outcomes are assigned to different values. Regarding player behavior, gamification dialogues with psychology and anthropology, examining its influence on motivation theory, goal achievement (Matallaoui et al., 2017), and flow state theory (Csikszentmihalyi, 1990). In addition to the interaction between humans and machines, the elaboration of gamified action is directly inspired by game design technology, which organizes game components in an industrial way based on cultural and entertainment industries. Finally, it connects with business, marketing, and organizational research (Wünderlich et al., 2020). Thus, games are attributed a systematic characteristic in a virtual context. This systematic feature can be complemented by elements that are not just games, which provide experiential results from the generation of hedonic pleasures, suspense, and fun (Xi & Hamari, 2020).

Gamification uses game elements as game design techniques to involve a way of thinking and acting. From another perspective, gamification is having fun with the things we have to do (Werbach & Hunter, 2012). Thus, gamification can be defined as the use of game-like elements in non-gaming contexts (Deterding et al., 2011; Wünderlich et al., 2020). Not limiting the contextualization based on the systemic view provided by game design elements to gamification, the following definition was proposed based on the scope and gains of this process: Gamification refers to a process of enhancing a service with affordances for gameful experiences in order to support users' overall value creation (Huotari & Hamari, 2017). In this definition, the systematic view is expanded to an experiential view by the player to help create value for the consumer from resources that contribute to the consumer's experience in the game. The creation of value through gameful experiences demonstrates the experiential subjectivity of each player, considering the individual perception of each one concerning the interaction with the game that voluntarily emerges between the player and the game (Huotari & Hamari, 2017).

Also noteworthy is the term design, recurrent in the definitions presented, reinforcing the deliberate option of a designer with a specific objective, in the case of gamification, altering the player's behavior (Deterding et al., 2011). Exploring the goals of gamification can vary according to the designer's intentions and context. In the context of health and well-being (such as sports and fitness, for example), motivation can be a central objective of gamification in performing individual tasks related to health, well-being, and fitness (Lopez & Tucker, 2019).

Steps to gamify a process

A gamified process can be analyzed based on six steps (Werbach, 2014):

1) *Define business objective*: how to benefit the business by emphasizing the final purposes more than the means, since one seeks to achieve these objectives by altering natural behavior. It is suggested that objectives can be: 1. listed, 2. prioritized, and 3. justified.

2) *Outline target behaviors*: what you want the player to do by direct and indirect links to business goals. Metrics by which they will be measured are also decided, as the target behavior must be concrete and specific. Examples are inducing consumers to spend more time on digital platforms or resonating with the brand on social networks.

3) *Describe players*: who will participate in the gamified activity, the business relationship with the participants, demographics, behaviors, and psychographics (Hamari & Tuunanen, 2014).

4) *Determine activity loops*: the games operate through loops and branching trees. This step is intended to 1. create engagement loops and/or progressive ladders in which the player's actions and responses to the system are analyzed – that is, the feedback that motivates the consumer; and 2. it is decided how the player's journey will be based on his progression in the loops, such as the moment of rest, climbing, and the boss (opponent with the highest level) (Werbach & Hunter, 2012).

5) *Entertain players*: activities that arouse at least one type of fun to generate emotional or social value, creating engagement and motivation for the player (Mitchell et al., 2020; Werbach, 2014).

6) *Deploy appropriate tools*: define the most suitable elements to create gamification, that is, the best game components, mechanics, dynamics, and aesthetics (Hunicke et al., 2004).

Elements of a gamification process

Gamification elements are the blocks of a gamified activity of different types, and when applied together, they will create different results, just like a set of Lego pieces (Werbach & Hunter, 2012). The game development literature and, consequently, the gamification literature classify such elements by hierarchy and characteristics.

By hierarchy, the gamification elements are (Hunicke et al., 2004):

1) *Components*: these are the most fundamental blocks of a game – specific applications viewed and used in the game interface with the player. Several components can be part of mechanics (Costa & Marchiori, 2015). Points, badges, and leaderboards (PBL) are the most well-known components of gamified systems. These three elements are used as a basis to start gamification (Werbach & Hunter, 2012). In the War board game, for example, the components would be the meeples, the cards, the dice, and the board, creating the world in which it is restricted to the magic circle in the game.

2) *Mechanics*: deal with the game's functioning, that is, its algorithms and rules, considering it as a game of cooperation or competition, chances, and prizes, for example. This is the most fundamental element of the mechanics, dynamics and aesthetics (MDA) framework, and together with the game content it supports the general dynamics of the gameplay and can be interpreted as part of a development process. This process assumes that the rules of the game represent the mechanics. At the same time, the systems fall under the dynamics of a game, and the fun, which comprises the player's emotional investment, falls under aesthetics. As a process, it is understood that the aesthetic element results from the interaction between the other two elements. Thus, the MDA framework serves as an aid for the interpretation of this transition and composition (Hunicke et al., 2004). In War, mechanics can be territory acquisition, turns, victory, competition, and chances on the dice.

3) *Dynamics*: components of greater abstraction that can be understood as the big picture (Werbach & Hunter, 2012). They serve to create the experiences with the narrative, the progression, and the relationships. The dynamics involve the characteristics of cooperation or competition through individual challenges that promote competition between players to achieve some objective of the game (Hunicke et al., 2004). In the War game, dynamic elements would be, for example, the turns, card exchanges, army gains, and conflicts created between players.

4) *Aesthetics*: they concern the emotions generated by the game at the time of interaction, which, in turn, arise from different types of fun generated by the game, whether emotional or social, from the subjectivity of each player and not only the game. Therefore, aesthetic elements result from the development of the mechanical and dynamic elements of the game (Hunicke et al., 2004). For War, it would have both fun when interacting with friends, enjoying the meeples and creating strategies, as well as visual through sensations created from the board and the dice that can cause different emotions to the player.

Entertaining players

By triggering emotion, the game increases interest and, consequently, engagement, being an important part of a gamified action, a premise for achieving goals (Werbach, 2014). There are different perspectives for understanding fun in the literature (Hunicke et al., 2004; Lazzaro, 2008), and the most parsimonious model differentiates four types of fun (Lazzaro, 2008):

1) *Easy fun*: involves the emotion of contemplating, for example, the details of a piece on the board. It is usually found in games in which curiosity is a key factor, which can be aroused in different ways, such as creating a reality of a new world when entering a new level or the possibility of creating a character. Keeping up with the city's growth in CityVille is an example of easy fun.

2) *Hard fun*: Solving challenges with strategies and puzzles like the Sudoku game. It is a kind of obstacle-based fun where feedback from the development is crucial for the player to feel fulfilled. One can identify this type of fun in fitness apps, where players must overcome obstacles, such as reaching ten kilometers in a race, and analyze their progress later "with choice of victory conditions" (Lazzaro, 2008).

3) *Serious fun*: relates to the emotion of a purpose. Combining factors intrinsic to the player and the game's content can generate sensations such as relief and excitement. "The Internal Experience key focuses on how aspects of the game external to the player create emotions inside the player" (Lazzaro, 2008). An example is the gamified activity iHobo, inspired by the Tamagotchi game, whose objective is to take care of a homeless person and, thus, create awareness of what life is like for these people.

4) *People fun*: refers to the thrill of bonding with people, like in co-op games or being part of the same team in FIFA or being part of the band in Guitar Hero. In this type of entertainment, social value is expected to be

generated through networking, made possible by the multiplayer characteristic, usually in games with the "people" factor (Lazzaro, 2008).

Player's journey

The player's journey generates engagement from a narrative built with three key concepts (Kim et al., 2018):

1) *Onboarding*: it is the moment of integration, the initial experience of a newbie, in which he learns the basics and sets expectations, learning how to achieve his goals.

2) *Habit-building*: in this phase, the player moves from beginner to regular through triggers, activity loops, and feedback systems. It is the period when gambling becomes a habit.

3) *Mastery*: in this third and final phase, the player dominates the system and wants to go deeper, becoming an enthusiast who has followed the path of mastery.

For the player to master the game, he goes through progression loops with 1. onboarding, 2. a moment of rest so that he can enjoy what he has learned, 3. a moment of climbing, 4. another rest, until, finally, he receives 5. a final challenge (boss fight) that ends the loop. For example, in the Super Mario Bros game (Figure 1), one can see where each part of the progression loop fits. When the boss is defeated, the player goes to the next world, which is more complicated than the previous one, and the cycle repeats until the end of the game.

Figure 1

Progression loop
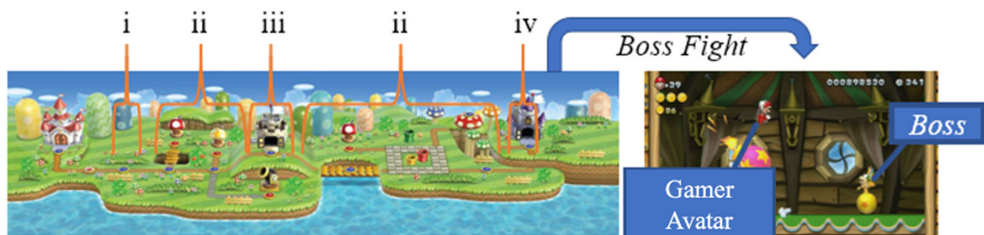
Progression loops drive engagement by causing (Kim et al., 2018): 1. motivation, willingness, and intention to act; 2. action, execution of the

proposed tasks to complete them and obtain the results; and 3. feedback, obtaining results for progress analysis, according to metrics used by the game such as leaderboards, points, and graphs.

Reward schedules and structures are two strategies game designers use to provide feedback to players (Werbach & Hunter, 2012). The reward structure determines the reward offered to the player who fulfills tasks defined by the game designer. These rewards can have monetary value (rewards) or symbolic value (badges or achievements) (Werbach & Hunter, 2012). On the other hand, the rewards schedule is the frequency of offering feedback, which can be (Linehan et al., 2015):

1) *Continuous reward*: it rewards each action taken. No matter what the consumer does, he gets rewards by keeping the player alive in the game. For example, consider a game in which the consumer is rewarded every time he enters this game.

2) *Fixed ratio reward*: it delivers boosters every n number of actions, *i.e.,* the consumer earns a coin every five helps, making him perform actions with certain recurrence.

3) *Fixed interval ratio reward*: it is given over time, such as gaining lives every five hours.

4) *Variable reward*: there are no stipulated proportions or intervals. By varying, the rewards surprise the player. For example, at the end of a campaign, there is a chest to be opened with some reward unknown to the player.

Types of players

In order to create efficient, personalized gamification to increase engagement, previous studies of the types of players can facilitate the identification of differences in the results regarding motivation, performance, and individual perception of the gaming experience (Huotari & Hamari, 2017). The interaction of players with each other and with the game world is a possible way of classifying players (Bartle, 1996):

1) *Killer*: these players seek to impose themselves on others through in-game actions. This behavior can be highlighted in games such as Call of Duty, where the player's main objective is to kill other players.

2) *Achiever*: their main motivation is to collect points, increase their levels, and explore the world to find treasures or ways to get more points. Unlike killers, achievers act to conquer the game world, not other players. Games with medals and trophies are great examples of how a game can generate

more engagement for these players. The sticker album is an example of a gamified action that attracts achievers.

3) *Explorer*: they like to explore the world and interact with its resources. This behavior can be observed in open-world games such as Minecraft.

4) *Socializer*: these players want to interact with other people, and this interaction is more important than winning or achieving goals. Travel games like Uno encourage this interaction; the more players, the more fun.

Presentation of Gamification Design Canvas

By comparatively evaluating the authors who discuss the gamification elements for management, we can highlight the main gamification strategies that form the basis of the discussion. Table 1 presents the authors, strategies, and a brief justification for their use in the model.

Table 1

Strategy and justification of the main theoretical gamification pillars

| Author	Strategy	Justification
Werbach and Hunter (2015)	Stages of the gamification process	Connects business objectives with defined steps for proposing a gamified action, listing key elements for good performance.
Bartle (1996)	Types of players	Presents a parsimonious model to identify players' relationships with their opponents and the simulated game environment.
Werbach and Hunter (2012)	Engagement loops	Describes the impact of different reward aspects on the player's relationship with the game.
Zichermann and Linder (2010)	Reward structures	Presents different forms of rewards that can be offered to the player to increase their involvement with the game.
Linehan et al. (2015)	Reward schedule	Proposes different reward intervals for players and discusses the impact of these intervals on players' engagement with games.
Kim et al. (2018)	Player's journey	Suggests that players are guided in learning the simulated game environment to acquire mastery of their abilities within this environment.
Lazzaro (2008)	Types of fun	Presents a parsimonious model to identify players' relationships with their goals in gaming environments.

(continues)

Table 1 (conclusion)

Strategy and justification of the main theoretical gamification pillars

Author	Strategy	Justification
Hunicke et al. (2004)	Hierarchy of elements	Proposes that gamification elements can be organized in a hierarchy.
Costa and Marchiori (2015)	Gamification components	Offers a list of components used in gamification that appear in scientific articles.

By taking advantage of the gap identified in gamification studies, this work aims to present, from the theory, a Canvas framework, which helps analyze elements used in the gamification of different processes (Figure 2). The Canvas format was chosen as a visual scheme that allows people to collaborate in creating or solving a complex problem systemically (Osterwalder & Pigneur, 2010) and enables a strategic view of business processes, the game itself, and the player. At the base of the Canvas, we used the six steps of the gamification process (Werbach, 2014).

Figure 2

Gamification Design Canvas
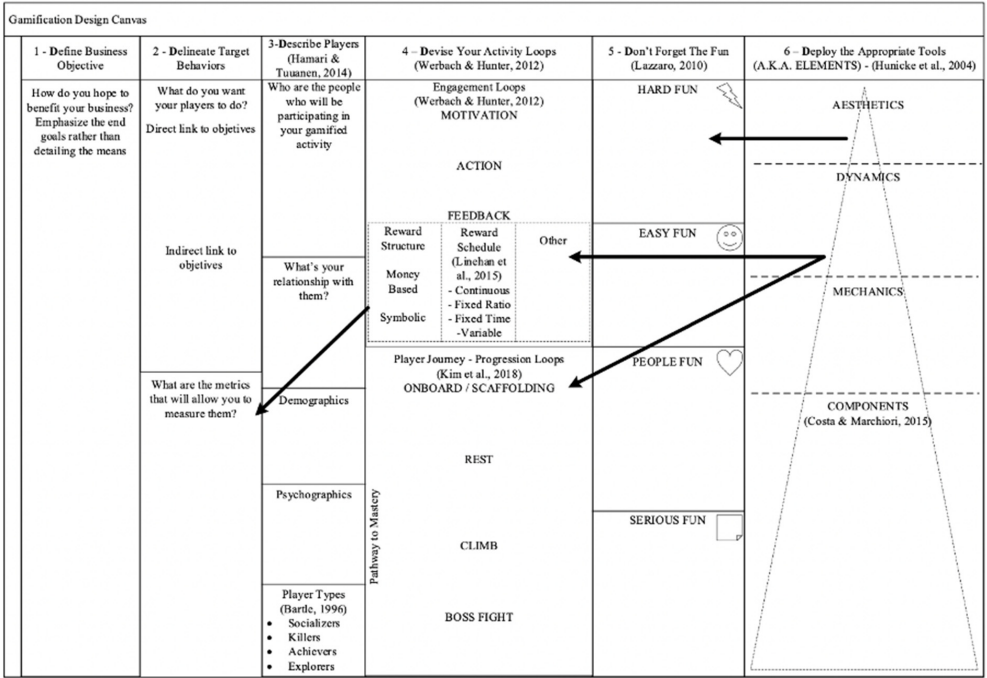
The first three columns refer to the business and the consumer/player. The last three refer to the game. The arrows highlight relationships between each part of the Canvas, such as the aesthetics relationship with types of fun, dynamics with player's journey and engagements, and rewards with metrics used to measure consumer behavior.

METHODOLOGICAL PROCEDURE

The qualitative research method was conducted as a multiple case study (Rashid et al., 2019) to understand how fitness apps use gamification for consumer engagement. During the first half of 2021, we analyzed four real cases of application of this type of strategy.

The case study protocol comprises five steps (Rashid et al., 2019; Yin, 2009):

1) *Definition of cases*: in order to analyze the phenomenon that is the object of this work, we identified fitness apps that used gamification.

2) *Case study protocol*: defines which propositions support the study and, thus, allow the fair evaluation of the cases. This step initially relied on the proposition of a Canvas framework, using bibliographic research and its treatment for the systematization of the constituent elements of a gamification strategy.

3) *Contact*: the sources and methods of collecting material are established.

4) *Interaction*: the result of the detailed search is placed in the contact step.

5) *Analysis of the case study*: the final diagnosis of the cases analyzed is made according to the propositions, thus, the analysis of the cases of the apps was carried out, seeking evidence of the formulated propositions.

Fitness apps are suitable as the object of this case study because monitoring different aspects of the practitioner's physical activity allows several opportunities for interaction with the consumer. Despite the growing awareness of the population, the regular practice of physical activities is a daily challenge for people around the world. Many of these motivations relate to characteristics that can be addressed using gamified actions. Fun is also observed as a common factor among adults and young people. As gamification is a possible answer to fitness activities, we looked for apps aimed at this audience that used gamification techniques to some degree (Tu et al., 2019). In order to meet the second objective of this study, the cases were

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presented, the gamification elements were analyzed, and then a relationship of similarity or disparity between these elements identified in each one was established, following the proposed framework. Thus, we chose:

1) *My Fitness Pal*: Under Armour app's objective is to monitor consumers' nutritional and physical performance in various activities.

2) *Nike Run Club (NRC)*: a Nike app focused on running.

3) *Nike Training Club (NTC)*: another Nike app that aims to monitor physical activities other than running.

4) *Zombies, Run!*: aims to encourage physical activity, especially running, through a scenario of challenges, with a zombie invasion narrative created by the app.

The qualitative case study methodology allows researchers to conduct in-depth research on a phenomenon in a specific context, all using various data sources. They allow analysis to be carried out from a wide range of points of view to reveal multiple facets of the phenomenon under study (Rashid et al., 2019). We chose the following data sources:

1) Keyword searches: public data available in app stores, social networks, and the internet, were searched during the first half of 2021 using the following keywords: steps for gamification; gamification elements; badges; points; leaderboards; likes; types of fun; people fun; hard fun; reward structures; reward schedules; and types of players.

2) Browsing the websites of the app's publishers during the first half of 2021 using the same terms as keywords.

3) Use of apps from a consumer perspective: five practitioners of physical activities consumers were trained to navigate the apps. The interactions of the consumers trained on the app were recorded in the app and an activity diary. Ultimately, the researchers had unrestricted access to the app's consumer profile and the field diary. The trained consumers were also interviewed by the researchers and asked if they had noticed the gamification elements listed in item 1.

4) The researchers also evaluated the gamification elements listed in item 1 and, which are present both in the navigation of the apps and in the pages of the app stores of the developers.

All elements were tabulated in a spreadsheet. The analysis of themes was carried out with the condensation of similar contents. The themes were compiled in two rounds, generating five major themes for analysis. Using such analysis categories (Yin, 2009), the pieces of evidence were consoli-

dated into Canvas frameworks for each fitness app, categorized by the gamification element identified, and subsequently compared. A detail of this evidence is presented in the next section in their respective categories.

RESULTS AND ANALYSIS OF THE CASES

The most salient elements of gamification in each app, whether observed by the history of consumers, the registration of the app, or by what was highlighted by the developers and in the stores, were defined by the predominance of the attributes raised in theory and highlighted in Table 1 and Figure 2. The adoption of such criteria emerged from the data collected in the study by contrast. Thus, even if a single app presented multiple attributes, the evidence was based on the recurrence of parameters of each user and attribute association.

A practical example is the Under Armour app, which activates several features for socializing users (*e.g.*, sharing the exercise, comparing performance, and inviting to events, among others). This app was the one that presented the most social interaction by the consumers trained, being classified as a socializer.

On the other hand, Zombies, Run! app activates several resources to instigate the user's curiosity for the simulated gaming environment (*e.g.*, "Know what will happen in the next chapter," content and teaser for the next season, instructions for collecting accessories, among others). This app was the one that presented the most comments of curiosity (attention) from the consumers trained, being classified as an explorer.

Under Armour: My Fitness Pal

1) *Define business objective*: to generate engagement in the practice of physical activities to eventually increase product sales, as well as Under Armour brand awareness.

2) *Outline target behaviors*: consumers are expected to do physical exercises frequently and, indirectly, increase their health and well-being. In this way, they would complete the challenges progressively and steadily. Within the objectives of engagement loops, the app offers continuous results depending on the activities performed and the stipulated frequency. The metrics used by this app are based on calorie intake or expenditure to analyze changes in body weight, maintaining a history of progress for the person,

and it can be expressed in calories ingested through food (micro and macronutrients) divided into breakfast, lunch, dinner, and snacks, and calories burned through physical exercises. In this case, information is used on the amount of training performed per week and the time of the exercise performed.

3) *Describe the players*: the target audience is youth and adults who would like to start, maintain, or improve their health and fitness, as well as be able to have fun in this activity, reduce stress, and be part of a community. The company communicates with consumers through one-way communication and social events. The main types of My Fitness Pal consumers are socializers, as they seek to progressively achieve their goals and be recognized through sharing experiences with friends and participating in communities provided by the app.

4) *Determine activity loops*: consumer motivation is physical well-being, increased performance, and personal satisfaction, as well as the possibility of belonging to social status within the community. They are expected to train, follow the proposed diet, and share their progress with friends. The feedback provided to consumers is separated into: weight gain/maintenance/loss (weekly weight goals), nutritional goals, and fitness goals. It also demonstrates the calories spent by type of training, according to weight used and time. This feedback is provided in graphs and metrics to expose different perspectives on consumer performance on the three fronts, measured daily. The consumer receives achievements at a fixed ratio by completing some exercise program and calorie changes. The rewards depend on the challenge events that the app adds to the platform, occurring at variable times. The community and various conversation groups generate engagement for the consumer to continue developing. The tools to add friends and freedom to create your diet and exercise routine, scan the food barcode to add it to your list and check calories, explanatory videos, and the ability to take pictures to track your progress are tools that contribute to this topic.

In Figure 3, there is an example of a nutritional plan, where I represents the consumer's daily caloric goal; II represents total daily calorie intake; III reflects the calorie expenditure by the exercises, resulting in the number of calories that should be consumed or, in this case, in the reduction of around 43 calories per meal; IV, in turn, demonstrates the calorie per food, in this case, oats, with the respective amounts of carbohydrate, fat, and protein. The nutritional analysis provides another insight into meal planning and a graphical view of progress. The app calculates the number of calories

spent in a workout routine created by the consumer. In this part, the consumer can launch the exercises and the respective weights and repetitions performed. Once the training is created, information is obtained about the average weight volume used in the training, the training time, and the calories spent during the activity.

Figure 3

Examples of My Fitness Pal screen view
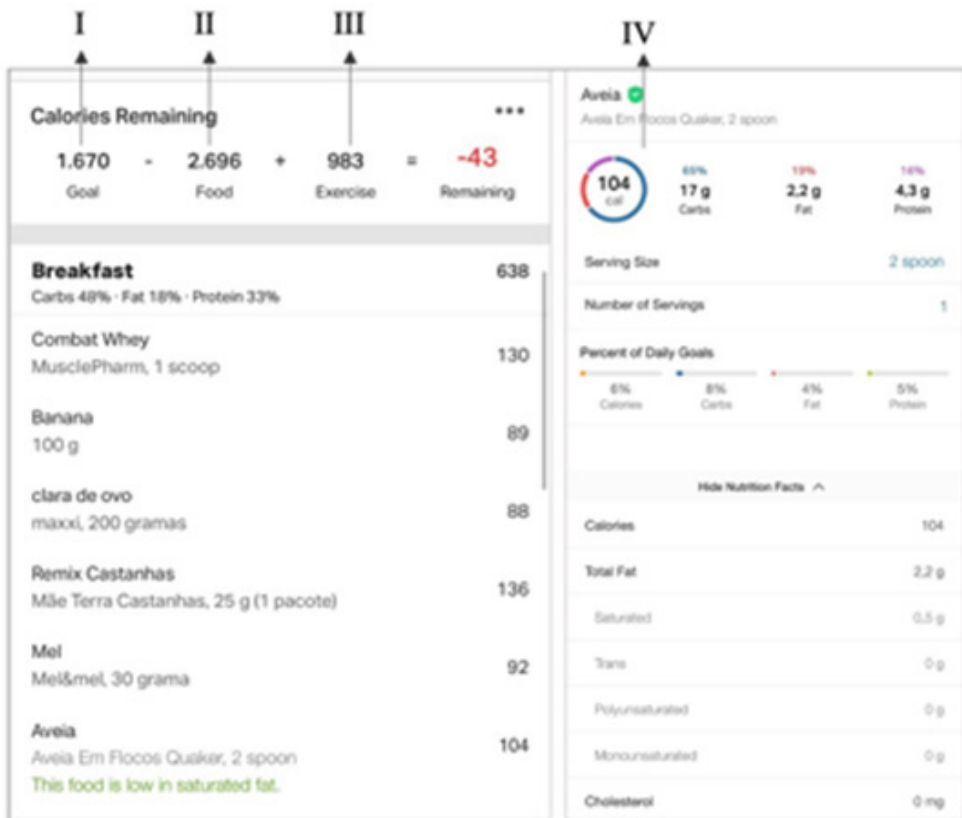
Regarding the player's journey, the My Fitness Pal app can be analyzed in:

- *Onboarding*: the consumer will be aware of his progression, that is, the path to be followed: starting from the beginner title to reach the next level at each stage. In addition to the notion of progression, in this phase, the consumer will learn to fill in the presented disciplines, that is, learn how to achieve goals using the app.

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- *Rest*: the consumer is expected to contemplate his victory. In the current context, this is a milder training period in which the individual performs a self-assessment on the fronts exercised from the feedback present in the app. These milder exercises can then be stipulated by the consumer within the range of activity options proposed, especially by the My Fitness Pal app.
- *Climb*: climbing refers to the consumer's progression in physical activity, in which each proposed activity, depending on the frequency of the results obtained, demonstrates greater intensity. Consumers have the option to choose their challenges depending on their level (beginner, intermediate, and advanced) to improve and leverage their level.
- *Boss fight*: this step refers to the effort to pass the level. Consumers can choose their routine activities (routine workout) to perform the activity and excel within the previously stipulated goal in a personalized way.

5) *Players entertainment*: the presence of hard fun is identified in the proposed physical challenges, which, however, may require some intellectual/psychological challenge to achieve them, such as concentration on breathing, for example, as well as keeping healthy by constantly controlling the calorie intake and expenditure. This process is identified mainly in the boss fight part, in which the consumer's physical conditioning must be consistent with the level of demand. The technological aspect, characteristic of the brand, is part of this easy, fun type. This is mainly due to the caloric calculation equation at the top of the screen, where you can follow the variables. The app offers people fun by allowing the consumer to invite and share the experience with friends and others on social networks. There is even the option to add friends to your profile and thus write comments where they can like, comment, and be part of Under Armour communities available in the app. The concept of well-being in doing physical exercises, becoming a healthier person, sharing the results, and motivating more people to do the same makes up serious fun, which can also be found in explanatory videos on how to perform physical exercises.

6) *Deploy appropriate tools*: in the My Fitness Pal app, the following gamification elements were found:

- *Components*: badges, achievements, mission, levels, points, and unlockable content.
- *Mechanics*: feedback, cooperation, and challenges.
- *Dynamics*: emotions, progression, social interaction, and restrictions.
- *Aesthetics*: visual guide (sensory pleasure) and funs (overcoming challenge).

Nike Run Club (NRC) and Nike Training Club (NTC)

1) *Define business objective*: to generate engagement in the practice of physical activities with the support of nutritional monitoring and sharing of results for an eventual increase in product sales, specifically Nike shoes, as well as brand awareness.

2) *Outline target behaviors*: the consumer is expected to practice physical exercise frequently, more specifically running. Indirectly, it is expected to increase the health and well-being of consumers and improve performance, specifically in running. Thus, consumers would progressively and constantly complete the challenges, monitoring their calorie burning and sharing their experiences with their social network. The metrics used depend on the app: NRC is mainly related to time, speed, and frequency of running, such as kilometers traveled, calories burned, comparison between participants, personal records, consecutive running; and NTC is a daily activity organized in programs or exercise plans stipulated by the consumer, such as training time, training type, training frequency, and consecutive training sessions.

3) *Describe the players*: the target audience is youth and adults who would like to initiate, maintain, or improve performance in walking, running, and other exercises, and maintain health and well-being while having fun in the activity, reducing stress, and being part of the Nike Members community. The company communicates with consumers through one-way communication and social events. The main types of consumers of the two apps seek to achieve their goals progressively and competitively, in addition to being recognized through sharing experiences with friends and participating in the community. Therefore, there are stimuli for achievers and killers in the first case and socializers in the second.

4) *Determine activity loops*: consumer motivation is physical well-being, increased performance in running (mostly) and other physical activities, as well as networking, belonging to the Nike community, or finding a run club.

Consumers are expected to train and share their progress with friends. The feedback provided to them is separated into: training to be done (running for the NRC and training for the NTC) and likes by the community. Both apps have rewards for completed activities, depending on the goal and program chosen by the consumer. Badges are used as a form of recognition. Regarding rewards schedule, the apps use recognition in several modalities:

- *Variable but standardized ratios*: for example, at NRC, virtual medals are based on the monthly distance covered, which can vary between 24 km,

40 km, 80 km, and 160 km, standards recognized by runners. There are also badges for total kilometers traveled or run levels. In NTC, there are rewards for each workout: three workouts, five workouts, and progressively up to 100 workouts.

- *Fixed intervals*: the NRC rewards the number of runs per week (3x Streak, 5x Streak, 7x Streak), weekly frequency (3-Week Streak, 4-Week Streak; etc.), and monthly (3-Month Streak, 6-Month Streak; etc.). In NTC, there are rewards for the weekly amount and monthly workouts (3x in a Week, 3 Weeks in a Row, or 9 Months in a Row).

- *Variable intervals*: the NRC recognizes personal records such as the farthest run, the longest run, and speeds per distance (fastest 1K and fastest mile). There are also trophies for "Just Do It" events related to Nike's global running community. In NTC, there are trophies for training at specific times, such as training five times between 5 a.m. and 8 a.m. ("early bird") or training five times between 9 p.m. and 12 a.m. ("night owl").

- *Rewards*: in NRC, other forms of feedback and retention are used, such as adding a friend or professionals to follow your training or joining a running club. Consumers can also create their running challenge and invite friends to join and compete to win a trophy. They can also participate in challenges created by Nike, linked to product launches, in which the winner receives products as a prize. In NTC, consumers can add their friends and watch explanatory videos. Figure 4 shows examples of this reward architecture.

Figure 4

*Examples of the Nike app rewards structure*
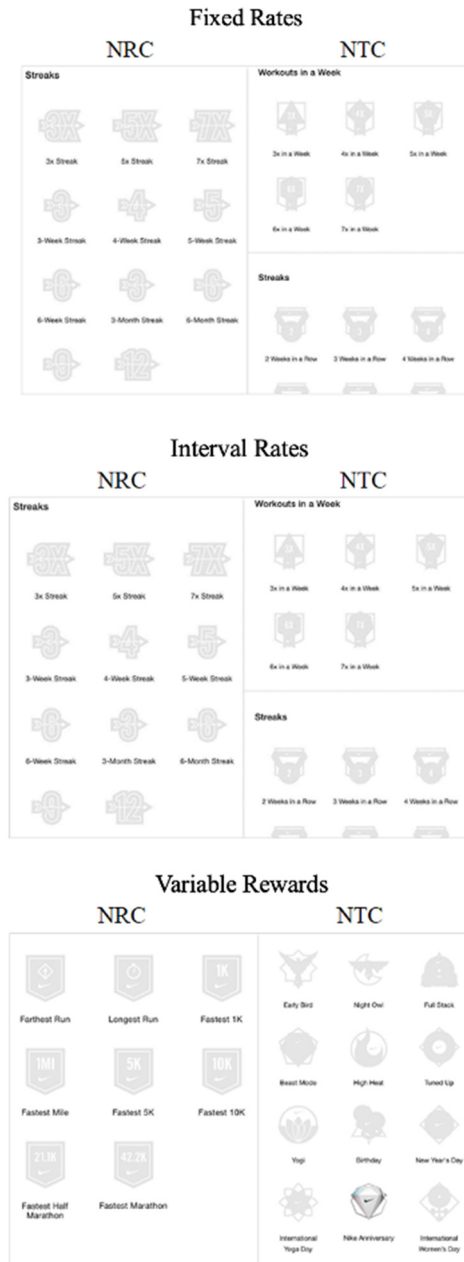
Note. App screenshots.

Regarding the *player's journey*, the apps can be analyzed in:

- *Onboarding*: it starts as a beginner, and the first activities can be stipulated by consumers, depending on their objectives. In each exercise chosen, there are instructions on how to perform it.
- *Rest*: in NRC, information about the importance of resting between workouts is available to consumers. Consumers can choose between milder exercises or a day off when contemplating their results obtained and their physical condition. In NTC, rest is stipulated within the activity, called "cool down," when the program activity is completed with stretching. However, when finishing some activity or the program, the individual can choose milder exercises to have this rest.
- *Climb*: in both apps, there is a transition between beginner, intermediate, and advanced. At each level, there is progression, where each exercise demands more skill and conditioning from the consumer. In NRC, there is another climbing metric, the so-called "run levels," which can be seen in Figure 5.
- *Boss fight*: in NRC, consumers can choose programs such as weight loss and health improvement, guided races, and progressive mileage. The intention, however, is to complete activities and advance levels parallel to the run level. In NTC, consumers can choose the exercises to do and the programs to follow, depending on their goals. Level progressions in both apps are fluid and do not offer a clear boss fight.

5) *Entertain players*: the presence of hard fun is identified in the physical challenges proposed by the two apps. The interface of the apps is full of impactful incentive images. With NRC, the consumer can exercise while listening to music, which invites the consumer to explore the app and take advantage of easy fun. The existence of community in the app appeals to the people fun of consumers. Both apps extensively explore the interaction with community members, either with the possibility of participating in social events or through interactions in the interface, such as giving a publication a "like" or achievements. In Figure 5, there are some examples of how NRC explores people fun. The concept of well-being in doing physical exercises and becoming a healthier person, following the execution of physical exercises through videos, in the case of NTC, and being able to share their results and motivate more people to do the same are part of serious fun.

Figure 5

Examples of progression loop and people fun in the NRC app
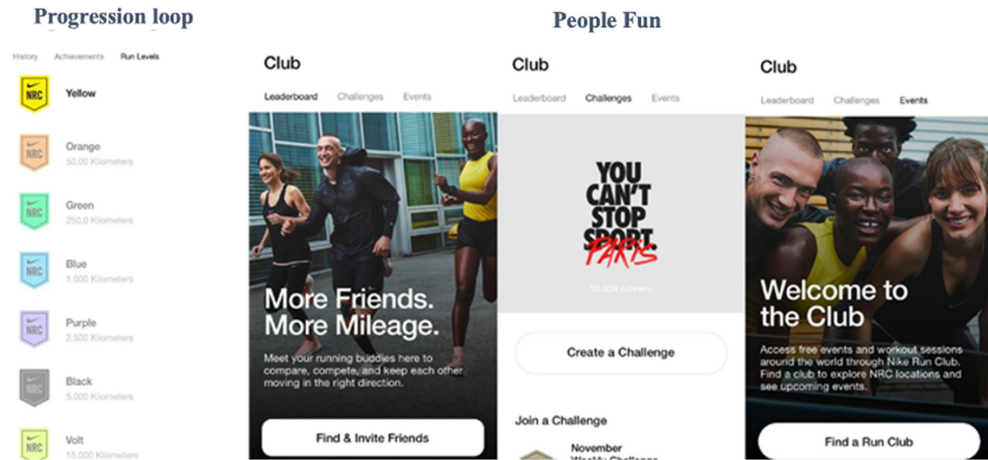
Note. App screenshots.

6) *Deploy appropriate tools*: we found the following gamification elements in NRC and NTC apps: *components*: badges ranking, collections, achievements, social graph, mission, level, and points; *mechanics*: feedback, rewards, competition, and challenges; *dynamics*: emotions, progression, and relationship; *aesthetics*: visual guide (sensory pleasure) and funs (overcoming challenge).

Zombies, Run!

1) *Define the business objective*: to generate engagement in physical activities, especially running, by selling virtual items to the consumer.

2) *Outline target behaviors*: the consumer is expected to do physical exercise frequently. Indirectly, the health and well-being of consumers are expected to increase. That way, they would complete the challenges progressively following the narrative. The metrics used by this application are incorporated into the narrative: distance covered; time elapsed; average rhythm; calories spent; number of resources; number of zombie invasions; and base construction progress.

3) *Describe the players*: the target audience is individuals who want to improve their health and ability to exercise, primarily run, and have fun in this activity. The objects of consumption are cultural products of the game's producer. The types of consumers in this app are explorers, who mainly

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benefit from the fictional world created, and achievers, who follow and complete the missions suggested by the story.

Figure 6

Zombies, Run! app screen view
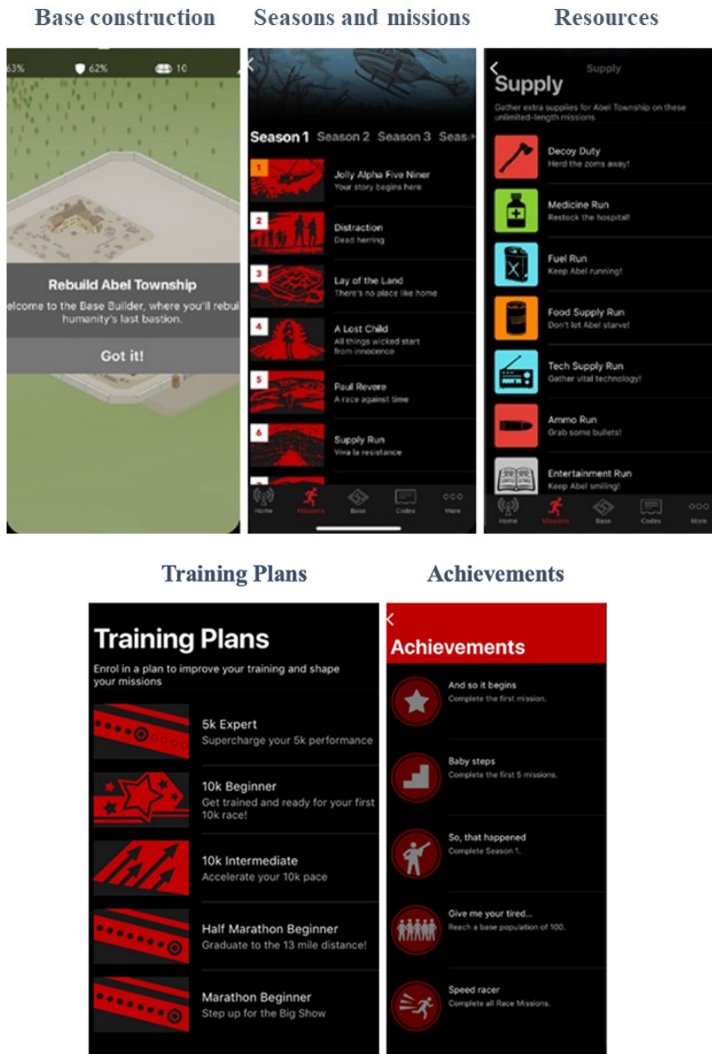
Note. App screenshots.

4) *Determine activity loops*: Consumer motivation is physical well-being, performance enhancement, and the fun of following the story of an immersive apocalyptic world through headphones. They are expected to train,

follow the story, and share their progress with friends. The consumer feedback is separated into story chapters and missions, running performance indicators, resources to use in the fictional world, and virtual goods to build the base in the virtual world. Rewards are various resources obtained along the way of the race, such as bandages, medicine, water bottles, and axes, as seen in Figure 6. In addition, the consumer can earn achievements by evolving in the story, completing missions, completing seasons, and developing their base. In Zombies, Run!, there are continuous rewards as the consumer earns supplies based on activities performed and keeping them alive in the game. Finally, the app also allows the creation of races and communities on social networks. Concerning the *player's journey*, the app has:

- *Onboarding*: consumers are introduced to the story, will make a level assessment, and will be aware of their progression, that is, the path to be followed to reach the boss level in each chapter.
- *Rest*: the app has a tab called Interval Training, also called Lowdown Moment.
- *Climb*: each chapter is a proposed race that, in the end, offers a new race to continue the story. After each race, a more intense one is proposed.
- *Boss fight*: at the end of each mission, there is a more difficult zombie to escape, making the consumer run more at the end.

5) *Entertain players*: hard fun is identified in running challenges and indoor exercises. Easy fun is the most common type present in the app with the sounds of zombies, engaging narrative, music, and storytelling full of interactive drawings and videos, and the possibility of building a base against zombies. People fun is offered through results sharing and community engagement on social media. Serious fun is offered through the wellness of exercising and becoming healthier and more active.

6) *Deploy appropriate tools*: in the Zombies, Run! app, the following gamification elements were found: *components*: virtual goods, collections, achievements, unlockable content, badges, mission, points, and levels; *mechanics*: challenges, rewards, feedback, and victory; *dynamics*: emotions, narrative, progression, relationships, and restrictions; *aesthetics*: visual guide (sensory pleasure) and funs (overcoming challenge).

DISCUSSION AND PROPOSITIONS

It is common among the cases: the main objective of generating engagement in the practice of physical activities, and the target audience and what

is expected of it. Although NRC and Zombies, Run! are apps dedicated to running, the ways to motivate, reward, entertain, and interact differ. In order to summarize the results of applying the gamification Canvas in Figure 7 with a comparative analysis between the cases, a color scale was chosen in which green represents great similarity between the cases, yellow represents medium similarity, and red represents low similarity.

Figure 7

Similarity analysis of fitness apps using Canvas
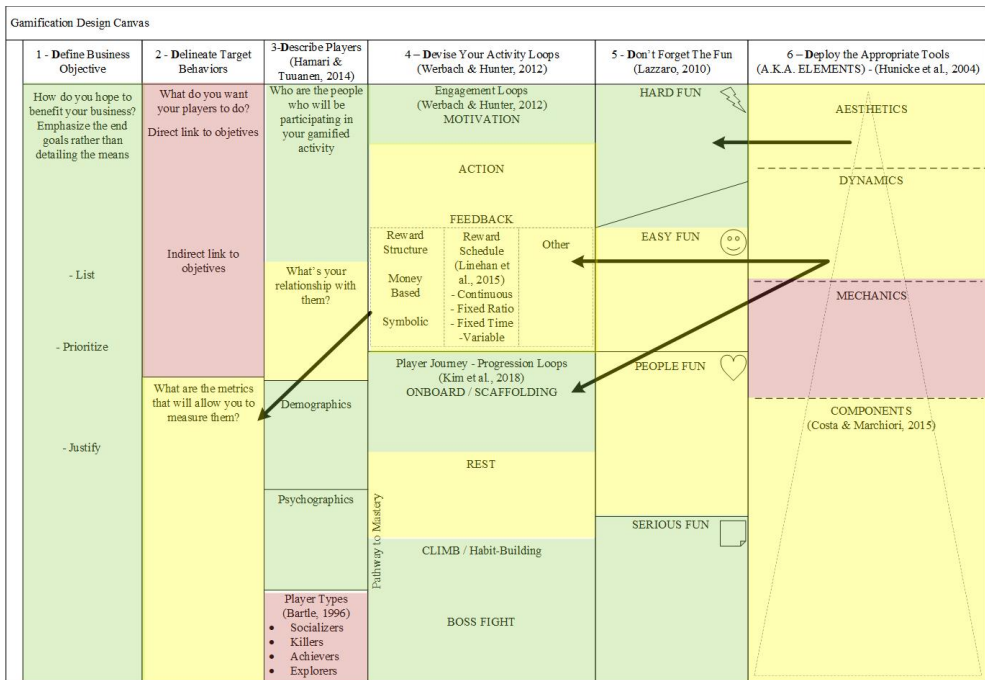
After analyzing the structures of the cases, it is possible to establish the propositions.

In the cases analyzed, the gamified activity is developed through the six steps represented on the Canvas, even at different levels. As gamification is a process with various steps, and not all of them are mandatory, when comparing different activities, these steps tend to be present, leading to the first proposition:

- P1: Gamification in fitness apps uses six distinct steps.

Among badges, points, leaderboards, and likes, the most used elements are badges and points, which appeared in all apps analyzed. Leaderboards and likes are present in the apps with more people fun, especially NRC.

As fitness apps are classic forms of gamification, they are expected to have the most used and prescribed components in the literature. Specifically, the social function of fitness apps is very present. Thus, it is also expected that they use the features of social appreciation (likes) (Tu et al., 2019), leading to the second proposition:

• P2: The gamification elements badges, points, leaderboards, and like are used in fitness apps.

In all cases, people fun is encouraged, mainly through communities where consumers share their results and tips and are recognized for this. The interaction varies in each fitness app analyzed. While in My Fitness Pal this feature generates cooperation between its consumers to reach their intended goals, NRC uses it to stimulate competition. Regarding Zombies, Run!, value creation occurs with the feeling of belonging to the community, where consumers become Runner 5 and feel part of a group. Hard fun was used less frequently.

Considering the perspective of practicing sports, fitness apps aim to make this practice pleasant and fun so that consumers remain active and practice physical activity. With elements such as performance measures, rewards, and social interactions, gamification motivates consumers to practice the exercises to stay recurrently active in the app (Tu et al., 2019). Fitness apps use two perspectives of fun. The first concerns the "utility of the hedonic experience when consuming the service, which the fun consumption experience can acquire." The second refers to belonging to a social network and consumption identity. In this way, the generation of emotional value from the use of rewards, badges, and points and the use of social networking through sharing on social media for the generation of value is exemplified (Tu et al., 2019), leading to the third proposition:

• P3: To motivate the consumer, fitness apps use people fun and hard fun.

The cases demonstrate different reward structures and timelines. My Fitness Pal offers rewards (achievements) as an interval variable. NRC and NTC opted for a more complex and varied recognition structure, while Zombies Run!, on the other hand, offers random and continuous rewards.

As fitness activities are complex and demand different efforts from consumers, fitness apps may use different recognition and feedback strategies

depending on their physical condition. New consumers can be encouraged to interact with apps with defined frequencies and receive rewards regularly to overcome inertia in exercise. Consumers who have gone through this initial situation tend to be encouraged to overcome their previous limits or goals common to individuals in the same conditions. Finally, more experienced consumers are not dependent on the app and will be interested in exclusive surprises or rewards, which grant distinction in their groups, leading to the fourth proposition:

- P4: Fitness apps use similar reward structures and reward schedules.

In these cases, the target audience is similar: young people and adults who seek to improve their health and physical capacity become active and reduce stress with fun and belonging to a community. Therefore, the players most activated by the gamified fitness apps are the socializers. Reward structure designs favor achievers but not as much as socializers. Killers are activated only in NRC.

Thereby, for each type of player, different combinations of elements generate motivation. In fitness apps, the intention of improving physical and well-being is linked to the consumer's action with the world to obtain results, leading to the fifth proposition:

- P5: The type of player fitness app is designed for its achiever.

CONCLUSIONS

By presenting a framework in Canvas format derived from theory, this work's first objective is fulfilled. The analysis of multiple cases (objective 2) was carried out, applying the characteristics identified to each case, and, as a result, some similarities and differences were found between the gamification elements used, depending on the specificity of the cases. The elaboration of the framework helped in the diagnosis of the propositions. These propositions refer respectively to the steps suggested for gamification, case choice, fun, player's journey, types of player, and Canvas presentation.

Therefore, it was verified that the four fitness apps studied, in addition to engaging in physical activity as a common goal, can be analyzed from the six steps suggested for the gamification process and that each app has particularities regarding the elements used, with badges and points being the most used. On the other hand, there are differences in the structure and schedule of rewards between apps. Interactivity, which stimulates people

fun, was also observed as a recurring factor in socializer's motivation, which was highly encouraged in the apps studied. Thus, even though some apps have similar proposals to each other, notably NRC and Zombies, Run! (focused on running and NTC) and My Fitness Pal (focused on other fitness activities, ways to motivate, reward, entertain, and interact), they differ from each other by using different elements of gamification.

As the main theoretical contribution, the proposed Canvas was very useful in elaborating the diagnosis of recurrent, similar, and distinct gamification factors in the cases studied. As a practical contribution, the framework for gamification can thus be used to compare the main competitors, facilitating the visual interpretation and comparison of each element used. Still, it can also be used to support the creation of gamified actions.

This study, however, has some limitations, such as the number of cases chosen, the specificity of context (fitness), temporal limitation, describing only the current situation of the apps, and it did not obtain the opinion of the companies that developed the apps studied. In other words, the study is limited to the analysis of four current fitness apps, which were carried out from three main data sources: public data, website navigation, and use of the apps from a consumer's point of view.

We believe that using the framework allows different opportunities for future research in other types of businesses that use gamification. It is also possible to evaluate the efficiency of using the Canvas in developing and efficiently a gamified action. Finally, the proposed framework intends to be parsimonious and inclusive, and one can test the limits of its scope and the value of its objectivity.

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