

See discussions, stats, and author profiles for this publication at: <https://www.researchgate.net/publication/324252689>

# White paper on Gamification in app development. Previous implementations, possible future implementations; small start to a broad topic and big future.

Technical Report · February 2018

DOI: 10.13140/RG.2.2.32434.09920

CITATIONS

0

READS

1,689

1 author:



Charles Bostwick

University of Maryland Global Campus

1 PUBLICATION 0 CITATIONS

SEE PROFILE

Some of the authors of this publication are also working on these related projects:



Gamification [View project](#)

25 February 2018

**White Paper: Gamification for App Development**



**Written by: Charles C. Bostwick**

## Executive Summary



Gamification in application development has come a long way since the development of smartphones and handheld digital tablets. Various companies have utilized gamification successfully to increase their user-base, revive a dying product, and launch a new product. When looking into app development and using gamification there

Is a reoccurring theme that seems to be implemented in most gamified apps. Typically most successful applications of gamification used in app development have social media integration, some type of reward system, and progress tracking. Typically, with the social media integration, the users are able to directly share their results with their peers. If there is a competitive aspect to the gamified elements, then the leaderboards/scoreboards are almost always readily available so that the user can get instant gratification knowing that they are on top. Gamification is a new and emerging element of app development that is just now

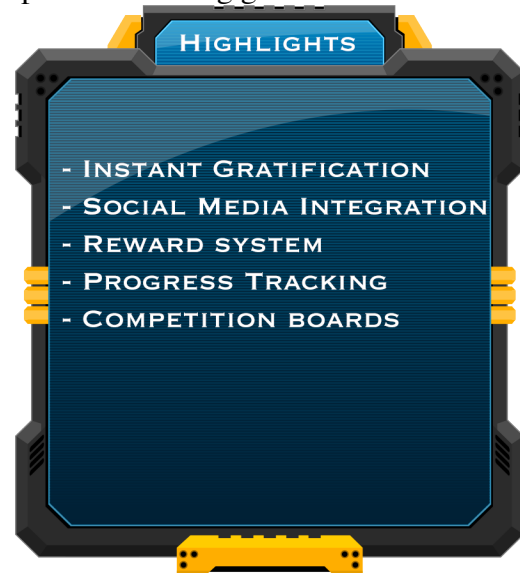


Fig 1. Highlights

starting to be deeply explored and used in today's digital marketplaces. Companies, freelance developers, and even the United States Military have successfully deployed gamification in various products they have launched. Some examples include Fitocracy, Mint, Bluewolf, the United States Air Force, and the United States Army. All of these examples have a combination of elements of gamification being real-time feedback, transparency, goal setting, badges, leveling up, and onboarding & mastery. App development using gamification has so much room to grow and there are still many avenues that have yet to be explored. Two great ways to utilize gamification is to develop an education app that helps some build a strong foundation and also develop an app that can help a user track their health and work towards bettering themselves. Both of these themes are phenomenal areas that can use gamification elements to help the user to accomplish goals and tasks all while improving themselves mentally and physically. Gamification is not just limited to these examples of gamification as gamification elements can be added to virtually any genre of app that a developer wishes to develop. Altogether, it is up to the developer on what elements they will use, and how they will apply them to the app that they are developing based on the needs of the customer and the market that the app is geared towards.

## Introduction



The term Gamification was initially coined by Nick Pelling in 2002. Gamification is essentially the implementation of game design techniques and elements into non-game contexts and activities (Deterding, Dixon, Khaled, & Nacke, 2011; Zichermann & Cunningham, 2011). Gamification specifically in application development, also known as “app” development, can be utilized to add game and video-game elements to everyday tools that are used by the masses; having a powerful impact on the user. Gamification has been used to increase user engagement, improve knowledge and learning, and enhance overall learning experiences (Shchimmoller, Mauzy, Meredith, & Austin, 2017). By implementing gamification in app development, a developer can turn a simple app that would be developed for completing various into a game that grabs the users attention, rewards them for accomplishing said tasks, and allows them to set goals for the number of tasks they have to wish to accomplish. During this process, a variety of features and items can be used that give the user instant gratification using a reward based system. Some of these features are implemented by use of mechanisms such as quests, levels, badges, points, leaderboards, virtual goods, avatars, narratives, and progress bars (Hung 2017). Gamification taps into humanities love and need for competition. It provides a platform for users to compete, earn achievements, and offer the possibility to engage and motivate users in a fun way (Beltrán, Sánchez & Rico, 2016; Khaleel, et al, 2015). There are several features of gamification and this idea can thus be built further on creating a comprehensive application that is non-repetitive, rewards positive behavior, allows the user to change negative behaviour, and be able to show-off their accomplishments. The applications that are developed can be used in a host of settings ranging from education, work environments, task managers, fitness, and personal goal setting. There are six key elements of success in regards to gamification in the realm of app development. These elements include Real-time feedback, Transparency, Goal setting, Badges, leveling up, and Onboarding & Mastery.



Fig 2. Elements of Gamification

**Real-time Feedback:** Utilizes both sounds and video interactions upon completion of tasks and actions. By having positive feedback it enforces good behavior. If an individual does negative actions, the feedback can cue the individual to learn quickly and adjust.

**Transparency:** Allows the user to see all of their current points, health, attributes, achievements, statistics, accomplishments, and anything of numerical value.

**Goal Setting:** Gives the user a long-term goal to aim for; essentially, this is the overall goal of the game that the individual is striving towards.

**Badges:** Badges or medals are awarded when an individual completes a task. This gives the user instant gratification. Badges act as a form of a digital identity. It serves as an outlet to share with your friends your accomplishment and gives you something to collect.

## ACHIEVEMENT



Fig 3. Achievements and Badges



Fig 4. Leveling up

**Leveling up:** As the individual completes tasks or objectives they earn experience points. As the individual/user earns the experience points they earn levels. This allows progression and takes away from the repetitive factor as different additional elements can be added for different level milestones. By earning levels it provided the user with more options and objectives to strive for.

**Onboarding & Mastery:** Utilizes a system to teach the user how to play and accomplish the tasks and goals that were developed for the app and how to use the application by “doing” rather than just reading how a user manual or direction booklet.

Gamification allows developers to tap into a barely discovered market in app development that will soon be a leading industry in the game market. The mobile gaming platform is an emerging game market and has been rapidly expanding over the years.

Moreover, developers have the opportunity to express new ideas and products that can revolutionize multiple areas of interest such as, education, personal development, and overall learning by adding in the gamification element. Looking at statistics from Statista



Fig 5. Market Stats

the market value of mobile app revenue worldwide is rapidly approaching \$74.4 billion USD. In 2017, it the market value was at a staggering \$59.8b, with it only being worth \$12.3b in 2012. Which shows how much the market has been growing over the past several years. As this is such a growing market there is a vast potential that is still untapped for developers. Using gamification as a footprint, developers can make their step towards increasing their revenue and earnings directly contributing towards the \$74.4b market-worth. Money doesn't have to be a driving factor towards developing apps as a developer can also utilize gamification in the development of free-to-use applications or any implementation that they would like.

## Previous Examples of Gamification



There has been a wide array of implementations of gamification that have hit the app store and stormed the Internet by force. Some of these implementations have been successful whereas others have failed. Each success or fail can be due to a variety of reasons and ultimately the success or failure of an app is a multi-faceted issue. Some of the contributing factors on the success or failure of the app are: how the app is marketed, is it user-friendly, is the GUI (graphic user interface) appealing, who the app targeted towards, is the developer credible. Overall, one of the key factors that were previously listed “Marketing.” Marketing is extremely crucial as if the users have never heard of the app or can’t see in anywhere then how are they even going to use it, let alone know about it.



The website [www.Fitocracy.com](http://www.Fitocracy.com) used to be a prime example of a well marketed and developed social fitness platform that employed gamification. Although now it is mostly now just a website that users can use to hire a coach for nutritional or fitness needs. Previously the website would target various gamer forums and video-game websites saying that they were built for the “nerds” and “geeks.” The platform had a strong gamified theme implemented. Each user would create their profile and be able to upload an image of them, write a short biography, and have an about me section. Added topics such as hobbies and interests were also optional to fill out. Once the profile was created the member started off as a level 1 character.

By accomplishing workouts and various fitness routines the member would earn experiences, which would increase their overall level. Being a social media



Fig 6. Level 1 Character icon

platform, the member could share and track their progress with the other members. Members could give each other “fist bumps,” which is basically giving the other person gratification and compliments on their achievements. There was milestones setup in which once the member accomplished a certain amount of tasks, such as running a certain distance, the member would then earn an award. They could showcase their trophies and other members could view all of the trophies that the member earned.

**MINT**

Mint is both an app and a website that helps a member track their finances. The website is located at <http://www.Mint.com>. Mint uses gamification to help members become financially independent and debt free. This platform implements a “Goals” tab where the user can list their financial goals and see visual representations via progress bars. You can select different accounts to pay off and create a debt campaign with a cool name. Mint seamlessly integrates with social media so that you can share your progress and let your friends hold you accountable. By adding in these gamification elements to daily financial tasks and goals it brings some enjoyment to something that may seem more mundane to people.

**BLUEWOLF**

Bluewolf uses gamification for their employees. It has a platform that entices their employees to get more engaged and be actively involved. By gamifying these elements, the employees are eagerly promoting and building the Bluewolf brand.

**MILITARY**

Even the United States military branches have taken an active approach to using gamification in the development of several of their computer-based training. Two examples include fire extinguisher training and computer security training. In the fire extinguisher training, the user is basically in a 2D side-scrolling game and controls a player. The player then has to run around and select the proper fire extinguishers to put out a variety of fires. As they put out the fires they earn points. If they use the wrong fire extinguishers they lose points. In order to complete the training, you have to earn a certain number of points. If the user gets too many of them wrong they have to start the game over otherwise they would not be able to complete the training and earn their certificate of completion. In the other training regarding computer security, the user is roleplaying an employee in an office. Various questions pop up, and then the user must make the employee in the training do the proper action, such as shredding a classified document the proper way. These actions then repeat while the user completes various tasks relating to different security countermeasures. As the user is completing these tasks they are earning points based on their actions that they take. Completion is implemented by having the player matched up against an adversary that is trying to get access to their systems. If they don't earn enough points then they lose. Another example of gamification in the United States Military is the U.S. Army using the game “America's Army” as a recruitment tool. America's Army allows people to play an Army simulator and see what life could be like if they joined the Army.

## New Ideas for Gamification Implementation



The field of Gamification is still young and rapidly developing, so there are numerous opinions as to what gamification exactly is (Boer 2013). Some say that gamification is all about using game elements and not creating a full game and creating a non-game environment. Whereas others feel that taking an everyday task and making it into a game is gamification at its core. With the constant evolution of tablet and cellular devices, new apps are constantly being developed to meet the consumers' demands. The increase of demands means new ideas need to roll out and new approaches need to be taken. Gamification can be a crucial element that is applied towards app development to provided development teams with a fresh look at previous tried approaches. A few prime areas of interest that gamification can be applied in app development are in the fields of both education and health.



Fig 7. Foundation App

Education is a broad topic as humanity is constantly learning throughout their lives. There are so many different areas of education that can have gamified elements applied when it comes to app development. A great implementation of gamification for app development would be in regards to a one-stop foundation building educational suite. The overall goal of the app would be to develop a platform for youths, teens, and adults could all learn and build a solid foundation, strengthening their chance of success in future educational endeavors. The app would be built like a role-playing game. In the beginning, the consumer is a level one player with zero stats. The user can then upload a picture to create their avatar, place in personal information; such as location, and about me, sex, age, and similar information. The user can then click through a few questions to list what their overall goals are. The subjects for building a solid foundation would include topics like meditation, memory palaces, memory mnemonics, study habits, concentration, note taking, and mental math. Each one of the topics can be broken down into mini-games within the overall app. While accomplishing tasks, the user will gain experience and level up their character. When accomplishing certain tasks and goals the member can earn achievements and accolades that they can show off and share with their friends. During this time of accomplishing tasks, leveling up, and earning achievements to show their friends, the user is also increasing their knowledge in a wide array of topics. They can be increasing their focus, learning new ways to take notes, improving their mental math skills, or mastering their memorization techniques. All while doing this, the app can be integrated with various social media platforms having buttons readily available to share with their friends on their recent accomplishments.





Fig 8. Health App

An app developed in the genre of health and betterment easily engages with humanities natural need to be competitive. Similar to the previously discussed foundation app, gamified themes and elements can easily be applied to the health genre of app development. By having a leveling and experience-based system for losing weight, or eating healthy items over unhealthy items, the user can easily start earning accolades and compete on leaderboards against their friends. If they just participated in a 5k run, they could easily log their statistics, earn points, and share it on their Facebook page. If the user isn't quite up to the capability of running a 5k yet, they could set their goals, slowly progressing towards their target and earning achievements along the way. During this period in which they are earning the achievements while working on their goal, the achievements serve as incentives to keep the member engaged and on task. The topic of health has so many different avenues and approaches that a developer could take. If the market that the developer is targeting is yoga, then the app could be developed strictly on yoga or if it was targeted towards running then the same gamification elements could be applied to a running app.

## Conclusion



In conclusion, gamification is a valuable resource that developers can use to further enhance the app being written. When developing apps, user engagement is crucial to the success of the app. Several major companies have used gamification to successfully launch their products and apps for multiple platforms. Fitocracy, Mint, Bluewolf, and the United States Army are just a few to highlight. All of them used elements relating to real-time feedback, transparency, goal setting, badges, leveling up, and onboarding & mastery. The market for digital apps has been rapidly growing since the development of smartphones and is rapidly approaching to become a 75 billion dollar industry. Since the field of gamification is still young and in its infancy it's difficult to see where it can take us in the future. Two great themes that are gamification can be applied to are educational applications and health or fitness related applications. Gamification is not limited to only these two themes, but in reality, it can be applied to most aspects of life to help someone work through the difficulties and accomplish their goals.

## References

- Beltrán, J., Sánchez, H., & Rico, M. (2016). "Increase motivation in learning Java Programming Fundamentals using Gamified Moodle: CaseL Central University of Ecuador". In *2016 11<sup>th</sup> Iberian Conference on Information Systems and Technologies (CISTI)*, pp1-4
- Boer P., (2013) Introduction to Gamification in *Docent Online Marketing*.
- Deterding, S., Dixon, D., Khaled, R., & Nacke, L. (2011). From game design elements to gamefulness: Defining "gamification." In A. Lugmayr, H. Franssila, C. Safran, & I. Hammouda (Eds.), *Proceedings of the 15th International Academic MindTrek Conference* (pp. 9–15). New York, NY: ACM.
- Hung, A. (2017) A Critique and Defense of Gamification *Journal of Interactive Online Learning Volume, 15* (1)
- Schimmoeller, Mauzy, D., Casey, K., Meredith, J., Austin (2017) Strategies For Success *Training Magazine Vol. 54 issue 6*, p. 56-59
- Schwandt, F. (2018, February 25). *Mobile Application Revenue*. Retrieved from <http://www.statista.com>
- Zichermann, G., & Cunningham, C. (2011). *Gamification by design*. Sebastopol, CA: O'Reilly Media.