Taking gamification to the next level

A detailed overview of the past, the present and a possible future of gamification

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Abstract

Gamification is the concept of applying game-design thinking to non-game applications to make them more fun and engaging. It has become a big trend in many industries today. The area is still new and the amount of gamified systems is constantly growing. The importance of gamification is controversial. Some say it is a meaningless buzzword, while others say it is a world changing concept.

This thesis aims to describe gamification, how and why it works and proposes a way to take gamification to the next level. The basic building blocks are explained in detail and after reading this thesis, developers should have a general idea of why they should invest in gamifying their systems and services. They should also have learned how to do this satisfactory.

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Contents

1 Introduction

Gamification is the concept of applying the mechanics of gaming to nongame activities to change people's behaviour (Gamification.org, 2012). The goal with gamification is to drive a specific behaviour and motivate the users of a gamified system[1]. This thesis describes gamification on a detailed level in order to clarify what gamification is and how it works, both in theory and in practice. Furthermore, a proposal on how to take gamification to the next level is presented as a part of the thesis.

1.1 Purpose

This thesis aims to increase general knowledge of gamification by explaining how and why it works. In order of doing this, this report explores gamification in detail and explains not only how gamification concepts are used, but also motivates the effectiveness of these concepts on a scientific basis. Examples of how to gamify in practice will be shown in order to enhance the understanding of the subject.

To sum it up, the thesis will answer these question:

- What is the definition of gamification?
- Why and how does gamification work?
- As a developer, how do you gamify a system satisfactory?
- What is the business value of gamification?
- What is the end user value of gamification?
- Can gamification be extended or improved?

[1] In this thesis, a system means a set of tasks. A system can be anything from a blogging service to a company's way of hiring new personnel.

1.2 Thesis outline

The list below describes what each chapter covers.

Chapter 2: Gamification: a detailed overview
This chapter provides information on how gamification is defined. It also describes the two main contents of gamification in detail; game mechanics and game dynamics.

Chapter 3: The psychology behind gamification
Gamification concepts are not fetched from thin air, rather the opposite. This chapter will explore why and how gamification works, or rather why and how game mechanics and game dynamics works.

Chapter 4: Gamification in practice
This chapter will present a number of basic building blocks which can, and often should, be used in all gamified systems. It also presents a number of advanced building blocks whose presence are more dependant on the type of gamified system.

Chapter 5: The value of gamification
Participation is important for almost every business, whether it is the participation of workers or of customers. This chapter explains why it is important to drive engagement and participation from users/customers/workers and the role gamification plays as a motivator. Gamification is not only great for companies but can also enhance the end user experience. This chapter covers both the business value and the end user value of gamification.

Chapter 6: A new way of gamifying - a proposal
A new way of gamifying is presented in this chapter. It itroduces a new way to motivate users.

Chapter 7: Conclusions and further work
This chapter contains discussion on the thesis and presents conclusions drawn. Possible further work will be presented as well.

Bibliography

2 Gamification: a detailed overview

At the most fundamental level, gamification is the concept of using game mechanics to drive game-like engagement and actions in a non-game context (Deterding, Dan Dixon, and Nacke, 2011). The logic behind gamification is simple. Most people like to play at least some sort of game. Hide and seek, chess or the latest computer games are all examples of games being played every day. But in everyday life, we are often presented with activities we dislike, whether it is boring chores or stressful work. By introducing game mechanics into activities to make them more game-like (read fun, rewarding and desirable), people would possible want to take part in these tasks proactively and continuously. This process is called gamification.

For example, gamification of education can make students want to go to school and learn. Gamification of work can make people excited about work and boost productivity. Gamification of commerce can give customers special offers and reward them for purchases.

Before diving into gamification, let us first talk about game mechanics and game dynamics, as they are both things one must understand before fully comprehending why and how gamification works. In short, game mechanics motivate behaviours while game dynamics satisfy desires.

2.1 Game mechanics

There is no single widely accepted definition of game mechanics. According to game designer Daniel Cook, game mechanics are rule based systems / simulations that facilitate and encourage a user to explore and learn the properties of their possibility space through the use of feedback mechanisms (Cook, 2006). Some of the mechanics are so simple and predictable that they can almost be seen as a kind of behavioural or psychological reflex, much like the patellar reflex of your knee when tapped by a physician. There are many game mechanics, and new ones are being discovered and constructed by game designers every day. The amount of ways a human can be motivated is practically infinite.

Game mechanics can be called basic building blocks. They can be strung together and combined in creative ways to create many different types of result. The outcome of this is that you can pretty much gamify anything. The following are examples of game mechanics:

- **Movement.** Many board games involve the movement of playing tokens. How these tokens are allowed to move, and when, is governed by movement mechanics.
- **Resource management.** Most games involve the management of resources. Examples of game resources include tokens, ammunition, money, land, natural resources, human resources and game points. The skillful management of resources under such rules allows players to influence the outcome of the game.

- **Spy.** Sneaking around with patience, listening in to conversation or breaking and entering are parts of some games.
- **Rescue.** Some games involve a part where the player should rescue someone or something.

There are way too many game mechanics for this thesis to describe all of them. Those most relevant to gamification will be described in detail in Chapter 4: Gamification in practice.

Despite the great variety, game mechanics are not enough to attract everyone. People are different and they are motivated by different things in many different ways. Game mechanics that work well for some may work poorly for other. Moreover, people get bored with routines after a while. This is where game dynamics comes in.

2.2 Game dynamics

Game dynamics are temporal evolution and patterns of both the game and the players that make the game (or a gamified activity) more enjoyable (Wu, 2011). The goal of game dynamics is to drive a desired behaviour in a predicted way. Early game researcher, Richard A.Bartle, who was in the duo who created the first MUD[1], has identified at least four types of gaming personalities: Achiever, Explorer, Socializer, and Killer, and that different gaming dynamics are required for different types of gamers (Bartle, 1996). Although this research dates back to the 90's (1990-1996), its result and content still holds and is being used by many game developers to motivate choices of game elements. The four player types can be seen in Figure 1 and are described below.

Figure 1: The four player types according to Bartle (Bartle, 1996). They are often represented as Clubs (Killers), Hearts (Socializers), Spades (Explorers) and Diamonds (Achievers)

[1]MUD: Multi User Dungeon, is a text-based multiplayer real-time virtual world. MUDs were very common in the early 90s

Achiever

These are players who prefer to gain ”points”, levels, equipment and other concrete measurements of succeeding in a game. They will go to great lengths to achieve rewards that confer them little or no gameplay benefit, simply for the prestige of having it. Every game that can be completely ”beaten” in some way appeals to the Achiever play style by giving them something to accomplish. Games that offer special rewards (i.e special movies and extra endings) for beating it with a 100% completion rating appeal to Achievers. Games that cannot be completely finished but keeps going, like most multiplayer games, still hold much appeal to the Achiever if they have collectibles, such as equipment and points.

Explorer

Explorers are players who prefer discovering areas, creating maps and learning about hidden places. They often feel restricted when a game expects them to move on within a certain time, as that does not allow them to look around at their own pace. They find great joy in discovering an unknown glitch or a hidden surprise. The Explorer pays close attention to detail and will often enrich themselves in any back story or myths they can find about the people and places in-game. Whereas an Achiever may forget about previous games as soon as they have conquered them, the Explorer will retain rich memories about what they experienced about their adventures.

Games that have little restriction and offers lengthy gameplay appeal to explorers.

Socializers

There are a multitude of gamers who choose to play games for the social aspect, rather than the actual game itself. These players are known as Socializers. They gain the most enjoyment from a game by interacting with other players, and on some occasions, non player-controlled characters with personality. The game is merely a tool they use to meet others in-game or outside of it.

The online environment is very appealing to the Socializer, as it provides near limitless potential for new relationships. Socializers start filling up their friend lists as soon as they start meeting people, and get to know them better through private messages and sometimes even voice chat. They take full advantage of the ability to join groups or kinships in many online games, and form quick friendships and try to help other people out.

This group is the one which has grown most since the release of Bartles research, much thanks to the social media explosion where socializers feel at home.

Killers

These players thrive on competition with other players, and prefer fighting them to scripted computer-controlled opponents. They love to create and spread destruction, so games that are high in carnage, action, and destructible environments are definitely a plus. Many of these gamers also enjoy the opportunity to depart from the norm of being ”the good guy” who comes to save the day. Instead, they will play on the side of evil or conquest. For most,

the joy of being a Killer results from a friendly competitive spirit. Many Killers are in it for the sport, trying to read their opponent's moves and generally acting with honour. For others, it is more about power and the ability to hurt others or the thrill of the hunt.

How to appeal to everyone

Bartle's research is very central to gamification and to this thesis. Consider the following example: an online blogging service decides to gamify their system by letting users compete against each other. The more someone reads your blog, the higher score you will receive. The score determines how high up on the ranking page you will be. This would only appeal to Killers and Achievers. It is very important, especially when changing already existing services, to decide what types of users the service wants and what player types they are of. A blogging service probably has all kinds of player types. Therefore, they could, in addition to the competition, also add the following:

- Insert levels. For every 50 blog posts or so, users could be raised a level. (appeals to Achievers)
- Give score for every comment a user posts (appeals to socializers)
- Give score to users who read many posts (appeals to Explorers and Socializers)

By doing this, all player types will at least have something to be motivated by. Of course it is very hard, if not impossible, to make everyone happy. However, incorporating elements appealing to more categories of players will raise the possibility of attraction. Here are some key points I have found to be good to have in mind when designing games, none of them contradicting another:

- Players should be allowed to play in their own pace
- Players should continuously be able to gather a resource
- The gathered resource should be able to be used for something, whether it is the unlocking of abilities, in-game wares or real-life wares
- The game must be progressive
- The game should be "neverending" in the sense that players feel that there is always something they have not yet discovered, completed or became best at
- Players should be able to compare their achievements with one another
- The game should contain surprises and hidden objects or places
- Players should be able to play alone
- Players should be able to play with others
- There should be some customization service in-game to allow players to be somewhat unique and recognizable (at least amongst their own friends)
- Players should be able to join groups and talk to each other (i.e chat)

Table 1 Connection between game mechanics and game dynamics.

Game mechanics	Game dynamics
Points	Reward
Levels	Status
Challenges	Achievement
Virtual goods and spaces	Self-expression
Leaderboards	Competition
Gifts and charity	Altruism

- Players should be able to compete with other players, but only if they wish

These points are also valid when designing most gamified systems.

What about non gamers?

A common theory is that everyone likes games. This theory can be supported by psychological research done by Abraham H. Maslow (Huitt, 2007). The theory will be covered in more details in Chapter 3.6: Everyone is a gamer. Do not get this wrong though, everyone does not like playing computer games. A game can be a mental challange, such as a crossword-pussle, or a physical challenge, such as playing golf. There is not one single game that everyone likes, rather there are millions of different games which appeals to different kinds of people in different ways.

2.3 Game mechanics vs game dynamics

Score and achievement are game mechanics used to motivate behaviours, but how and precisely when the rewards are unlocked over time and the precise reward schedule are game dynamics. Clever game designers can create new game dynamics by combining various game mechanics over time to make gameplay more interesting and engaging. This is the reason why so many people are confused about the distinction between game mechanics and game dynamics. Some people even treat these two terms synonymously, but really they are two different things. Table 1 shows examples of the connection between game mechanics and game dynamics.

Players can also go through various game dynamics too. The simplest is the player's level-up journey: novice — experienced — expert — master. Game dynamics is all about timing, well designed game dynamics brings players to the next stages at the right time so the players feel accomplished. On the other hand, poor game dynamics tend to lose players along the way, either due to boredom or creating overly-complex challenges, and thereby making the game less engaging.

To summerize: game mechanics are the rules and rewards that make up game play and what makes it challenging, fun, satisfying, or whatever other emotion the game designers hope to evoke. These emotions, in turn, are the result of the fulfillment of desires and motivations we call game dynamics.

2.4 The history of gamification

The use of the word gamification dates back to 2004. It may have been Nick Pelling, a British-born game programmer, who first coined the word for his so called “gamification consultancy” company (Pelling, 2012). His idea was to help companies evolve their products into entertainment platforms. His vision was that every device would soon become a game. His company closed due to lack of customer interest and he himself wrote on his meetup.com profile “I invented gamification (though 7 or 8 years too early, *sigh*)”.

In October 2007 Bunchball (Bunchball, 2012), backed by Adobe Systems (AdobeSystems, 2012), was the first company to provide game mechanics as a service. Since then many companies market services which specializes on gamifying systems. Many companies have adapted gamification concepts to their services in various ways since then.

The gamification of education is an interesting topic as it could increase children’s motivation to learn. A big actor in this area is Khan Academy (KhanAcademy, 2012). Khan Academy is nonprofit organization with the mission to offer high education to anyone, anywhere. They were rather early in gamifying their system in order to motivate those who seek education even further. Codecademy is another website offering free education to anyone (Codeacademy, 2012). Codecademy teaches users how to code JavaScript, Python, HTML and CSS. Through clever use of gamification they have succeded in making it a fun task. Both of these online academies have received much publicity thanks to their use of gamification.

2.5 Gamification vs serious games

Gamification is by definition not a game, as it only uses game-design thinking in non-game context. In a way though, gamification can be said to turn a non-game system in to a game. This depends on how games are defined. There is a term related to, and which is commonly confused with, gamification; serious game. A serious game is a game designed for a primary purpose other than pure entertainment. The ”serious” adjective is generally prepended to refer to products used by industries like defense, education, scientific exploration, health care, emergency management, city planning, engineering, religion, and politics (Derryberry, 2007). Serious games are designed with the intention of improving some specific aspect of learning.

They are very similar, gamification and serious games. both use game-design thinking to enhance learning. But there is a difference. For example: many military academies use serious games as a way to enhance learning, such as flight simulators, tank simulators and war simulators. These are actual games designed with the pure purpose of being educational. Gamification can often enhance learning, but not by making something a game, but by using game mechanics in order to make something more motivating and fun. Both of the two concepts are important issues but often fit for different contexts.

To summarize: serious games are activities where ”serious content” (real-world problems)

are being put into a game to make it more easy to understand and more enjoyable to solve. Gamification, on the other hand, uses game-design thinking on everyday activities in order to motivate users and make these activities more fun. They are like two sides of the same coin: one take real-world problems and puts them into a game, the other takes game-design thinking and puts them into real-world problems.

2.6 Summary

Gamification is the concept of taking techniques from games and game design and apply them to non-gaming contexts. While the term gamificaiton is relatively new, the psychology behind it has been in use for decades. Gamification can potentially be applied to any industry and almost anything to create fun and engaging experiences, converting users into players.

Game mechanics and game dynamics are the magic components in gamified systems. They motivate users in different ways in order to drive a behaviour. Game mechanics are the rules that make up game play and what makes it challenging, fun or satisfying. These emotions, in turn, are the result of the fulfillment of desires and motivations we call game dynamics.

3 The psychology behind gamification

This chapter will further explore why and how gamification works, or rather why and how game mechanics and game dynamics works. To understand why game mechanics works, a simple behaviour model by B. J. Fogg, an experimental psychologist of Stanford University will be used. The model, Fogg's behaviour model (Fogg, 2009), is easy to understand and is often used in game context. As seen in Figure 2, the model says that there are three required factors underlying all human behaviour:

- Motivation - the person wants to perform the behaviour (because of pleasure, pain, hope, fear, acceptance, rejection)
- Ability - the person can carry out the behaviour (factors can be time, money, physical effort, brain cycles, social deviance, non-routine)
- Trigger - the person is triggered to do the behaviour (i.e. he is cued, reminded, asked, called to action, etc.)

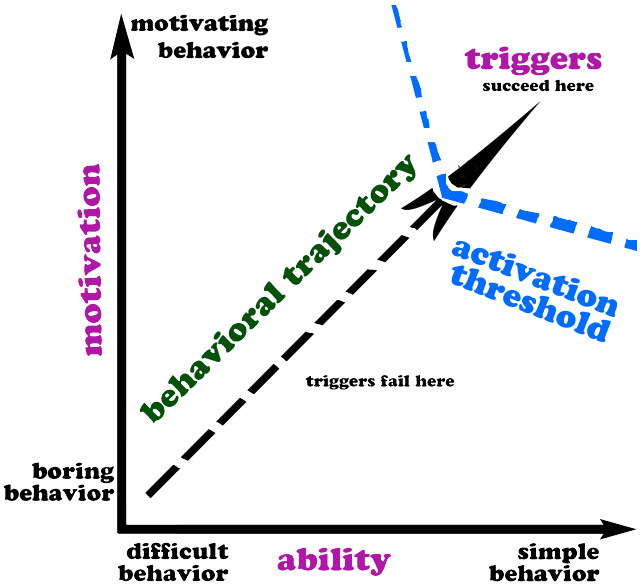

Figure 2: Fogg's Behavior Model shows that three elements must converge at the same moment for a behaviour to occur: Motivation, Ability, and Trigger. When a behaviour does not occur, at least one of those three elements is missing.

3.1 Motivation

A widespread theory to describe human motivation is Maslow's hierarchy of needs (Maslow, 1954). The hierarchy is often portrayed in the shape of a pyramid as seen in Figure 3. The largest and most fundamental levels of needs are at the bottom, and the need for self-actualization are at the top. The pyramid's levels will be described from the bottom up.

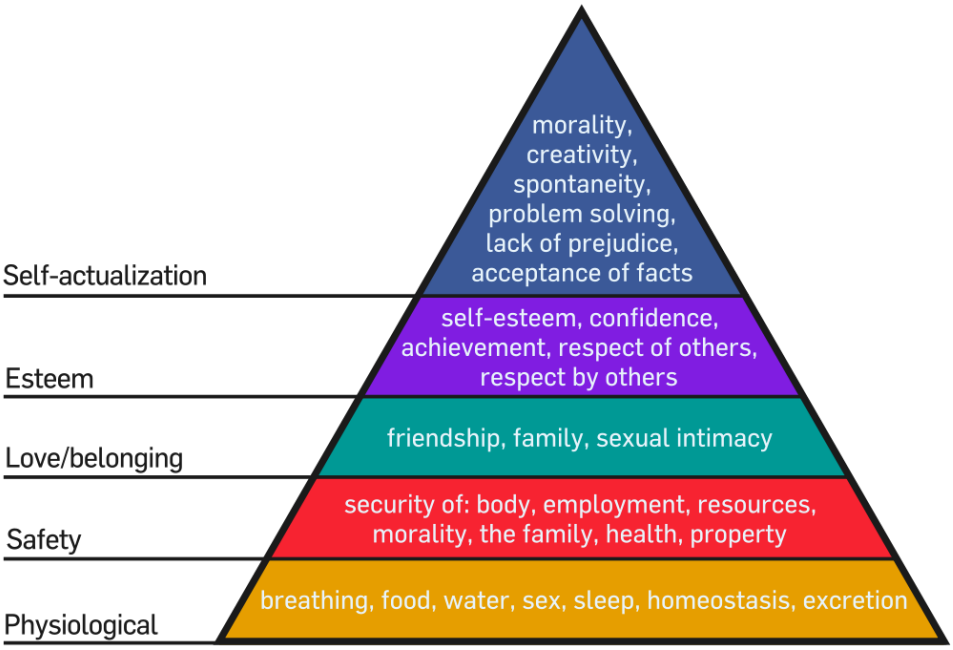

Figure 3: Maslow's hierarchy of needs portrayed as a pyramid. The most important and basic needs are at the bottom. (The picture is taken from Wikipedia).

Physiological

Physiological needs are obviously very important but are not related to the topic at hand and will not be discussed further.

Safety

In games, players are truly safe from harm. In knowing this players can feel secure that their work is going toward something which cannot be destroyed. Health, morality, and resources are theirs to command. They do not get sick, they can not be robbed, and the laws of morality do not apply. Employment and family bonds can come from that of the group of players they spend their time with. It is an overall safe environment, where players can forget about their ”real life” problems.

Belonging

In games, players fill the need of belonging by social cohesion and community dynamics. A majority of mankind are socializers and many companies has discovered the need for a high feeling of belonging in modern games (Zichermann and Cunningham, 2011). In single player games, players can fill this need if the game has great personality and computer controlled characters which interact with the players.

Esteem

Many games fill the players' need for esteem by giving them achievements, status, ranks and reputation for their endeavours. The need for esteem is not as big as the one for belonging, but if both of those needs are filled at the same time the users will feel even better about themselves.

Self-actualization

Examples of ways to fill this need is to progress, learn, discover, get points and complete quests. All of these concepts can be found in games. This layer of the Maslow's hierarchy of needs was the first one to be addressed in early games. After a couple of years the need for some sort of measurement of the player's skill was found. So local ranking lists and local status for individual games was implemented. Score gathering (think dots in Pacman) have been around for a long time. That filled the need of esteem. Today, almost every game also has some sort of social aspect, be it multiplayer, chat or sharing of one's highscores.

Negative feedback as motivation

Games often motivate people through positive feedback, such as accumulation of points, badges, status, progress, customization, pleasant surprises, etc. Negative feedback can also be used, but it is less effective in practice. Negative feedback mechanisms can lead to the complete abandonment of the gamified activity, unless the users are extremely motivated. Negative feedback should be used with caution (Devi, 1972).

Extrinsic vs intrinsic motivation

In this thesis, motivation will be divided into two camps - intrinsic and extrinsic. Intrinsic motivation is an innate drive to do something, e.g. curiosity. Extrinsic motivation pushes you to do something in order to attain a certain outcome or reward. Extrinsic motivation can be any type of reward or outcome, e.g. money. Whether or not there is a distinction between these motivations is controversial. For the sake of discussion, this thesis will differentiate intrinsic motivation from extrinsic motivation.

Steven Reiss has proposed a theory that found 16 basic desires that guide nearly all human behaviour (Reiss, 2004). The 16 basic intrinsic desires that motivate our actions and define our personalities are:

- Acceptance, the need for approval

- Curiosity, the need to learn
- Eating, the need for food
- Family, the need to raise children
- Honor, the need to be loyal to the traditional values of one's clan/ethnic group
- Idealism, the need for social justice
- Independence, the need for individuality
- Order, the need for organized, stable, predictable environments
- Physical activity, the need for exercise
- Power, the need for influence of will
- Romance, the need for sex
- Saving, the need to collect
- Social contact, the need for friends (peer relationships)
- Social status, the need for social standing/importance
- Tranquility, the need to be safe
- Vengeance, the need to strike back/to win

In order to satisfy users, many of these desires should be considered when gamifying.

Which type of motivation should be used?

A gamified system should always try to increase and clarify the intrinsic motivation of its users. The intrinsic motivation is very important for a long lasting relationship between a system and its users. Extrinsic motivation can be very powerful but its effect can make the intrinsic motivation lesser. In fact if someone wants an extrinsic reward badly enough, it can become intrinsic and authentic. This is one way to explain alcoholism and sugar addictiveness.

Let us look at an example where extrinsic motivation could have the wrong effect: the high school Gamischool has taken gamification techniques to heart. Students receive an amount of points depending on how well they perform on different tasks. Points can also be achieved by being nice to other students and helping each others. There is a highscore list of points of the top ten students. So far so good. The highscore list appeals to students of the Killer-type and Achiever-type while Socializers and Explorers like to help other students with their studies. Only intrinsic motivation is used so far. Now the principal of the school wanted to motivate the students further and introduced a new rule which said the best students could exchange points for real life money. By doing this the intrinsic motivation is reduced. Even though some students may thrive in this environment, many would feel uncomfortable. Worst thing yet is when they finish that high school and start college. They could have

diminished intrinsic motivation toward learning because they are used to being motivated by external factors.

In education and work it is important to be careful when using too powerful extrinsic motivation so the intrinsic motivation does not get diminished. This being said the best result is often accomplished by combining the both motivation types. Systems should use extrinsic rewards only to satisfy intrinsic needs.

3.2 Ability

Ability is often associated with skill. However, Fogg's behaviour model (Fogg, 2009) says that ability can be time, attention, mental capacity, or any resources that the user might need to complete a task. If a user does not have these resources, he or she will not have the ability to carry out the task. Without ability, the amount of motivation and how good the triggers are does not matter.

Let us look at a little extreme, but educational, example: you are in a boat with some friends. You are talking about swimming when you mention that you have never learned how to swim. The person next to you does not believe you and pushes you off the boat, into the water, to prove that you can, in fact, swim. You are in the water struggling for your life, but you still can not swim. The people in the boat starts promising millions of dollars if you can swim to the shore. You are extremely motivated; you do not want to die and there is a lot of money just waiting for you. But you still can not swim, because you just do not have the ability. It is important to avoid motivating users into doing something they can not do. They will become annoyed and the motivation can have opposite effect. A way to avoid this is to increase the ability of users.

There are two general approaches to increase ability. The usual way is to increase the real or perceived ability of users through practice and training. So their ability (together with the proper motivation) would exceed the activation threshold needed to perform the target behaviour. This is used frequently in both games and gamification. Examples of this is to give motivation, i.e levels or badges, for ongoing playing or ongoing usage of a service. The ability is increased which makes it easier to motivate and trigger the users in the future.

Another method of increasing a user's perceived ability is to make the target behaviour simpler so the user require less ability to accomplish the behaviour. This essentially lowers the activation threshold of the target behaviour. This is widely used in games but less common in gamification. Most likely it is because gamified work is still real work that needs to be done with real abilities and no shortcuts. There are, however, ways to make the gamified work appear simpler, and these are used frequently in gamification. For example:

- Divide and conquer (break up a complex job into smaller and simpler tasks)
- Cognitive rehearsal/guidance (showing you how the job is done and how simple it is)
- Cascading information (instructions and information are released in minimum snippets to guide you through a multi-stage task).

Often the first method is used together with the help of the second and the third.

3.3 Trigger

Despite the level of motivation and ability, a trigger at the appropriate time is necessary to bring about a behaviour predictably (Fogg, 2009). A trigger is simply something that prompts or tells the users to carry out the target behaviour now. The most important aspect for the trigger is timing. An appropriate trigger at the right moment not only leads to the inception of the predictable behaviour, it also makes the users feel good about doing it. A poorly timed trigger could have adverse effects. Not only is the behaviour not carried out, it might not produce the desired outcome, and on top of that, users can get annoyed, frustrated, and develop a negative emotion about the activity.

Example of triggers that do not work the way they should are spam email and pop up ads. They usually prompt users for some action, and users usually understand what they want and are aware of them. Most people probably dislike these triggers. The reason for the general dislike of spam and pop up ads is because they seldom arrive at the right moment, that is when we are motivated and have excess ability. Figure 4 shows how it could look like if you entered the wrong website in the early days of internet.

Figure 4: Pop up ads are not as usual as they once were. The pop up ads functioned as a trigger, but users were often not motivated to push the ads. Modern ads on websites are often related to the context in which they exist. Thanks to that, they are more likely to be pushed by users, as the users are more likely to be motivated. (The picture is taken from Wikipedia).

The reason for why a trigger is necessary is that even if a user is motivated and has the ability to perform a task he or she may be:

- Unaware of his or her ability (e.g. did not know that a certain action could be made or unaware of the simplicity of the task)
- Hesitant (e.g. unsure if it is appropriate, unsure if it is the right time or questions the motivation)
- Distracted (engaged in another routine activity due to behaviour momentum; the tendency to keep doing what one have been doing)

A good trigger should be designed to avoid all these obstacles. Figure 5 and Figure 6 show examples of good triggers. Many games use these types of triggers in order to learn users how to perform a task without using up unreasonable amount of time. A trigger can take an infinite number of forms but its purpose is always simple; it prompts the user for immediate action. The user must, however, be able to understand what the trigger means and be aware of it. Fogg has outlined three types of triggers (Fogg, 2009) :

- Spark: For people who have ability, but not motivation. This type of trigger is often built-in as part of the motivation mechanism.
- Facilitator: For people who are motivated, but lack ability or perceived ability. This type of trigger often simplifies the task by highlighting its simplicity. It is often used with the progression dynamics to create anticipation as the user practice and improve his ability towards the final goal. Both Figure 5 and Figure 6 are good examples of the facilitator type.
- Signal: For people who have both the motivation and the ability. This type of trigger should only serve as a reminder. It should not try to motivate users who are already motivated. Otherwise it can easily turn into an annoyance. It should not simplify the task either. Doing so may actually make the task seem boring and not challenging enough.

Fogg found that people in general are most receptive to facilitator and signal triggers because sparks sometimes aim to motivate people to take actions they would otherwise not take. This would be interpreted as annoying to many users.

When designing triggers for games and gamified applications it is important to have Bartle's gaming types in mind (Bartle, 1996):

- Killers are competitive and triggers that challenges them can quickly take effect.
- Socializers on the other hand could be bothered by such confrontations. On them it is much better to present something like: "Many of your friends are doing this, want to join?".
- Achievers are driven by status and levels. Triggers that are associated with a raise in status could be effective.
- Explorers are driven by discovery. A trigger which calls upon their unique skill for help without pressure could work. Another trigger could be something like, "Be the first one to discover the hidden place and win the treasure".

Well thought through triggers can, of course, appeal to any player type.

Figure 5: The developers of the popular mobile game Infinity Blade has grasped the concept of motivation-ability-trigger. In the first fight, a person swings a sword at you. As a new player you have no idea on how to avoid him hitting you (which was a trigger for action), therefore you lack ability. You have great motivation though, you do not want to be hit! The game is paused and shows the user how to block, immediately giving the user the ability to perform the task. The use of facilitator triggers is a great way to guide new users. (The picture is a screenshot from the game Infinity Blade).

Figure 6: After the first block in Figure 5, the user is given positive feedback while the learning continues. The user now learns how to strike back through another facilitator trigger. The game will always guide the user through all new actions and give positive feedback upon completion. Gamified systems should thrive for this as well; learning while doing, that is. (The picture is a screenshot from the game Infinity Blade).

3.4 Flow

Flow is the mental state of operation when you are so immersed in what you are doing that you forget about physical feelings and time. Mihaly Csikszentmihalyi is the originator of the term (Csikszentmihalyi, 1990). He says that flow is an optimal state that can be attained when the challenges we encounter are matched to our ability. If the task at hand is slightly too easy we fall into a state where we feel in control. We can fall into many other states as well. Figure 7 shows the different mental states in terms of challenge and skill level.

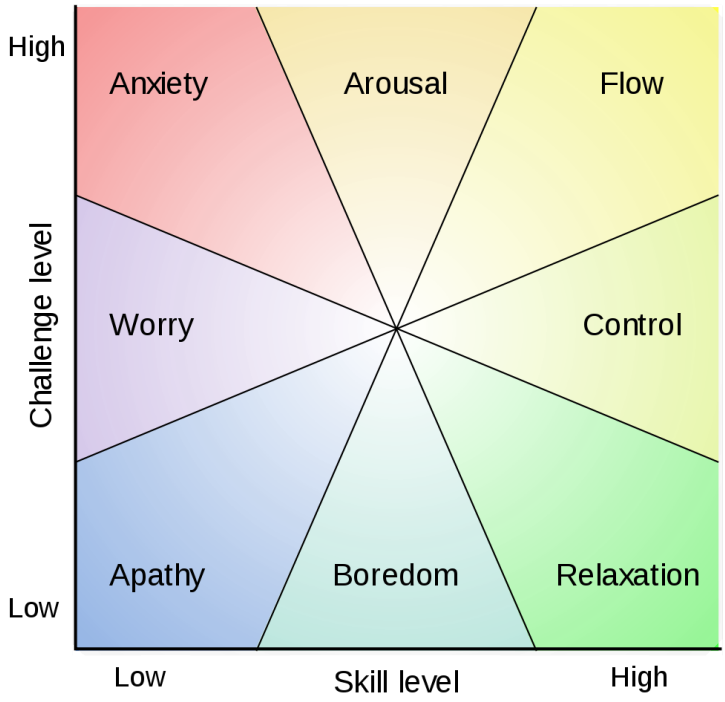

Figure 7: Flow is the mental state of operation in which a person in an activity is fully immersed in a feeling of energized focus, full involvement, and success in the process of the activity. This figure shows the different mental states in terms of challenge and skill level. (The picture is taken from Wikipedia).

What this means is that developers have to make sure tasks are challenging enough for the skill level of the user. Many users attempt to challenge themselves but they often pick a task which is too hard leading to a state of anxiety. This is why many people like to stay in the comfort zone of control and relaxation and do not like to challenge themselves. Therefore, flow is not a common state of mind. But if a person stays in the comfort zone too long their skill level will continue to grow and come closer to boredom. As humans we are therefore motivated by challenges, surprises and varieties to avoid boredom.

Csikszentmihalyi found that flow is most common in creative professions such as artists, composers, scientists and mathematicians (Csikszentmihalyi, 1997). This is because they require much self-challenge to create something original. Another group that experience flow quite often is gamers; people who frequently play games (computer games, video games, etc.). The reason to why flow is common for gamers is that they are constantly challenged by the games they play. As their skill level increases, the difficulty of the game should increase as well. This hopefully leads to the user being in flow as much as possible,

only deviating to arousal and control.

So what all this means is that developers cannot simply create games, or gamified systems, where people are given achievements and score. They would get bored and tired. Developers have to adapt the difficulty with the user's skill level to find and balance on the fine line between arousal and control.

3.5 Simplicity

There is a widely accepted design principle called KISS, which is an acronym for "Keep it simple, Stupid!" and was articulated by the successful engineer Kelly Johnson (1910-1990). It states that most systems work best if they are kept simple rather than made complex. Simplicity should therefore be a key goal in design and unnecessary complexity should be avoided. This principle holds for gamification as well. But what is simplicity?

B.J.Fogg has besides the Fogg's behaviour model developed a sophisticated psychological framework to define and evaluate simplicity (Fogg, 2009). The framework basically says that behaviours that counts as simple must not require any resource that you lack at the time you perform a task. Simplicity is a measure of your access to the following three categories of resources:

- Scarce resources such as money and time.
- Effort resources such as physical and mental efforts.
- Adaptability resources such as one's capability to break social, personal, behavioural or cultural norms.

This means that if you do not have access to a needed resource at the moment you carry out a task, that task will not be simple. Consider the following example: it is a regular morning and you need to take a shower before going to work. You get up early so you do not have to hurry. It is a simple task. But if you overslept and have to hurry, you will lack time as a resource. This means that the otherwise simple task is not simple anymore.

Simplicity is really determined by the collection of your scarcest resources at the moment you perform a task. So a behaviour is perceived as simple by a user if he or she can complete it with fewer resources than expected. What we can do to increase a user's ability is to do one or both of the following:

- motivate users to practice on a task over time so that his or her ability (skill) increases over time.
- increase the user's perceived ability by increasing the perceived simplicity of a task.

A positive attribute of gamification applications which is used in particular by learning systems is that tasks which the user does not have the actual ability to perform, i.e lack of skill, can still be done by letting the system guide and motivate the user through a learning process to get the skill needed. Often users may perceive the difficulty of a system as harder than it really is, if that is the case we should decrease the task's perceived difficulty to motivate the user further.

3.6 Everyone is a gamer

Many theories state that everyone likes games. They believe that there are no such thing as a non gamer. They are not, however, proposing that every human like playing computer games. A game can be a mental challange, such as Sudoku, or a physical challenge, such as playing golf. It can be a creative activity, such as building Lego® towers or playing with a toy railway. There is not one single game that everyone likes, rather there are millions of different games which appeals to different kinds of people.

It is human nature. We are born curious about our world and seek to understand it by playing with it. We test limits, look for patterns, establish rules, and strive for achievements. These are core building blocks of games. Games can satisfy the top four layers of Maslow's hierarchy of need (Huitt, 2007). This, together with the mental state of flow (Csikszentmihalyi, 1990), is the reason for why there have been cases of players who died while playing. Because games fill so many needs, players can actually forget about the most important needs; the physiological.

Once a developer has accepted the fact that everyone is a gamer and that they are all equally valid types of gamers, he or she can begin to have fun exploring new and different ways to create games. The same is valid for gamers as well. They should try exploring outside of their comfort zone to see if they can get their gaming fix from something other than what they are used to.

3.7 Summary

Game dynamics use positive feedbacks to build the users' motivation. Game dynamics increase the perceived ability of users by making difficult jobs simpler; either through training/practice or by lowering the activation threshold of the target behaviour. Game dynamics place triggers in the path of motivated users when they feel the greatest excess in their ability. That is, triggers that prompt the user for action are designed to bring about the convergence of motivation, ability, and trigger all at the same moment.

Consider the following example: you have been running a 20 kilometers long marathon without drinking anything. When you reach the goal, you are exhausted and thirsty. Your friend comes to congratulate you. He holds a water bottle, which you desire, in his hand. You are motivated to take the water bottle (thirst), you have the ability (it is right there in front of you). When the friend asks if you want water, of course you say yes. The question was the trigger. Without a trigger, it is not certain that a task will be performed.

If using motivators and triggers in a correct way, while keeping track of ability, game dynamics (and game mechanics) are very effective drivers and manipulators of user behaviour. And that is why gamification can turn chores into something fun and enjoyable.

4 Gamification in practice

The psychology behind gamification has been covered; how and why it works. In this section, examples of how to gamify in practice will be shown. This section is aimed at developers and designers of systems rather than users of gamified systems.

4.1 Basic building blocks

As mentioned in Chapter 2.1, game mechanics are used to gamify services and systems. These game mechanics make up the basic build blocks of gamification. Some examples of these can be found below.

Points

This is one of the key ingredients for a successful gamified service. One of Reiss' 16 basic desires is saving (Reiss, 2004). To collect things is a basic human need and collecting points is a great way to satisfy this need. These points can be used to buy goods, unlock content or just as simple motivation with no deeper motive. Points can be handed out when users perform actions. These actions can be weighed so different actions give different points.

Levels

Levels are often point thresholds, meaning that when reaching certain amounts of points the user's level is incremented. When reaching a new level the user might be able to make some decisions, e.g. to choose a new outfit for an avatar, to choose a virtual price or get a discount on some purchase. Often features or abilities are unlocked as players progress to higher levels. Levels together with points and achievements are the greatest components of motivation for gamification.

Leaderboards

Leaderboards bring aspiration of fame, of having one's name noticed and remembered by other users and also drive desired behaviour through competition and collecting. Leaderboards can take many different forms, i.e. a blogging service can have the posts of its most popular writers on the start page to highlight them. The purpose of that kind of leaderboard is exactly the same as a regular gaming leaderboard; to elevate the most successful users.

Table 2 Achievements have to exist in different difficulties to attract both new and old users and different player types. This is an example on how to put a ”score” value on points.

Amount of points collected	Name of achievement	Worth (score)
100	Pocket full of points	10
1 000	Beginner collector	15
10 000	Collector	25
50 000	Point gatherer	40
200 000	Point hunter	60
1 000 000	Millionaire	100

Achievements

Achievements are representations of having accomplished something. These can be either virtual or physical. They fill basic desires such as making a game (or gamified system) more challenging, provides a measure of status and lets users collect. Both achievements and points can be used in leaderboards to drive competative behaviour. Achievements give people goals and the feeling of going somewhere. Achievements can be represented in the form of e.g. badges and trophies. A general approach is to give achievements for accomplishing the first tasks in a system. By doing this, users will be drawn deeper and deeper into the system and meanwhile learn how the system works. For example, in a gamified blog service, make sure that a user receives an achievement for publishing his or hers first post.

Achievements can be handed out for basically any accomplishment in a user's interaction with a system. There should however always be achievements for collecting various amounts of points. These are not to be equally spaced, the distance between the amount of points needed for achievements should grow non-linear. The reason for this is to make sure that the reward motivates the effort and that the effort increases with skill level.

One way of handling leaderboards and status measurement is to make achievements worth different amounts of “score”. Table 2 gives an example of how achievements for collecting points can be handled. By following the idea of the example, leaderboards are not only governed by amount of points collected but also the number of achievements and their worth (basically difficulty). This will satisfy not only the Achievers and the Killers but also the Explorers as they will gather many achievements which can be hard to find or accomplish for others.

Competitions

Competitions enable your users to challenge not only themselves but also each other. Once every user has done the competitive activity, the user with the highest score wins a reward while all the others get a consolation prize. This is great for turning single user experiences into multi user experiences and making them more social. An example of this for an image uploading internet community is that in a week's time users can vote on each others images. At the end of the week, the image with the highest ratings will have a large fixed position

on the community's start page for a week while all other images will randomly be shown at the rest of the startpage. This will drive a wanted behaviour from multiple users and the prize will not cost the company anything but still, hopefully, please all users.

Virtual goods

While collecting points just for the fun of it is often effective enough, it helps having a place to spend points. It also provides a bigger reason to collect more points. Virtual goods can be of any form and are very system dependant. However, one type of virtual goods that fits most systems is items that offer customization of something that reflects personal identity. For a blogging service this can be clothes for an avatar, new colors for a profile, larger images, better quality images, different designs of profile pages, etc. Having a personality and feeling unique is a need many people have and customization can often fulfill that need.

4.2 Advanced building blocks

Some building blocks are more difficult for developers to implement in a good way.

Real goods

Giving users the ability to buy real goods for in-game points is also a possibility. It requires a secure system to avoid cheat and hackers but can be a great motivator. These goods can be anything relavant to your company, from coffees to cars.

Loss aversion

Loss aversion influences users not by reward, but by instituting punishment. This is very hard to do in such a fashion that it does not annoy users. If done correctly it can motivate them very much though. An example of how this can be implemented for the blogging service is to let users lose points if they do not post a entry or a comment for an entire week.

The illusion of free

If players feel they are getting something for free, due to someone else's work, they will be very satisfied and feel as if they have been very lucky. This is not something that fits many systems but online stores could do this quite easily. For example by virtue of 100 other people having bought something you get it for half the price. You recognize work has been done, by the other 100 people spending money, and feel as if though you have been very lucky.

Appointments

Appointments have been around for very long in real life to motivate customers at e.g. bars; so called Happy Hours. In a blogging service it could be implemented so that users who

post exactly between 9.00 and 9.30 have a chance to win something.

Community collaboration

The entire community works together to solve a riddle, a problem or a challenge. For a map service, users could be asked to find a number of objects at certain coordinates. When all of the objects have been found, all registered users will get a month free premium access to their services.

Epic meaning

In her speech at Ted Talk (McGonigal, 2012), Jane McGonigal says that players who feel they are working to achieve something great; something awe-inspiring that is bigger than themselves will be highly motivated. She even says that we can solve real world problems such as famine and wars through game-like motivation. That is a very interesting topic and is very related to gamification but will not be discussed further in this thesis.

Epic meaning is a subset of community collaboration. It could be implemented in a blogging service through making an official statement like: “When our community have published 10 000 000 blog post, we will donate 1 000 000 euros to sharity”. Users will be motivated as they work together towards a greater goal.

Countdown

If users only get a certain amount of time to perform a task they will have increased initial activity and it will increase a lot until time runs out. For example, a company could reward points for performing a task in a certain amount of time, say 30 minutes. The workers do not have to do it but many will still be motivated. This will not always be optimal though as it can be stressful for some.

Enigma

Any website who posts a huge mysterious time countdown on their start page will riddle visitors and hopefully (probably) make them interested in what happens when the countdown is done. This makes visitors more motivated to visit the website and much more motivated to visit when the countdown is about to be done. As to what happens when the countdown is done is very dependent on the system. A blogging service could switch to a new fresh design in this way.

Discovery

Many users love to explore and be rewarded for it. A website could have hidden pages which are accessible through some links which can be hard to find. A blogging service could give reward to users who read at least 100 blog posts every week. That is also a sort of discovery.

Lottery

Losers will not take a loss personally if it is clear it was a lottery and the winners will be very happy and probably keep using the system.

Ownership

If users feel a connection to something in a system, e.g. a virtual pet, loyalty will be created. Users feel as if they have to take care of their pet and will visit/use the system regularly. Some systems let users own an avatar, which they can change appearance of.

Others

There are many other game mechanics which can be used as building blocks in gamification. The ones mentioned here are the most common.

4.3 Summary

Developers of gamified systems have to plan ahead and choose their building blocks carefully. Far from all building blocks fits every system. Some building blocks are almost a must in some form though, i.e. points and achievements. The building blocks can be implemented in different ways and should be related to the need of the four gamer types: Achievers, Explorers, Killers and Socializers (Bartle, 1996). In general; systems should be simple, but still have challenging and rewarding tasks.

5 The value of gamification

This chapter discusses why companies should use gamification and why users should care.

5.1 Business value - participation

In business, it is important to build long lasting relationships with people - whether they are users, customers, employees, students, etc. (Burke and Hiltbrand, 2011). Participation builds relationships and relationships build loyalty. Therefore it is important for companies to get people to participate and engage in whatever activities would benefit the company. Gamification can easily be used to drive participation in various activities:

- reading articles
- creating content
- sharing content
- vote on content
- rating products
- explore websites
- working
- shopping

Through participation of different sorts it is easy to collect statistics. These statistics can be used to make a system better to further enhance the user experience. Not all consumers would want to be included in gamification strategies. Therefore, it is important for a company to consider its target audience. Gamifying existing systems without extreme planning can be counterproductive. If some users feel left out or if the system is unevenly balanced in its reward to different users, the amount of users could suffer. Another complication is that a serious product may seem less serious if it is gamified in an unproper manner.

5.2 The end user value - enhanced experience

Gamification need not only be good for business, but also for the end user. Whether you are an employee, a student or a customer there can be ways to benefit from gamification. For example, an online web shop gives away a free gift to a user for every 500 points earned. For a certain amount of money spent, points are earned. Users also earn points by

rating products and sharing their purchases on social networks. Users will benefit from this by receiving free gifts and have an enhanced user experience. The web shop would also benefit, by building relationships with its customers and, hopefully, increase their sales. By letting users benefit from sharing products, the web shop company also receives free commercial.

I have not found any drawbacks with gamification for end users, except that too much extrinsic motivation can diminish one's intrinsic motivation. And of course, if a system is gamified in a bad way, the end users could suffer. For example, a blogging service that only focuses on motivating frequent users could loose irregular users and visitors.

6 A new way of gamifying - a proposal

Gamification is the concept of applying game-design thinking to non-game context. What if there were an underlying game, beneath the non-game context? The game could have shared resources with the gamified system which could be used in different contexts. Players in the game would be users of the gamified system and vice versa.

Consider the following example: many university students like playing games of some sort. What if there could be non obligatory quizzes in every course they take at a university? These quizzes could be related to the student's current course and for every correct answer, a point is gained. The student could earn achievements and the school could have a leaderboard, where the students total points during all their years at the university are summed up. Notice that nothing is obligatory, so people who would be stressed by obligatory competitions does not have to deal with that. So far, the students' learning process have been gamified. Let us say that the university has developed an exciting role playing game where players can gain levels, fight evil and solve puzzles. The game itself is really fun to play and appreciated by the students.

The game could potentially be used to increase the motivation of students without making it into a serious game (Derryberry, 2007). By letting the earned points in the gamified system give bonuses in the game, users of both systems will be motivated to study harder in order to answer correctly on the quizzes. This new concept is not only applicable to education but to all kind of industries.

Let us look at another example: a large company is the owner of one TV channel, one newspaper, one magazine and two online social communities. They would like to connect all their services. A good way to do this is to turn users of one service into users of all the services. By clever gamification, the services could have shared point gathering and such. By creating a fun online game, in which players benefit from using the other services, they would reach out to a broader audience and motivate users into using all the different services.

If children from their early ages could be motivated into learning more, while still having fun, it would be groundbreaking. Serious games can often be too serious or to boring (not every subject is fun to learn about). By using this technique, games will still be games; fun and exciting. This new way of gamifying is not tested and no research has been done. It would be interesting to see if it could work. The main purpose is to motivate users from new angles.

I believe that this proposal would work well for some specific cases. For example, when a company or organisation wants to string together their services in order to reach a broader audience and motivate them even further.

7 Conclusions and further work

The questions that this thesis aimed to answer were:

- What is the definition of gamification?
- Why and how does gamification work?
- As a developer, how do you gamify a system satisfactory?
- What is the business value of gamification?
- What is the end user value of gamification?
- Can gamification be extended or improved?

All of these questions have been addressed. Gamification has been defined and its components explained in detail. The psychology behind gamification has been studied. How to gamify systems and best practices have been addressed. Both the business value and the end user value has been explained. The proposal for a new way of gamifying must be further developed and be tested. Its purpose is legit though; to reach a broader audience and motivate them from a new angle.

The entire thesis can work as a guide for developers and organisations. The extensive background on gamification, including the psychology behind it, shows that gamification has great potential. A lot of companies and nonprofit organisations, including schools, are starting to use more and more gamification to motivate workers, students and customers (Gartner, 2012).

Limitations

There are many different views on gamification. While this thesis has tried to take an objective look at gamification, there has been a number of choices made which has made it easier for me to motivate the use of the concept. Examples of these choices are the models used for describing human behaviour.

Further work

The area of gamification is still new and there is much research and development to be done. It would be interesting to see how gamification fit into other psychological models than the ones used in this thesis. Other models may prove that gamification has less advantages, or the opposite; that it has even more. The only way to find out is to continue doing research in the area. The proposal of a new way of gamifying is interesting but not tested. It would

be exciting to implement it. I believe gamification is here to stay, if not in its present form, in an extended form. I find the area very interesting and hope to be able to work with it further. Hopefully, I will find time to do case studies of systems which use, or could use, gamification.

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