In the Magic Circle

[figure 1: magic circle vs real world]
The "magic circle" (in games and digital media) is the space in which the normal rules and reality of the (real) world are suspended and replaced by the artificial reality of a (virtual) game world.
The magic circle of a game is where the game takes place.
To play a game means entering into a magic circle.

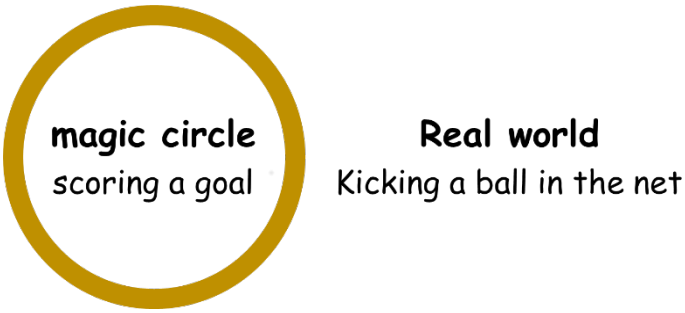

Figure 1 magic circle vs real world

Welcome in the magic circle.

Sources:
Literature
The following authors and books have inspired me and guided me to produce this short course in gamification.

- For the Win: How Game Thinking Can Revolutionize Your Business, Kevin Werbach
- Actionable gamification: beyond points, badges, and leaderboards, Yu-Kai Chou
- Gamify: How Gamification Motivates People to Do Extraordinary Things, Brian Burke
- Reality is Broken: Why Games Make Us Better and How They Can Change the World, Jane Mcgonigal

Beside these books, which you really need to read if want to deepen your knowledge on gamification, I encountered numerous blogs of various people share great ideas and interesting experiences. The information is yours, you only need to browse for it.

Images
Figure 1: magic circle versus real world
Based on Huizinga's magic circle

Figure 2: Ballotbin
Published by Rachel C 30/08/2019 on Twitter, a cigarette-butt-questionnaire "Does the prospect of a hard Brexit worry you?"

Figure 3: Piano stairs
Movie on Youtube of a Piano stairs experiment

Figure 4: Find the objective
Image from Middleseats.com

Figure 5: Target audience
Image from Medium.com

Figure 6: player types
Based on Bartle / Mangiatordi

Gamification, introduction

The basic definition of gamification is: "The application of game techniques in a non-game context".
Game techniques make games engaging and **motivating**. They intensify the player's need to learn, compete, master, socialize, achieve, …
To gamify an application is to leverage the user into perceiving the application (or parts of it) as game or play.

Brian Burke says “gamification is middleware for (digital) motivation”.
One could say that gamification is the digital successor of nudging. Nudging is a concept which proposes positive reinforcement and indirect suggestions as ways to influence the behaviour and decision making of groups or individuals.
Gamification can exist due to almost ubiquitous digital connection we have. At a relative low cost we are connected constantly with the cloud, the internet and all kinds of services that are eager to collect our data and equally keen on overstimulating us with all kinds of information.

Examples
Ballot Bin
https://ballotbin.co.uk/
[figure 2: Ballot bin]
Nudging example.
A solution to keep cigarette butts off the street: this bin is an ashtray with a changeable question plate displaying a question and two answers. Smokers vote by putting their cigarette butt in the slots underneath their preferred answer. The litter stacks up behind the clear glass front in two columns, showing which answer is more popular. Smokers find the Ballot Bins much more engaging than alternative ashtrays and are more likely to use them. Independent evaluation shows the Ballot Bin reduces cigarette butt litter by 46%.

Figure 2 Ballotbin

Piano stairs
[figure 3: Piano stairs]
Maybe more gamification than nudging.
The Fun Factory team set themselves the challenge of getting more people to take the stairs by making it fun to do so. Stairs located next to escalators were transformed into a working piano, with every step playing a note to the Swedish public


Figure 3 Piano stairs

https://www.youtube.com/watch?time_continue=11&v=2lXh2n0aPyw&feature=emb_logo

Mission, who wants what

Define begin and end, the pathway

To implement gamification, which is a user-centred design, one must find a match between the wishes of the client (who orders to gamify an application) and the needs of the user (who uses or considers using that application).

Client and stakeholders

Who is involved, who instigates this gamification and for what reasons?
You need to know them well because your solution needs to breath their brand, their quality, their products.
And, if they don’t like your solution, you have to convince them that the target audience likes it.

Define (business) objectives

[figure 4: find the objective]

Figure 4 Find the objective

1. list objectives:
   create a concrete list of goals, be specific.
   It is not about the overall organization mission, but about the increase of customer or the student retention, improving employee productivity, increase of website visits, sign up for a service, post in a discussion board, exercise for at least 20min, visit your restaurant, …
   The clearer the objective, the easier it is to check if the objective is reached (in the end).
2. rank objectives
   Focus initially on the significant objectives (and later you can expand).
3. further reduction
   narrow down the list by crossing off anything that is a means rather than an end.
   The "end" is the goal, the destination. The "means" are the resources and preparation you use to get there.
   Is getting more visitors to your website a real objective or is it more a means to increase your revenue?
   Ask yourself: if the gamification would result in only this objective, would you consider the project a success?
4. justify objectives
   For each remaining objective, specify how the organization would benefit from reaching the objective.

Return to this list regularly, for it is easy to lose sight on your final goal when you're walking the path.

Define the target behaviour

Now you've a clear list of objective you can define which behaviour the player must exhibit. What do you want the player to do? And how will you measure if the player does it?

1. List actions
   make a list of actions, behaviours that promote the defined objectives.
   Again be specific and concrete.
   Example: sign up for an account on your website, exercise for at least 15 minutes, take a daily quiz,…
   Keep it simple.
   List many behaviours and actions allowing your users to have options, so they can choose activities they prefer.
2. Develop metrics:
   Metrics are methods to translate a behaviour into a quantifiable result. Each behaviour or action should generate a number and the collection of numbers can generate feedback.
   In the first place these numbers allow for analytics, so we can see how many times actions were taken or behaviours occurred and correlate with the targeted business objective to see if the gamification is a success.
   Of course we need to give feedback to the user as they should be encouraged to repeat the action or behaviour. For that we need to understand which feedback will encourage our target audience.

Target

Target audience

Figure 5 Target audience

[figure 5: Target audience]
Who is living at the other side? Whom do we wish to reach? What is their relation to you? Employees or customers? What motivates them? What demotivates them?
Put yourself in their shoes.

Persona

Build an image of your users. They will not all be the same, so create multiple images.
Create persona, give them a name, a gender and a life. Consider what would be the reasons for them to use your application, why would they be interested in you as a business or as an organization. Which are their goals? And what would they do to reach those goals. How do they live, what are their hobbies, …?
[figure 6: player types]
A good way to categorize your users is the use of archetypes as the four player types described by **Bartle** (look at Wikipedia Bartle taxonomy of player types)

1. Explorers: they which to search for new content,
2. Achievers: they love to earn badges of level up,
3. Socializers : they want to tell their friends what their up to and like to know how they are doing,
4. Killers: they wish to control and impose.

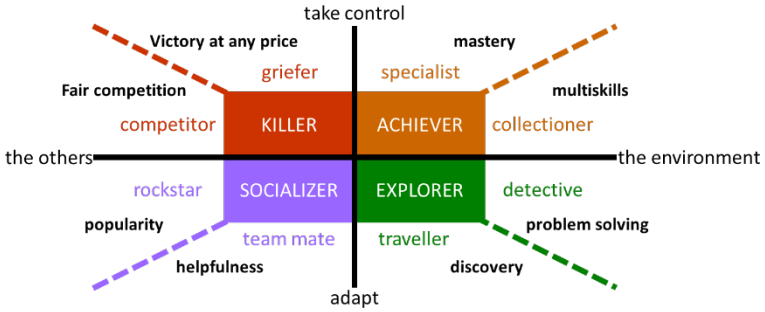

Figure 6 player types

This is no absolute science, so be creative in segmenting your player community.
Create a small biographical description for each typical player with an avatar (virtual representation) and describe how your system (business, product, service, …) fits (motivates) in the life of this fictive person.
The more detailed each type is the easier it gets to design activities.

Life cycle

And imagine the life cycle of each of those types. They all start as novices who need handholding and reinforcement. As they become regulars, they'll need novelty and new challenges. And finally they become experts who yet again need harder (but not too hard) challenges and reinforcement of their status.
Remember to offer opportunities for players at all stages.

Motivation, why would they play

Means to get there

You now know what the (business) objective is and which actions or behaviours your target audience should do or exhibit in order to reach those objectives.
And you have a clear idea on who your target audience is, what they live for and what moves them, what motivates them to act.
Now get them to act.

Design game activities

So you need to motivate users to act and since you're creating an application that implies you have to design actions that motivate users. In order to define a diverse set of game actions we have to look at the mechanics why games work.

Octalisys

Yu-Kai Chou has devised a nice tool called Octalysis (look at Wikipedia Octalysis) for structuring and analysing game activities. It is a design framework that lays out the eight core drives for humans motivation. These eight drives are handles with which you can activate emotions in your users and those emotions will motivate your users into action, into showing the desired behaviour.

[figure 7: emotion leads to motivation]

Figure 7 emotion leads to motivation

8 drives

These are the eight drives:

1. Epic Meaning & Calling
   You are the hero. You are chosen to take action. You are doing something greater than yourself.
   If these emotions appeal to you, you're willing to act without any extrinsic reward (without payment of any kind). You just do it because you feel you are contributing for a better world.
2. Empowerment of Creativity & Feedback
   You like to be creative, enjoy to see the results of that creativity. You like to figure out new things and try different combinations.
   If so the game should empower you to be creative.
3. Social Influence & Relatedness
   You enjoy being a part of a community and to relate with other members. You feel driven by the accomplishment of others. You like to help out others.
   To allow these emotions, the game should entail a social platform where you can meet other players and share with them your experiences.
4. Unpredictability & Curiosity
   If the unexpected is what you are looking for, if you like to gamble, then you wish the game continuously surprises you with new twists and randomness.
   [figure 8: Octalysis]
5. Loss & Avoidance
   If you experience the fear on missing out on specific opportunities, or you don't want to quit since you have worked so hard to get there, then this core drive has been activated.
6. Scarcity & Impatience
   We all feel the need for the things we can't have. This core motivates us because we are impatient, we wish to have it now and it is hard to get it or it takes time to get it, whatever "it" is.
7. Ownership & Possession
   As soon as you own something you wish to care for it, improve and protect it and possibly

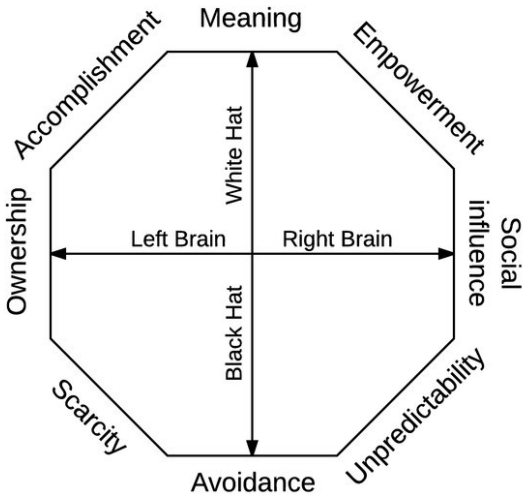

Figure 8 Octalysis

get more of it. It might be that you spent a lot of time customizing something to your own liking. You wouldn't like this to break down or disappear, so you protect it and take care.

8. Development & Accomplishment
   You have accomplished the challenge. You have mastered this problem. You have developed the solution.
   If you like these emotions, you are motivated by badged, point and leaderboards (PBL's). Challenges drive you to develop skills and achieve wisdom.

white & black hat

White Hat Core Drives are "positive" motivation elements that make us feel powerful, fulfilled, and satisfied. They make us feel in control of our own lives and actions.
In contrast, Black Hat Core Drives, make us feel obsessed, anxious, and addicted, all more "negative" emotions
The different drives are categorized like this.

White	Black
Epic Meaning & Calling	Scarcity & Impatience
Development & Accomplishment	Unpredictability & Curiosity
Empowerment of Creativity & Feedback	Loss & Avoidance

intrinsic/extrinsic

Left Brain (Extrinsic) vs Right Brain (Intrinsic) Core Drives
The human brain consists of two hemispheres, the so called left brain and the right brain. Some neural functions or cognitive processes have the tendency to reside in one part of the brain. For example, language functions appear in the left brain for 90% of the right-handers. [figure 9: brain lateralization] This is called "function lateralization" and although recent research calls this in question (the brain still holds many secrets), there is this popular simplification presenting the functional differences between the hemispheres: the left brain is used for logic, mathematics, rational thought, whereas the right brain is typically strong in intuitive thought, emotions, creativeness and imagination.

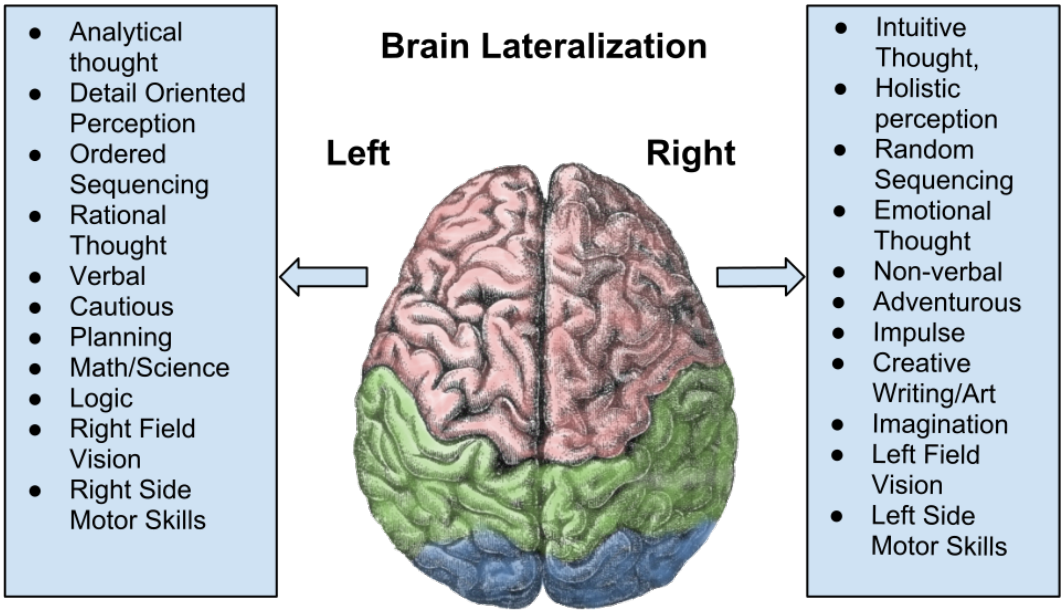

Figure 9 Brain lateralization

In Octalysis the reference to left or right brain is more symbolic and connects the different drives with a "logical brain" or an "emotional brain" and it categorizes drives into extrinsic motivation and extrinsic motivation.
Motivation is the reason we act, we feel enthusiasm to do something, we feel a need or have a reason for doing something.
Extrinsic motivation comes from outside ourselves. It is about "what you need to do".
Commonly they are rewards or the threat of punishment and also competition is an example.

While extrinsic motivations rapidly get us to work towards a goal, they only last as long as the external award is satisfying.
Intrinsic motivations comes from inside ourselves. It is about "what you want to do" .Our interest or enjoyment in the task itself is what drives us to act without external pressure. Examples are: the will to master, to increase capabilities, the wish to be autonomous, independent.
Although intrinsic motivation can be long-lasting and self-sustaining, as a positive reward experience will support the tendency of well-being and autonomy reinforcing the intrinsic, motivation, fostering and growing the intrinsic motivation takes time and effort. It is difficult to know what interests a person, what might induce intrinsic motivation.

Left	Right
Development & Accomplishment	Empowerment of Creativity & Feedback
Ownership & Possession	Social Influence & Relatedness
Scarcity & Impatience	Unpredictability & Curiosity

There is much more to find on motivation in psychology, behavioural sciences and cognitivism. Typical examples of **behaviourism** are Pavlov, slavering dogs, and Skinner, feeding or punishing rats. The systematic application of reward or punishment conditions and reinforces responses in anticipation of further rewards or punishments. Consider how well this is reflected in the current motivational method. Salary and bonusses are our rewards and we fear demotion and firing. Because this is systemically applied we expect to receive bonusses and rewards and we expect to be punished if we make mistakes.
A common example of **cognitivism** is the Self-Determination Theory (SDT) which focuses on what humans need to allow their innate growth and well-being tendency to flourish. SDT suggests three categories: competence, relatedness and autonomy.
An example illustrates this:
Why do I like to solve Sudoku puzzles? No one forces me to do so nor do I get any rewards. This simple game activates my intrinsic motivations. Since I can choose which puzzle I want to solve now and how I solve it is entirely up to me, my intrinsic need for autonomy is activated. After I figured it out, I feel competent and I can proudly share this achievement with my friends so I feel relatedness.
Ultimately one can experience "**flow**", when one is fully absorbed in their activities regardless the context due to intrinsic motivation
(https://en.wikipedia.org/wiki/Mihaly_Csikszentmihalyi)

DON'T forget fun!

[figure 10: anatomy of fun]
Others have formulated different models helping you to design a gamified application.
Nicole Lazzaro, an expert in Player Experience Design (PXD) for mass-market entertainment products, defines four fun keys that generate important emotions:

1. Hard Fun: Fiero – in the moment personal triumph over adversity
2. Easy Fun: Curiosity
3. Serious Fun: Relaxation and excitement
4. People Fun: Amusement

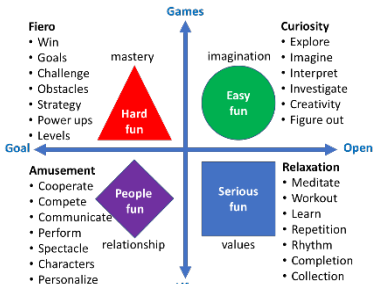

Figure 10 anatomy of fun

Embedding these four types of fun creates emotion from interaction in productivity software as well as games. As usability only focuses on minimizing complexity and reducing user

frustration designing the application with these keys increases user motivation by harnessing the power of play, so concludes research at XEODesign.

What are the mechanics

Decreasing order of abstraction

[figure 11: Pyramid of Gamification Elements]

To activate the player's motivation there needs to be a user interface interacting with the player using game mechanics and game rules forming a core engagement loop.

In order to build this user interface you need to go through several layers of concepts.

Compare this with building a car: a car consists of major abstract concepts: an engine, passenger space, wheels and brakes and a steering device (roughly, this is only a comparison). Let's call these dynamics.

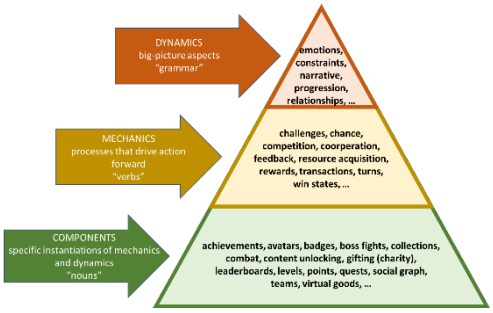

Figure 11 Pyramid of Gamification Elements

From there on you move on to more concrete mechanics: for the engine you might choose an electric motor, you specify the car to be carrying up to five passengers and so on. Lastly you specify the components: the motor will exist of a rotor, bearings, a stator, windings,…

The same principle will be used here. Dynamics provide a coherent experience (like grammar in language), the mechanics are the processes that drive action forwards (like verbs in language) and components are specific examples in which mechanics or dynamics are represented (like nouns in language).

What follows are a list of dynamics, a list of mechanics and a list of components. The lists state the most important or the most common dynamics, mechanics and components.

Dynamics

Dynamics are the first step to activate the player. The most important dynamics in a game are:

- Constraints: limitations and trade-offs, the rules a player must follow (in order to participate in the game).
- Emotions: like curiosity, competitiveness, frustration, happiness, these will drive people into intrinsic and extrinsic motivation.
- Narrative: as in "epic meaning", the story that helps the player to retain and interact with the presented material. A strong narrative will create empathy in the player, a tight bonding between player and the mission.
- Progression: relates to accomplishment, as the player grows and develops.
- Relationship: or social pressure, allowing the player to interact socially or virtually.

Mechanics

Mechanics achieve the dynamics and generate player engagement. They intend the user to perform certain actions in order to attain a defined game state.

These are the ten important ones:

- Challenges: tasks that require effort to solve, preferably with epic meaning. https://fold.it/portal/: foldIt presented the public with a game to solve scientific puzzles. Where a team of experts didn't solve the problem in over 10 years, 46000 volunteer players felt challenged and solved the puzzle in 10 days.
- Chance (randomness): chance allows replayability, excitement and unpredictability. Every time the cards are shuffled a new challenge emerges, unforeseen storms or enemies make you realize you have to take care of your gear, food and shelter (while you're roaming the undersee world of Subnautica (https://www.youtube.com/watch?v=Eofzr90R1bg).

- Competition: which implies there are winners and losers. Although numbers show that the appeal of competition declines with the age of the player (https://quanticfoundry.com/2016/08/11/appeal-of-competition/) , it is still a commonly used mechanic. Of course a good game provide the loser positive (or funny) feedback, inviting the player to try again.
  In Super Monkey Ball 2 failure made gamers happier than winning, because when a player failed immediately an funny animation sequence was showed and made players laugh.
- Cooperation: and collaboration the focus of MMORPGs (Massively Multiplayer Online Role-Playing Game) like for example the very successful game World of Warcraft (https://www.youtube.com/watch?v=PazufneUQTA&t=39m). Players cooperate in teams to tackle different quests.
- Feedback: is quintessential, always. The players needs to know how he is doing, preferably in a positive way. Mind that feedback exists in many shapes apart from "congratulations, you did it" messages. Negative feedback can come in the form of your avatar getting weaker, positive feedback can be shown through unlocking new features.
  The effects of negative feedback are examined for example here: https://www.gamasutra.com/blogs/JoshBycer/20130724/196901/Examining_Negative_Feedback_in_Game_Design.php
  The use of feedback loops are discussed for example here: https://learn.canvas.net/courses/3/pages/level-4-dot-4-feedback-loops
- Resource acquisition: this is obtaining useful or collectible items. To acquire something, to collect things is appealing to the basic human instinct, it is ingrained as something joyful in our modern consumerist culture. The player experiences progression through the increase of the quantity and the quality of the collected items. This also allows for a steady growth of complexity as collected items may be combined into bigger functionality. For example in Farmville, the more experienced the player the more the player can collect, grow different plants and animals, but also the more complex the management of the farm will be (and the more experience one can gain).
  This mechanic also offers players to differentiate as they choose how to shape their personal collection.
  Read more for example here: http://www.leagueofgamemakers.com/game-elements-acquisition/
- Rewards: are received as benefits for some action or achievement. Rewards systems appear in any environment providing positive motivation (intrinsic or extrinsic), but the model has to be thought out. As stated before, extrinsic motivation through extrinsic rewards quickly loses value. And Skinner (see motivation) found that a variable ratio reward was most effective. In his study pigeons were most likely to press a lever when there was a 50% chance of receiving a reward, even more than when they received a rewards every time. For example World of Warcraft applies this principle as only sometimes players can get their hands on the loot from a killed mob.
- Transactions: or trading between players happens in games like Farmville and Path of Exile (in World of Warcraft some trading is possible but there is usually no need for it). Most of the time transactions are actually a simple exchange of resources between players, not to be compared with real trading which happens in the real world. Nevertheless, it generates communication and interaction.
  This is not to be mistaken with transactions or microtransactions where the player does in-game purchases for real money.

- Turns: or the sequential participation by alternating players, one player gets to perform his actions before another can. But a turn can also be a segment of the game set aside for certain actions to happen before moving on to the next turn.
  Look at this Wikipedia page: https://en.wikipedia.org/wiki/Game_mechanics#Turns
- Win states: Some games, like a sports match (a finite game), end at a certain point and declare a winner (and thus also a loser). Other games (infinite games) go on (sometimes endlessly) and although you might encounter challenges that end with a winner and a loser, you just experience a 'win state', a successful completion of a part of the game after which the game continues. In Pokémon Go the capturing of a Pokémon is a win state.
  [figure 12: Pokemon Go capture]

Figure 12 Pokemon Go Capture

Components

Below is a list of sixteen important forms that mechanics or dynamics can take.

- Achievements: are self-contained game goals that offer challenges, satisfy goal-oriented players and allow players to see each other's accomplishments.
  Examples: "pacifist-run" in which you complete the whole game without killing anyone, win 5 games in a row.
  Sometimes achievements get published: https://euw.poroscience.com "Win a game with Talon" (a fierce knight).
- Avatar: or a visual representation of player's character. Sometimes these are just very simple images but more often game designers allow for customisation of avatars and in some games these avatars become very intricate. Avatar-based customization enables the player to identify more with the in-game character and increases their sense of autonomy. There are games where other players build your character depending on how you play (how brave you are, how you collaborate, how much enemies you've killed).
- Badges: are a visual representation of achievements, usually in the shape of a badge. Then there is an overview where you can click on each badge to get information on what you've achieved. But, as specified in previous example, badges can take on other forms, like specific features of your player's character.
- Boss fights: these are especially hard challenges as bosses are usually opponents with increased health, high damage and unique abilities. Defeating them gets you to the next level.
  Read here about the creation and analysis of boss fights:
  https://www.gamasutra.com/blogs/DmitryAborilov/20190318/338639/Creating_Cool_Boss_Fights.php
- Collections: or sets of items or badges to accumulate. As players are diverse, they feel differently challenged. Many games therefore offer a wide variety of things to chase for (or buy if the player isn't patient enough).
  In Pokémon Go inventory management is a time consuming task and players chat with each other to discuss management strategies.
- Combat: or fight or battle, typically short-lived. The player is bound to be confronted with an obstacle that needs to be fought with. Either you fight with a sea animal to

provide you with food, or you fight with a troll to get access to a dungeon.
Take a moment of and browse through YouTube in search for great combat scenes from different games.

- Content unlocking: Aspects of the game only come available when players reach certain objectives. In the game "Hogwarts Mystery" (based on the Harry Potter film series) you have to build your character by taking classes, making friends, perform small tasks, all the time maintaining your resources and checking your scores. Meanwhile you receive small parts of the story line, slowly revealing tips and hints (some of them of course misleading) to enable you to learn about the mystery. Through the game unknown parts of the castle open up and new people (friends and enemies) introduce themselves.
- Gifting: or opportunities to share resources with others. Since June 2018 this feature was released in Pokémon Go. Now you can connect with real-life friends and keep track of their adventures. Sending gifts to your friends raises your friendship level and unlocks bonusses when you play together.
- Leaderboards: are visual displays of players progressions and achievements. It gives you an idea of your status in comparison with other players. Although you might feel overwhelmed by their scores it is a good place for finding strategies on how to play. In a game that enables you to simulate betting on stock exchange, reviewing the top players will give you an idea on how they play, what their strategies are. In doing so, most of the time your winnings will increase and you'll learn a thing or two.
- Levels: or defined steps in player progression. Reaching a new level triggers a dopamine rush. It's important to reward users quickly so they feel positively reinforced and wanting for more.
- Points: or numerical representation of game progression, often called XP (experience points). Some players just keep aiming at collecting point even when the game is not about that. One user of Duolingo (https://www.duolingo.com/), a gamified language learning application, saw on the leaderboard the huge amount of points some other players racked up and posted questions on which strategies to follow to earn rapidly more points. Of course, by taking more lessons.
  Usually points are shown also in graphs or progress bars. Since LinkedIn, a gamified social network connecting workers and employers, introduced the progress bar users felt taunted of being 35% of a professional, giving them the extra push to complete their profile or status.
- Rewards: receiving something good for doing a given task induces a positive emotion, as long as the reward is fairly and fitting. Yu-kai Chou describes different types of rewards depending on context, https://yukaichou.com/marketing-gamification/six-context-types-rewards-gamification/ https://yukaichou.com/marketing-gamification/six-context-types-rewards-gamification/
- Quests: or predefined challenges with objectives and rewards, a journey or expedition where challenges are overcome. They can be optional or mandatory in order to get to the next level.
- Social graphs: a representation of players social network within the game, mostly appealing for the Socializer, a Bartle player type. At a certain point Facebook connected with League of Legends to allow players to connect with friends.
- Teams: defined groups of players working together for a common goal. Implementing this feature enables for collaboration, team building, communication. Playing in team gives shy players enough safety to allow themselves to show their abilities, while others learn about leadership.

- Virtual goods: game assets with perceived or real-money value, collectables. These appeal the human drive to own and possess. Most of the time you need to keep on collecting items in order to build, grow or evolve in the game.

You'll find that some of these components overlap in functionality, are called differently in various games.
The list is there to inspire you to find more, create new and combine a set of components to gamify an application in order to induce a certain behaviour in the user of the application.
In fact you wish the user to use these components and features and luckily they do.

Game techniques

Browsing through the internet you can find game techniques, examples of strategically combined components and or dynamics as they are currently used in games. J.Helmy and Yu-kai have published several of these techniques and describe what they are, how they function and where they are used. Looking them up might inspire you and you get to learn some good practices from professional game or gamification designers.
Let's look at some of these techniques.

Progress Bar

A progress bar or a completeness meter informs users of how close they are to completing a set of tasks by showing percentages of completion along the way (further in this course there is an image of a progress bar).
LinkedIn, a professional social network, found their users dropping out of the onboarding process as they were struggling keeping their profile and job history up to date.
As soon as LinkedIn introduced a little progress bar on the side of the users' profile to show how complete their profiles are, actually pushed users to keep up. Apparently users find a progress bar that is taunting them as only 35% professional quite upsetting, enough to make them find the time to complete their profile, exactly the behaviour LinkedIn was looking for.

Easter Eggs

In applications or games an Easter egg is a hidden object. A message, an image or a feature invisible to the user unless a certain action has been performed.
Search on the internet for Easter eggs in computer programs and you'll find many, among which is a huge collection of Easter eggs in different Microsoft products.

Glowing Choice

A typical user or player doesn't enjoy reading manuals or watching long tutorials on how the use the application or play the game. They much more prefer to just jump in and test things out. And this is where the glowing choice comes into play. The glowing choice, a bright button, a bright arrow or flaming on-screen area, attracts the user's attention into the right direction of what to do next. A helpful feature when you're trying to explain the user how to proceed and often used during the onboarding phase.
[figure 13: Glowing choice]

Figure 13 Glowing choice

Random Rewards

Random rewards often in the shape of a mystery box can consist of anything (extra points, power-up, virtual resources,…) and will be discovered once a specific action is completed.
Pokémon Go players are familiar with the mystery box which act like a lure and enable you to catch a specific Pokémon.

Remember that this is just a short list. There are hundreds of these techniques, some of them actually really useful and easy to embed in your application.

The phases of a player's journey

A player has a life cycle, they all start as novices which need hand-holding and strong reinforcement. Next they become regular who find the challenges effortless and need novelty in order to stick with the activity. Finally players become experts who seek for explicit reinforcement of their status and intricate challenges.

Activity cycles:

Although at the start you might think of a simple game where the game starts and there is linear progression from step 1 to step 2 until the end, a good gamification system is slightly more complex. To model the actions of a player the concept of "action cycles" is commonly used. Basically the concept describes that the actions of the user induce feedback and activity which in turn again provoke user actions. For example, you share a photo on some social media, this triggers a notification to all your friends who respond in commenting your photo, which trigger a new notification back to you and so on.
Two different kinds of activity cycle become apparent: engagement loops and progression stairs.

Engagement loops:

[figure 14: Engagement loop]
What a player does, why they do it and how the system responds is described in an engagement loop. The key element is feedback. The player feels motivated and acts which produces a game activity, a visual response and feedback which in turn motivates the player to proceed. Any of the game components can be seen as a form of feedback aimed to induce new motivation for further player actions.
However what the engagement loop doesn't cover is the progression of the player. That will be captured by progression stairs.

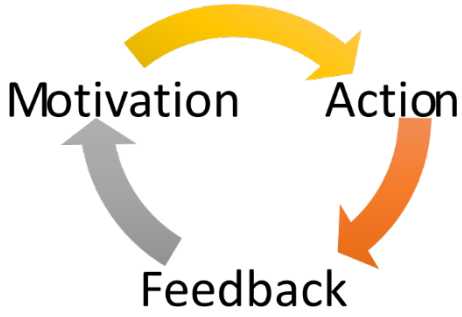

Figure 14 Engagement loop

Progression stairs:

[figure 15: Progression stairs]
The game experience will change as players evolve through the game and this is reflected by the progression stairs. Players will progress to a next level and although this implies escalating difficulty, the increase shouldn't be linear. Often getting through the first levels is quite easy but passing through higher level will often cost more effort time and experience points. What follows is how these progression stairs change and steadily guide to player through the experiences of discovery, challenges and the satisfaction of mastery.

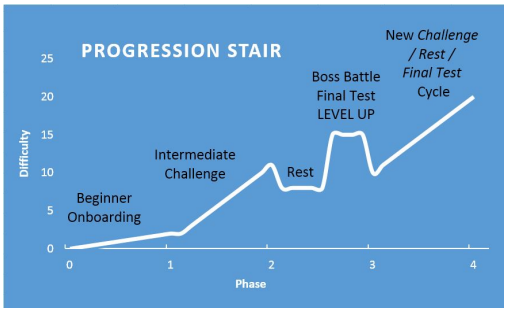

Figure 15 Progression stairs

Game phases

[figure 16: phases of a player's journey]

The user of an application goes through several stages during his usage of the application. Roughly one can discern four phases: discovery, onboarding, scaffolding and end game.
These phases occur naturally in the user while using any application, so if we manage to prepare the path and guide the user, his experience will improve, which is exactly what we want (remember: gamification = user-centred design).
Yu-kai Chou proposes to analyse all the phases using his Octalysis framework.

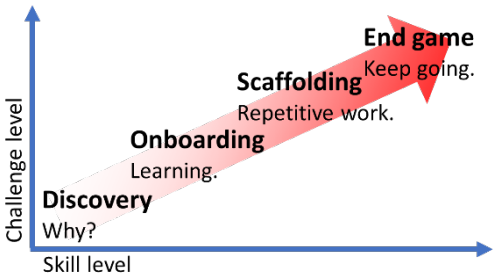

Figure 16 phases of a player's journey

Discovery

During the discovery phase the user literally discovers the application, reads about it, makes the effort of installing it and try out the application. The phase ends as soon as the user actually signs up.
Evidently marketing is important to attract new users, the gamified solution should also allow the newbie to gain a minimum level of familiarity up to the point where the user can decide if it is worth more of their attention, if the application is useful for them.
(Yu-Kai Chou https://yukaichou.com/gamification-study/4-experience-phases-gamification-1-discovery-phase/

Onboarding

The user has just signed up and he will remain in the phase until he has mastered the fundamental skills in order to use/play and achieve early win states.
In this phase it is key to make the user feel confident, smart and competent. Important components will be instruction, interaction, empowerment and feedback.
As you need the beginner to quickly learn how to use the application, you will approach him with hands-on step by step interaction. Design for the naïve and unexperienced user. A glowing button or glowing choice sometimes accompanied with a pop-up is usually rapidly noticed by the user and he will soon connect the responding activity with this button. Allow the users to explore autonomously and click the non-glowing choices, again as they'll soon understand what the better option is. It is OK to make mistakes.
Teach the application by using the application, learn by doing. With instructional scaffolding there is initially a lot of support which is taken away gradually while the user develops and learns how to use the application autonomously. Whenever some support is left behind, the user has (should have) learned something and the game might release a win state so the user actually experiences progress.
It is important to know which features you want the user to become fluent in. Press those one or two key elements upfront and focus all your energy on hammering those learnings.
Gradually ramp up the complexity and guide the user into discovering new features, inspire them into progress. Progress indicators like progress bars and a list of unfinished tasks motivate users through intrinsic motivation.
If there is a story to be told, a narrative, then use short 1-2 minute animated video or a story board with 3 to 4 images with just 1 or 2 sentences.
(Yu-Kai Chou https://yukaichou.com/gamification-study/4-experience-phases-gamification-2-onboarding-phase/)

Scaffolding

In this phase the user has mastered basic tools and rules to play the game and has experienced early win states. If the application or game is finite then the user will at a certain time reach the last fight or challenge and leave this phase.

Why would a user come back over and over again for the same actions? While the collection of actions is limited, it is with this given set of tools that the user must make his journey discovering how to make the most use of the gamified application.
Again the user must be guided and supported and this is done by scaffolding and scaffolds., As the application tries to tailor the experience to the needs or the ability level of the user, the scaffolding happens in many different ways, as prompts or text popping up, or even new battle challenges, ... They appear constantly and disappear as soon as you've learned the new specific thing.

- Read more on scaffolding and the zone of proximal development (ZPD) here https://www.simplypsychology.org/Zone-of-Proximal-Development.html
  Hence the name of the phase, "scaffolding consists of the activities provided by the educator, or more competent peer, to support the student as he or she is led through the zone of proximal development. Support is tapered off (i.e. withdrawn) as it becomes unnecessary, much as a scaffold is removed from a building during construction. The student will then be able to complete the task again on his own."
- https://www.gamerslearn.com/home/2018/6/11/scaffolding-and-adaptation-2-6m35t-bc6ct
- Yu-Kai Chou: https://yukaichou.com/gamification-study/4-experience-phases-gamification-3-scaffolding-phase/

Endgame

Does the game or gamified solution end or not? Usually a game stops and there is a winner, or the journey end because the player now knows the whole story and the mystery has been revealed. But Yu-kai Chou explains here, https://yukaichou.com/gamification-study/4-experience-phases-gamification-4-endgame/, that one should reconsider the endgame not as an end but as a lasting phase where experienced users remain in the game, without scaffolds since they know all mechanics, all the gameplay. Those masters can be motivated to keep on using the application through many different means.
Regardless the initial reason for the creation of the gamified application, maybe it was to teach users about your products and there is that moment where a user has learned all there is to know, providing new gameplay to keep those learned users using the application has beneficial outcomes. When the provider of the application invests in the longevity by updating the application and introducing new gameplay, the application stays alive allowing knowledgeable users to introduce new players. This results in more users and more data on how the application is used and which impact it has on business. And so business gains more insight on how to improve the application.

Tune your feedback

In her book Reality is broken, J. McGonigal a world-renowned designer of alternate reality games, asks: "No one likes to fail. So how is it that gamers can spend 80% of the time failing and still love what they are doing?"
What she refers to is about negative feedback and fun failure. Research proved that the right kind of failure feedback actually is perceived as a reward making the player become more engaged and more optimistic about the odds of success. You can find the publication of the research here: Phasic Emotional Reactions to Video Game Events: A Psychophysiological Investigation,
https://www.researchgate.net/publication/247503384_Phasic_Emotional_Reactions_to_Video_Game_Events_A_Psychophysiological_Investigation.
Feedback in a game should trigger a deep feeling or emotion in the player.

And players wish to feel emotions, therefor feedback loops will regulate behaviour in the direction of the feedback. So if you provide metrics (information) for success than users will be motivated in that direction.
Of course users like to receive reinforcement about how they are doing. And feedback is informational and given in unexpected ways then the player's autonomy increases along with the intrinsic motivation.
The psychology behind giving and receiving feedback is at least a course on its own. For now it is wise to keep it simple and always come back to the basic idea that feedback is actually everything that application or game does to communicate with the user. All the graphics, all kinds of pop-ups or information bars are ways to inform the user about the impact of her/his actions. And that should result in an emotion in the user enticing, nudging, persuading the user to proceed and keep on playing the game or using the application.

Put it all together, mock-ups and scenarios

[figure 17: Mock-up on paper]
[figure 18: Example of a (fast) mock-up tool]
Now you have all the bits and pieces at hand to create a gamified application. You know where to start, what business objectives and target behaviours need to be reached and how you can nudge the audience to use the application. Creating a mock-up, a prototype, in coding or hand drawn screen layouts on paper, helps to get ideas about the look and feel of the application. The mock-up allows you to simulate the game.

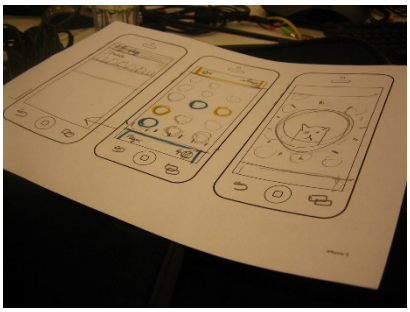

Figure 17 Mock-up on paper

Define different scenarios for every persona you have selected where you walk through the application. Go into as much detail as you can for the scenario, so you can test the logical steps between actions and feedback. Try to imagine how and why a specific persona uses the application, which emotions pop up in the persona and she or he reacts. The more detailed you go the easier it is to find flaws in the design.

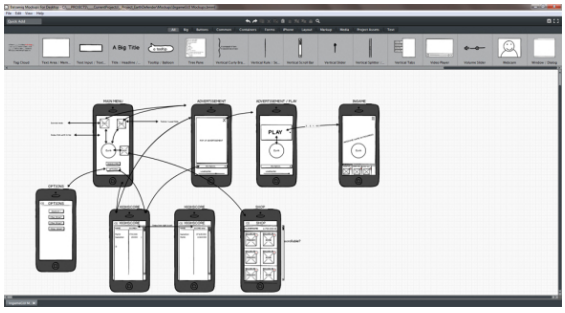

Figure 18 Example of a (fast) mock-up tool

As the application wishes to appeal to many different users, you want to make sure there are goodies for everyone. You-kai Chou proposes to use the Octalysis framework to check out how balanced the application activates the different core drives. Since the game has different phases you can use the framework for every phase. And also for every scenario for each of the different gameplays.
The mock-ups can also be used to demonstrate the application, the gameplay, the different scenarios to acquire feedback from the users.
Remember: in this stage you can fix it on the drafting board with an eraser while later you'll have to use a sledge hammer to fix the construction.

Measure and collect data

You need to collect data for two important reasons.

Points

Firstly you need to somehow measure what actions the user takes, when the action occurs and how frequently. Through algorithms, combinations of rules and calculations, feedback is then generated.
[figure 19: Progress bar]
You can choose to either show or hide points. If you show them than use graphical elements like a progress bar. Even simple graphics like this can drive people to reach 100%.

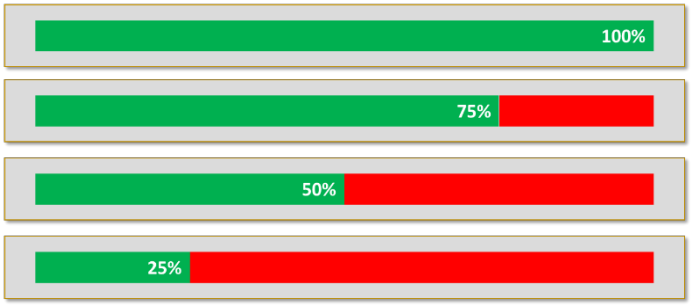

Figure 19 Progress bar

This data will be needed to analyse gameplay so you can adjust the algorithms and tweak the mechanics, so it becomes harder to win points or more difficult.
One particularly phenomena needs to get attention. Are users gaming the game? Players will explore the edges of the system and search for ways to cut corners. Most designers have no problem with that actually they encourage their users to beat the system, but this needs to be anticipated to avoid problems.

Reaching the target

Secondly you need to try to translate behaviour into quantifiable results. This is actually what the business is interested in. Does their investment, the creation of a gamified application, result in the desired behaviour in the users. And then even more analytics can be derived from this: how many users were attracted in using the application, when and how did they used it?

Legal issues

[Figure 20: legal hammer]
Some things you have to keep in mind when you collect data or publish an application.

Privacy

Is the application conform to the General Data Protection Regulation (GDPR). Data privacy laws apply primarily to customers. Labour laws apply if the users are employees.

Figure 20 Legal hammer

Advertising rules

If the application functions as advertising, there are rules about what actions are going to cause problems. For instance it is prohibited to deceive users.

Intellectual property

This involves all things like copyrights, trademarks, patents, trade secrets.
But less evident are the property rights in virtual assets. Who owns the points or achievements users collect, as they might start selling them to others.

sweepstakes & gambling

If the application offers prizes with monetary value, then the application falls under specific judiciary rules.

Test and iterate, learn as you go

[figure 21: your design vs your users]

Figure 21 your design vs your users

Whilst you're immersed in the design process it is hard to keep and objective eye looking out for flaws, voids, contradictions or other issues. Although creating scenarios for various persona and use them to walk through the use of the application or the gameplay is a way of discovering weaknesses, the opinion of an outsider will really expose problems. As early as possible you need to get feedback from users to check if the design works for them. The (paper) mock-up or prototype are perfect tools to start a conversation with users to get insight in their view on your design. Then you take what you learned from the user to amend the design.

And create a new prototype and do the test again. It is this iterative process that brings powerful results. The iteration can be used in any phase of the design process, even after the application has been launched and you're looking for improvements. In order to be cost-effective you should implement iteration as early as possible. It is always cheaper to create a new mock-up to test than it is to develop a complete application and change this based on user feedback.

There are multiple benefits of iterative design.

[figure 22: swing tree analogy]

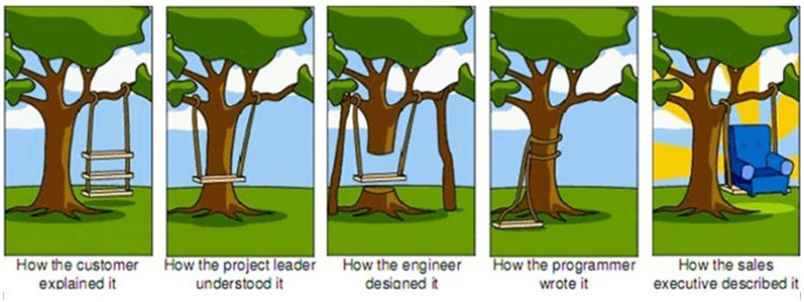

Figure 22 Swing tree analogy

A tree swing cartoon or tire swing cartoon is a humorous graphical metaphor that purports to explain communication pitfalls in the division of labour in the development of a product. An iterative design will rapidly identify those misunderstands and establish clarity early in the development lifecycle.

As the user is involved from the early stage on, they will feel more engaged and connected with the process and their feedback will ensure that the application meets their needs. Likewise the development team will feel more certain that their efforts are focused on adding value for the users.

With each iteration the application will become more mature and progress will be visible to the stakeholders ensuring them that their money is being well-spent.

Future

Preachers of gamification predict that gamification will penetrate all aspects of human society as a means to make us more efficient and more happy. Fact is that our society is rapidly becoming more complex and the members of that society need to change and adapt to keep up the pace. Maybe gamification is the right tool to make people become more aware, more efficient, more able and willing to join forces. Or maybe it becomes a tool to turn people into a well-trained and well behaved citizen, accepting everything big industries throw at them. Either way it is intelligent to study gamification and its features. Thus we will learn how to use gamification in an efficient and beneficial manner and we will more rapidly recognize misuses or unappropriated use.

Meanwhile the medium through which gamification can exist is extending promptly as big data, augmented reality, sensors and the internet of things become increasingly applied in

daily life. The industry already benefits from applying gamification to collect significant amounts of data and combining gamification and mixed reality to effectively educate employees. Likewise governments, politics and civic institutions are taking up gamification to change public behaviour, train and recruit employees and to build better e-services.

Miscellaneous

- Interesting course on gamification
  https://www.slideshare.net/AlirezaRanjbarSHoura/gamification-course-cafeit-8hour
  Gamification course @CafeIT (8-hour), Alireza Ranjbar SHourabi
  Published on Aug 11, 2017
- Get inspired by Yu-kai Chou
  https://www.youtube.com/watch?v=v5Qjuegtiyc
- Nice table of gaming elements
  https://www.gamified.uk/user-types/gamification-mechanics-elements/

About the author

Hiram Bollaert, MSc Mathematics, is a lecturer and researcher at the Artesis Plantijn University College Antwerp. Hiram's strong vision on future learning and creativity reflects in the way he coaches his students and how he collaborates with colleagues, continuously inviting them to close the gap between students and teachers to evolve towards an alliance of learners. Currently, all he talks about is gamification and active learning in various international projects to infuse participants with these ideas.