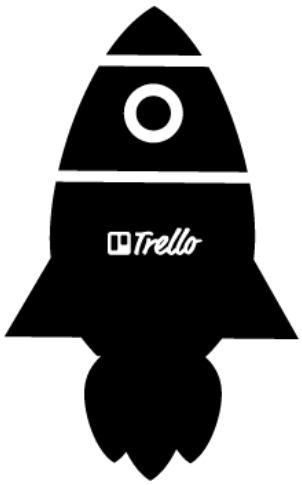
Prototyping a gamification layer on Trello, a Kanban based online project management system

Denitsa Todorova | Nima Zargham | Arun Geo John



SS 2015 : Gamification & Game Studies

Universität Bremen & Hochschule für Künste

Introduction

This document describes the project that is aimed at creating a gamified prototype of the Kanban based online collaboration system, Trello.

The prototype which was created based on our previous research , uses Gamification to increase the motivation of the average Trello user and to make the experience of using the system, more engaging.

In this project, we created a static prototype demonstrating the user interface of the system with the gamification added to the system. We also suggest future improvements after integrating the first stage of gamification described in this report.

Research

Prior to the creation of the prototype, we carried out extensive research about motivation theories, motivation at work and gamification. We also conducted a user study among Trello users regarding their experience with a project management systems like Trello and the issues they encounter while using it. We have compiled all of our results into a paper called 'Gamification of a Kanban based online project management system' [1]

Our user study revealed that, despite its extreme popularity, Trello has a lot of room for improvement. Many of the users had problems with the system primarily due to the lack of three main behavioural traits:

- motivation
- self discipline
- proper communication

People also complained about distraction, management issues, poorly synchronized work, distribution of labor,team members respect and not enough emphasis on task deadlines.

Combining our user study with the research about motivation at work and the motivation drives, we found that a majority of the problems encountered by Trello users could be solved using gamification. We concluded our paper with possible suggestions and recommendations for gamification.

Gamification Frameworks

For creating the prototype, we used two different frameworks to understand and analyse the products and problems that we were solving with Gamification.

6D framework

We used the 6D framework [2] to find out, what exactly are the goals of introducing gamification for our project should be. It gives a clear framework defining the business objectives, what the ideal product should look like, activity loops and fun & tools.

The 6D framework is a design process with these six elements, steps or premises:

1. Define Business Objectives
2. Delineate target behavior
3. Describe your players
4. Devise activity loops
5. Don't forget the fun
6. Deploy appropriate tools

Business objectives of Trello

What are the business objectives of Trello?

- Increasing user productivity
- Attract more users
- Get the users to use the system regularly

Ideal user Behaviour

What does an ideal Trello user do?

- Create cards regularly for every major task

- Move cards regularly to show progress
- Assign members to the cards
- Add descriptions, due dates and labels to cards to organise the boards
- Finish the tasks before deadline
- Archive cards to keep the board from clutter

Players Types

As Trello is a primarily productivity tool, the primary user base is forced to become either of these two player types: achievers and socializers. Although there are opportunities in the system for healthy competition and exploration, player types like killers and explorers have almost no place in such a system .[3]

Activity Loops

There are mainly two activity loops in the new system and both of them are built atop the points system.

- Engagement Loop : This is the primary set of activities which keep the user engaged in the system. The users are rewarded points for every activity in the system and then we introduce a store to Trello where users are allowed to spend their points. Store will sell items that enables the user to actively engage with the system. This creates a loop where the user gains points by engaging with the system and spends it on items that further encourages for more engagement.
- Progression Loop : The progression loop is implemented using a Level system where a user can progress to higher levels, once he / she has acquired a particular amounts of points

Fun

By using entertaining micro-copy in the interface and selling engaging virtual goods through the store, we made the experience of using Trello more enjoyable.

Tools

We started gamifying Trello using the common gamification elements PBL,(Points, Badges and Leaderboards) and a progression system. But for further work, we used the Octalysis Framework.

Octalysis Framework

For implementing gamification elements into Trello, we used the Octalysis Framework [4] by Yu-kai Chou. It was introduced in 2014 and has gained some significant attention over the past year.

The Octalysis Framework requires work on several levels.

- Level 1: Finding the role of the core drives in the system
- Level 2: Designing the journey of a player through the system
- Level 3: Designing the system to fit the different player types

Although our primary focus was on the first level, we have also considered the 4 stages of a user journey. Level 3 is beyond the scope of this project but the system can be altered later.

Level 1

The first level is defining roles of the core 8 drives of gamification:

1. Epic Meaning and Calling,
2. Development and Accomplishment,
3. Empowerment of Creativity and Feedback,
4. Ownership and Possession,
5. Social Influence and Relatedness,
6. Scarcity and Impatience,
7. Unpredictability
8. Curiosity, Loss and Avoidance.

These 8 drives forms the 8 sides of the octagon of the Octalysis and are divided into two pairs of groups:

Left Brain vs. Right Brain Drives

- Left Brain Drives: Core Drives which have a tendency towards extrinsic motivation
- Right Brain Drives: Core Drives which have a tendency towards intrinsic motivation

White Hat vs. Black Hat gamification.

- White Hat Drives : Core Drives which are considered as positive motivations,
- Black Hat Drives : Core Drives which are considered as negative motivations.

Ron Bentata, a digital product critic in collaboration with the author of the framework, Yu-Kai Chou have also provided a tool for game & gamification designers to help analyse different systems. The tool, accessible at yukaichou.com/octalysis-tool/, allows designers to create a octalysis diagram of their system.

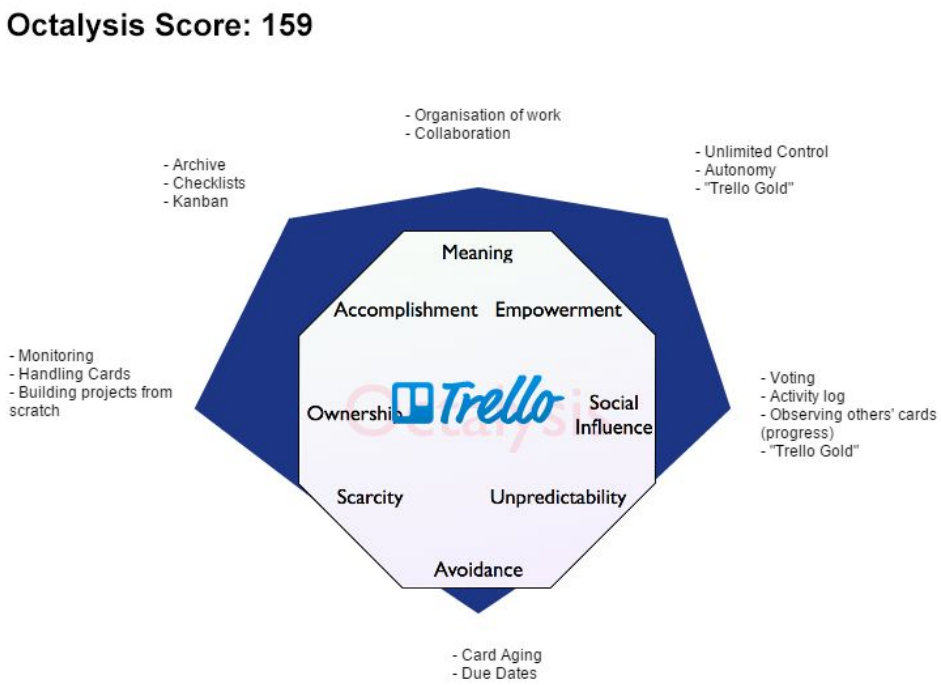


Figure 1. *Octalysis score before adding gamification*

We analyzed the current state of the system with the tool and found which motivation drives should be strengthened to make the system more engaging. The analysis showed that the system is heavily focused on White Hat Core Drives, which means users feel great and empowered but there is lack of a sense of urgency to commit the desired action. The tool also suggested that Trello has good balance of intrinsic and extrinsic motivational drives.

Building on the work done with the 6D framework, we added further tools to increase the other core drives esp. the Black Hat drives.

Scarcity	**Avoidance**	**Unpredictability**
Day Streak, Levels & Progression, Store	Inactivity punishments	Discoverable Badges, Unlockable content

Table 1. *Game elements & mechanics that we proposed which enhances the Black hat drives*

Meaning	**Accomplishment**	**Empowerment**
Micro-copy	Statistics, Levels Profile Development, PBL(User),	

Table 2. *Game elements & mechanics that we proposed which enhances the White hat drives*

Ownership	**Social Influence**
Profile Development	Statistics Team Leaderboards

Table 3. *Game elements and mechanics that we proposed which enhances the other drives*

Analysis of the Trello system after gamification revealed a significant difference. We were able to balance the white and black hat drives enabling an equilibrium across the system.

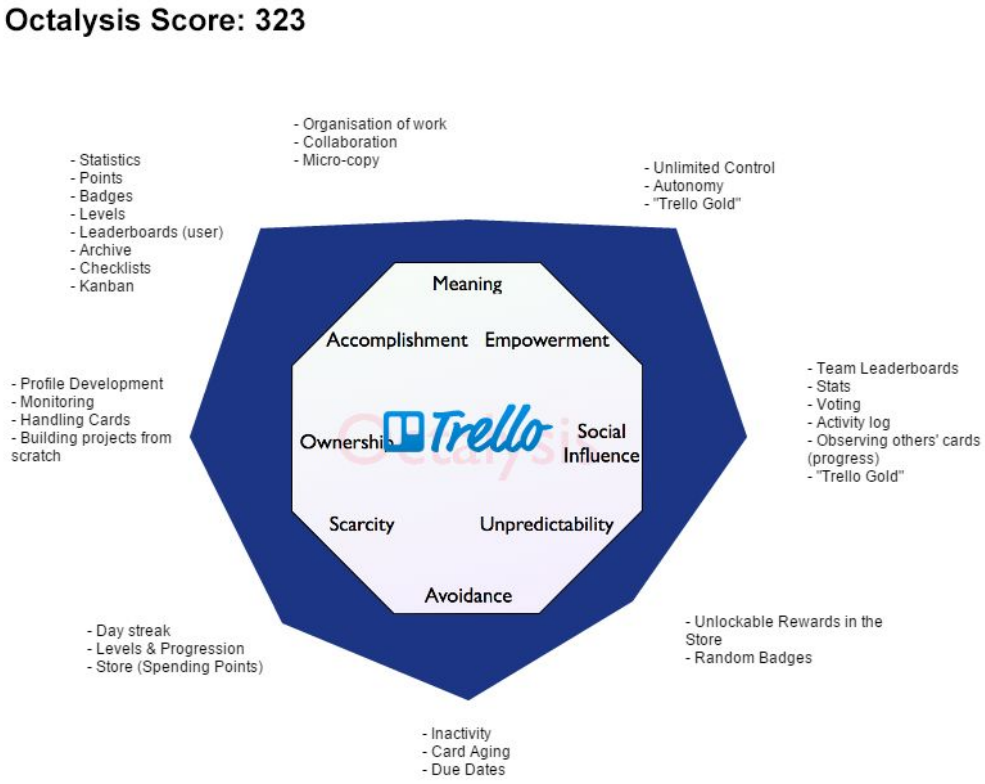


Figure 2. *Octalysis score after adding gamification*

Level 2

The second level of Octalysis is about analyzing the entire journey of a user through the system: from discovery, onboarding, scaffolding, to endgame.

The ‘discovery’ part of the Trello has already games and elements of gamification. There are games with the mascot of Trello and users are also encouraged to invite new members for what they get awarded with a feature called Trello Gold.

For the next stage, onboarding, we suggest a gamified initial board where the users will be guided through the most important features of Trello. They will see how many points they get for performing each action and at the end they will receive their first badge. The aim is to encourage them to try all the features of the system and to learn how to use the maximum out of it. The onboarding helps the user grasp, the value and the level of importance of each of these actions.

The third stage, scaffolding, is about the regular everyday use of the gamified system . We use several methods to motivate the users to perform their regular actions in the system. As was mentioned before, we use a engagement loop consisting of the players performing their everyday actions => gaining points for that => spending those points in the store. Then to get more points they have to perform actions in the system again. We have also added features that will enhance the drives like meaning, empowerment, social influence, unpredictability, avoidance, scarcity, ownership and accomplishment, which are described in detail in the table.

The last stage of the journey (referred to as the ‘endgame’), deals with the techniques that keep the players within the system (i.e. preventing users from leaving the system). We encourage the regular use of Trello, by deducting points for prolonged inactivity. This idea uses ‘avoidance’, (one of the core drives) and the longer they are out of the system, the more points they lose. Furthermore, a feeling of ownership for the created projects and the developed profile would also help keep the users in the system.

Gamifying Trello : Game Elements and Mechanics

Based on the paper ‘Gamification of a Kanban based online project management system’ [1] , and the 6D and Octalysis frameworks, here is a detailed review of all the game mechanics and elements that were used in our prototype.

Points

We made a list of all the possible actions a user can perform in the system and assigned them different amount of points, based on the importance of each action.

We also have several mechanics to control spam and abuse of the system, we propose a few limits for the amount of points a player could gain. We have also set a global maximum point limit per day that is 100 points in order to prevent abuses.

	Action	Points	One time limit	Limits (per day)
1	Creating a card	+5	-	50 points
2	Moving a card	+5	-	20 points / card
3	Adding a member to a card	+5	only once	2 Cards
4	Adding a comment to a card	+1	-	20 points /card (for both activities combined)
5	Adding an attachment to a card	+1	-	
6	Adding a description to a card	+1	only once	-
7	Adding a label to the card	+1	only once	-
8	Adding a due date	+1	only once	-
9	Adding checklist to a card	+1	only once	-
10	Creating a checklist item	+1	only once	20 points / card
11	Marking a checklist item complete	+1	only once	-
12	Finish a task before the deadline	+5	only once	-
13	Archiving a card	+1	only once	-

Table 4. *A list of points for activity on cards*

If people have only positive awards and no negative points, they lose the sense of urge and the system is not effective enough. This is why we have also introduced punishment points for inactivity. The users will not lose too many points so that

they do not feel pressured by the system, but they will still get an external sense of urge that could get them back to the system [1].

	Action	Points	One time limit
2	Inactivity for a week	-10	-
3	Inactivity for a month	-100	-
4	Inactivity for 3 months	-200	-

Table 5. *List of penalties for inactivity*

Badges

In addition to the points, the users will be awarded with badges for certain actions. The badges are divided in two groups - collectables and discoverables.

Collectables

Those are the badges that are constantly shown in the users' profiles. The users can see what they can win and what they should do to win them. Those badges are used to set goals and guide the users to perform useful activities in the system (for example, they will know in advance that they will be awarded if they create all their cards with a proper description, assigning labels and members to them).

Discoverables

Discoverables are the second kind of badges. Those badges also award the active users, but they are not shown in advance. We use them to give the users sense of surprise which is also important for an engaging system (according to the Octalysis framework).

The badges are divided into three levels - bronze, silver and gold. Bronze will be the easiest to be earned, but the gold ones will be very rare and they will be only for the most devoted users of the system.

	Bronze	Silver	Gold
Creator	Created 10 cards	Created 100 cards	Created 1000 cards
Active	Active every day for one week	Active every day for one month	Active every day for one year
Reliable	Moving cards every day for one week	Moving cards every day for one month	Moving cards every day for one year
Friendly	Commenting 50 times	Commenting 100 times	Commenting 500 times
Commentator	Commenting 10 times on cards to which you are not assigned	Commenting 50 times on cards to which you are not assigned	Commenting 200 times on cards to which you are not assigned
Meticulous	Giving a proper description for 25 cards (give name, assign labels, write description)	Giving a proper description for 50 cards (give name, assign labels, write description)	Giving a proper description for 200 cards (give name, assign labels, write description)
Archiver	Archiving 10 cards	Archiving 100 cards	Archiving 500 cards
Time keeper	Assign due dates to 10 cards	Assign due dates to 20 cards	Assign due dates to 50 cards
On time	Archiving 10 cards before the due date is over	Archiving 20 cards before the due date is over	Archiving 50 cards before the due date is over

Table 6. *A list of discoverable badges that can be earned*

Streak

We want to encourage the people to go back to the platform every day. This is why they are awarded for making day streaks. Streaks will multiply the points the user can earn.

To give realistic aims, not working in the weekend will not break the streaks. There will also be an additional number of days per year (around 30) which will be allowed to be used as “holiday”. This will give the option to “freeze” a profile in this time limit so that the streak does not get broken and also points do not get lost due to inactivity.

Days streak	Multiplier
50	2x
150	3x
500	4x

Table 7. *A list of the multiplier bonuses provided by streaks*

Leaderboard(s)

There are two kinds of leaderboards: team leaderboard and individual leaderboard.

The team leaderboard compares the overall points gained by an entire team for each board (representing a project) within an organization. This encourages teamwork and shows the importance of the contribution of each team member to the entire project.

The individual leaderboard is comparing team members within one board. Friendly competition is encouraged because it can motivate the people, but still the focus is not on this leaderboard. This is why it appears only in the settings of the board. According to our previous research [1] healthy competition could

motivate people, but it should not be too aggressive, because this will have the opposite effect.

Levels

To give the users a stronger sense of accomplishment, after getting a certain amount of points, they will be able to level up in the system. For balancing the number of points needed to complete a level, we used the progression loop, proposed in the 6D framework .

It is also important to mention that levels are based on the overall activity of a user in the whole system. This means that no matter how many points they have for each board, their level will be global and it will be based on the overall amount of points gathered in the system.

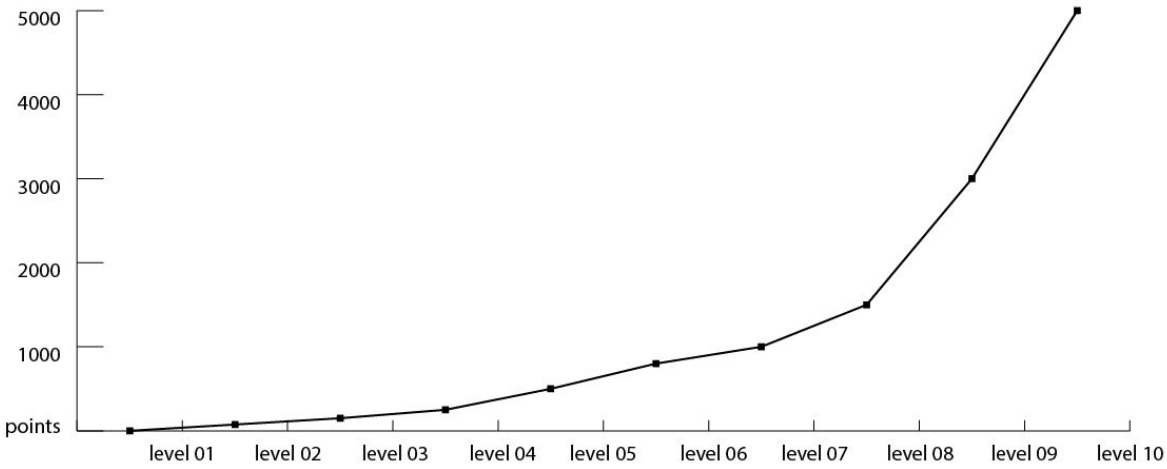


Figure 3. *Amount of points needed for each level in our system*

We based the required amount of points for each level on the gamification framework of Kevin Werbach. After each easier level, a harder one will follow, and then an easy level again, and so on. The only difference in our case is that the curve will increase much faster because the longer the users use the system the more multipliers they will get because of making streaks and they will start gaining points faster.

Gamifying Trello : Features

Turning Gamification into a power up!

Trello enables its users who use the boards to enable and disable features under the label ‘power ups’. Power ups enables the users to opt in or out from features they don’t really require. This makes Trello quite flexible and versatile. Currently features like Calendar, Card aging and Voting are included as ‘power ups’ in the system.
Our initial research has shown that Gamification can be ineffective to certain kinds of people. By making Gamification a power up, we allow the users to choose if they want to use it or not. For the ones that want to use it, it will be possible to turn this feature on and off at any time. It is important that the information about activity and earned points would be collected in the background, so that the system can stay balanced for the users that prefer to have gamification on and turning gamification on and off wouldn’t actually affect the system.

Trello Store

Trello store is the place where users can redeem their points by getting stickers, backgrounds for the board or other fun stuff. The store is a key point for closing the activity loop in the system as was discussed earlier with the frameworks. This way people will be motivated to perform actions (which is the objective of the prototype), get points and spend them. After spending them they will have to interact more with the system to gain more points and so on.

An important remark to be noted is that spending points in the store will not affect a user's’ level. They will be able to see the overall points they have gained and check how many of those were spent and how many have left for using in the store.

We are using the award system that Trello already has for Trello Gold. Here we award the activity with badges, custom backgrounds and extra storage space.

It is also important to mention that the store uses a subscription model for the transaction. The user does not own the items that were purchased from the store but rather gains access to them for particular amount of time. This enables the system to keep the user in the activity loop without actually introducing new items on regular basis. Trello Gold also awards the users only for certain amount of time and we will use the same time limit in the store. This means that people will spend a certain amount of points per month (or year) and they will be able to subscribe or unsubscribe from a certain feature.

Items	**Costs**	**Unlocks at Level**
Buying a new sticker	25	1
Uploading a custom sticker	250	2
Buying a new background	50	3
Uploading a custom background	500	4
Storage Space (250 MB for a month)	250	5
Save search	500	6
Storage Space (500 MB for a month)	500	7
Uploading custom emoji	750	9
Storage Space (250 MB for a year)	2500	10
Storage Space (500 MB for a year)	5000	15

Table 8. *A list of sample items that could be bought from the store*

Onboarding:

According to the levels in Octalysis, the Onboarding is the first stage where we can engage the users. This is why we suggest introducing a gamified interactive walkthrough for the new users. An example welcome board already exists in the system. It is a list of the most important action a user can perform in the system.

We are revamping the welcome board: the new one will be a sample board for practice after signup (2-5 mins walk through) and then the user will get achievement points and a badge. This will be useful for:

- teaching the most important actions a user can perform in the system
- learning how many points are given for each action and this way showing which actions are more important
- it is also important to make the intro skippable
- the users can go back to this board at any time and continue
- there will also be a reset button, so that the exercise can be performed again if necessary

After going through the onboarding the users will be able to choose to turn gamification on or off. They will also be able to do that at any moment later from the power ups menu.

The following actions would be taught in the onboarding process are:

- Movement
  - Add yourself to the card
  - Move the card to “Doing”
  - Open the card and check the tasks
  - Move the card to “Done”
  - Archive the card
- Creating a new card
  - Create a new card (in the first list)
  - Add a description
  - Assign yourself to the card
  - Assign Sample Member (or Taco, the trello dog) to the card

        - Add a label (choose the “test” label)
        - Add a checklist
        - Add list items
        - Add a comment
        - Set a due date
    - Showing the gamification power up and the option to disable it (it can be turned on or off anytime)

Analytics

Although analytics are not part of game elements or mechanics, they are extremely useful for motivating the users and even for gamifying a system.

Using Analytics

Data generated by analysing the user activity on the system is a key for using game elements.

Presenting analytics to a user : Personal informatics

Presenting the data generated by the user’s activity can motivate the user to work more efficiently on Trello.

For example, presenting the number of card movements as a visual representation helps the user understand the quantity of work done over a period of the time.

A user of the system will be able to see the analytics data for three different sets of activity data.

- personal activity : a comprehensive view of all the activity of the user in the whole system
- board activity : a comprehensive view of all the activity on a particular board by all its members.
- organisational activity : a comprehensive view of all the activity, on all of the boards of an organisation by all its members.

For this version of the prototype, we have chosen mainly 7 data points to be presented to the user in the form of graphs and statistics.

1. points earned
2. cards created
3. cards moved
4. cards archived
5. comments
6. how many days has everyone worked
7. overall activity and daily streaks

Creating the prototype.

The prototype was designed using Adobe Photoshop and Adobe Illustrator.

Studying Trello and Planning

The first step in creating the prototype was to study the working of the entire Trello system. We studied the user interface of the website and the different kinds of interactions that are available in the system.

Creation of assets

We created a set of icons for the new gamified interface and also a small set of the important badges that will be shown in the system.

Figure 4. *Badges added to the prototype.*

Redesigning the existing UI

After activating the gamification power up, there will be some changes in the existing user interface. First, the top bar will be changed. Next to the profile image and name a number of overall points and the days streak will be displayed. Those are going to be the most important statistics and this is why they will be visible all the time in the system. They are important because we want to encourage everyday activity and regularly using the system and those streaks will lead to more awards for the active users.

Furthermore, a statistics tab will be added to the settings pages for an organization and an individual user. Badges will also be added in the statistics page and on the home page. On the board page a leaderboard button will be added, as it has no special settings page.

Creating new pages

Furthermore, several additional pages had to be created.

One of them is the Store Page. As we have already mentioned it is a very important page as this is how we close the gamification loop. On this page the users will find cards with the features they can subscribe and a graphic representation of the points that were earned and spent.

Another page that had to be created was the board statistics page. As the board does not have a separate settings page like an organization or a user, a new button on the board will be added and it will open a new window with board statistics.

Future

According to the fractal interest curve as illustrated in Figure *5*, we plan to introduce the gamification layer on Trello in several stages.

In the first stage, we propose:

1. Onboarding (gamified)
2. Statistics

3. PBL
4. Store for subscribing features

For the next stages, we can develop this gamification layer further. For the first stage we used Level 1 and Level 2 of Octalysis, and for the next iteration we can use Level 3 of Octalysis. This means that we are going to think in detail how to motivate the different types of players that are using the gamified system.

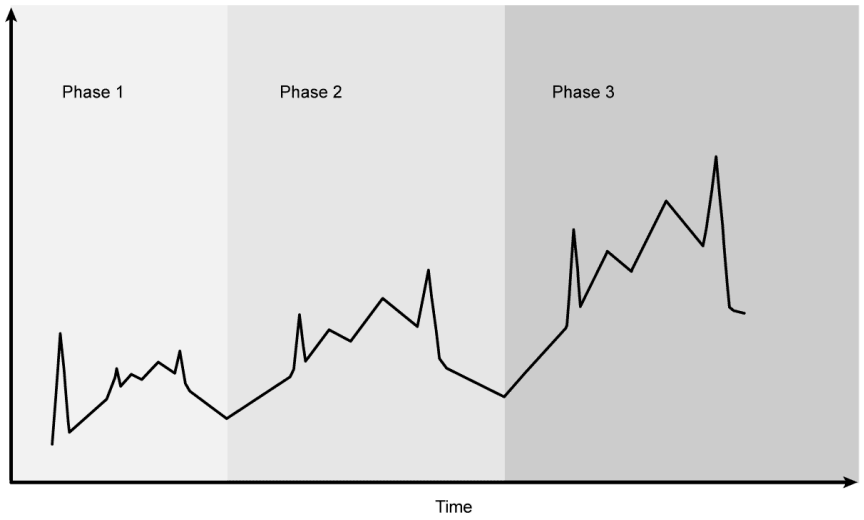


Figure 5. *An illustration of a fractal interest curve as explained by Jesse Schell [6]*

Features to be implemented in the next phases

Badges on Boards (Team Badges)

In order to encourage collaboration across the team members, it is important to reward achievements accomplished together as a team.

Example: All the members in a team (using a particular board, not the organisation) would receive a badge when the total sum of the points from the board reaches a 1000 points.

Time tracking as a subscribable power up

Although plugins have been created to support this feature, an integrated time tracking is a much requested feature among Trello users.

Our suggestion is that the users should not worry about starting and stopping timers. There can be one list as the “Doing” list and when a card is moved to this list the time tracking should start. This will have two positive effects: the tasks will be easily tracked and no cards will be forgotten if the timer will show how long time they have been in the list.

Acknowledgements

We want to dedicate our acknowledgment of gratitude towards the following significant advisors and contributors: We want to thank Jan Broer for his support and encouragement. We also want to thank Vitaliy Filipov who kindly provided helpful comments on this document and offered a lot of valuable advices on the prototype.

References

1. Gamification of a Kanban based online project management system; Denitsa Todorova, Arun Geo John, Nima Zargham, Abdullah Noman, Alex Fehler; (2015)
2. 6D Framework designed by Kevin Werbach
3. Hearts, Clubs, Diamonds, Spades: Players who suit MUDS by Ricard Bartle http://mud.co.uk/richard/hcds.htm
4. Octalysis Framework by Yu Kai Chou http://www.yukaichou.com/gamification-examples/octalysis-complete-gamification-framework/#.VcSOQ6aqpBc
5. Trello website
    a. https://trello.com
    b. https://trello.com/about/branding

c. http://help.trello.com/article/817-trello-gold-user-guide

d. https://trello.com/gold

e. https://trello.com/taco-out

f. https://trello.com/taco-game

g. https://trello.com/b/nPNSBZjB/trello-resources

6. The Art of Game Design by Jesse Schell