# Affordances and structures of risks and rewards: A case study of Clash Royale

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## ABSTRACT

A good gameplay analysis must consider the dilemmas that appear during the gameplay. Therefore, new dilemmas may appear every single game played and the lack of methods to analyse patterns in those dilemmas is a common problem amongst game designers. This current method utilizes a structure of risks and rewards to understand the balancing in the game, also how the knowledge about the affordances present in the game can evidence the playskill. For this case, the game "Clash Royale" that is a popular player versus player game can be helpful by methods of how players battle for a single objective, beating their opponent. "Clash Royale" was developed by Supercell for mobiles. Nevertheless, the affordances that appear during the gameplay do not bring complex schemes. For that, we can visualize the risks and the rewards of each affordance during the game. This method, which analyse affordances together with the risks and rewards structure of the game not only analyse how the affordances work, but also how those affordances works can directly relate to how the game balance work. For this article, we are going to analyse a specific match from the championship series provided by the developer of the game.

**Keywords**: Game Design, Game Structures, Risks and Rewards, Affordances, Clash Royale, Game Analysis.

## **1 ANALYZING AFFORDANCES**

Affordance is a property of the objects to afford an interaction and we can notice it by the sense of vision. For example, if you want the player to click a button, first you have to make the player notice the object that have this affordance (to click). If this button does not look like a button, you are probably going to have to make it look like one. Nevertheless, sometimes designers can use this to play tricks in the players, for example, making a faux button, so when the player click above it nothing happens. [3] [2] However, in this analysis we are not going to talk about how to make it easier to visualize an affordance.



We are going to analyse the mechanics of the game; the affordances will be a tool that we are going to use to take notes of those mechanics. For that, we must not take notes on every perceived affordances during the game, but only the affordances directly related to the mechanics of the game. [1] We want to find patterns between the perceived affordances, to evidence how the mechanics of the game relate to them. For example, we can divide then in "affordances noticed in the scenario" or "affordances noticed in the character" [7] as it was done in previous works and even create smaller groups after this like "affordances that makes the character moves" or "affordances that makes the scenario changes" like on previous works. [5] This help us to understand the core of the game or even its rhythm.

This kind of analysis results in the following scheme. (figure 1)



Figure 1 : A generic scheme of the method

It is important to remember that some games cannot fit in this scheme, for example, "god games" or "strategy games" sometimes does not have controllable characters and only have the section "Affordances Perceived in the Scenario".

## **2** THE METHOD AND MATERIALS

Resuming the method, first we playtest, then we take notes on a list, then we create schemes from the notation, then we further

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analyze the data utilizing the fundamentals of the game design. [1] The materials we need to try this method is a game, notations tools and some gaming experience [1].

To analyze the affordances of a game we need the game to be in a playable state. If the game is not finished, a prototype can be helpful. Once we are able to play, we can begin noticing the affordances and taking notes on every affordance. This process can be extensive depending on the kind of analysis we are doing, we can do it in parts, as we did in this paper, or we can make a full game analysis.

After, when we finish taking notes of the affordances we can begin by creating schemes as we saw in the first figure (figure 1). Those schemes are helpful for making it easier to visualize and to understand the relations between the game affordances. Therefore, when we finished schematizing we can start to notice in those schemes if the affordances are relating to each other the way that the designers thought about it or if it those affordances have problems of interactions. However, it is important to think about the fundamentals such as, rhythm, challenging levels, player experience and fair play. Because, if the game has problems with any of that the game has to be improved, by that, we mean that the game has to be reprogrammed and then designers can use the schemes and the notations to explain to the programmer of the team those problems found during the analysis.

It is important, as designers, to think about the game always as an unfinished status that can be improved by reprograming. Designers can analyze the game multiple times and still find new affordances that happens because the real affordances, all the affordances in the games, are a massive number of data comparing to the affordances we can notice.[2] However, it does not means that the game cannot be played and published as well. Once you publish a game, it is impossible to control the ways that players will understand the affordances. Therefore, if we use recorded data from other players to take notes of the affordances, instead playing the game yourself, can be also a rewarding experience. [4] Finally, after the analysis of interaction we can start to analyze if the game is challenging. For that, we can use the structures of risks and rewards.

## **3 STRUCTURES OF RISKS AND REWARDS**

The structures of risks and rewards fundaments the dilemmas that players face during the gameplay. Therefore, in a balanced game the rewards must match the efforts of the risks that the players are willing to face. [10] [6] Designers should think about making players to choose between playing it safe for a low reward or taking risks for a big reward. Creating those dilemmas will make your game more challenging and interesting. [9] It is important to remember that a good gameplay somehow relates to how much the players think it is challenging their abilities. [1] For that, designers must think those dilemmas through their relation with the fundaments of game design. "Art of Computer Games Chris Crawford, explain those fundamentals. Design" Resuming quickly, they concern in making a game that has many information for the player balance, a rhythm for the player do the interactions during the time of the gameplay and trying to aim into a challenging gameplay. [1]

#### 3.1 Case of a simple choice dilemma

The dilemmas created by the designers should make players to choose between the affordances of the game. Therefore, those

dilemmas can form patterns during the gameplay. For that, we must analyze the most common patterns.

The first dilemma scheme is to make player to choose one affordance between two or more affordances. For example, in a game of evens and odds the first rule is that players have to choose between even numbers or odd numbers. Therefore, we are telling players that they have to choose between two affordances "choosing even" (Affordance A) or "choosing odds" (Affordance

B). The following scheme represents this simple dilemma (figure 2).



Figure 2 : A scheme for simple choice dilemmas

#### 3.2 Case of multiple choices dilemma

Multiple choices dilemma instead of make players to choose one affordance between two or more this dilemma affords that the player choose one or more affordances between a number of affordances. As videogames are a time based medium, the order of the choices are also important, so choosing the affordance A first then the affordance B sometimes results in a different reward than choosing affordance B first and then affordance A. The following scheme (figure 3) represents those cases of multiple choices dilemma.



Figure 3 : A scheme for multiple choices dilemmas

## 4 ANALYZING CLASH ROYALE AFFORDANCES

Once we understood the method we can begin analyzing, this following analysis is an example of how it should look like. Clash Royale is a game designed for touch screen technology and developed to for a Philippine company named Supercell. The classic game mode is a battle arena between two players.

The main mechanical action that the player commands during the gameplay is a movement of dragging a card and pulling in the arena to battle. It can seem a simple affordance "dragging and pulling" but in the interface of the game, we can visualize data that create dilemmas for using this simple affordance.

These affordances we can perceive utilizing the schemes from this methods, creates a structure of patterns, which in turn indicates the rhythm of the affordances, the main cards patterns of affordances and the affordances available in the scenario. [7]

We can perceive these patterns by taking notes of the affordances visualized during the gameplay. The attempt is to write short resumes without using mathematical statics, these technics of game notations utilized in the iterative design method by the means of helping the designer to instruct those data of interactions to the programmer of the game. [8]



Figure 4: Scheme based on the Clash Royale Affordances

In the superior scheme (figure 4), we can notice how to group affordances by patterns found in the graphic interface of the game. A page of the interface group up the Shop Affordances. Another page of the interface group up the Battle Arena Affordances. There is a page in the interface of the game for Deck Managements Affordances and other two last ones of Social and Tournament Affordances (figure 4).



Figure 5: Scheme of Battle Arena Affordances

Inside the Battle Arena Affordances (figure 5), we can visualize the rhythm of the game as soon as we start an analysis. The perceived affordance of visualizing the elixir loading in a pink bar (Affordance G, table 1) is an affordance that marks the time for players to use the cards. Therefore, these affordances of the rhythm are linked to the affordance of the Cards (Affordance E, table 1).

Α	Visualize Battle Data (Hit points of characters)
В	Visualize Structures Data (Hit points of constructions)
С	Visualize Rewards (Spoils earned in the end of battle)
D	Visualize The Type of Card (Common, Rare, Epic, Leg.)
Е	Visualize The Cost of Elixir (From 1 to 9, min. to max.)
F	Place the Card in The Arena (Dragging and Releasing*)
G	Visualize the Amount of Elixir (From 0 to 10, min to
	max)

**H** Visualize the Chronometer of the Game

Table 1: The Battle Arena Affordances and their interactions

It is important to designers explain to the players the relation of those affordances (G, E). For that, the designers can group by positioning close to each other in the interface, as we can see in the image. (Figure 6) The pink elixir-loading bar and the respective costs of elixir in the cards.



Figure 6: The pink loading bar of elixir and the card costs

## 4.1 Analyzing Recorded Data from a Championship Game

Nowadays analyzing recorded data and player's dossier is an important tool for designers and programmers of games. "With game analytics becoming a major factor for game developers player dossiers are the converse analytic systems built for players. These systems provide new spaces for players to congregate and use visual tools to gain insights from their recorded gameplay". [4] In the following schemes, we can visualize the results of an analysis of affordances inside the Grand Final from the Championship of Latin America.



Figure 7: Cards used by the player "Atchiin"

In the image (figure 7), we can visualize the cards used by the player named "Atchiin". The deck, as usual brings eight cards, the average cost of the deck is. The average cost can be calculate as 3.8, we can use this online tool to consult average costs "Clash Royale Deck Builder (clashroyaledeckbuilder.com/build).



Figure 8: Cards used by the player "Adrian Piedra"

In the image (figure 8), we can visualize the cards used by the opponent player named "Adrian Piedra". The deck average cost of elixir in the deck cards is 3.0. We can visualize some dilemmas of simple choice that the players choose, by how they managed the decks. The player "Atchiin" takes more risks utilizing a deck that has a superior average costs, as well, if we think about that rewards should match the risks a good gameplay can bring high rewards for a player who chooses more risked decisions. [10] The winner of the match was "Atchiin" and he took the prize and the trophy for the country of Brasil.

## 4.2 Analyzing the Dilemmas of Risks and Rewards from the Championship Game

During the gameplay, we can notice that is possible to combo affordances of the cards if you have the required amount of elixir that the cards costs. Therefore, we can analyze the dilemmas in the champion deck of the final match, managed by the player "Atchiin". For this short analysis of dilemmas, we named the cards from "A" to "H" and input their respective elixir costs in the chart. (table 2)

| Card |
|------|------|------|------|------|------|------|------|
| A    | B    | C    | D    | E    | F    | G    | H    |
| 9    | 6    | 4    | 4    | 3    | 2    | 2    | 1    |

Table 2: The cost of elixir in the cards of the player "Atchiin"

If we suppose that, the player has a full elixir bar and the following cards costing, nine elixirs, six elixirs, four elixirs and two elixirs we have the following situation. (table 3) We can notice that the card "A" brings only one multiple choice available, that is to combo with the card "H" (table 3) if the card "H" is not available the player has to wait the elixir load to use the next card. Making the affordance to use the Card "A" an link for a simple choice dilemma where players can only choose one affordance as answer.

Inputed	Allowed	Blocked	Blocked	Blocked	Blocked
9 Elixir	1 Elixir	2 Elixir	3 Elixir	4 Elixir	6 Elixir
Card A	Card H	Cards F,G	Card E	Cards C ,D	Card B

Table 3: The risks and rewards of using "Card A" (table 2)

## **5 CONCLUSION**

During the process of designing a game the designer has to work in a team with the programmer and the artists, we can easily visualize it by the affordances of the games. [8] The designer has to be able to analyze the systems created by programmers and give them a feedback of his work, this method of schematizing the affordances can be a very helpful tool for improve the communication between the designer and the programmer of the team.

This method still can improve by programmers, using theory crafting, a method that brings math to the equation of the affordances to analyze the data of the decks and balancing the card affordances. However, we can notice that to visualize the dilemmas in a gameplay we do not need to make calculations, the ecologic perception in our sense of vision is enough for designers to extract the necessary data to give a feedback to programmers.

The affordances and the dilemmas noticed during the gameplay, all the schemes notations if modified create new dilemmas, and this can be a helpful tool to the designers. Therefore, designers together with the programmer can input new game mechanics through the managing of the affordances that will be available in the interface.

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