MDA DATA DESIGN ANALYSIS: CATAN

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Introduction

The game of *Catan* was originally created by Klaus Teuber and published in 1995 as a multiplayer strategy boardgame for 2-4 players. The game we will specifically be looking at is the digital adaption of the game for PC on *Steam,* titled *Catan Universe* , applying the MDA framework to analyze the game, and delving deeper into the data design of it, starting with aesthetics , moving on to dynamics, and then mechanics.

Aesthetics

Using MDA we take a look at the aesthetics of *Catan Universe.* The game's most prominent aesthetic components focus on Challenge as well as Fellowship.

Challenge forms through the randomization of the board at each match, resulting in a differently laid out playground, wherein the player must decide the course they chose to overcome the obstacles(which win condition will be pursued?) in the way of being the winner. T

he Fellowship aspect is also very important in a strategy game like *Catan*. Managing relationships between players is crucial. In almost every game, players will find themselves lacking one resource or the other, making trading with other players the best option, given the high costs of dealing with the bank. Players aren't just going to trade with you if you've robbed them 3 times and blocked off their route, so there is a psychological social game being played here as well.

Dynamics

Catan handles dynamics through use of things like the store and placement system. As players play, they will begin to notice trends in the way people play, and look at different options based on an enemy's perceived route to victory. For example, you'd want to block the road of anyone seemingly attempting to win by having the longest road.

The layout in which players place their initial settlements, as well as the value they find of certain resources in a game, drastically changes the way in which the game will be played, and the win conditions possible. Someone with no brick hex's at the start of the game may avoid longest road due to the brick cost, but may instead pursue harbormaster win condition. These emerging dynamics, ones that shift with each game, ultimately push the strategic element of the game even further, resulting in more experienced players playing longer and more challenging games than casual players.

The game uses 2 6sided dice to distribute resources, the number rolled producing resources for all players with a settlement attached. The odds of dice rolls are fairly well documented, with the highest appearing number being 7. While catan does indicate the odds to the player through the tiles on the board and dots indicating high odds, it is still up to the player to determine a strategy from the randomized board layout and these high value spots. A heavy flowing resource, for example, does not have to be personally consumed, it can be traded to other players or the bank, and the variety of decisions like these connect the dice based randomness to the idea of resource management.

The emergent dynamics of the game greatly allow for varying playstyles as well, but also hint to the player that they should probably know a little about everything to be safe from the randomized scenarios. Given that Victory Points are the win condition, how you meet this goal is irrelevant. Catan offers players paths to victory through things such as longest road or harbor master, and

focusing on these objectives allows for more points through a combo like system, where the sum is greater than the parts. However with this chance for great reward comes great risk. Someone disrupting another player's longest road can force them to switch their strategy entirely, or a player taking a harbor needed for the harbormaster win condition. Players can also win by simply expanding their settlements across the board and spreading out upgrades, however the difficulty of this is usually higher, and not feasible in conditions where enemy players have the space to expand as they please to suit their decided win condition.

Mechanics

Catan consists of a few primary mechanics that drive the game. Resource management, Placements, Trading, Card drawing, and the system of randomization for the dice and board layout.

The initial randomness that we are introduced to lies in the board itself. *Catan* randomizes the map each playthrough, shifting around each of the 19 hex tiles to form 1 of well over a trillion combinations. This randomness means that the game is practically never the same, as the shifting values in resources also create games that learn further towards certain win conditions. A game with very little brick will most likely have players shying away from building for the longest road(as roads require brick), but may rather go for other achievements related to the harbor or maxing out cities(which uses 2 grain and 3 ore).

The placement of pieces in catan is fairly simple, with few restrictions in the way. Players can only place settlements where a road leads(aside from the game setup), and each settlement must be at least 2 roads away from any other settlement. Players may also only unlock the effect of a harbor by building a settlement on the harbor spot.

The resource management component closely links with that of the dice and board layout, in that resources are handed out based on dice rolls(and players settled on that hex). Understanding the odds of rolling each number and playing for settlements on high odd hexes, allows the player to envision more strategies and better plot out routes to victory. It also creates a sense of tension. Knowing that the robber has the highest chance at appearing, can affect the cards the player plays when reaching 8 cards in hand(as anyone equal to or above this number allows the player to be robbed, discarding half their cards).

The game also increases in scale as it goes on, progressively making each round more complex. Settlements can be upgraded to double the production , producing 2 resources on a dice roll instead of 1. There is also an increase in settlements and the option for harbors(which reduce bank trad costs in various way. E.g halving trade cost, 4-->2), which decrease trading cost to the bank, something that can become a very valuable asset in the late game, when trading needed cards to the enemy can result in their victory. At the beginning of the game, resources are fairly easily traded back and forth, but during late game, when production is happening at a far higher rate, trading becomes an option for spying on another players resources, as well as becoming a risk, forcing the player to consider the cost of giving an enemy a resource they need.

Now for Trading, the value of which cannot be understated. As can be seen by now, each component of catan is linked and has adverse effects on the other. Board placement and progression effects resource production, resources open the option for trade and expansion, expansion then leaves the door open for things like harbors, which reduce the trade cost of resources. This now means the player will trade less for more, but also means they will consistently

have more cards, putting them at a higher chance of being robbed, but the player is now also opened up the option to trade with the bank for scarce materials at a cheaper price. This can also be compounded. For instance, "?" Harbors provide a 1 trade cost decrease to a random resource from 4 down to 3, e.g. a harbor for wood means only 3 wood is now needed to attain any other resource, as opposed to 4. Adding a wood harbor would then further decrease this by 2, making it a 1 to 1 trading ratio, which means in the late game if the player has large amounts of wood, they essentially have access to every resource through the bank, while still earning those other resources naturally from the board.

Lastly we have the cards. The cards play a large role in catan, adding to the randomness of the game through card drawing from a shuffled deck, but adding strategy in the way these are played. The cards vary, from allowing the robber to be moved to steal an enemy's card, to free victory points, roads, and resources. At the right time, these cards can change the odds of the game, however they do require a decent amount of resources to purchase, so there is a risk reward tradeoff as the player has no idea of what they might draw. The deck itself is also interestingly a component that can solely allow the player to win the game. By collecting enough Knight cards, the player can win by attaining an army worth of victory points. This just adds to the amount of strategies that can be used in catan.

Conclusion

The game of catan is clearly very nuanced, with its inbuilt randomness adding to the replayability of it, and forcing the player's to think and adapt in real time to strategic decision made by the enemy . Catan has gone through 5 major published iterations, changing, improving, and evolving as it did, and with such a complexly linked system of changes, it is clear that balance through testing and iteration is a necessity in producing a game with good feel to a player.

Bibliography

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