Board Game Design Project

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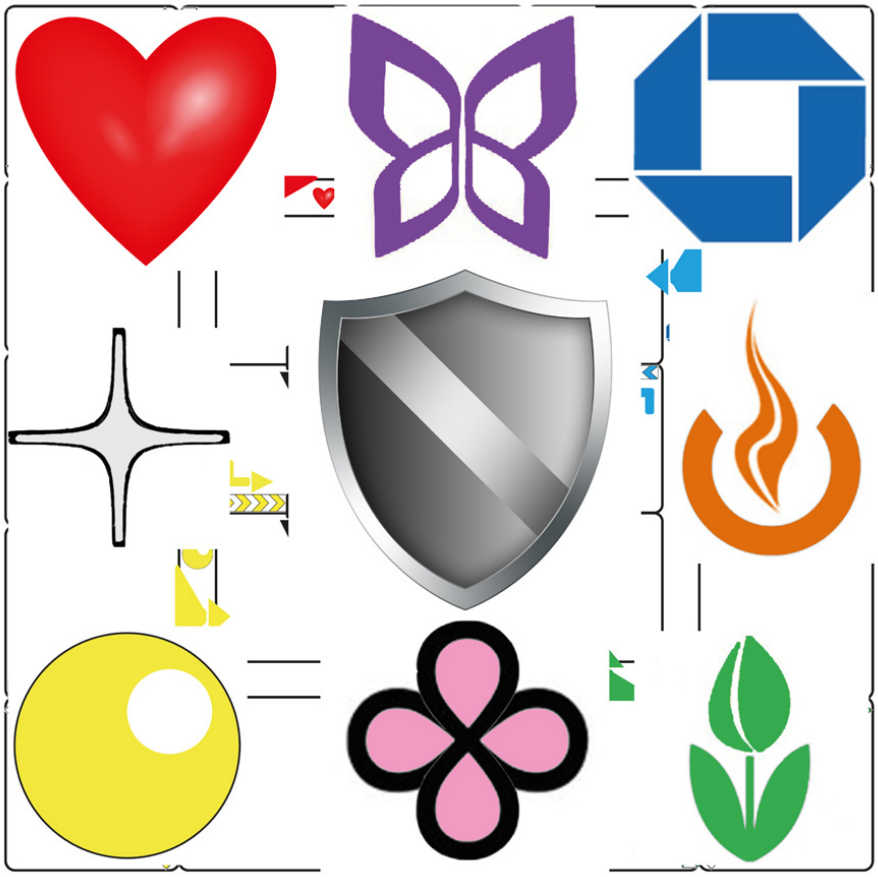

Tower of Hanoi

- the board game

Documentation & Illustration by

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1. Goal:

Create a new board game within an hour.

2. Background:

As part of a team building exercise, we were asked to design a board game within an hour. We were given a choice of different looking coins, totems and toys. The condition was to design the game around the toy(s) that we choose, i.e the toy should be the core element of the game.

3. Motivation:

As a team, we came to an agreement soon enough about the demographics for our game. We unanimously decided that we wanted our game to be played by Adults. We understood that a board game for adults would be enjoyed when it had a nice balance between Chance and Strategy.

4. Brainstorming:

Our initial brainstorming was about choosing a toy that intuitively had a strategic element to it. We believed that the toy's significance in our game should be self-explanatory to the players. We soon found such a toy - a set of Ice-dice Pyramids. Ice-dice is a press-your-luck type action dice game which uses five sets of small glass pyramids.

The set of stackable-pyramids

- Ice-Dice pyramids are a set of glass pyramids of five different colors - red, blue, yellow, green and black.
- For each color, there are three stackable-pyramids of different sizes. The smallest pyramid fits perfectly inside the bigger one, which inturn fits inside the biggest one.
- For each color, the three pyramids can be stacked on to a single pyramid unit.

4.1 Tower of Hanoi:

As soon as we started playing around with the pyramids, we were reminded of the mathematical problem - Tower of Hanoi.

[Refer the link - http://en.wikipedia.org/wiki/Tower_of_Hanoi]

Figure of the model set of Tower of Hanoi

'Tower of Hanoi' puzzle consists of three pegs and certain number of disks [usually 3-7]. The disks are of different sizes stacked bottom up from the biggest to the smallest. The objective of the puzzle is to move the entire stack from one peg to another. The main constraints are

1. Move only one disk at a time.
2. Each move is about taking the topmost disk from one peg and put it in the desired peg which is empty or over all the disks that may already be present on that peg.
3. No disk can be placed over a disk smaller than it.

4.2 Main Features:

This puzzle's constraints were applicable to the stackable-pyramids too, which formed the basic inspiration for our game. Soon we had a list of features that we wanted in our game.

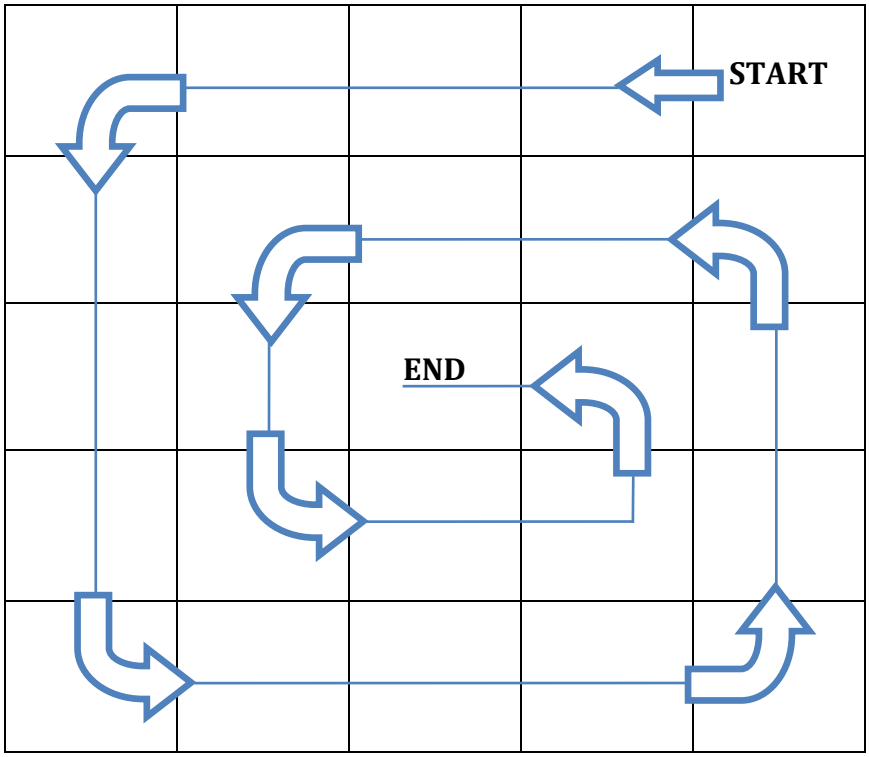
- Each player is supposed to move the entire stack of his pyramids from the starting-point to the destination
- For every move, the player can move only one pyramid.
- A player can place a pyramid either in an empty space or over a smaller pyramid [Pyramids fit over each other based on size]. He cannot place the pyramid in a space already occupied by a pyramid of the same or bigger size.
- We wanted to use dice for our game to bring in an element of chance.
- Each player's decisions should either hinder or help the other player's chance of winning the game.
- So, our game space should enable players to have a higher degree of interactivity.

4.3 Game space:

As we brainstormed about our game space, we decided that we wanted a game space which was not linear. The main reasons were

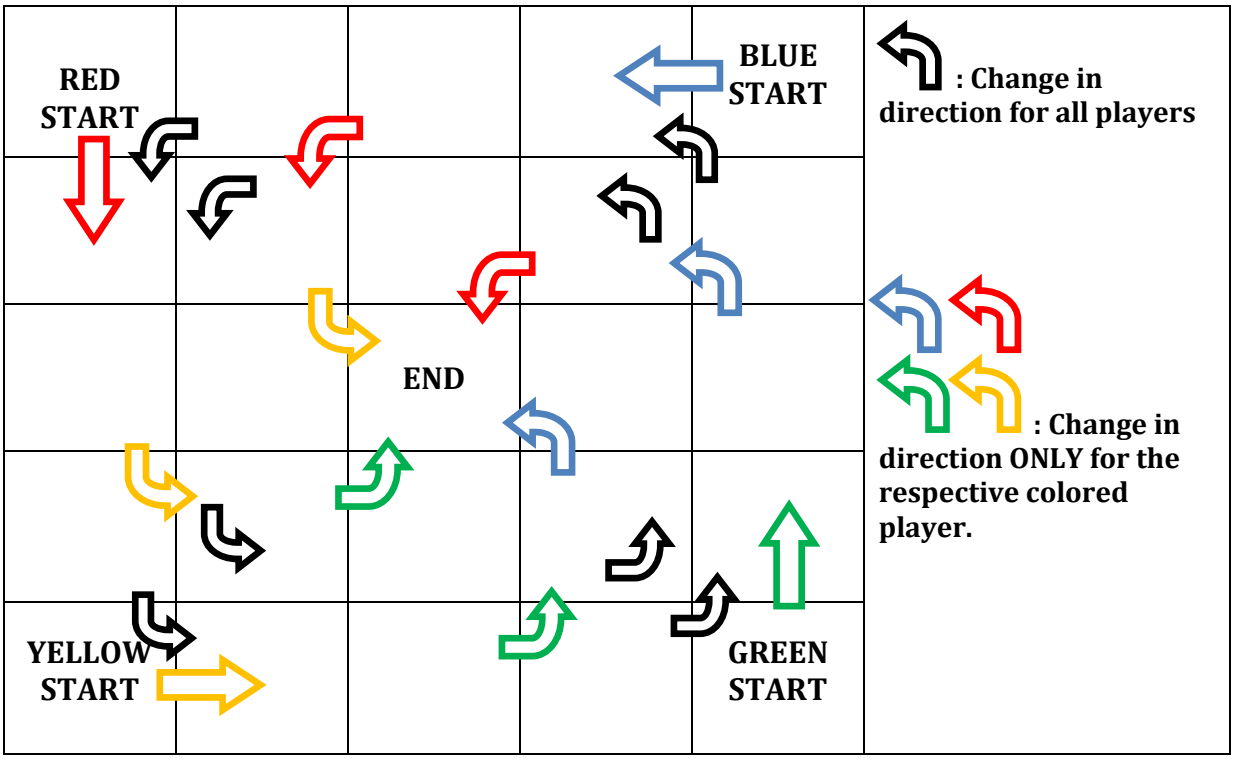
- A linear game space would make the game essentially a race. A race-like-board-game would not sustain players' interest for long.
- A linear game space also limits a player's chance of interacting with every other player. A player can interact only with the players closer to him in the game space.

Hence we decided to have a game space that spiraled from the start to the end. Our initial sketch is essentially a 5x5 square.



Rough sketch of one player's game space

If this is the path for all players, then the game space becomes linear again. Instead, it would be really interesting if this is the path for one player, while the remaining three corners serve as the start-tile for the other three players. So each player would have his own path, which is shared most of the time with the other players and not shared at other times.



Rough sketch of the entire game space

5. The Game:

Having nailed down the game space and the features that we wanted, we were able to complete the design pretty soon. After two play-tests, we had the game-play down to the detail.

5.1 Players

The game can be played by 2 to 4 players, though ideally 4 players would ensure the most fun.

5.2 Average play time

The game takes about 45 minutes to 1 hour to complete.

5.3 Checklist

A D6 die and 3 stackable pyramids of different color for each player. Refer the link to download the game board image - [http://www.moreaboutmohan.com/uploads/hanoi_normal.pdf]

Figure of stackable-pyramids

5.4 Goal

At the beginning of the game, the player's pyramids are stacked over each other near his start tile. The first player to move all his pyramids from the *Start-tile* to the *End-tile* wins and the game ends there.

5.5 How to play

1. The players choose the color of their choice and stack their colored pyramids near the their respective *start-tile*.
2. The youngest player starts the game and the game continues with others in clockwise direction.
3. During each turn, a player rolls the die. The player counts the tiles and moves one [and only one] of his pyramids forward directly into the tile as indicated by the die. The pyramids that may be present along the path of tiles , don't matter while the player makes his move.
4. When a player's pyramid has completed one complete round in the outer loop of tiles, the pyramid can be moved into the inner loop of tiles. Refer the game board image for the respective path of each player.
5. The middle pyramid can enter the *End-tile* only after the smallest pyramid. Likewise, the biggest pyramid can enter the *End-tile* only after the middle one.
6. The game ends when a player moves all his pyramids into the *End-tile* in the right order.

5.6 Constraints

The following game-constraints have to be followed throughout the game.

1. Only one pyramid stack can occupy a tile at any time.
2. A player can never move a pyramid into a tile occupied by a pyramid of bigger size [bigger only], irrespective of which player the pyramid belongs to.
3. A player can move a pyramid into a tile occupied by a pyramid of smaller size, by stacking it over the smaller pyramid, irrespective of which player the pyramid belongs to.
4. A player cannot move a pyramid which is captured by a bigger pyramid stacked over it, unless the bigger pyramid is moved.
5. If a player's pyramid is captured by a bigger pyramid of another player, the player has to wait for the bigger pyramid to be moved. The player can instead choose to challenge his own pyramid against the other player's pyramid. [Refer the next section for challenge mode]. If the player does not want to challenge, then he can continue to wait.
6. If a player decides to move a pyramid into a tile occupied by a pyramid of the same size, he by default, challenges his pyramid against the other player's pyramid. He can choose to move another pyramid of his, if he doesn't want to challenge.
7. The player HAS to move one of his pyramids for the entire number of tiles indicated by the die. He can neither skip a turn by choice nor move a pyramid for fewer tiles than indicated by the die.
8. On the other hand, the player has to forfeit his turn, if he does not have any pyramids to move, as indicated by the die. This can happen during one or more of the following conditions.
    - His pyramid(s) is stuck near the *End-tile* waiting for a smaller pyramid to enter first (and/or)
    - His pyramid(s) is captured by bigger pyramid of another player (and/or)
    - the tile he is supposed to move the pyramid into already has a bigger pyramid in it.
9. Pyramids are stacked at the beginning. Hence the pyramids can enter the game space only one at a time. The small pyramid can enter only after the middle and the big ones have entered the game space.
10. Pyramids have to be moved into the *End-tile* in the reverse order inorder to win. The smallest pyramid goes in first, followed by the middle one and the big one.
11. The pyramid should enter the *End-tile* completely using the number from die. For instance, If the player's pyramid is three tiles away from the *End-tile* and the die shows a number greater than 3, then the player cannot move this pyramid. He has choose another valid move, if any. Otherwise he would have to forfeit his turn.

5.7 Challenge mode

A player can enter the challenge mode with one of his opponents on one of the two instances mentioned below. In both instances, the challenge is optional. The player can also choose not to challenge the opponent. But once challenged, the opponent can never refuse to play the player's challenge.

1. When a player's pyramid is captured by an opponent's bigger pyramid stacked over it, the player can wait till the opponent moves his pyramid or the player can challenge this particular pyramid against the bigger pyramid of the opponent. The player's pyramid becomes free, if he wins the challenge.
2. When the die indicates the player to move a pyramid into a tile which already has an opponent's pyramid of the same size, the player can choose to move another pyramid. Instead, if the player still wants to move the original pyramid into the occupied tile, he could do so by challenging his original pyramid against the opponent's same size pyramid. The tile becomes free for the player to move his pyramid if he wins the challenge.

The challenge mode is executed immediately independent of the regular gameplay. Both the player and his opponent must roll the die once. The player who throws the highest number wins the challenge. The loser's pyramid is sent back to the respective *Start-tile*.

A player can challenge any opponent only at the end of his turn, i.e after he has played or forced to forfeit his move completely. A player can only answer an opponent's challenge out of his turn.

5.8 Advanced Version

The advanced version has a longer gameplay as it is more difficult to win. Refer the link to download the game board image -

[http://www.moreaboutmohan.com/uploads/hanoi_advanced.pdf]

The only changes in the advanced version compared to the original version are

1. The game space is essentially a 7x7square. It can be played 4- 8 players.
2. 4 stackable-pyramids per player can be used.
3. The game space has SAFE ZONES where the usual pyramid restrictions do not apply. Any number of pyramids can occupy the safe zones. So, any pyramid can be moved into a safe zone without any restrictions based on size. No capturing takes place in the safe zones.
4. All *start-tiles* of players are by default **safe zones**.
5. A player can refuse a challenge posed by an opponent. As penalty, he loses his immediate next turn. The player cannot refuse two consecutives challenges.

6. Future Scope

In both the versions, there are many alternatives that can be used instead of the pyramids. To name a few - disks of different sizes, stack cups, Russian nested dolls etc. In each case, the size restriction has to be adjusted accordingly.