

Game Design based on Ramayana

Project report submitted in partial fulfillment of the requirement of the degree of
Bachelor of Design

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Abstract

Indian mythology and stories are slowly being lost as the years go by. These stories are an important part of our cultural heritage and need to be integrated back into the lives of children in order to preserve them. With attention spans decreasing, this project aims to keep people engaged in the story by integrating them into games.

This project used a series of play-tests followed by design iterations and problem-solving. A database of characters, locations, boons, curses, and weapons used in the story was made.

The final game is simple and easy to follow in order to aid in better participation and ease of explanation of the game. Since the cards and board are simple, they can also be played in multiple different ways in order to hold attention spans longer.

With the playtests conducted, it has been noticed that there is an ongoing exchange of stories that takes place when the game is being played. This result was an unexpected but welcome one.

Index

	Title	Page
1.	Introduction	6
2.	Initial Project idea	7
3.	Secondary research	8
	3.1. Literature review	8
4.	Primary research	14
	4.1. Information database	14
5.	Game Design	16
	5.1. Game ideation	16
	5.1.1. Mindmapping	16
	5.1.2. Initial Game Ideas	17
	5.1.3. Game Ideas Expanded	18
	5.2. Game Iterations	19
	5.2.1. First Iteration Game Design	19
	5.2.2. Playtest 1	22
	5.2.3. Playtest 2	25
	5.2.4. Addressing Problems in Playtests	28
	5.2.5. Playtest 3	31
	5.2.6. Solving Recurring Problems	33
	5.2.7. Playtest 4	37
	5.2.8. Playtest 5	39
	5.2.9. Information condensation	41
	5.2.10. Story Timeline	44
	5.2.11. Character Information	45
	5.2.12. Playtest 6	46
	5.2.13. Playtest 7	48
	5.2.14. Data Visualisation	49
	5.3. Visual design	50
	5.3.1. Mood Board	50
	5.3.2. Card Design	51
	5.3.3. Board Design	62
	5.4. Final Game	67
6.	Conclusion	70
7.	Acknowledgments	71
8.	References	72
9.	Appendix	73

1. Introduction

The art of storytelling is slowly vanishing and the rich heritage these stories carry is being lost. Indian mythology offers teachings that have been passed down through generations, the Ramayana being one such epic. It serves as a medium through which several values and principles can be taught. There is a gap in the present efforts to preserve these mythological stories.

India has an extensive history of games originating from it, from chess to snakes and ladders. Games allow an opening for social interaction and often serve as a source of bonding. The project is aimed at teaching the younger generations Indian mythology in a way that is easy to learn and fun by designing a product to help preserve the story of Ramayana.

Learning through playing a game is a way of keeping players engaged and offers players a multitude of different and new situations and gameplays that test their knowledge and skills.

This project hopes to create a game that helps captivate players into reading about and learning about Indian mythology.

2. Initial Project Idea

Ganjifa, an ancient Indian card game, was historically believed to have been brought to India and popularised during the Mughal period. The cards were typically circular, although some rectangular decks have also been part of the artists' imaginations. The art on these cards usually told stories of that region.

Ganjifa as a game is slowly dying. The project was meant to revive the game by studying why the game is in a decline, revamp it and launch it so that more people start playing it again.

The project was to include:

Illustration, Simplifying game, Packaging, Marketing

The reasons for not continuing with this project include:

- Continuous efforts in the direction of reviving the game and the art alongside were already in progress by a lovely community in Karnataka. This project would have reworked the art style instead of promoting it and that would have been a disservice to the art and the artists.
- The project was heading in a different direction than the one I wanted.

The project morphed instead into creating a new game in order to have the flexibility of playing around with the visualization of the game instrument. The game however still was to be about Indian mythology.

3. Secondary research

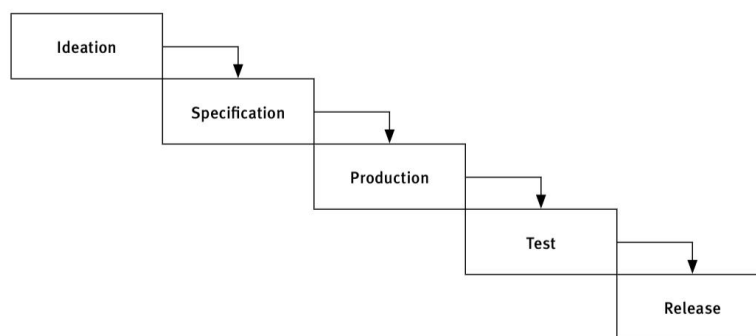
3.1 Literature review

The literature review consisted of reading books on game design and the amalgamation of education and games. The following are the points integral to designing a game that was found through the readings.

Production Methodologies:

These are methods that can be used to start with designing a game.

i) Waterfall Method: In this method, the production of the game goes linearly like a cascading waterfall, once the pre-production is done, which includes ideation, prototyping, and concept art is done, the next step is taken. No matter what problems arise in the game later, earlier steps are not visited again. This method is simple, but because of the rigidity in structure, it was not followed in the project. [5]



Waterfall Method

ii) Iterative Process: In this process, an idea for a game is taken and instructions are thought of for it. It is then prototyped in crude terms and tested. Every small change is prototyped and tested with players, if there is a problem found, the ideation is done again. This method helps understand unpredictable player behaviors and makes more room for error correction. However, this method is much less predictable. In this project, this particular method is employed in order to design the game. This method helps formulate a better understanding of the inner workings of players and the decisions they make and uses it to make a better learning environment for players.[5]

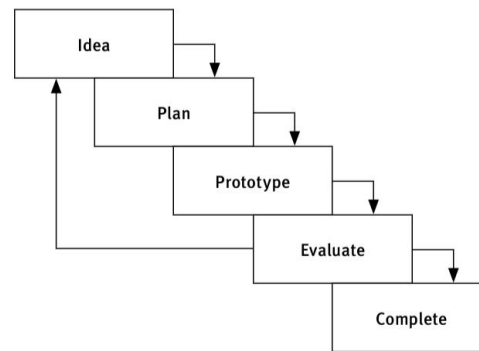


Fig 1: Iterative Process

Playtest:

A playtest is a full run-through of players playing an iteration of the game. It is used to find problems or collect feedback from players in order to make the game better. The aim of playtesting is to conduct a scientific inquiry into the element of a game[5].

Playtesting methods:

Some playtesting methods are as follows:

i) Think Aloud Protocol: Playtesters being asked to talk about pain points, frustrations, as well as desires, helps understand where the game is going right and where it needs to be worked on. Every observation should be noted down and analyzed later, from the time taken to make each decision to where the player is failing, etc. This can be done by recording each playtest. [5]

ii) Self Playtesting: In this method of playtesting, the designer can play the game themselves and find limitations or problems within the game. The gameplay states can be calculated through this method but how enjoyable the game is cannot be. This method can also be a little biased.[5]

iii) A/B Testing: In this playtesting method, two groups of players are given two different iterations of the same game to play. This helps in identifying what ideas work and which ones don't. [5]

Play:

The abilities of players and the difficulty level of the game need to be fine-tuned so that it is overall enjoyable to play and this can be seen after playing the game through playtests.[5]

Game Flow:

The game should have oscillating sections of challenges to provide players with opportunities to make meaningful decisions. When players have an easy section at the beginning followed by increasing intensity, it pulls them into a frame of mind that focuses on the gameplay more. The interest curve drawn for the game should showcase this oscillation.[5]

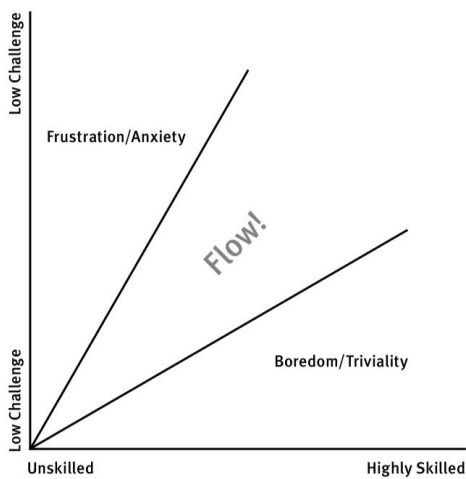


Fig 2: Challenge Created

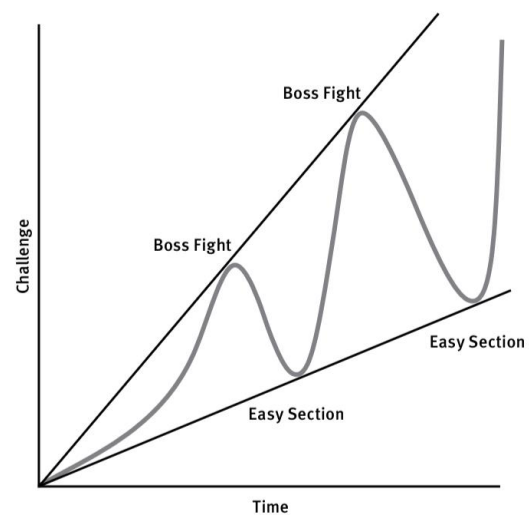


Fig 3: Oscillations in flow channel

Learning Curves Payoffs:

In order to engage the players while they learn the game, they need to be rewarded when they learn. This can be done in the following ways.[5]

i) Mini Payoffs: The game includes small rewards after each set of plays in order to keep the player interested. This however is very hard to get right and required extensive playtesting.[5]

ii) Reduced Learning till Big Payoff: This method uses reduced instructions for some variations of gameplay so that players can play it casually until they learn the rules.[5]

iii) Longer Learning Periods: This method lets the game be played by players who already have reached a 'flow'. The game would then only cater to people who are able to learn the game without mini payoffs and can wait for the big payoff, which is to win the game.[5]

Player Agency:

Players must be able to make their own decisions throughout the game in order for those decisions to be meaningful. If the player does not have agency in the game, they will feel constrained and grow tired of the game quickly.[5]

Competition:

Having competition between players in the game helps in maintaining a competitive streak, raising the level of stakes the players have. This makes the game more interesting to players.[5]

Constraints:

There need to be limitations to the decisions that can be made throughout the game, otherwise, there will be too many choices and players will get overwhelmed. [5]

Reward:

The game should incentivize players to reach the end of the game by handing out an award either externally, or internally in the game.[5]

Success criteria or objectives:

Having a concrete goal or aim that players need to focus on reaching by the end of the game increases user engagement. This in turn increases information retention in players.[5]

Game Instructions:

If the players aren't able to understand the game with the instructions given with the game, the instructions need to be made clearer as the designer will not be able to go and clear doubts for each player once the game is manufactured. Game instructions must be clear and precise. They must also talk about edge case situations and be able to clear all doubts and questions that a player might have.[5]

Game Rules:

Rules present goals for players. Goals can be used to incorporate, conceal, or guide players toward the game's learning objectives.[1]

i) Operational: This set of instructions is the basis of playing the game. They tell the player how the game is to be played. [1]

ii) Constitutive: These are rules that players need to figure out on their own in order to solve problems thrown at them during the gameplay. These are the most important in order for learning to happen in the game.[1]

iii) Implicit: These are rules that are understood by people without the need to be stated explicitly. For example, a dice can not be rolled onto other players' tokens, otherwise, they will fall.[1]

Game Space:

Having a "Prepared Environment" helps in perpetuating more connections and interactions, thereby letting participants have an environment to explore but at

the same time giving them a direction towards learning initiatives. Thus having a physical board in the game would help in better learning.[1]

Learning Experience in Games:

i) Variable feedback system: In a game, when a move is played and the next move can only be another move and this goes on in the same predictable manner, there no longer is a challenge. In order for learning to take place, there has to be unpredictable gameplay. In games where a player plays against another player instead of the game, it leaves room for unpredictability.[3]

ii) Mastery Problem: If a player that has complete mastery over the game can still reap rewards from easy plays, they will take all those plays and leave none for inexperienced players. This makes the game useless for both of them.[3]

iii) Cost of Failure: There needs to be a repercussion for failure so that players know to do better the next time around.[3]

4. Primary research


4.1 Information database

In order to proceed further, there was a need for a thorough examination of the Ramayana. The reason for picking Ramayana and not Mahabharat were rooted in the complexities of the stories. The Mahabharat is a much longer, more branched-out epic. This would have been much more difficult to put in a database.

Three different translations of the Ramayana were consulted for this. A database of characters and their relationship with each other, events, places, weapons used, boons granted and curses placed was made as these seemed to be information that the cards or board of the game could be based on. It would also ease the process of referencing the Ramayana for the design of the game.

The primary sourcebook had 75 chapters [6]. This database has these chapters noted down, which is further divided by events that took place during each chapter. The main character in the event along with any secondary characters that played a role in it and any relationship that these characters had were noted. The location of the event and any relation the location may have with another location were collected. If there were any weapons, boons, or curses used or granted, these were also added to the database. Over 500 events were noted down and this information was taken through three book sources.[7]

The database can be accessed through the link below.

 [BTP Ramayan](#)

	A	B	C	D	E	F	G	H	I	J	K
1		Chapter Name	Event	Primary character	Secondary character	Relationship with other characters	Place	Relationship with Place	Weapons	Boons	Curse
2		1 The Conception	Horse sacrifice for progeny	Dashrath			Kosala Kingdom	Near River Sarayu north of Ganga			
3	1		Performed the yaga	Sage Rishyasringa			Ayodhya	Capital of Kosala			
4	1		Went to Bhrahma scared	Devas			Heaven				
5	1		Went to Vishnu	Lord Bhrahma			Heaven				
6			Got boon from Brahma that he should be invulnerable and invincible against Devas, Asuras, Gandharvas and other such beings. He didn't say mankind	Ravan						He should be invulnerable and invincible against Devas, Asuras, Gandharvas and other such beings. He didn't say mankind	
7	1		Ravana wanted to dethrone Indra	Indra			Heaven				
8	1		Would be born as four sons of King Dasaratha to defeat Ravana	Vishnu			Heaven				
9	1			Hari		Vishnu	Heaven				
10	2	Sage Vishwamitra	Drank 1/2 Payasam from yaga	Kausalya	Ram	Wife of Dasaratha	Ayodhya	Capital of Kosala			
11	2		Drank 1/4 +1/8 Payasam from yaga	Sumitra	Lakshman	Wife of Dasaratha	Ayodhya	Capital of Kosala			
12	2				Satrugna			Capital of Kosala			
13	2		Drank 1/8 Payasam from yaga	Kaikyei	Bharat	Wife of Dasaratha	Ayodhya				
14	2										
15	2										
16	2										
17	2		Viswamitra, while he was king once went to visit Vasishtha's ashrama. The King wondered good food came from.	Vishwamitra							
18	2			Vasishtha			Vasishtha's Ashram				
19	2		Cow Sabala and explained that she was the fountain of unending plenty.	Sabala	Vasishtha's sons	Vasishtha's divine cow	Vasishtha's Ashram				
20	2		Vishwamitra tried to steal cow	Vishwamitra	Vishwamitra's army		Vasishtha's Ashram				
21	2		Vasishtha killed Vishwamitra's sons			Vishwamitra's sons	Vasishtha's Ashram				
22										Divine arrows and be master of every weapon,* gave him all the weapons available	

Fig 4: Database Screenshot

	A	B	C	D	E	F	G	H	I	J
1		Chapter Name	Event	primary character	Secondary character	Relationship with other characters	Place	Relationship with Place	Weapons	Boons
41	4		Rama and Lakshmana go with Vishwamitra to defeat rakshasas	Ram	Vishwamitra	Guru	Ayodhya			
43		Rama Slays the 5 Monsters	Before retiring Vishwamitra initiated the princes in two secret mantras Bala and Atibala	Ram	Vishwamitra	Guru	Bank of the River Sarayu			Spells had the virtue of guarding them from fatigue and harm.
54	5		Rama defeats Tataka	Ram	Tataka		Dandaka forest			
56	5		Vishwamitra teaches divine astras to ram, who teaches Lakshman	Ram	Vishwamitra		Dandaka forest		Ramachandra	
67	5		Maricha and Subahu came and Ram caught them with Manavastra	Ram	Maricha		Siddhashrama		Manavastra	
96	9	Ram wins Sita's Hand	Rama strings and breaks Rudra's bow and wins Sita's hand in marriage	Ram	Sita	Spouse				Rudra's Bow
116	15			Ram						
120	16		Ram declined the proposal and also said o one should go with him	Ram			Ayodhya			
121	16		Ram says that Kaikeyi is not to blame and fate works in different ways	Ram			Ayodhya			
123	17		Ram, Lakshman and Sita set out to the forest	Ram	Sita		Ayodhya			
124	17		Dashratha wanted Ram to take an army and elephants, Kaikeyi opposed, Ram agreed with Kaikeyi	Ram	Kaikeyi		Ayodhya			
125	17		Ram, Lashmana and Sita wear clothes made of bark	Ram	Sita		Ayodhya			
129			The people of Ayodhya try to stop Ram from going but ram tells them to obey the king's command and treat Bharatha kindly	Ram	People of Ayodhya		Ayodhya			
130			They slept on grass on the side of Ganga and when the people of ayodhya who had followed them were asleep they travelled further.	Ram	Sita		Ganga			
133	19	Alone by Themselves	Crossed Tamasa and went to the forest	Ram	Sita		Tamsa	Tributary of Ganga in UP		
138	19		Ram asks once again if Lakshmana wanted to go back, he said no	Ram	Lakshman		Bhardwaja's Ashram			
139	20	Chitrakuta	They spent the night at Bhradwaja's Ashram	Ram	Sita		Bhardwaja's Ashram			
142	20		Ram asked Lakshman to give Sita anything she asks for in order to raise her spirit	Ram	Lakshman					
173		27 The Brothers Meet	Ram and Sita were happy there. They would sometimes go to the river Mandakini and spend time there.	Ram	Sita		River Mandakini			

Fig 5: Database in use for primary character Ram

All the primary characters from the database were made into cards that are shown below. A total of 162 unique characters were there.

5. Game Design

5.1 Game ideation

5.1.1. Mindmapping

The project began with a quick brainstorming of what possible game ideas could be. This started by initially looking at the genres of games and then ideating various possible games. All the ideas gathered were jotted down together in the form of a mind map.

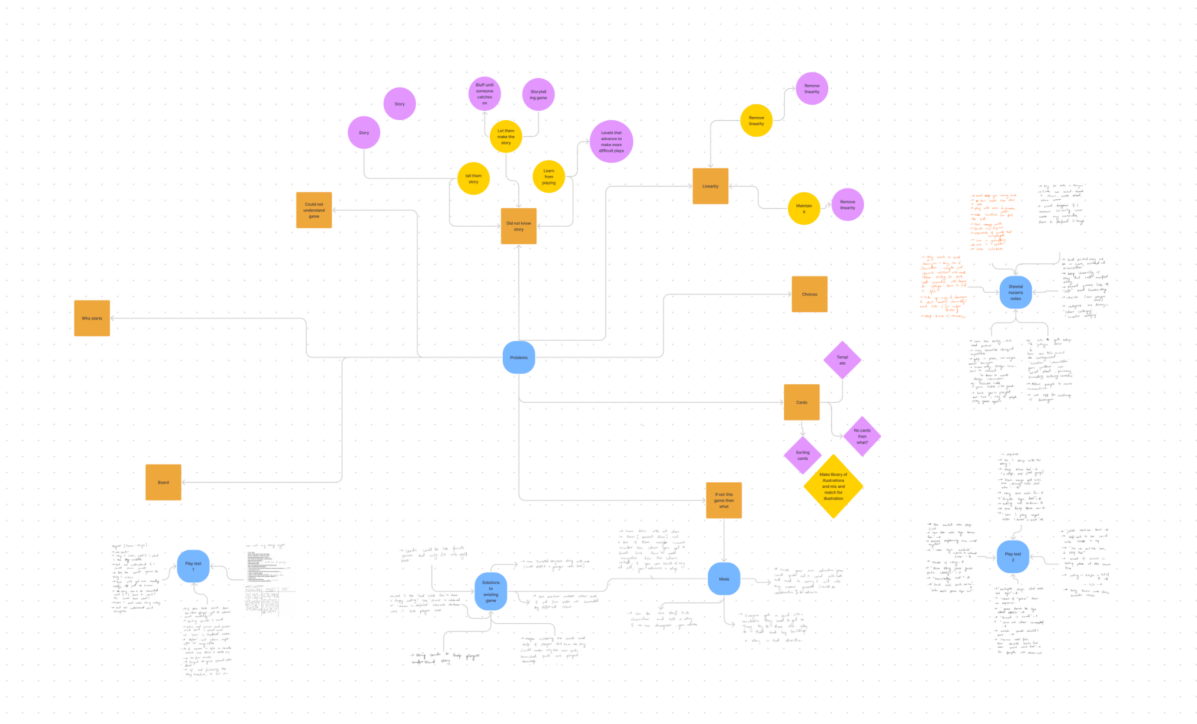


Fig 6: Mind map of ideas

Out of this mindmap, the possibilities of the genre of game that could be built were explored. Some of the possible game genres were:

Possible genres of Games

1. Strategic
2. Trivia
3. Chance or luck
4. Algorithmic
5. Battle or wargame
6. Team-based or single
7. Worldbuilding
8. Deckbuilding
9. Narrative
10. Social deduction
11. Trading

For this game to be educational, trivia, strategic and narrative genre of game were the most viable options. Taking these genres, some game ideas were thought of.

5.1.2 Initial Game Ideas

- Get in and out of Chakravayuh
- Vishnu's avatars
- Mahabharat Strategy game
- Befriend animals to defeat Ravana
- Ravana's POV
- Live in the jungle with Sita
- Shoot arrows with Arjun
- Dronacharya's Lesson on war
- Chanakya's teachings
- Hide from the Kauravas
- Find the missing item
- Samudra Manthan
- Various plant gods
- Jadi Booti

- Get Ganga to flow down
- Get boons from gods
- Make the Ram Setu bridge

5.1.3. Game Ideas Expanded

A few ideas were taken from the initial list and were expanded a little to see if a game could be made out of them. These were the ideas.

Ram Setu Bridge: Can have starting and end cards. Build a story. people can interrupt your bridge with cards

Based on: plant and animal knowledge, magical demons and quests to interrupt the path, riddles from gods in disguise, trivia about Ramayan.

Get Ganga to flow down: Everyone gets a sky and land card and the sky card is at the bottom and the land at the top. Each player wants to finish their card's land and the cards must be placed in ascending order

Hide from the Kauravas: Half people have to find, half have to hide. Maybe everyone can see your cards or everyone can see only half the cards.

Find the missing item: A person can get a card that tells you what's missing and you need to find it first to end the game may be a missing person, tactic, or war instrument

Samudra Manthan: Have to avoid bad things that come out and collect the good ones

Jadi Booti: Hanuman has to find the plants in a limited time. A trump card where you can carry the whole mountain.

After looking through the ideas, the most exciting one seemed to be the Ram Setu Bridge Idea. There were more ideas generated towards this particular idea. For the duration of the project, this idea was to be worked on through each iteration and seen to the end. Several ideas that were listed out could be

combined into one game. If the end iteration of the Ram Setu Bridge idea did not turn out to be a viable game, the next option would be explored.

5.2 Game Iterations

5.2.1. First Iteration Game Design

After selecting a game idea to expand upon, which was the idea of the Ram - Setu bridge, The basic gameplay was decided upon. The first iteration of the board for the game and the cards are shown below.

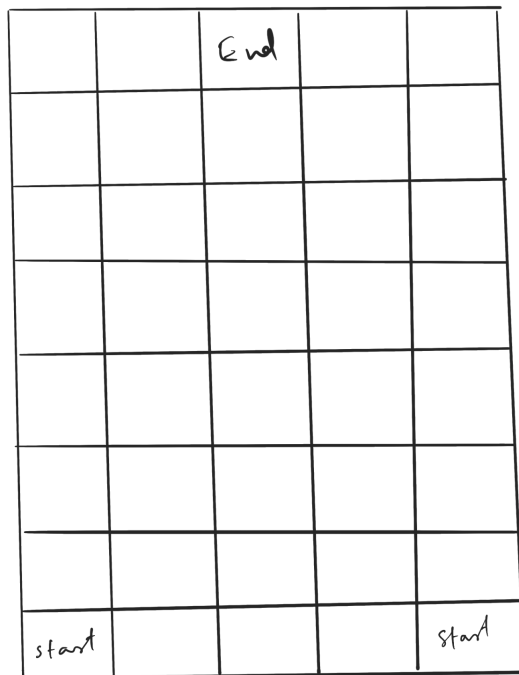


Fig 7. Board design



Fig 8 . Initial card design

The rules for the first iteration of the game were the following:

Rules

1. Problem statement

To reach the finish line before your opponent by building a bridge using cards that are connected.

2. Number of players

Two players

3. What is the object of the game for each player? What are the short-term goals?

Players need to connect cards based on their relationship with each other to build a bridge, which can disrupt other players' bridges too.

4. Do players work together or alone? Who is their adversary: the game, other players, or something else?

Players playing against each other.

5. Key rules

If you know a card especially difficult that could set the other player back or block their moves, you can place it on their bridge. The first card to reach the 'end block' wins. You can conquer your opponent's bridge at the last moment.

6. What resources do players manage?

They manage a separate deck of cards.

7. What do the players do? What decisions do they face?

The players try overtaking bridges longer than theirs. They have to make decisions on what cards they can have and what to put next. If none of their cards can be joined, they can draw a new card but then they will have to give a card from their deck to the opponent.

8. What information is public, hidden to particular players, or hidden from all players?

Individual decks are hidden from the opponent and the 'draw' deck is hidden from both players. The cards on the board are open for all.

9. What hinders players? What are the tradeoffs?

Not knowing what events connect

Players overtaking each other's bridges

Not having connecting cards.

10. How does the game end? Are there winning conditions?

Ends with a player reaching the end block first. the colour that touches the block first wins

11. Turns in the game

Player 'green' blocks the 'after' side to corner player 'yellow'

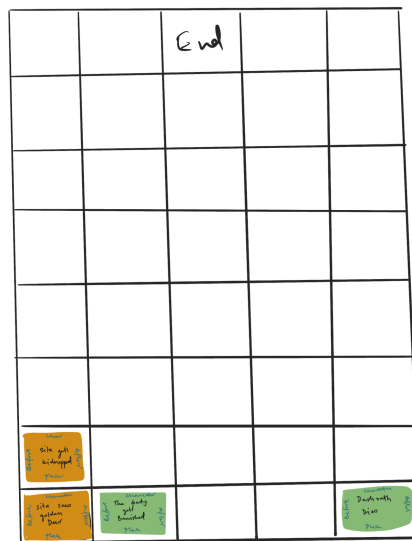


Fig 9: A turn in the game

After the rules were decided upon, There was a playtest conducted in order to assess the idea.

5.2.2 Playtest 1

The first iteration of the game was put through playtest. The picture below shows the game prototype and the game played on it. Each coloured circular chip denoted a player.

All players were dealt with a certain number of cards and they had to start making connections from their individual 'start' point and 'build a bridge to the 'end' space first.

Players could make connections on each other's bridge, the only thing that mattered was to fish on the 'end' space on the board.

The cards could be linked to each other by a common character, place, or according to whether or not they happened before or later on a timeline. These could only be linked by the respective sides marked on the cards.



Fig 10 : Game played in playtest 1

Major Insights:

1. Players did not know who got to take the first turn.
2. The story of Ramayan is linear, the matter of, if a card describing an event in the middle of the story is played at the beginning of the game, was yet to be discussed. The linearity of the story might make it harder for players to move forward.
3. Rules regarding the drawing of cards were not clear. A player waiting while doing nothing instead of drawing cards was a grey area.
4. The Color scheme of the cards was confusing. Did not understand the card template.
5. Rules regarding what happens if a player runs out of cards were unclear.
6. If a player took a new card, does the other player get to choose a card randomly?
7. Sorting cards was hard.
8. Define that the previous card decides which hand is placed.
9. 'Place' is rendered useless. 'After' isn't clear, right after, or any after.
10. If the square is between two cards, which one does it relate to two was unclear.
11. There were too few cards.
12. Players enjoyed the game enough to want a longer board.
13. Sense of nostalgia was invoked, players talked about hearing stories when they were child

The picture below shows the gameplay of the playtest.

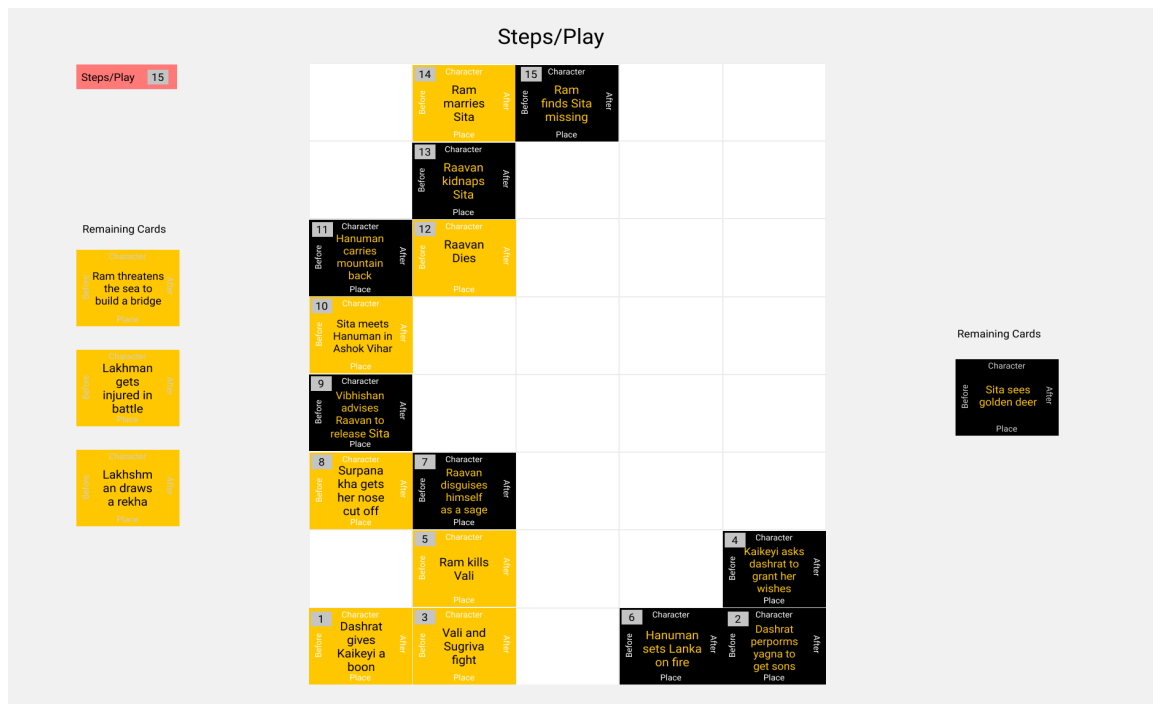


Fig 11: Gameplay

These complaints could be narrowed down to the following categories:

1. Unclear rules
2. Linearity of the story in the game
3. Design Flaws in the card
4. Redundancies within the game

Since this was the first playtest, minor changes were made for the next iteration in order to understand if the problems occurring were due to individual players or due to inherent game flaws. The following changes were made to the game.

1. Cards were made the same colour and small enough to fit into designated squares.
2. Cards still had events on them
3. More cards were added to the deck

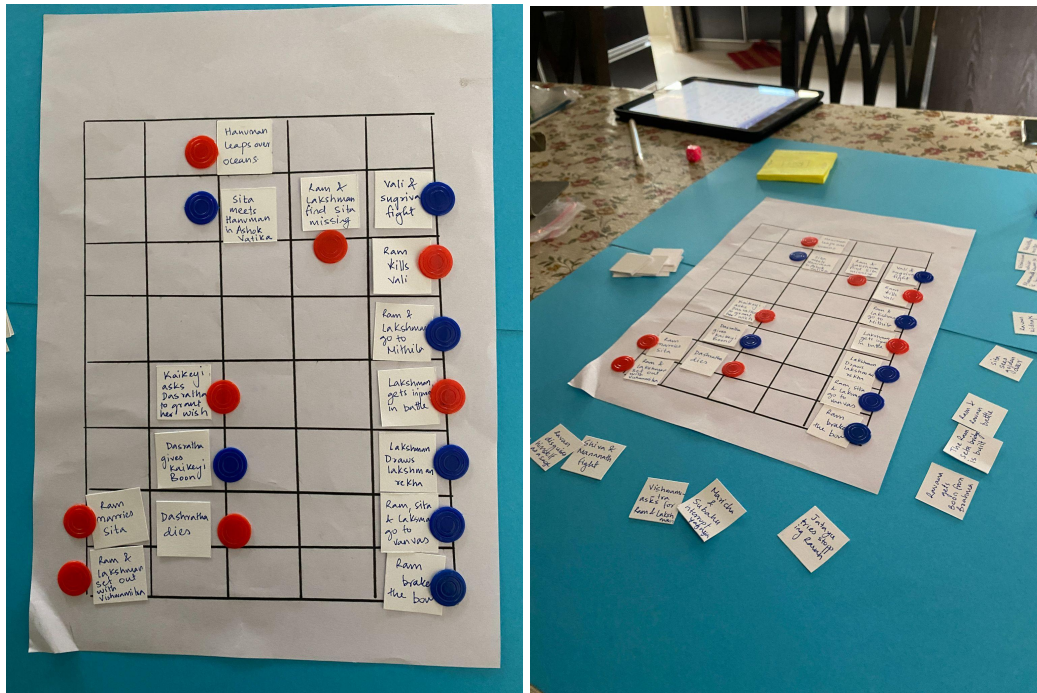


Fig 13. Gameplay of the second playtest.

Major Insights:

1. Did not know who got to take the first turn.
2. Rules unclear
3. Don't know what happens next in the story. Need to read the story once. Only know the main story, not the branched stories.
4. Players wanted an information source to cross-reference the decisions they took.
5. Questions regarding if a player could play multiple steps in one turn were raised.
6. Inter connections between various places and characters on cards were not defined.
7. The board took little time to finish, players wanted a longer route.
8. Rules regarding the drawing of cards were unclear.
9. Rules regarding playing the cards diagonally were brought up.
10. Players who didn't know the story needed help throughout to figure out the events
11. After understanding the rules, players started strategizing about which cards to place in their moves ahead and what to do to stop other players from winning.

12. Players started retelling stories about the characters and versions that they had heard.

The complaints could be narrowed down to the following categories:

1. Unclarity in rules
2. Linearity of the story in the game
3. Gaps in Knowledge of Ramayana
4. Length of Game
5. Redundancies within the game

There were several recurring problems in the gameplay. There also seemed to be several gaps in the understanding of the story of the Ramayana. There was a need to address these problems.

5.2.4. Addressing Problems in Playtests

To think of solutions for these problems, a brainstorming session was done. Each major problem was ideated upon.

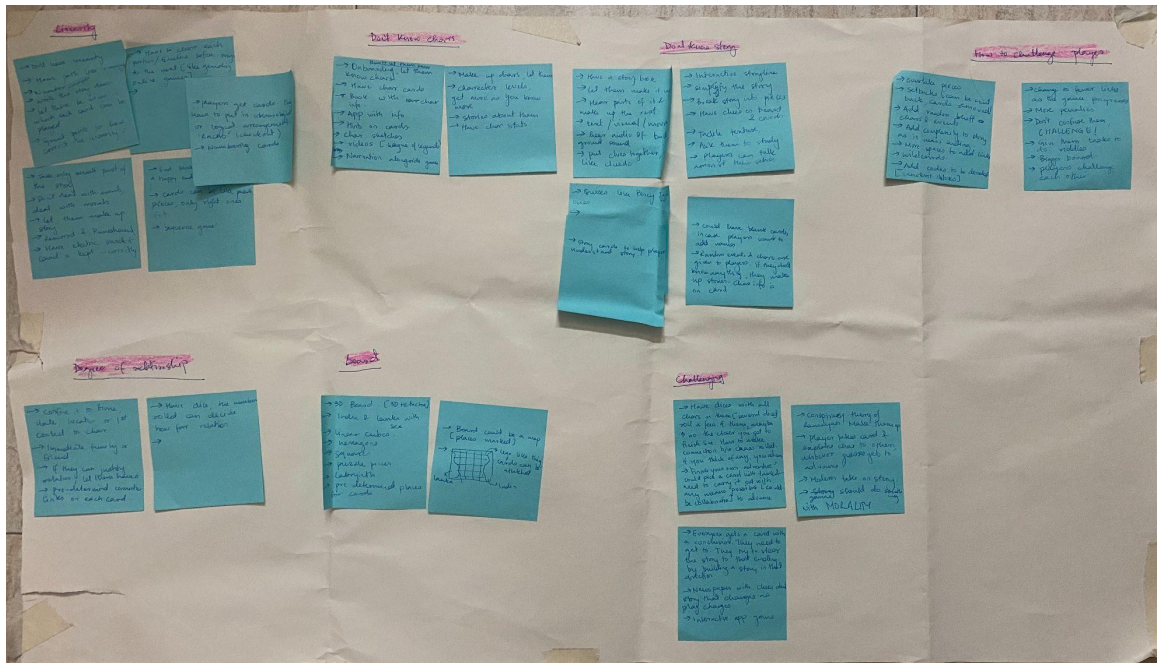


Fig 14: Brainstorming Board

Some ideas that address these problems from the board are as follows:

Linearity and Redundancies

1. The linearity of the story might make it harder for players to move forward. Instead of events, characters could be listed on cards. This would eliminate the issue of the linearity of events in the game. This would also address the problem of having 'Place' positions in cards being rendered useless.

Increasing Challenge

1. Each character could have powers that help in some of the spaces on the board
2. The degree of relation between cards could be bound.
3. Cards can be overturned and can join the other player's bridge.
4. Players could have to remove a card because of an event that takes place in the story. All cards attached to the one removed would also need to be removed.

5. Add codes to be decoded like Sanskrit shlokas
6. Challenges between players.

Length of the Game

1. Penalties can be moral dilemmas or riddles
2. Can add hexagons in order to increase connection
3. Predetermined places for cards
4. Board could be a map with factual places marked on it

Gaps in Knowledge of Ramayana

1. Include a visual aid in form of a movie
2. Hearing audio of background noises with respect to events taking place in the story at that portion of time.
3. Story cards to be played in portions
4. Quizzes can be taken alongside the game
5. Simplifying the storyline
6. Letting players talk amongst themselves

Since one of the biggest problems faced by players was the unending nature of the story, there was a need to simplify the story.

Simplifying the storyline

To simplify the story so that characters in each phase could be singled out, the Ramayana was broken down into fifteen parts. These parts are listed below.

1. Dasharatha has four sons.
2. Ram and Sita get married.
3. Kaikeyi gets Ram banished from the kingdom.
4. Ram, Sita, and Lakshmana go to the forest.
5. Surphanaka is wounded by Lakshman.
6. Supanakha asks her brother Khara to avenge her.
7. Khara and his army are defeated, and they ask Ravan to avenge them.
8. Ravan kidnaps Sita
9. Ravan slays Jatayu.
10. Ram and Lakshman meet Hanuman
11. Hanuman sets fire to the whole city of Lanka.

12. Ram and Lakshman build a bridge from the tip of India to Lanka.
13. An epic battle follows between the armies.
14. Ravana is finally killed by Rama, and Sita is freed.
15. They return to Ayodhya, where Bharata returns the crown to Rama.

These parts were listed and the most important characters from each part were listed under them. These would be the cards played in the next iteration of the game.

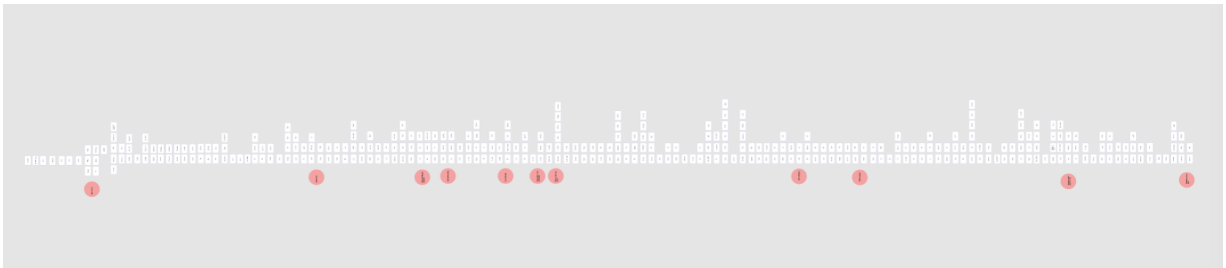


Fig 15: All character cards arranged according to the timeline of the story

Since arranging all character cards in the story timeline added too many cards to the story, only the most important characters were put on the timeline.

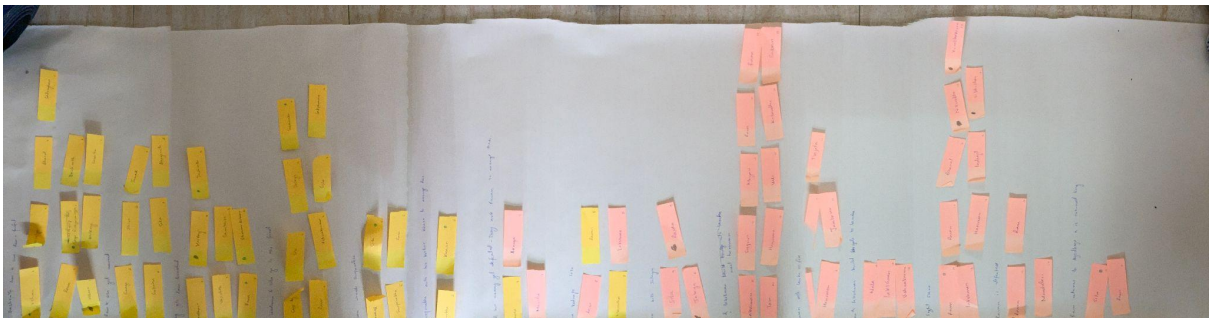


Fig 16: Important character cards arranged according to the timeline of the story

After having sorted the most important characters in a timeline, it was easier to make cards with only these characters. This eliminated the recurring problem of players not knowing minor characters. If more skilled players want to play the game, additional cards can be added with more obscure characters. With the skill level displayed by ordinary players, it made more sense to stick to a more basic character set.

5.2.5. Playtest 3

The third playtest was conducted with cards that showed just the character instead of events and they were to be connected when a player pitched a relationship between the two characters of the cards and all other players agreed on it. This was done to play with the linearity of the story. The board was changed to hexagonal placeholders to give players more ways to connect characters. Given below are pictures of the beginning of the gameplay and the board prototype. The aim of this iteration was to finish on the 'end' space on the board first.

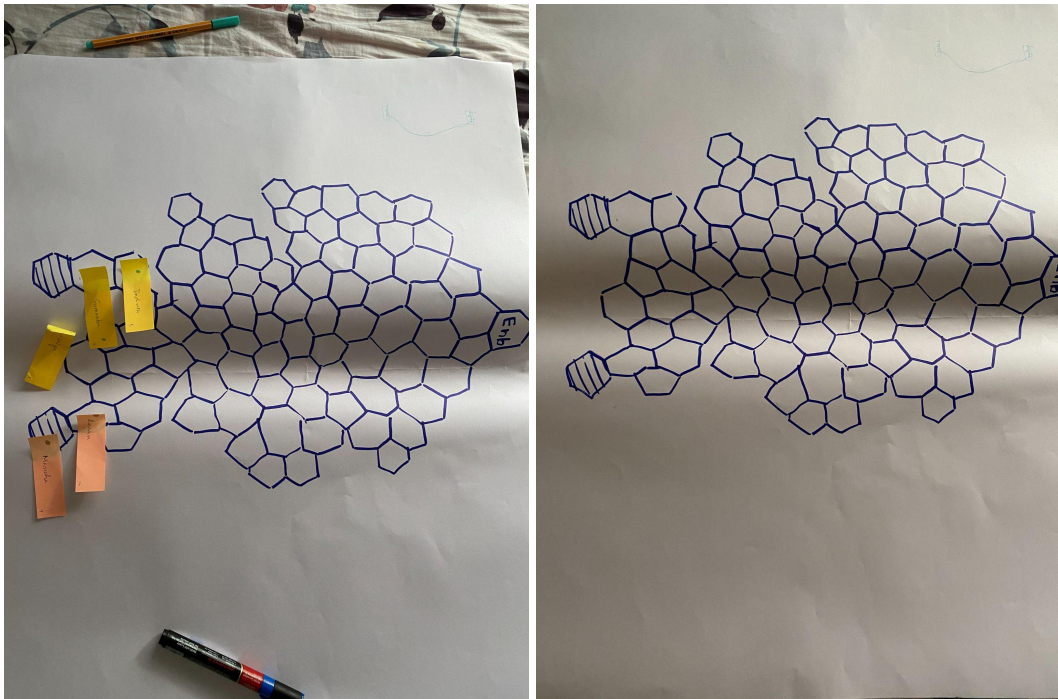


Fig 17. Gameplay of the third playtest.

Major Insights:

1. Questions regarding additional information about characters arose regularly during the game. Players needed some context for the characters
2. The number on the cards confused players
3. What degrees of the relation between characters are allowed was not clear
4. The story starts to bring more competition at the end and could have more space there on the board.
5. Could the players connect the same character card to the character
6. Several cards needed at the beginning of the game needed to be thought of.

Some previous problems were eliminated but there were still some problems in this iteration of the game. This led to another session in which problems were looked at and solutions to them were thought of.

5.2.6. Solving Recurring Problems

1. Linearity

2. Have numbered cards in order to help players remember the timeline of events.
3. Take a smaller part of the story
4. Let players make the story up
5. Have rewards and punishments for the following linearity
6. Cards can be like puzzle pieces, only the right ones fit into each other
7. Have players clear each portion of the timeline before heading to the next portion
8. The board could have a path, like games like monopoly.

2. Lack of knowledge about Characters

1. Include stories about characters in the game
2. Have character cards
3. Book with Character information can be provided
4. Hints can be given on the card
5. Character sketches can be provided
6. Narration alongside the game can be included
7. Cards can have more details and statistics about the character

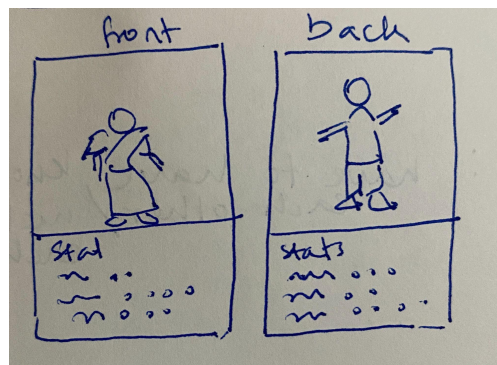


Fig 18: Iteration of card

Statistics could include:

- Strength
- Conviction

- Part in story
- Degree of relations
- Special Powers
- Locations
- Timeline

3. Lack of knowledge of the story

1. The cards can be divided into
 - a. Characters
 - b. Quotes
 - c. Timeline
 - d. Boons
 - e. Curses
 - f. Weapons

This could let more diverse connections and relations be made.

2. If players are unable to make any connections with the cards in their hands, they should be able to swap a couple of their cards with the common deck cards. However, if this is allowed, players will take advantage and keep swapping until they get the cards they want. Players can get a limited number of swaps per game and this move could be counted as a whole turn. They would not be able to play a card that turn, this would push them to not use this move often.
3. Including a storybook

4. Degree of the relation between cards

Relation between cards:

1. Can be based on whether or not the characters have met each other or not.
2. The following can also be used as measures of relations between cards:
 - a. Location
 - b. Time
 - c. Family
 - d. Friend

5. Board

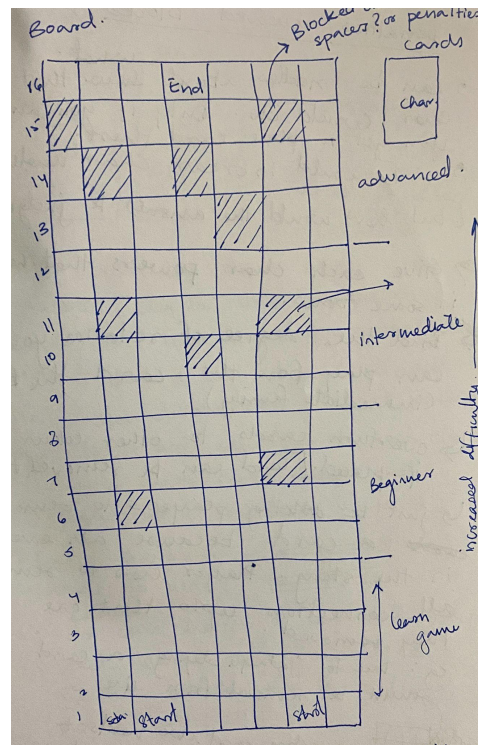


Fig 19: Board Iteration

1. Can make the board have 15 divisions like divisions made of the story. If a character from that timeline is played, extra powers can be given.

6. Increasing Challenge

Increasing Challenges:

1. Can be riddled about what that character would do. Only if the player answers it can they get to place a card on the spot.

This would increase character understanding but the issue of what the right answer would be and who gets to judge the answer arises.

7. Miscellaneous:

1. If cards were double-sided, they will be visible to the other players. They could however have completely different characters on each side so that even when it is visible to a player, it would render it useless.

There can be a physical board provided to each player that can be used to hide their cards

Each player could have separate decks with separate colours, this would reduce the competition that occurs due to players having reduced choices of cards as the play progresses.

These were some ideas that were generated to address the main problems faced in the game. These were then divided into solutions that could be implemented in the game according to the direction it was growing in or not. One of the problems that were seen repeatedly was that the players were confused about the game rules. Therefore there was an effort put to simplify the game as much as possible in order to make it as easy to follow as possible.

5.2.7. Playtest 4

In this playtest, there were 4 individual boards that could be attached and played on according to the number of players playing. The playtest was conducted with two players.

The ability to swap cards if players were not able to make any connections was added. There were also an increased number of blocked spaces on the board that cards could not be played on.

The blocked spaces increased as the players got closer to the 'end' space. There were also a number of weapons, boons, location, and curse cards added to the game.

The cards were colour coded for each of these categories. In this iteration, all cards were kept face up on the table so that all players had the ability to see all cards. The cards were also numbered according to which portion of the timeline they came for in hopes that players found it easier to make connections with cards that came from the same timeline

The players won if they placed their cards on the 'end' space before other players.

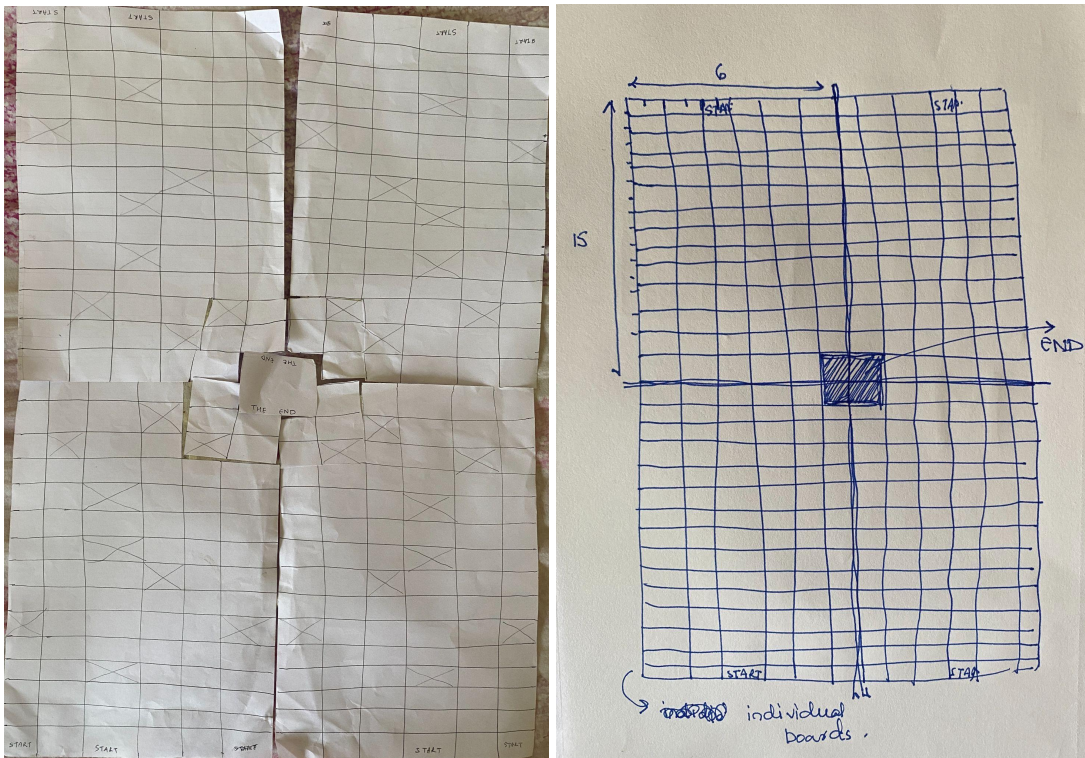




Fig 19: Gameplay of play

Main Insights:

1. Board was too big
2. The number of cards was too many when only 2 players were playing.
3. More Obstacles were needed in the game
4. The 'Start' position on the board let players ignore the last 2 columns of the board.
5. The numbering systems in the cards were not used
6. The game facilitated an exchange of stories.

5.2.8. Playtest 5

In this playtest the same board and cards were used as in the previous playtest. The start position was shifted from the third column to the last column so that players would use the whole board. There was a point system added to this iteration. Each time a player picked up a card, 2 points were deducted, the same with swapping cards. The first player to reach the end was rewarded with 15 points. The player who had the most points in the end won.

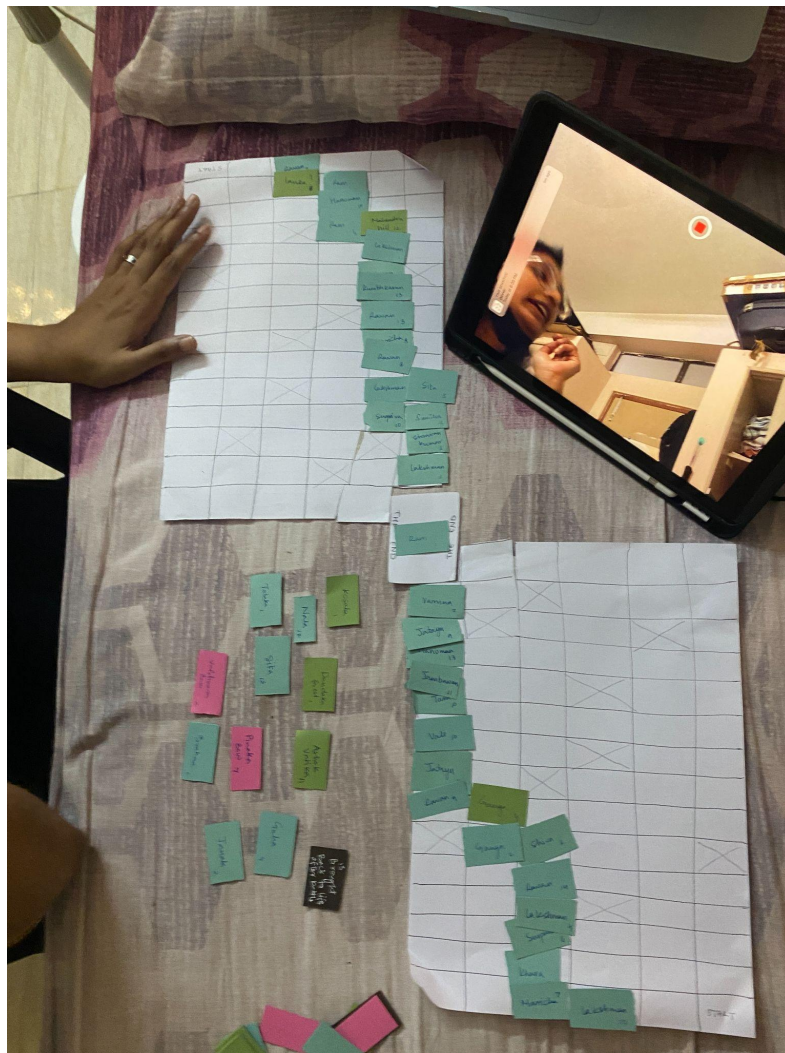


Fig 20: Gameplay of playtest 5

Main Insights:

1. The game stalls in difficulty. It does not raise the stakes by the end of the game.
2. The penalty for setting a wrong link between cards is not definite.
3. The board was too big.
4. The number of common cards like 'Ram' and 'Lakshman' made it too easy to make connections.
5. The point-based system is rendered useless as the main objective of the player is to still finish at the 'end' space before other players, since the reward points were too high.
6. Players were still confused about the characters.
7. Players were able to play even without a vast knowledge of the Ramayana.

5.2.9. Information condensation

In order to reduce the constant confusion players had with lesser-known characters, the character list was reduced.

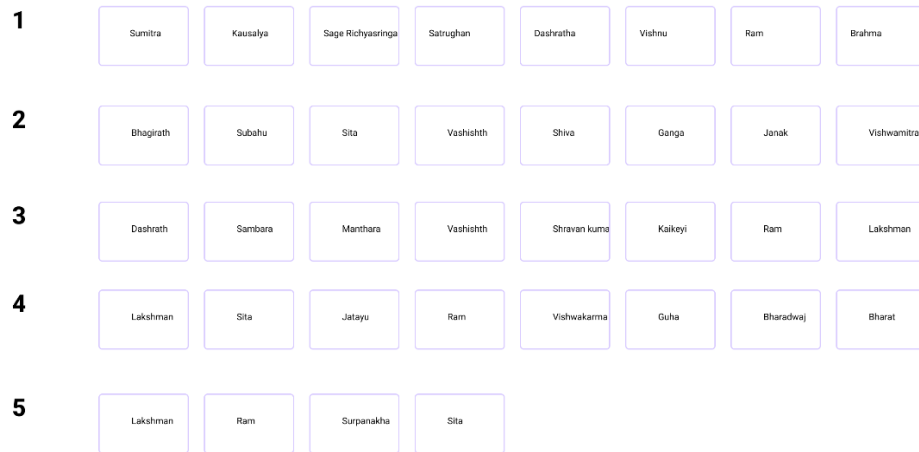


Fig 21 : A few characters from the character list

The Story was earlier divided into 15 parts. These parts were decided based on simple retellings of Ramayana. The most widely known parts were used as markers. This system had its problems since different players had different levels of knowledge and this division was very subjective. Upon searching for a better division of the story, it was found that the Ramayana was already divided into 7 portions based on what portion of Ram's life it took place. Out of the 7, 6 portions were used in this game. The final portion was not included due to it taking place after the war had ended.

The previous 15 portions could be placed under the new portions. All the cards were thus put under their new divisions.

The divisions were as follows:

Bala Kanda

1. Dasharatha is the King of Ayodhya and has three wives and four sons, Rama, Lakshmana, Bharata, and Shatrughan. Rama is the ideal and perfect son and grows up with his brothers.
2. When he came of age, he married Sita, the princess of a nearby kingdom.

Ayodhya Kanda

3. However, Bharata's mother is Kaikeyi, who resents Rama being the crown prince. She calls up a debt that Dasharatha owes her and asks for Rama to be exiled for fourteen years and for her son Bharata to be made crown prince instead.
4. The devastated Dasharatha has no choice and Rama prepares to leave for exile. Sita and Lakshmana will not leave his side however and follow him into the forest.

Aranya Kanda

5. While in the forest, Surphanaka, a female rakshasi (demoness) becomes enamored of Rama and is wounded by Lakshmana while trying to kill Sita.
6. She flees to her brother Khara and asks him to avenge her.
7. However, Khara and his army are defeated by Rama and Lakshmana, and only one member of their entire army survives. This lone soldier flees to the island kingdom of Lanka and begs Surphanaka's brother, the mighty king Ravana to avenge them.
8. Ravana kidnaps Sita, taking her away to Lanka.
9. Slays Jatayu.

Kishkindha Kanda

10. Hanuman and Ram meet

Sundara Kanda

11. Hanuman sets fire to the whole city of Lanka.
12. Rama, Lakshmana, and the Vanar army build a bridge from the tip of India to Lanka.

Yuddha Kanda

13. War

14. Ravan defeated

15. They return to Ayodhya, where Bharata returns the crown to Rama.

5.2.10. Story Timeline

The aim of the game was to let players learn as they play the game. The iterations consistently showed that there needed to be a booklet or a source of information that needed to be included in the game so that players could double-check their connections or use it as a reference.

Taking the earlier section of the story, the cards were put on a timeline in order to illustrate when in the story they appeared. Each card was included in each section of the Ramayana that they had an appearance in.

The picture below is an overview of the entire timeline. The timeline will be available in the appendix.

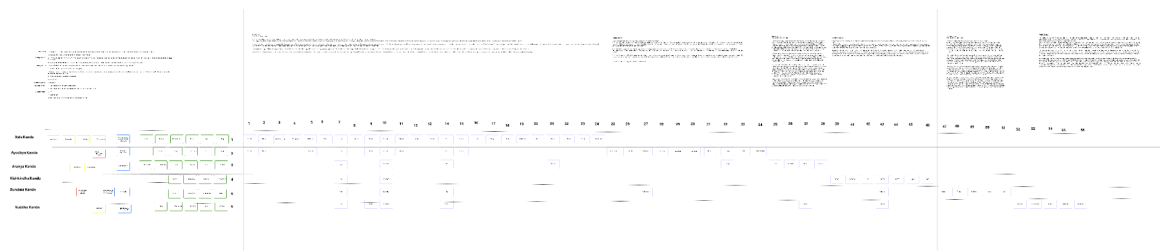


Fig 22 : Story timeline

The picture below is a slightly more zoomed-in version.

	Bala Kanda	Sumitra	Kausalya	Sage Richyasringa	Satrugnan	Dashratha	Vishnu	Ram	Brahma	Bharat	Lakshman	Kaikeyi	Bhagirath	Subahu	Sita
Ayodhya Kanda		Sumitra	Kausalya			Dashrath		Ram		Bharat	Lakshman	Kaikeyi			Sita
Aranya Kanda								Ram			Lakshman				Sita
Kishkindha Kanda								Ram			Lakshman				
Sundara Kanda								Ram			Lakshman				Sita
Yuddha Kanda								Ram		Bharat	Lakshman				Sita

Fig 23 : Zoomed in storytimeline

5.2.11. Character information

Along with the timeline of the story, getting information about who the characters were, what happened at locations, who was cursed by whom, etc to the players was necessary as seen by previous playtests.

There were 95 cards and information about them as well as parts that they played in the story were listed out.

1	Sumitra	Lakshman and Shatrughan's mother. Dashrath's wife.	22	Subahu	Viswamitra performed a sacrifice, and rakshasas, Maricha and Subahu, defile dit.
2	Kausalya	Ram's mother and Dashrath's wife.	23	Varuna	"Varuna, presented Janaka Rudra(Shiva)'s bow and two quivers. That was an ancient heavenly bow, which no ordinary man could even move."
3	Sage Richyasringa	Performed yagnya to praise ethe gods in order for Dashrath to be granted kids.	24	Parshuram	Parashuram came to Ayodhya after hearing about Ram breaking the bow Parshuram's father was killed by a king so Parshuram wanted to end the Kshatriya race, was therefore the enemy of them. Prshuram had an identical Vishnu's bow that he wanted ram to string, if ram was able to string it, they would battle Ram strung the bow and Parshuram understood he was Vishnu's avatar too, just like Parshuram, so he went away to Mahendra mountains Once strung the bow needs to be drawn so Parshuram gave away his powers from tapas to the bow and ram
4	Satrughan	Lakshman's brother. Sumitra and Dashrath's son			
5	Dashratha	King of Ayodhya. Ram and lakshman's father. Husband to Kausalya, Kaikeyi and Sumitra.			
6	Vishnu	Ram is Vishnu's avatar. One of the three main gods of Indian mythology			
7	Ram	Kausalya and Dashrath's son. Oldest prince of Ayodhya. Vishnu's avatar. Sita's husband. Lakshman, Shatrughan and Bharat's brother.			
8	Brahma	Granted Vishwamitra with title of Brahmarishi. Granted Ravan the boon of invulnerability.			
9	Bharat	Ram and Lakshman's brother. Kaikeyi's and Dashrath's son			
10	Lakshman	Ram's brother. Sumitra and Dashrath's son.			
11	Kaikeyi	Bharat's mother and Dashrath's wife. Invokes wish granted by Dashrath when she saved him in battle, to banish Ram from the kingdom and to crown Bharat as king.			
12	Bhagirath	King Sagara, Bhagirath's ancestor, launched a great horse-sacrifice and prince Amsuman was in charge of the sacrificial horse. Indra, in the guise of a Rakshasa, managed to carry off the animal. and put it in front of an avatar of Vishnu who was meditating. Bhagiratha did tapas in Gokarna to Brahma, who said he would give him a child but the earth could not withstand the force of ganga so he should pray to Shiva. Ganga flowed on Bhagiratha's ancestor's ashes and purified them.			
13	Subahu	Viswamitra performing a sacrifice, Rakshasas, Maricha and Subahu, defile it.			
14	Sita	King Janak's daughter. She was born of the earth. Ram's wife. Kidnapped by Ravan.			
15	Vasisith	Brahmarishi. Dashrath's guru who was preparing for Ram's coronation. Vishwamitra was jealous of him.			
16	Shiva	One of the three main gods of Indian mythology. Shiva's hair held Ganga in its knots in order to slow the force of her falling to earth down.			
17	Ganga	Ganga flowed on Bhagiratha's ancestor's ashes and purified them. She was kept tied in Shiva's hair.			
18	Janak	King of Videha, Friend of Dashratha, and Sita's father.			
19	Vishwamitra	Viswamitra, while he was king once went to visit Vasisitha's ashrama and tried to steal a cow from him. Viswamitra cursed Vasisitha's sons to die After more tapas, Brahma made him brahmarishi, he was happy Vishwamitra was Ram and Lakshman's guru and lead them to Videha.			
20	Tataka	Sunda, her husband was cursed by Sage Agastya and died. Provoked by this, Tataka and her son, Maricha pounced on Agastya who cursed them to be monsters living on the carcasses of men.			
21	Maricha	Tataka's son ans Ravan's friend. Turned into a golden deer to lure Ram and Lakshman away from Sita when Ravan wanted to kidnap her.			

5.2.12. Playtest 6

This iteration had a reduced board size to decrease the time taken for the game.

There was a character sheet that was made for the game. All the characters in the sheet were organized under the timelines they fell under. There was also a sheet of the timeline with characters and when in the story they came that was given with the game.

The numbers on the cards were removed due to repeated cases of no player using them.

The game did not have a point system. Every player had 10 cards and they needed to reach the end to finish first.

The dark grey boxes could not have cards put in them.

There was a concept of the degree of connections between cards that was agreed upon before the game began.

The aim was to finish by placing the card first on the 'end' space



Fig 24 : Sixth playtest gameplay

Main Insights:

1. It was hard to find characters on the sheet
2. Was hard to agree on what connections between cards could be considered.
3. There was no penalty for wrong connections made
4. With the concept of just having to be the winner by the player that places the card at the 'end' space first, players could just keep skipping turns and wait till the last possible moment to play the cards.
5. Having players play only on their own boards would limit the conversations around stories that were taking place and would limit interaction between players.
6. Players wanted to play another round after the game finished.

5.2.13. Playtest 7

In this iteration, the game's objective was to finish all the cards in a player's hand by putting them down on the board by making connections. The first player to do so would win.

There were penalties for placing cards with connections that were wrong. Players had to pick up 2 cards in that case.

Cards could be swapped if players could not think of any connections. This however would end the player's turn.

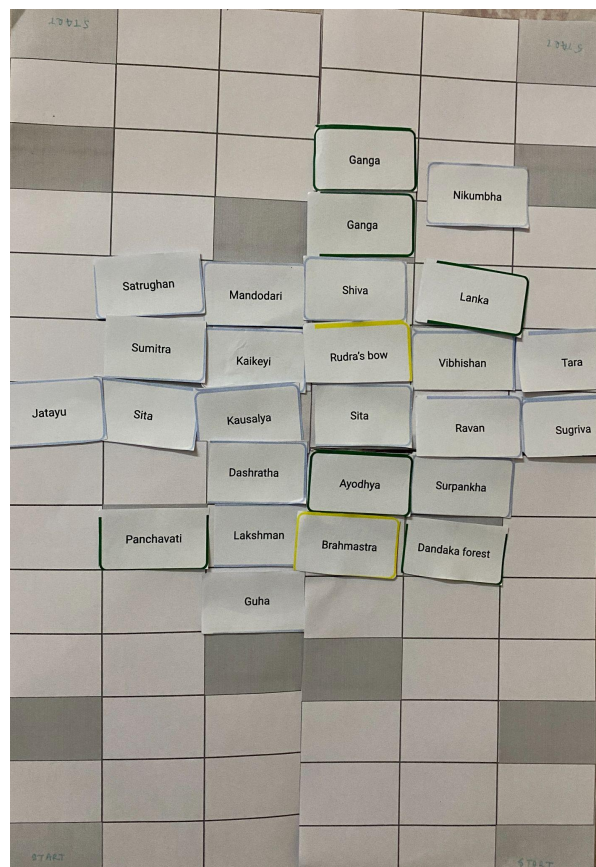


Fig 25 : Seventh playtest gameplay

Main Insights:

1. The cards were too small to hold or shuffle.
2. There was a problem deciding which connections were allowed.
3. The game rules were more clear and players had started recognising characters and their stories.

5.2.14. Data Visualisation

Character connections

In the last playtest, there was a need to have at least possible first-degree connections written down on the character sheet. Beginner players with little to no knowledge of the Ramayana needed a reference sheet for possible connections for each character. This information was thus added to the character sheet.

1	Sumitra	Lakshman and Shatrughan's mother. Dashrath's wife. Possible 1st degree links: Lakshman, Shatrughan, Dashrath, Kausalya, Ram, Sita, Kaikeyi, Bharat, Ayodhya, Kosala		
2	Kausalya	Ram's mother and Dashrath's wife. Possible 1st degree links: Ram, Sita, Lakshman, Shatrughan, Dashrath, Sumitra, Kaikeyi, Bharat, Ayodhya, Kosala		
3	Satrughan	Lakshman's brother. Sumitra and Dashrath's son Possible 1st degree links: Ram, Sita, Lakshman, Shatrughan, Sumitra, Kaikeyi, Bharat, Kausalya, Dashrath, Ayodhya, Kosala	20	Varuna Varuna, presented Janaka Rudra(Shiva)'s bow and two quivers. That was an ancient heavenly bow, which no ordinary man could even move. Possible 1st degree links: Shiva, Janak, Sita
4	Dashrath	King of Ayodhya. Ram and Lakshman's father. Husband to Kausalya, Kaikeyi and Sumitra. Possible 1st degree links: Ram, Sita, Lakshman, Shatrughan, Sumitra, Kaikeyi, Bharat, Shrawan Kumar, Vasishth, Janak, Vishwamitra, Parshuram, Ayodhya, Kosala	21	Parshuram Parashuram came to Ayodhya after hearing about Ram breaking the bow. Parshuram's father was killed by a king so Parshuram wanted to end the Kshatriya race, was therefore the enemy of them. Parshuram had an identical Vishnu's bow that he wanted ram to string, if ram was able to string it, they would battle. Ram strung the bow and Parshuram understood he was Vishnu's avatar too, just like Parshuram, so he went away to Mahendra mountains. Once strung the bow needs to be drawn so Parshuram gave away his powers from tapas to Ram. Possible 1st degree links: Shiva, Vishnu, Ram, Sita, Janak, Lakshman, Vishwamitra, Mithila
5	Vishnu	Ram is Vishnu's avatar. One of the three main gods of Indian mythology Possible 1st degree links: Ram, Sita, Lakshman, Kausalya, Dashrath, Shatrughan, Bharat, Shiva, Brahma, Parshuram		
6	Ram	Kausalya and Dashrath's son. Oldest prince of Ayodhya. Vishnu's avatar. Sita's husband. Lakshman, Shatrughan and Bharat's brother. Possible 1st degree links: Sita, Lakshman, Shatrughan, Sumitra, Kaikeyi, Bharat, Shrawan Kumar, Vasishth, Janak, Vishwamitra, Parshuram, Hanuman, Bali, Sugriva, Vishnu, Ravan, Sumantra, Bhardwaj, Khara, Akampa, Sabri, Jatayu, Jambavan, Angad, Surpanakha, Vibhishan, Ayodhya, Dandaka forest, Ganga, Mithila, Kosala, Brahmanstra, Panchavati	22	Kosala Kingdom Ruled by Dashrath Possible 1st degree links: Ayodhya, Ram, Lakshman, Sita, Kaikeyi, Sumitra, Kausalya, Dashrath, Shatrughan, Bharat
7	Brahma	Granted Vishwamitra with title of Brahmarshi. Granted Ravan the boon of invulnerability. Possible 1st degree links: Vishnu, Shiva, ravan, Vishwamitra, Vasishth	23	Ayodhya Capital of Kosala Possible 1st degree links: Ayodhya, Ram, Lakshman, Sita, Kaikeyi, Sumitra, Kausalya, Dashrath, Shatrughan, Bharat
8	Bharat	Ram and Lakshman's brother. Kaikeyi's and Dashrath's son Possible 1st degree links: Ram, Sita, Lakshman, Shatrughan, Sumitra, Kaikeyi, Kausalya, Dashrath, Ayodhya, Kosala	24	Dandaka forest Forest Vishwamitra takes Ram and Lakshman to when teaching them. Forest of rakshasas. Ram goes there after banishment. Possible 1st degree links: Ram, Lakshman, Sita, Maricha, Tataka, Vishwamitra, Jatayu
9	Lakshman	Ram's brother. Sumitra and Dashrath's son. Possible 1st degree links: Sita, Ram, Shatrughan, Sumitra, Kaikeyi, Bharat, Vasishth, Janak, Vishwamitra, Parshuram, Hanuman, Bali, Sugriva, Vishnu, Ravan, Sumantra, Bhardwaj, Khara, Akampa, Sabri, Jatayu, Jambavan, Angad, Surpanakha, Vibhishan, Ayodhya, Dandaka forest, Ganga, Mithila, Kosala, Panchavati	25	Mithila Kingdom Ruled by Janak Possible 1st degree links: Janak, Ram, Lakshman, Sita, Vishwamitra, Parshuram
10	Kaikeyi	Bharat's mother and Dashrath's wife. Invokes wish granted by Dashrath when she saved him in battle, to banish Ram from the kingdom and to crown Bharat as king. Possible 1st degree links: Ram, Sita, Lakshman, Shatrughan, Dashrath, Kausalya, Sumitra, Manthara, Ayodhya	26	Ganga River flowing near Ayodhya. Ram slept near it on the first night of banishment. Said to flow from Shiva's hair. Possible 1st degree links: Ram, Lakshman, Sita, Shiva, Ganga
11	Subahu	Vishwamitra performing a sacrifice, Rakshasas, Maricha and Subahu, defile it. Possible 1st degree links: Maricha, Vishwamitra, Dandaka forest		
12	Sita	King Janak's daughter. She was born of the earth. Ram's wife. Kidnapped by Ravan. Possible 1st degree links: Ram, Shatrughan, Sumitra, Kaikeyi, Bharat, Janak, Vishwamitra, Parshuram, Hanuman, Sugriva, Ravan, Sumantra, Khara, Jatayu, Jambavan, Angad, Surpanakha, Mandodari, Ayodhya, Dandaka forest, Ganga, Mithila, Kosala, Panchavati	27	Invincible against devta, asuras, and gandharvas Ravan got boon from Brahma that he should be invulnerable and invincible against Devas, Asuras, Gandharvas and other such beings. He didn't say mankind. Possible 1st degree links: Brahma, Ravan
13	Vasishth	Brahmarshi. Dashrath's guru who was preparing for Ram's coronation. Vishwamitra was jealous of him. Possible 1st degree links: Ram, Dashrath, Brahma, Vishwamitra, Ayodhya, Kosala	28	Strength boon Tataka's strength came from a boon granted by Brahma. Possible 1st degree links: Tataka, Brahma
14	Shiva	One of the three main gods of Indian mythology. Shiva's hair held Ganga in its knots in order to slow the force of her falling to earth down. Possible 1st degree links: Vishnu, Brahma, Ravan, Parshuram, Ganga		
15	Ganga	Ganga flowed on Bhagiratha's ancestor's ashes and purified them. She was kept tied in Shiva's hair. Possible 1st degree links: Shiva, Ganga	29	Rudra's bow Varuna, presented Janaka Rudra(Shiva)'s bow and two quivers. That was an ancient heavenly bow, which no ordinary man could even move. Possible 1st degree links: Shiva, Janak, Sita, Varuna, Parshuram, Mithila
16	Janak	King of Videha. Friend of Dashrath, and Sita's father. Possible 1st degree links: Sita, Ram, Lakshman, Vishwamitra, Dashrath, Mithila		
17	Vishwamitra	Vishwamitra, while he was king once went to visit Vasishth's ashrama and tried to steal a cow from him. Vishwamitra cursed Vasishth's sons to die. After more tapas, Brahma made him brahmarshi, he was happy Vishwamitra was Ram and Lakshman's guru and lead them to Videha. Possible 1st degree links: Ram, Lakshman, Sita, Janak, Dashrath, Vasishth, Brahma, Mithila, Kosala, Ayodhya, Dandaka forest		
18	Tataka	Sunda, her husband was cursed by Sage Agastya and died. Provoked by this, Tataka and her son, Maricha pounced on Agastya who cursed them to be monsters living on the carcasses of men. Possible 1st degree links: Maricha, Dandaka forest		
19	Maricha	Tataka's son and Ravan's friend. Turned into a golden deer to lure Ram and Lakshman away from Sita when Ravan wanted to kidnap her. Possible 1st degree links: Tataka, Ravan, Sita, Ram, Lakshman, Dandaka forest, Panchavati		

5.3.2. Card Design

A standard card size of 2.5”*3.5” was taken for the cards since there were constant complaints regarding the size.

Colour Palette

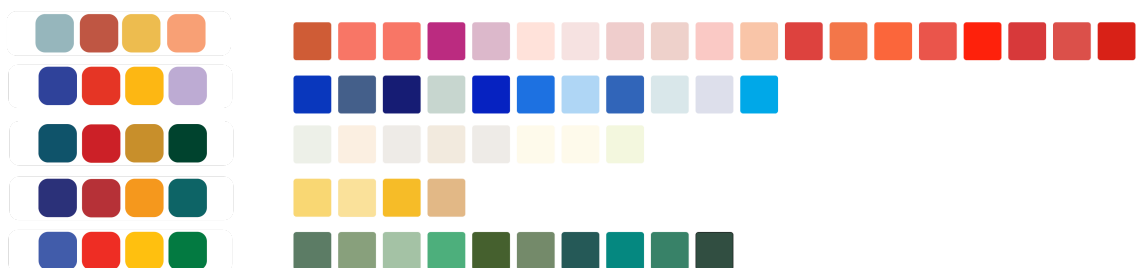
People snack when playing games. Not having white backgrounds on cards would make it easier for people to play more freely because then they aren't afraid of getting the cards dirty.

The Ramayana like most myths is long and winding, it seemed boring to people, wanted to make the game as colourful as possible and bright to off play this. Also, bright colours are attention-grabbing and more visible.

The colour palette extracted from the mood board was the one that is featured below.



There was a need for 4 colours, one for each card and a few secondary colours. In the beginning, colour palettes of 4 colours each were made from the colours extracted from the mood board. To try more colours and combinations, similar colours were grouped together and tried with colours from other groups. One colour each from the blues, reds, yellows, and the greens as well as a base colour was to be selected. These colours would offer the most contrast.



After narrowing down a few colours, they were texted on mockups of cards to perform a test run to see how readable the text would be.



The colour palette was selected according to how readable the text was in those colours as well as keeping in mind the versatility of the combinations that could be made and used by mixing and matching these colours.



Fig: colour palette

After feedback, the colours in the palette were deemed not compatible as some were cool tones while others were not. There did not seem to be harmony between the colours. So an attempt to make a different colour palette was made. This time, earth toned colours were chosen as the Ramayana was an old epic. Earth toned colours would be better suited to the story.

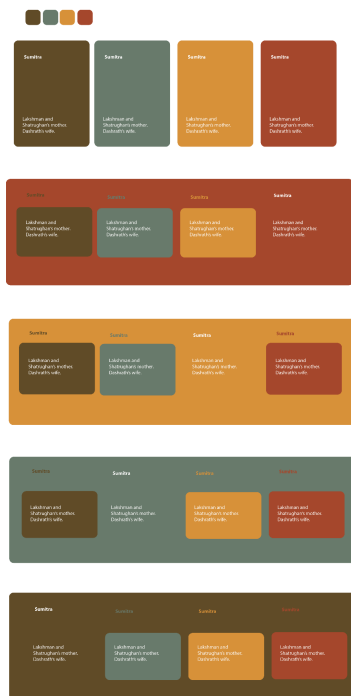
These were a few of the colour combinations.



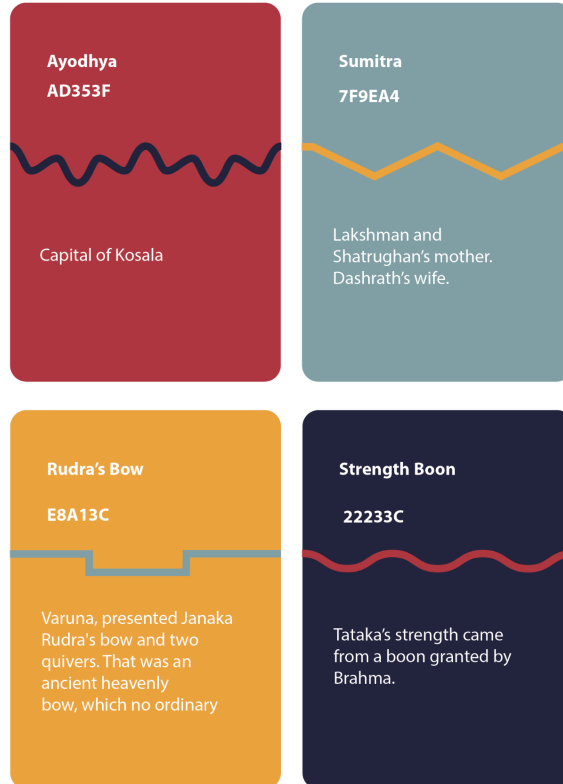
Out of them, a few of the following were shortlisted, based on colour contrast.



The previously mentioned colours were tested out in order to examine the readability of text.



After the tests, the final colour palette chosen was the one below.



Font

A few fonts were selected. There were a few of special interest since they came from the Indian Type Foundry. These fonts needed to be playful but still readable to the elderly as well as to children.

Sans Serif	Misc	Serif
Poppins	Grandstander	Playfair
Raleway	Skia	Bodoni
Century Gothic	BONDI	Lora
Gilroy		
Hind		
Orkney		
Guide		

Fig: Selected Fonts



Fig: Selected Fonts

The selected fonts were put on cards to check readability. The serif fonts were hard to read in bright colours, same was the effect of some of the calligraphic fonts.

After narrowing the fonts down, Poppins, Bombay Mono, and Granstander were left.



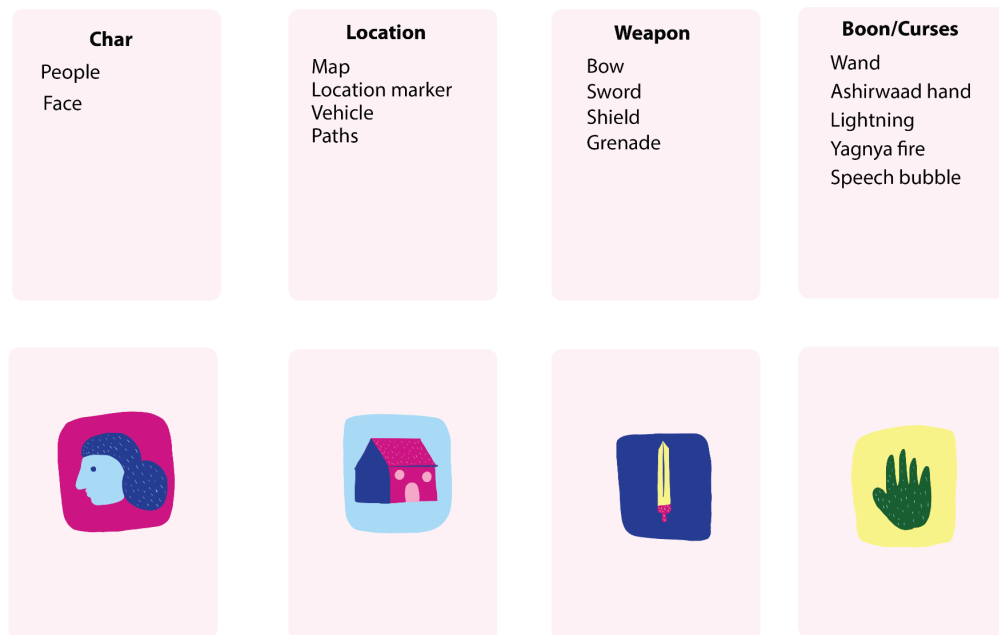
The final font chosen was Poppins. It was clear to read, the numbers all followed the same line and it was a font from the Indian Type Foundry. It was professional due to the clean lines but still playful enough due to the rounded-edged its letters had.



Icons

Icons needed to be made for the different card groups since there was a need to include multiple options to communicate the card's group. It would cater to people with disabilities as well as make it easier to know which card is which if there are tears or the colours fade.

The icons were playful and were inspired by Gond art.



The boxed version of the icons took a lot of space and some were not clear, so more iterations were made until the one below were selected.



Card Design Iterations

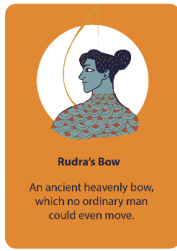
Some iterations of the card design were:





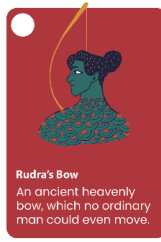
Rudra's Bow

An ancient heavenly bow, which no ordinary man could even move.



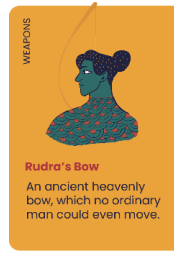
Rudra's Bow

An ancient heavenly bow, which no ordinary man could even move.



Rudra's Bow

An ancient heavenly bow, which no ordinary man could even move.



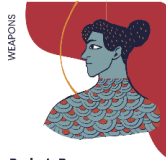
Rudra's Bow

An ancient heavenly bow, which no ordinary man could even move.



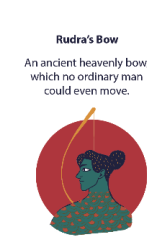
Rudra's Bow

An ancient heavenly bow, which no ordinary man could even move.



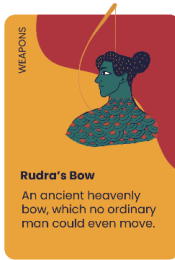
Rudra's Bow

An ancient heavenly bow, which no ordinary man could even move.



Rudra's Bow

An ancient heavenly bow, which no ordinary man could even move.



Rudra's Bow

An ancient heavenly bow, which no ordinary man could even move.



Rudra's Bow

An ancient heavenly bow, which no ordinary man could even move.



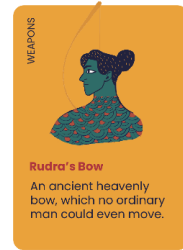
Rudra's Bow

An ancient heavenly bow, which no ordinary man could even move.



Rudra's Bow

An ancient heavenly bow, which no ordinary man could even move.



Rudra's Bow

An ancient heavenly bow, which no ordinary man could even move.



Rudra's Bow

An ancient heavenly bow, which no ordinary man could even move.



Final Card Design

The design of the card includes the name, short description, illustration, and icon on the front and the name of the game at the back.

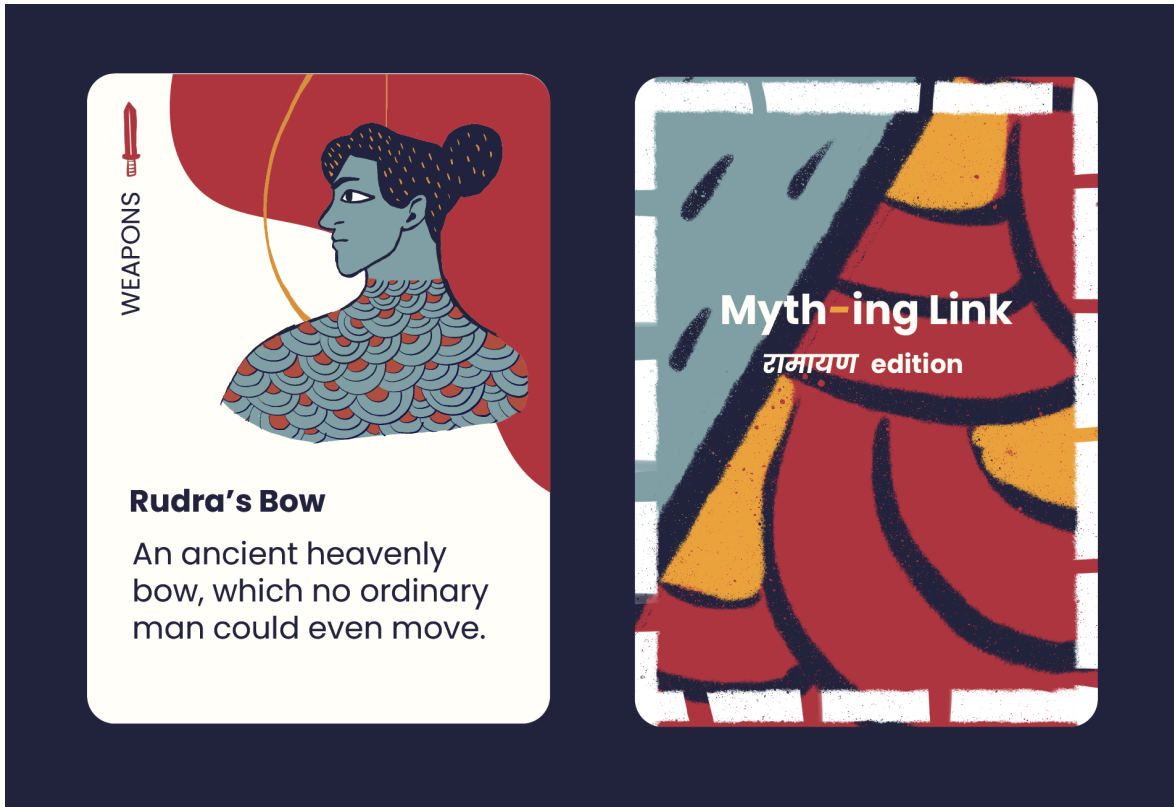


Fig: Front of card

Fig: Back of card

5.3.3. Board Design

The board required visual clues to guide players through the timeline of events, therefore illustrations needed to be made. For each portion of the story, key objects were thought of and illustrated.

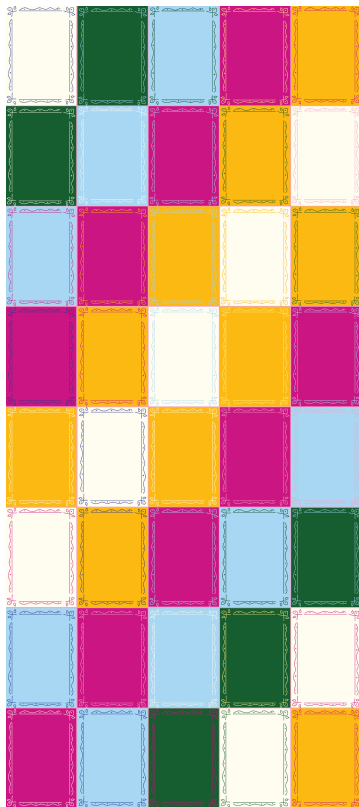
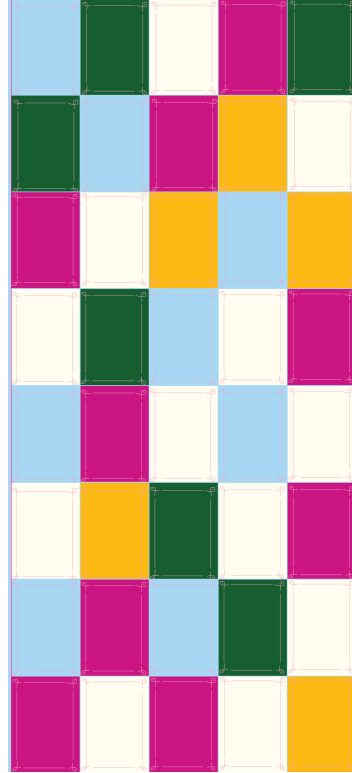
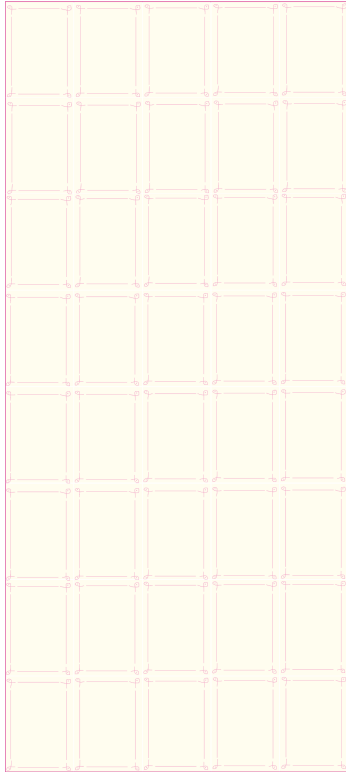


The following illustrations were used on the game board. They were influenced by the Gond art style.



Board Design Iterations

The following were some of the iterations of the board design.





Final Board Design

The final board design could be used by either side. The first board was based on patterns in Gond art and depicted the sun. Ram was a 'Suryavanshi' king, which meant he was said to have descended from the sun god. The Ramayana is also a story about the light winning over darkness. These two ideas were used in the concept. On the second board, the illustration is of a route through which the story is traveled.



Final Game

Game Name: Mything Link

Game Play:

Players need to put down all the cards in their hands through links first. Cards are linked through common connections between the characters, locations, weapons, boons, or curses mentioned on individual cards.

If they don't know any of the remaining cards in their deck, players are allowed to swap a maximum of three of their cards with cards from the draw pile. This can be done twice during the entire play by each player. Doing a swap amounts to the player receiving a penalty of receiving an extra card.

If the card connection is invalid, the player gets an extra card.

If challenged and the link is valid, the player who is challenged loses a turn.

If a card is picked, the turn is over.

Special conditions: If a card is to be placed at a location where there already are multiple cards placed around it, a minimum of one card should have a connection with the card being placed. 1 point is given for each additional connection that is made with a different card.

The cards can be played in multiple iterations of the game and players are free to make their own games as well.

Defining Connections:

Ram married Sita.

Sita was the daughter of Janak.

Varuna presented Janak with Rudra's bow.

Ram to Sita: 1st level connection

Ram to Janak: 2nd level connection

Ram to Varun: 3rd level connection

Casual players should use 1st and 2nd-level connections. 3rd level connections are harder. The level of connection should be agreed upon before the game starts.

1st level: cards with an identifiable direct relationship

2nd level: cards with one step or level further relationship from 1st level.

1st level connections

Character to Character when they have met each other or have a familial relationship

Character to Location when the character has visited that location

Character to Weapon when the character has been granted or been in contact with the weapon

Character to Curse when the character was the one who was cursed or cursed someone/thing else

Character to Boon when the character was the one who was given a boon or gave one to someone/thing else

Location to Location when one of the location falls inside the other

Location to Weapon when the weapon was made, found, or granted at that location

Location to Curse when a curse was laid when the person/object was in said location

Location to Boon when a boon was granted when the person/object was in said location

Weapon to Weapon when the weapons were used against each other or together

Weapon to Curse when the curse was laid through the weapon

Weapon to Boon when the boon was granted through the weapon

Curse to Curse when both curses were laid at the same time and on the same person

Curse to Boon when they were used to nullify each other

Boon to Boon when both boons were granted at the same time and on the same person

6. Conclusion

The aim of this project was to create a game in order to preserve the story of Ramayana. This project involved creating a database of the Ramayana based on events, characters, locations, curses, boons, and weapons in the story. This was followed by multiple iterations of the game that were playtested and changed according to feedback and problems identified. The visual design of the game was then done.

Problems encountered included a lack of varied playtesting groups, this could be rectified by playtesting in school environments. Through the playtest, it was interesting to see how players interacted and shared stories with each other.

Further scope of this project would include playtesting with a high fidelity prototype and a more varied audience. The visual design for the packaging and other components of the game needs to be taken up. The game can then be marketed to the Indian audience.

7. Acknowledgments

I would like to extend my gratitude to the following people for extending their support to me throughout this project: My guide, Prof. Sheetal Gokhale, for her invaluable advice, continuous support, and immense knowledge, which played a crucial role in shaping this project. I would also like to thank my panel members, Prof. Udaya Kumar, and Prof. Pankaj Upadhyay, for the valuable feedback on the project. And finally, I would like to thank everyone in the Department of Design, IIT Guwahati, for their constant support over the last four years.

8. References:

Book:

- [1] Kalmpourtzis, G., 2018. Educational game design fundamentals. 2nd ed. CRC Press.
- [2] Adams, E., 2014. Fundamentals of game design. Berkeley, CA: New Riders.
- [3] Koster, R., n.d. A theory of fun for game design. 3rd ed. Sebastopol: O'Reilly Media Inc.
- [4] Schell, J., 2008. The art of game design. 1st ed. CA, USA: Elsevier Inc.
- [5] Hiwiller, Z., n.d. Players making decisions. 1st ed. USA: New Riders.
- [6] Jagannathan, N. and Sundaram, P., 2003. The Kamba Ramayana. New Delhi: Penguin Books, India.
- [7] Chandrasekhara Aiyer, N. and Vālmīki., n.d. Valmiki Ramayana.

Journal paper/article:

- [8] Stenros, J., Paavilainen, J. and Mäyrä, F., 2011. Social interaction in games. *International Journal of arts and technology*, 4(3), pp.342-358..
- [9] Smith, A., Reitsma, L., van den Hoven, E., Kotzé, P. and Coetzee, L., 2011, October. Towards preserving indigenous oral stories using tangible objects. In *2011 Second International Conference on Culture and Computing* (pp. 86-91). IEEE.
- [10] Madhavi, B., 2014. A Glance at Educational Philosophy in Indian Mythology and its Timelessness. *International Journal of The Frontiers of English Literature and The Patterns of ELT*, 2(1).

9. Appendix

Link to Ramayana database:

https://docs.google.com/spreadsheets/d/1sC7bo43jAMjRb12k16AuKLh_5WN0ym-uxvZJfocHtk/edit?usp=sharing

Cards Used:

https://drive.google.com/file/d/1Uw5w0X3R1nULRStypPdYCqnx_BGALfap/view?usp=sharing

Initial Character description:

<https://drive.google.com/file/d/1SraDKol91hDYPSwlgV--YSrljaBaBoNN/view?usp=sharing>

Character Description file:

<https://drive.google.com/file/d/10P0Ff630PiW0UnAsABqgIXY7iQa3bTL4/view?usp=sharing>

Initial Extensive timeline:

<https://drive.google.com/file/d/1OHAtNSAoFQH-PmqPCO0-2MwMvZPrF1UL/view?usp=sharing>

Character Timeline:

<https://drive.google.com/file/d/1fl37ioJKtthuQ7gcH9OEulwhzLXjRye/view?usp=sharing>