

X  
गलत  
फॅमिली



## **Summer Internship**

### **Project Report**

#### **Gamification of Education**

**Company:- IDC,IIT Bombay**

**Duration: - 1 month (8<sup>th</sup> April to 8<sup>th</sup> May)**

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IIT Bombay

## Certificate of Participation

Workshop on  
**GAMIFICATION OF EDUCATION**

This is to certify that

**Mr. Ratan Singh**

has participated in the workshop on  
**Gamification of Education**  
conducted by *Industrial Design Centre, IIT Bombay*  
from *8th May 2015 to 8th June 2015*

Prof. B. K. Chakravarthy  
Workshop Co-ordinator  
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Workshop Faculty  
IDC, IIT Bombay

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## **Abstracts**

The workshop on gamification of education was organized by IDC in collaboration with the Rajya Shiksha Kendra from Madhya Pradesh education board. The intention of the workshop was to develop a language based game for first standard kids. A card based game to help children identify the correct alphabet was designed. This concept was also prototyped for a digital interface with the theme of a kid feeding his pet dog to keep him healthy.



## **Acknowledgment**

I would like to express my gratitude to Prof. Uday Athavankar for giving me an opportunity to work under him and for his invaluable guidance, support and inspiration all throughout the development process of my project. I would like to extend my gratitude to my friends for their insightful discussions and their incessant support in spite of their busy schedules.

Ratan Singh  
14634008





## **Introduction**

### **Project -1**


Project brief:

The project KHEL (gamification of education) was conducted at IDC, IIT Bombay along with RSK (Rajya Shiksha Kendra) for government schools of Madhya Pradesh. In this project we were trying to develop the educational game for primary school across the state .we were working on Hindi language game and our motive is to make such game which help children to learn a language in playful manner.

Initially this game was based on board game/card game then we shifted into digital medium.in this duration of time we have developed two card/board game and game play and game flow for digital media.

### **Phase:-1**

To develop a game activities which help children learn Language and Mathematics through self-motivation and enjoyable learning.



# OBJECTIVE

Our aim was to develop a game that showed them similar looking drawings and try focusing more on the intricacies of the script. Learning why and when a certain alphabet can be pronounced “aa” or “ka”

- Children should be able to identify *Hindi* letter
- They should also differentiate between correct and wrong letters
- They can play the game with little guidance of teacher
- Children should be able to pronounce letter correctly
- Learn how to associate letters in surrounding objects

## Phase:-2

### Targeted Age Group & Problem Areas

In this project we have interact with children and RSK (Rajya Shiksha Kendra) team members and they have shown us which types of silly mistake children's do. Through that mistake we tried to teach how to identify correct letters. This game is made for class 1<sup>st</sup> & 2<sup>nd</sup> standard student/ who is in below 1<sup>st</sup> & 2<sup>nd</sup> standard.



#### Problem Areas

- Children are not able to recognize correct letter , if we show the picture of anaar and say 'A' se anaar than they only recognize only the shape or anaar not the letter 'A'.
- Traditional methodology for teaching *Hindi* is instructional oriented
- Content could involve more practical reference and application for children to relate
- Children are not motivated due to repetitiveness and lack of fun
- Coercion of instructions
- Evaluation system burdened children to score marks
- Regional language and dialects varies from Hindi
- Limited availability of fun activities related to Hindi

### Phase 3



#### Explorations & Ideation:

- Several ideas were come up, games were divided into pre-online and post online game depending on requirement of skills to play
- Galat Family - game based on maze puzzle with Hindi letters to promote writing understanding
- Tap game - an outdoor game with involves calling of noun words
- can be played in Hindi and English
- Illustrated stories in rhyme fashion for learning *varnmala* and *swar*
- Racing game with *matras* and letters
- Tracing games for writing letters facilitated by iPads/smart phone apps
- Make a chain game - an outdoor game with a letter assigned to each player in which they have to make words by catching letters

अ

a

आ



- For a child seeing the alphabets for the first time, every script and scribble is a drawing.
- It's through persistent teaching that they start associating an alphabet to a particular "drawing"

## Phase 4

### Structure and Contents

- The game comprises of 52 set of hand cards corresponding to 52 letter from *hindi varnmala*
- Each set contains about 3 correct letters, 2 wrong version of the same letter, images associated with selected letter and a bonus cartoon character
- Each card is color coded, set wise on its back, to organize them in a set
- 52 large cards with correct letters for reference and for selecting letters during gameplay
- Difficulty level can be set by children themselves by adding more then one set at a time

**The task is to quickly scan through the thrown cards in front and recognize the correct alphabet from the wrong ones.**



- Competition in picking up the cards adds on the fun as well as improves the eye coordination and recalling power of the child.
- The child starts looking at the basic and unique characteristics of each alphabet and its corresponding typeface.
- To adding cartoon character in this game makes more joyful and fun full learning for child

## Phase 5

### Observations & Testing



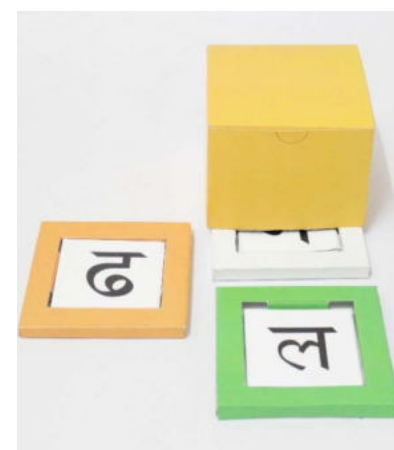
- Prerequisite to play the game is children need to know letters
- Kids like to have a role play of teacher assigned to players
- Children were correcting each other's letter by recognizing correct one and what are the silly mistake in wrong latter
- They were engaged in picking cards and enjoying it
- They were engaged in play until they have learnt all the letters
- They were recollecting and associating objects from past learning and surroundings

## खेल के नियम

- समूह के छात्र से कोई एक छात्र शिक्षक का पात्र निभाएगा जिसे बड़ी पट्टीका के बीच से कोई एक पट्टीका उठानी है और उसे सभी सहभागी छात्रों को दिखना है
- शिक्षक सभी कार्ड के पीछे भाग में जो भी आकृति हो पहले उस आकृति के सभी कार्ड को मिलाएगा जिससे उस समूह के सभी कार्ड बाकी समूह के
- कार्ड से पृथक हो जाएँगे
- माना की वह आकृति 'क' अक्षर से मिलती है
- जब 'क' अक्षर के सभी कार्ड एक साथ मिल जाए तब शिक्षक उन सभी कार्ड को हवा में उपर फेंकेगा
- तब अन्य छात्रों को सही अक्षर के कार्ड को उठाना है (एक छात्र एक बार में अधिकतम दो कार्ड उठा सकता है)
- और जब शिक्षक बच्चों से अपने अपने कार्ड दिखाने कहेगा तब सभी छात्रों को अपने अपने कार्ड दिखाने होंगे
- जिसके दोनों कार्ड सही होंगे उस छात्र को २० अंक प्राप्त होंगे
- जिस छात्र को सही कार्ड के साथ कोई भी कार्टून आकृति मिलती है तो उसे सही कार्ड के १० अंक और कार्टून कार्ड के ५ अंक मिलते हैं
- यदि कोई छात्र दोनों कार्ड गलत उठाएगा तो उसे शून्य अंक प्राप्त होंगे
- इस प्रकार शिक्षक इस खेल का संचालन करेगा

## Phase 6

### Final product packaging (card game)





### Future Aspects & Scope

- The medium of game could be changed to digital interaction
- More cards could be added to a set for learning words and *matras*
- Adding picture card and concept of adding half letter card will increase difficulty level in the game

## Project 2



## Phase 1

	1	2	3	4	5	6	7	8	9
क									
ख									
ग									
घ									
च									
छ									
ज									
झ									
ट									

**OBJECTIVE:**

- Understanding of making of words
- Vocabulary
- Placing of coordinates
- Matras

In this game our objective was to develop such game which includes understanding of making word and increasing vocabulary among children. This game is word battle between two opponents player at the end who has more pawn the will be a winner.

## Phase 2

1 2 3 4 5 6 7 8 9

क  
ख  
ग  
घ  
च  
छ  
ज  
झ  
ट

**GAME PLAY:**  
game involves rolling of 2 dice at a time that shows position of co-ordinates on which pawns are placed.  
Size of pawn determines the number of words and co-ordinates determines the number of letters in a word

### खेलने की प्रक्रिया

- सर्वप्रथम खेल आरंभ होने से पहले खिलाड़ी स्वयं को दो समूहों में विभाजित करे, तत्पश्चात अपने-अपने जलीय जंतुओं का विभाजन करे और उन जलीय जंतुओं को अपने अपने स्थान पर स्थापित करे

- समूह विभाजित होने के बाद हम सिक्का उछाल कर यह निर्धारित करते हैं की कौन सा समूह पहले पासा फेंकेगा
- यदि पासो मे मानलीजिए,५, 'GA' संख्या आती है तब हमे अपने जलीय जंतुओ को 'GA' और ५ की वर्गाकृति मे स्थापित करना है और प्रतिद्वन्दी खिलाड़ी को जो भी बड़ी संख्या हो उतने अक्षर के उतने शब्द बनाने होंगे जितनी वर्गाकृति दूसरे खिलाड़ी का जलीय जन्तु घेरता है
- यदि विरोधी खिलाड़ी यह शब्द १मिनट की समय सीमा समाप्त होने के पूर्व बना लेता है तब उसे प्रतिद्वन्दीके जलीय जंतुओ को मारने के विकल्प मिलते है जिसमे उसके पास हथियार स्वरूप बम , और गोलियाँ होती है
- यदि वह बम का प्रयोग करता है तब जलीय जन्तु का संपूर्ण विनाश हो जाता है और वह गोलीओ का प्रयोग करता है तब उसे बारी - बारी से मारना होगा
- अब पासा फेकने की बारी विरोधी खिलाड़ी की आती है ओर वह पुनः यही प्रक्रिया दोहराएगा
- और अंत मे जिसके भी सबसे ज़्यादा जलीय जन्तु जीवित होंगे उसे विजेता मान लिया जाएगा
- विजेता का निर्धारण यह खेल ३ बार खेलने के उपरांत ही किया जा सकता है
- खेल के नियम
- यदि पासो मे दो ६ एक साथ आते है तब 'मृतसंजीवनी' शक्ति मिलती है जिसके द्वारा हम अपने किसी भी जलीय जन्तु की पुनः जीवित कर सकते है

### Phase 3

#### Prototype of Game

यह है हिन्दी  
वर्णमाला चार्ट  
और मात्राये

अ	आ	इ	ई	उ	ऊ
ए	ऐ	ओ	औ	अं	अः
क	ख	ग	घ	ङ	
च	छ	ज	झ	ञ	
ट	ठ	ड	ढ	ण	
त	थ	द	ध	न	
प	फ	ब	भ	म	
य	र	ल	व	श	
ष	ष	ह			
ञ	त्र	ज्ञ			

अ	आ	इ	ई	उ	ऊ
a	aa	i	ii	u	uu
ए	ऐ	ओ	औ		
ee	ai	oo	au		

यह है आपकी  
शब्द- भूमि  
जहाँ आपको  
पासे के अंक  
के आधार पर  
अपने जलीय  
जीव जन्तु  
स्थापित  
करने होते हैं

9	8	7	6	5	4	3	2	1
								क
								ख
								ग
								घ
								च
								छ
								ज
								झ
								ञ

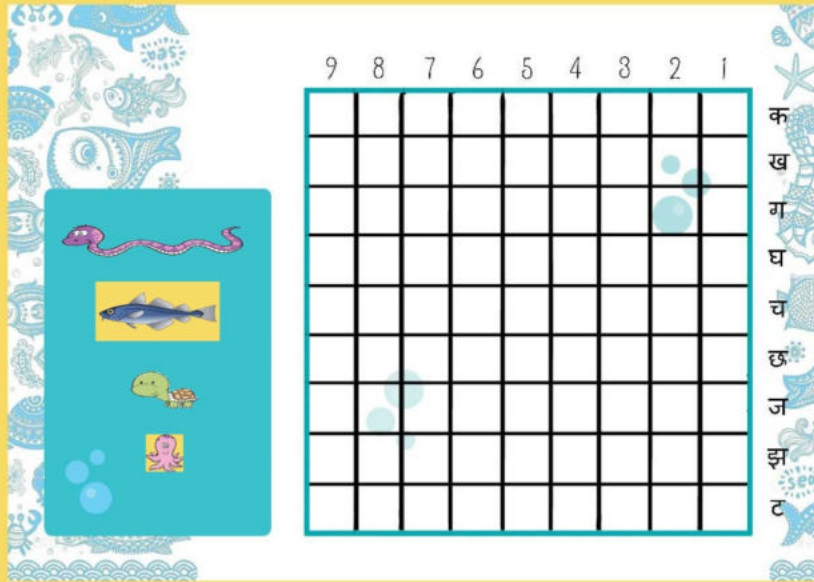
# खिलाड़ी १

9	8	7	6	5	4	3	2	1
								क
								ख
								ग
								घ
								च
								छ
								ज
								झ
								ट

# खिलाड़ी २

1	2	3	4	5	6	7	8	9
क								
ख								
ग								
घ								
च								
छ								
ज								
झ								
ट								

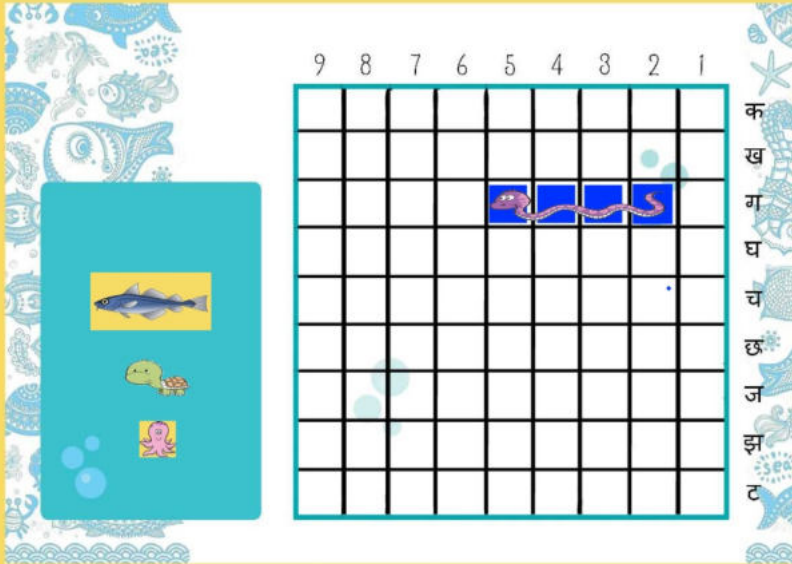
कौन पासा फेकेगा यह सुनिश्चित करने के लिए हम सिक्के को हवा में उछालेंगे



यदि पासो में  
ग और ५  
आए तब हमें अपने  
जलीय जन्तु  
को उस स्थान पर  
रखना होगा





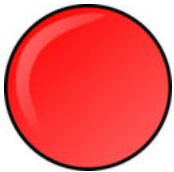


मिठाईवाला  
पुष्पमाला  
असमंजस  
दियासलाई

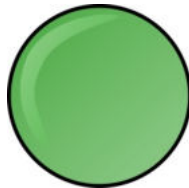


*To kill that pawn we may use either bomb or bullet if we use bullet so we have to use as many bullet as much space taken by the pawn but we can destroy the pawn using of one bomb also.*

*The pawn can have one extra life using of Hilling power (mrit-sanjiwani)*



Bomb



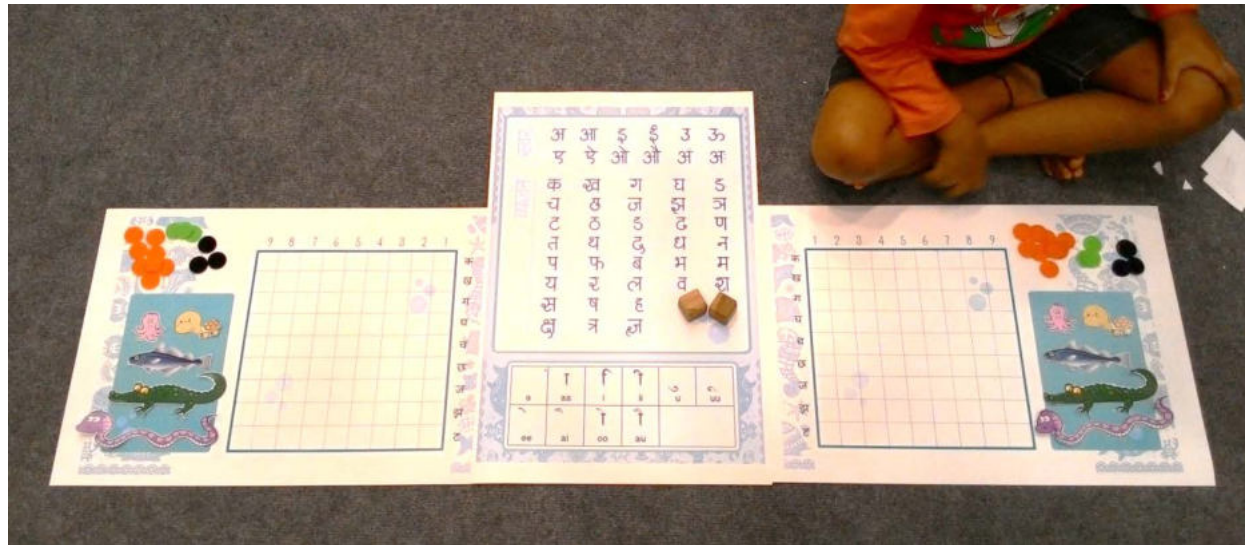
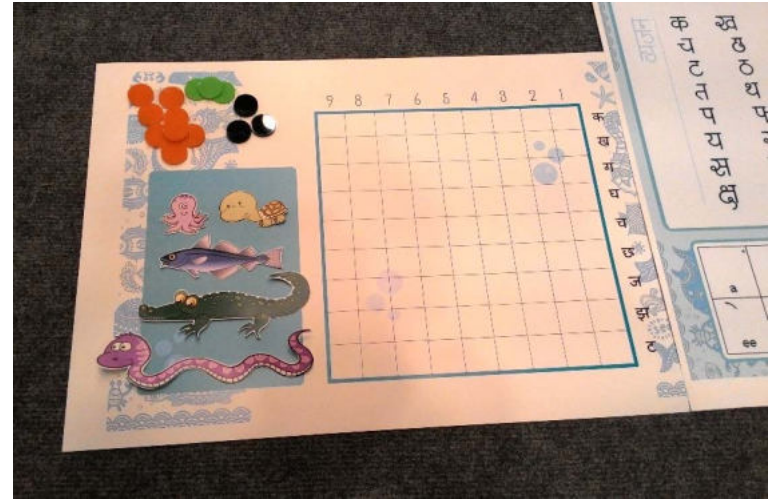
Hilling Power (mrit-sanjiwani)



Bullet

## Phase 4

### Observations & Testing



## GAME PLAY FOR DIGITAL MIDIA



# GAME PLAY

### Core Mechanics

The task is to quickly scan through the flashing rotis in front of them and recognize the correct alphabet from the wrong ones.

The player keeps collecting points by trying to capture as many correct alphabets as possible in his food bowl.

*We converter our one game in digital platform the mechanism, joy and learning part still same. That was an avatar based game.*

## Phase 1

### Concept of the game

The main concept of the game is alphabets (dog treats) will keep flashing in the middle of the screen and children have to try to pick up the right alphabets and drag it to their dog food bowl.

After that they have to match the collected alphabets with the alphabet shown on the plate, this is the part of the game where the correction and teaching part happens. If the collected alphabet (dog treat) matches with the correct one then his dog will be happy, if it's not then the dog will be sad. We have introduced some powers also like barking power, jump power and health which is needed to move on to the next levels.

The entire game happens in a tournament fashion where you keep collecting health points to move on and qualify for bigger rounds. The dog evolves with you as you progress in the game, getting stronger and cooler.

There are some bonus rounds and mini matches where the dog has to jump on correct letters to reach the end, make the loudest bark. So this is where all the

Points that he gathered throughout the game would matter.

## Game Specification Document`

1. Introduction about the basic functionality of the game

a) Purpose of the game

*To introduce them to the concept of alphabets. Able to recognize and recall alphabets by learning the specific characteristics of each alphabet.*

b) Target audience of the game

Pre nursery, class 1<sup>st</sup> or 2<sup>nd</sup> standard students.

**Game salient features**

	Features	Yes	No	TBD
1	Online game			
	If yes to Online Game – Admin module to manage game content	yes		
2	Downloadable game (offline game)	Yes		
	If yes to Downloadable Game – Size of game less than 3 MB ?			TBD
3	Multiplayer game-How many?	Yes		
	Minimum	1		
	Maximum	4		
4	Both Single player game & Multiplayer game	Yes		

5	Design /Graphics Quality			
	• Realistic			
	• Cartoon	Yes		
6	Art style			
	2D Art			
	2.5 D Art	yes		
	3D Art Rendering			
8	Game Style			
	Turn based game	Yes		
	Action adventure game			
	RPG game			
	Avatar based	Yes		
	Other			

## Game Function

		Details
a	Login/Guest Play Requirements Single sign-on	TBD
b	Database Specification Save and Load Avatar system Level up system	Yes
c	Tournament system Ladder system in tournaments Local tournaments Connected tournaments	yes
d	Referral system Invite Friend	Yes

	Challenge Feature	
e	Redemption program Badges and Tokens	yes
f	Scoring system Time Based Score Game Play Based Score Level based score Negative Scoring Level up system	Yes Yes Yes Yes Yes

## Phase 2

### Prototype of Game



Individual  
Player Screen

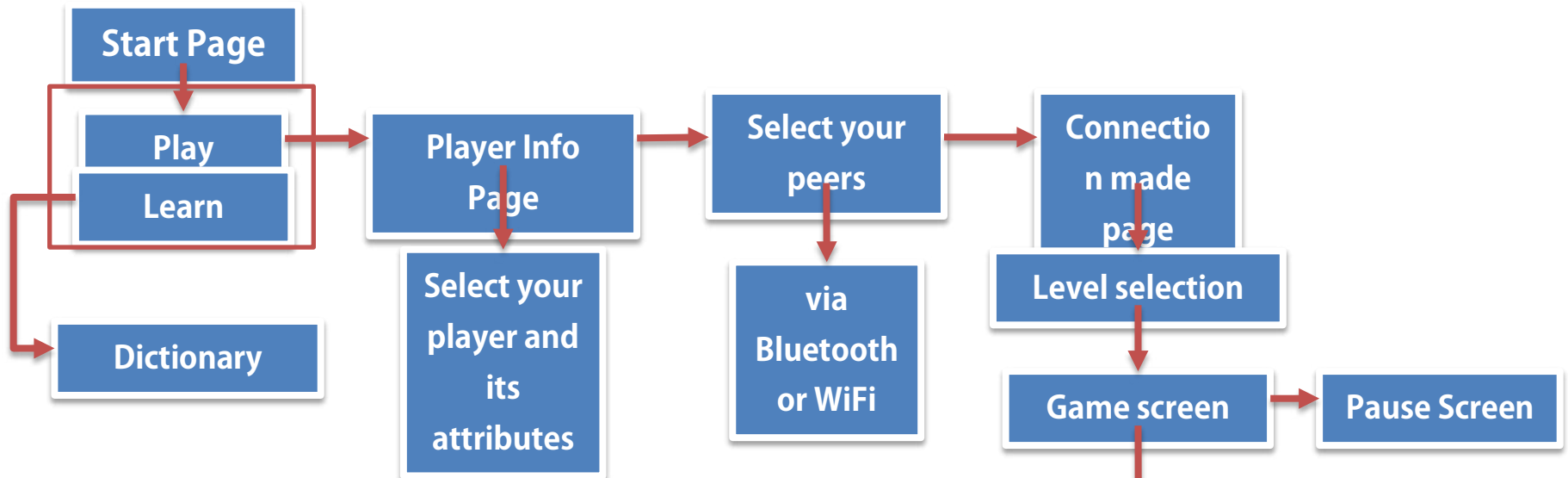
## PLAY MECHANICS

The player interacts with the game through simple drag and swipe mechanism.

This should feel as if something is about to escape your vicinity and you are trying to grab it to your side.

It should have an elastic band feel that if you don't grab and pull it to your side, it would retract back to the central position.

## Game Flow



## Screen Flow

GALAT FAMILY





# PROGRESSIVE MECHANICS

The ultimate goal of the player is to collect the most right alphabets than your competitors (AI/Players) and gain as many health points as possible.

The player keeps gaining health points for every correct move and that helps him to grow and evolve his character in the game.

He gains bonus points like “barking power, leaping jump” for exception performance in a game.

These powers will be required in mini matches after each season that adds variability in the overall game score.

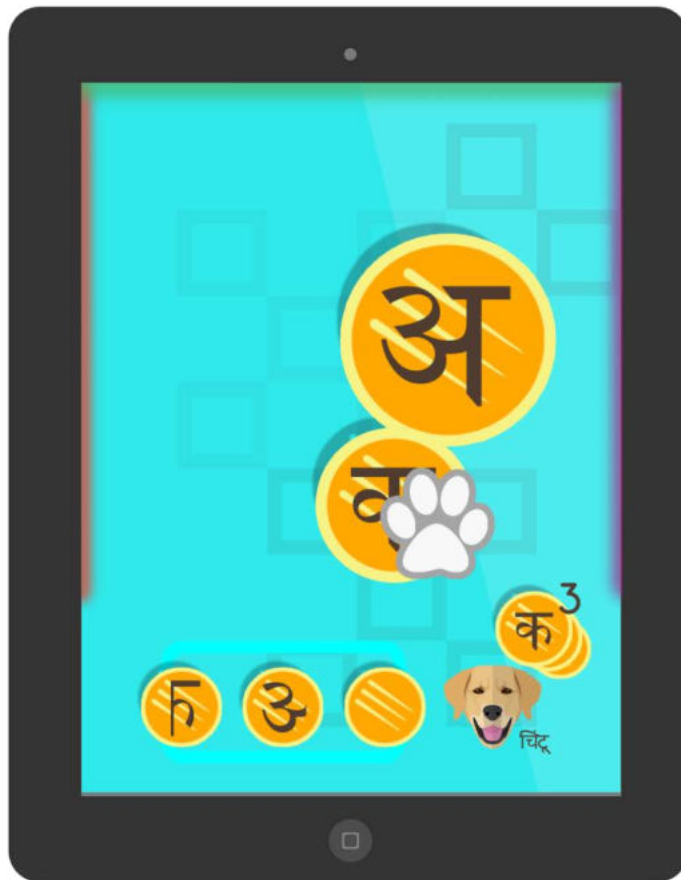


Player2

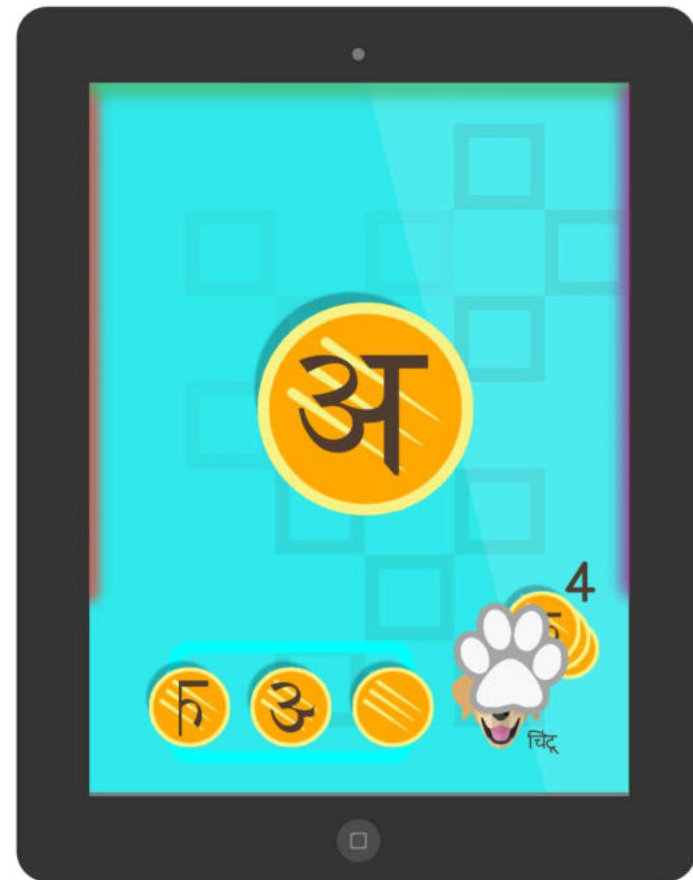


Player1

Player 1 is passing a letter which he does not require if player 2 wants to take that letter than he has to garb that letter towards his food bowl.



Player 2



Player1

If player 2 doesn't need that 'A' letter given by player1 than he has to grab another letter which is flashing on screen



Thus swapping of wrong/right alphabets happen among the connected tablets

Player 2 doesn't need letter 'A' than he sand it to another player

### Phase 3

#### Concept of Half Letters

With same game play and make more difficulty level high we introduced concept of half letter, if player can able to make correct letter through addition of two or more than two incorrect letter than he can kept that half letter in his food bowl.

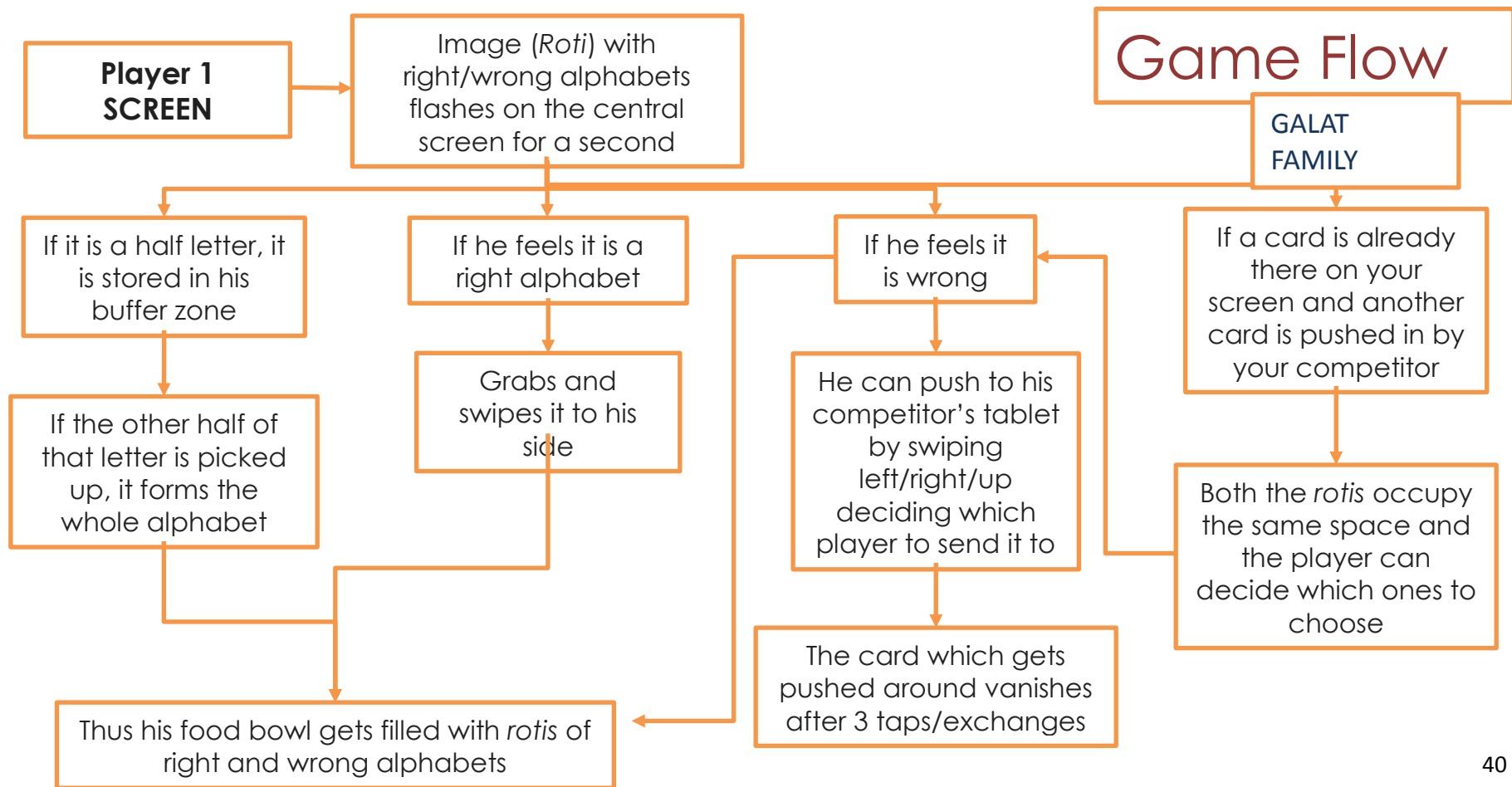


The player on noticing a half letter that came to his screen; he may use up the rest half of the letter from the buffer zone and thus form a complete alphabet



**Thus a complete  
alphabet is formed and  
the player can now drag  
and collect it to his side**

## Game Flow



## Phase 4

### Scoring Method



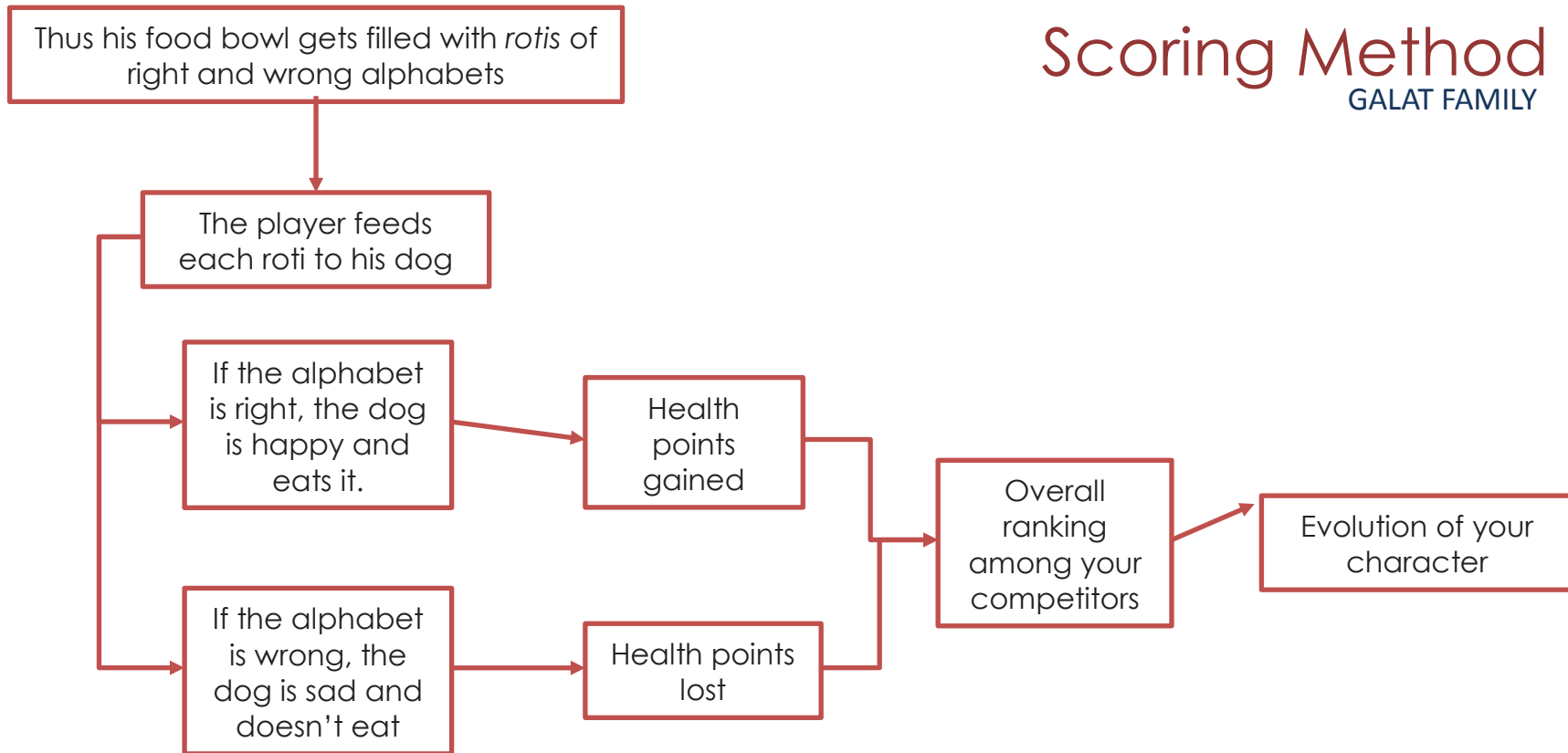
If the collected alphabet (dog treat) matches with the correct one then his dog will be happy, if it's not then the dog will be sad. We have introduced some powers also like barking power, jump power and health which is needed to move on to the next levels.





# Scoring Method

GALAT FAMILY



## Phase 5

### Conclusion

During the entire process of game design I have learnt how a game can help children to learn in a better way. This was an opportunity for me to enhance my design thinking and visualization skill. We had a group for this project where I learnt how to work in a time and how each member's opinion is significant to develop a good game.

Through this project I have understood how a board game is converted into a digital plate form, how a game flow for mobile application format is developed. And also that how the pre-production for the game design process is done.

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