



IDC
IIT Bombay



Gamified Usability Testing Tool for Virtual
Marathi Keyboards on Android platform

Interaction Design Project 3
by Kaustubh Limaye
Guide Prof. Anirudha Joshi

Text Input Evaluation

Transcription Task
High internal validity

Composition Task
High external validity

COPY condition

Task 1/10

You will be shown an English sentence. You just need to **type it in**. Please proceed **quickly and accurately**.

Type the following text:

No there will be plenty of others.

REPLY condition

Task 1/10

You will be presented with a message you **received on your mobile device**. You need to **write a reply**.

We want you to invent and type in a fictitious (but plausible) response. **Use your imagination**. Please proceed **quickly and accurately**. Do NOT include any private information (such as real email addresses, phone numbers, or names).

Write as if you were actually typing the reply on your mobile device. Do NOT write about your actions or state of mind.

tried... going 2 bed. love u

COMPOSE condition

Task 1/10

Imagine you are using a **mobile device** and need to **write a message**.

We want you to invent and type in a fictitious (but plausible) message. **Use your imagination**. If you are struggling for ideas, think about things you often write about using your own mobile device (but don't just copy one of your messages). Please proceed **quickly and accurately**. Do NOT include any private information (such as real email addresses, phone numbers, or names). **Invent a new message** for each task of this type.

Write as if you were actually typing the message on a mobile device. Do NOT write about your actions or state of mind.

SITUATION condition

Task 1/10

You will be presented with a short fictitious situation. Imagine you are using a **mobile device** and **compose a message**.

You should **respond in your own words**. There are no right or wrong answers, but your response should be **plausible given the situation**. Your response need not be strictly supported by the text, **use your imagination**. Please proceed **quickly and accurately**. Do NOT include any private information (such as real email addresses, phone numbers, or names).

Write as if you were actually typing the message on a mobile device. Do NOT write about your actions or state of mind.

Aubrey handles procurement of supplies in your office. Your printer no longer contains magenta or cyan ink. Make a request to Aubrey.

AID condition

Task 1/10

Due to a medical condition or accident, **imagine you can't talk or type** on a normal keyboard. Instead, you use a special **communication device that speaks for you**. You operate this device by pushing a button whenever your desired letter is highlighted. By repeatedly pushing the button, you can spell out words, phrases or entire sentences.

Invent a fictitious (but plausible) communication you might make using your device. Think of the things you might want to say to your family, friends, caregivers, and people you meet in the community. Please proceed **quickly and accurately**. Do NOT include any private information (such as real email addresses, phone numbers, or names). **Invent a new communication** for each task of this type.

Write as if you were actually using your communication device to speak for you. Do NOT write about your actions or state of mind.

Text Input in Marathi

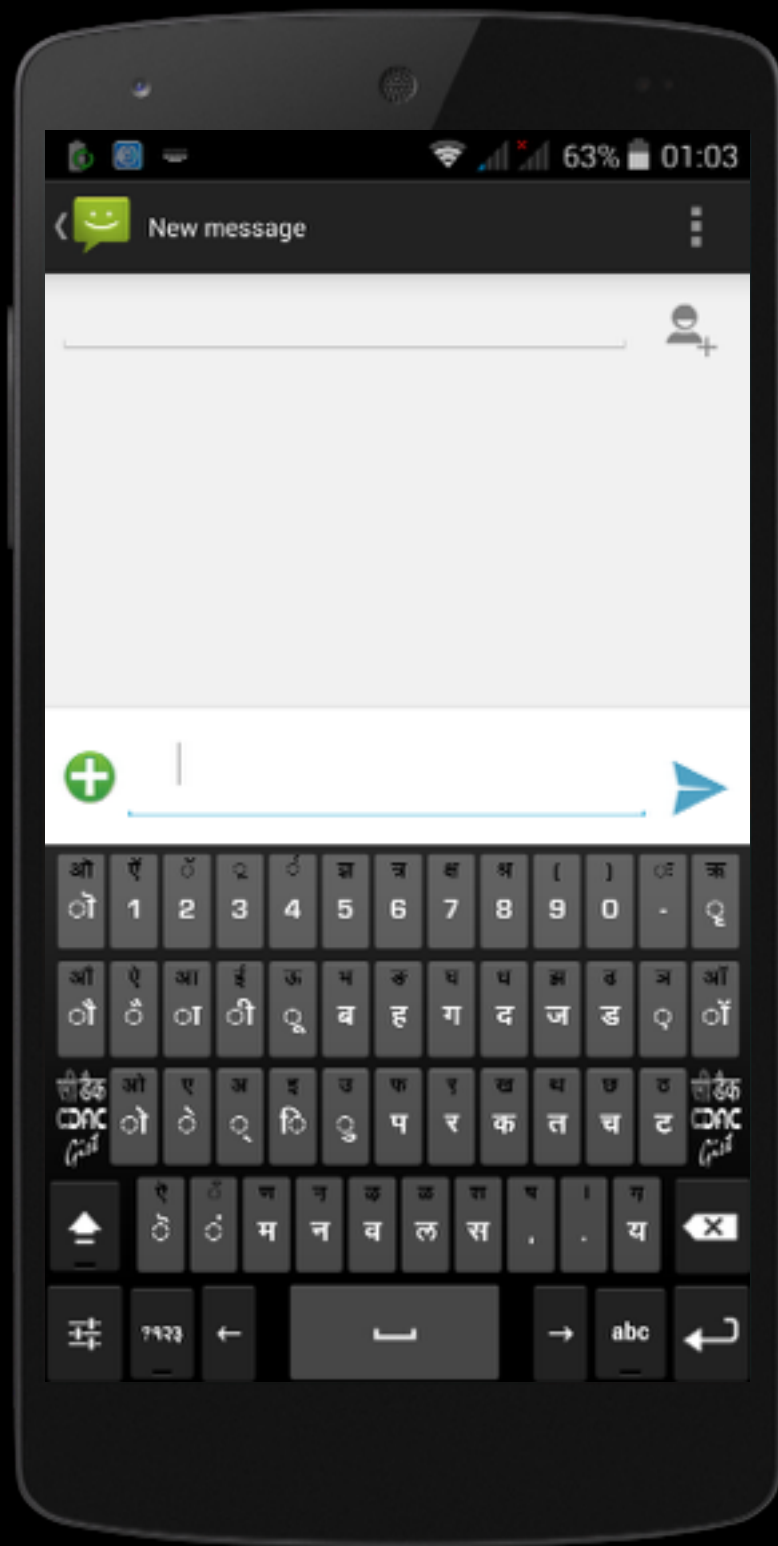
Marathi speaking population is 71,936,894 (India 2011)

Approximately 8 crore people. (World)

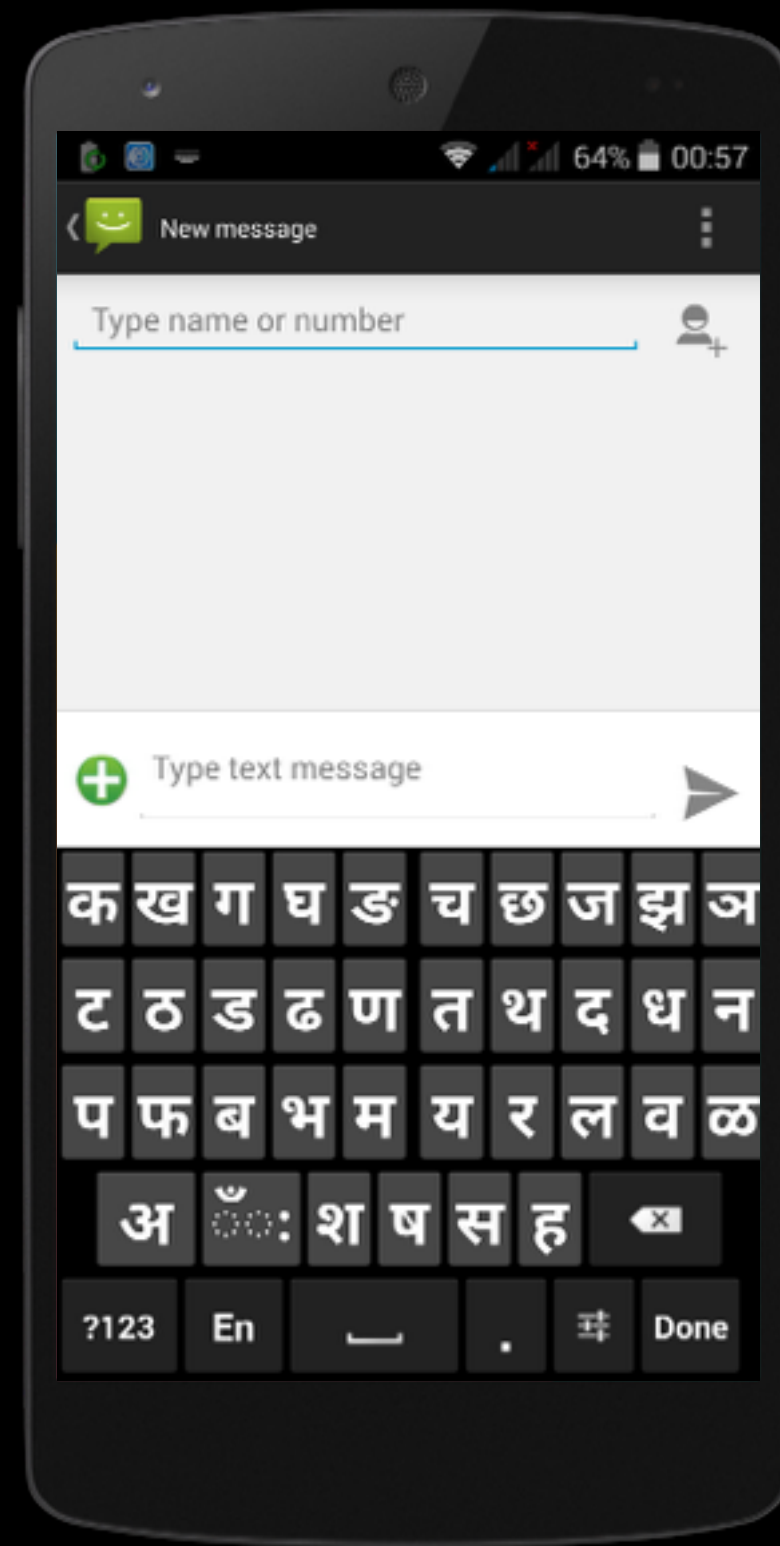
302 million estimated internet users. (India 2012)

The Marathi Wikipedia - 34,000 articles, 23,000+ Registered Users (2012)

Standardisation of virtual keyboards for Indic scripts



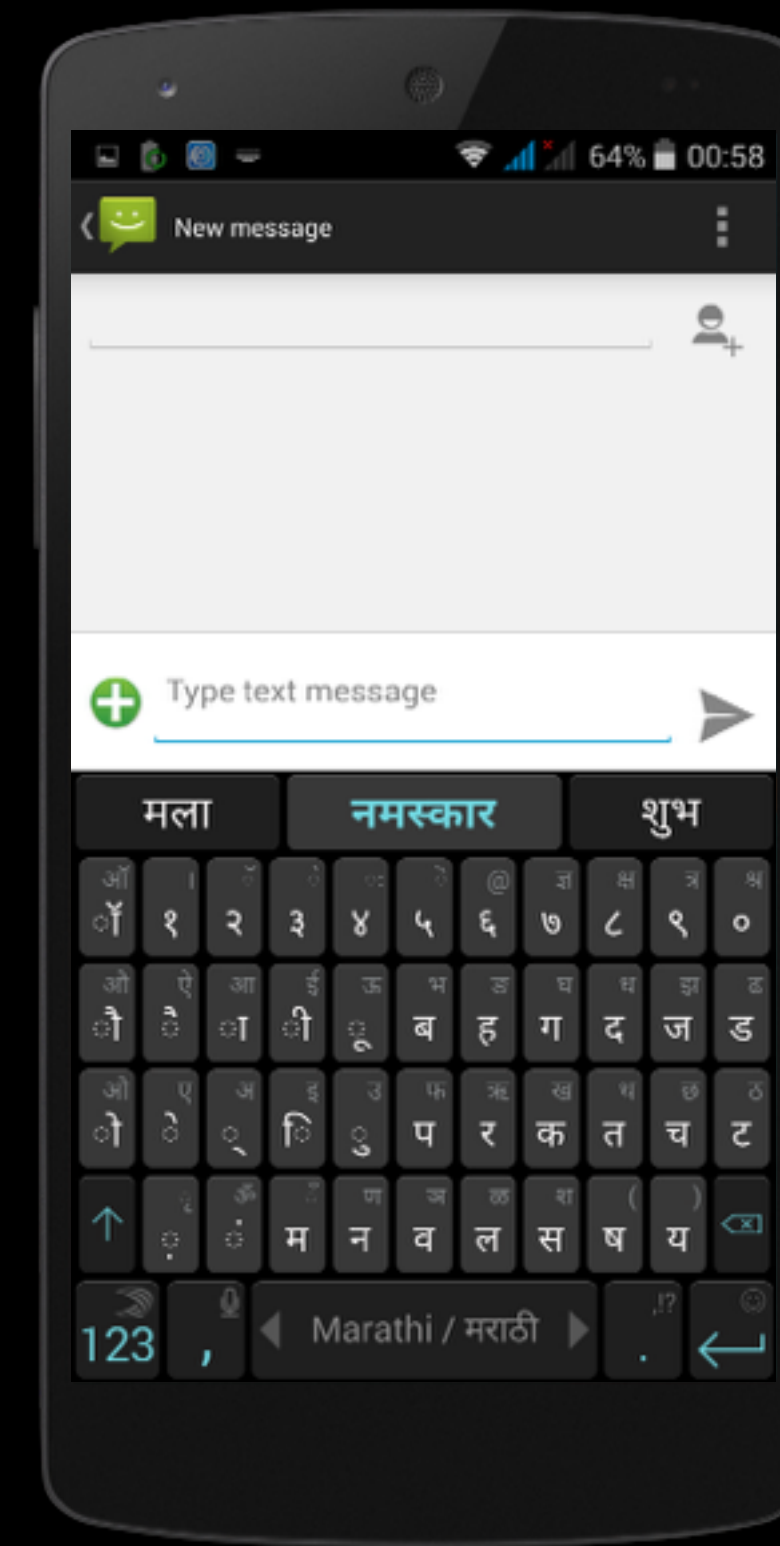
C-DAC



Sparsh



Swarchakra



Swift-key



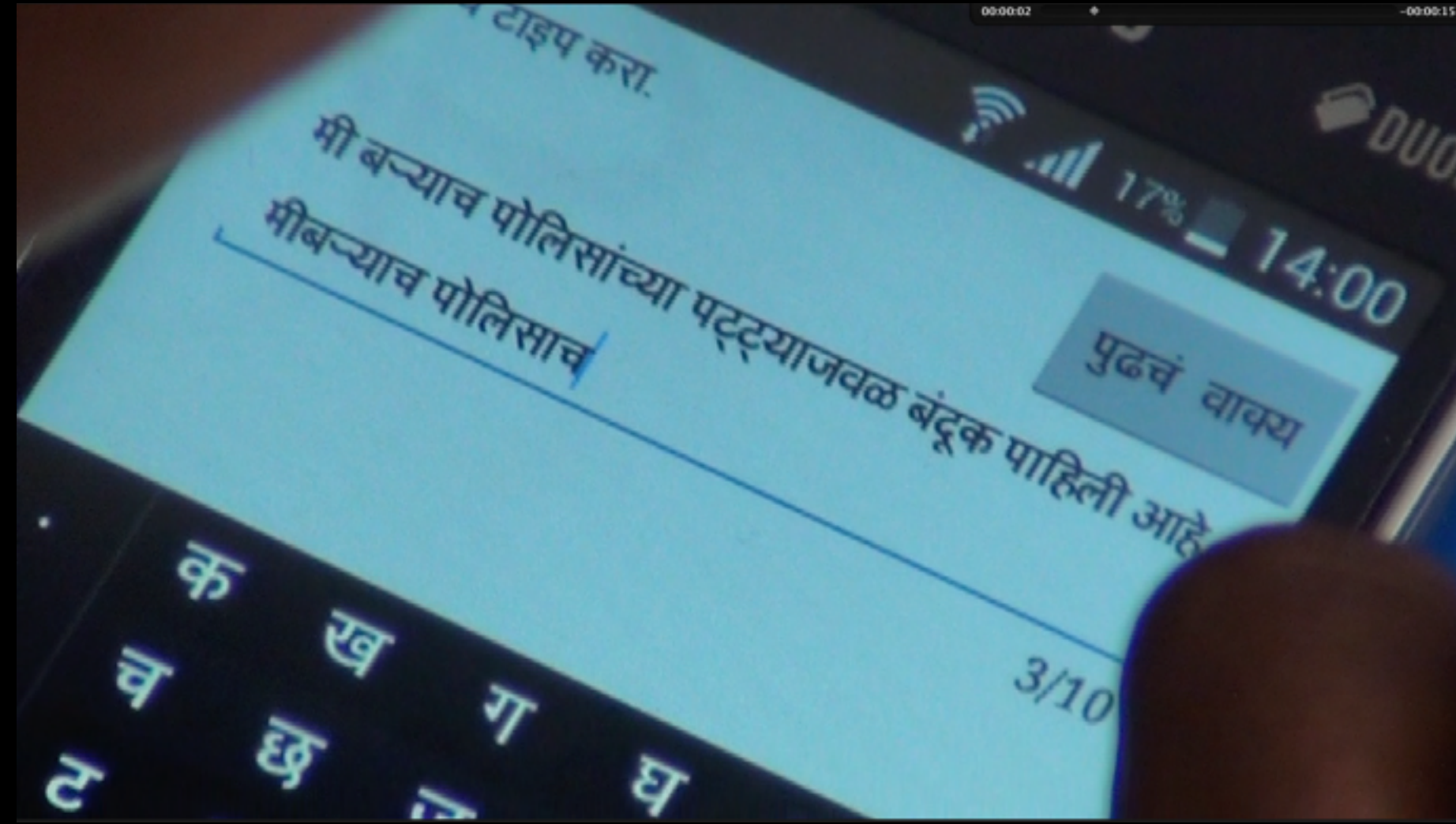
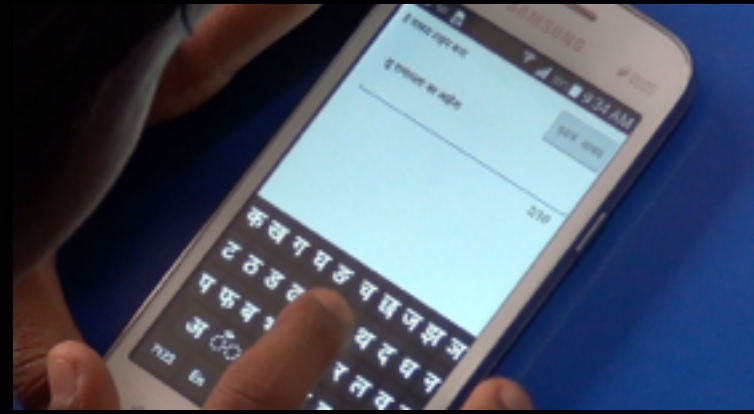
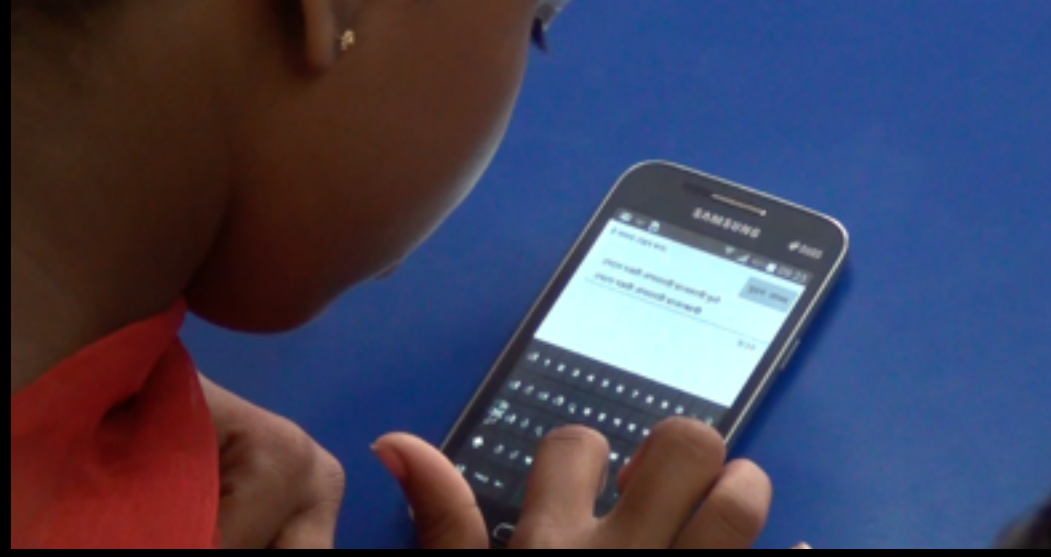
BMC school
Kanamvarnagar, Vikroli



ZP primary school
Paudewadi, Nanded

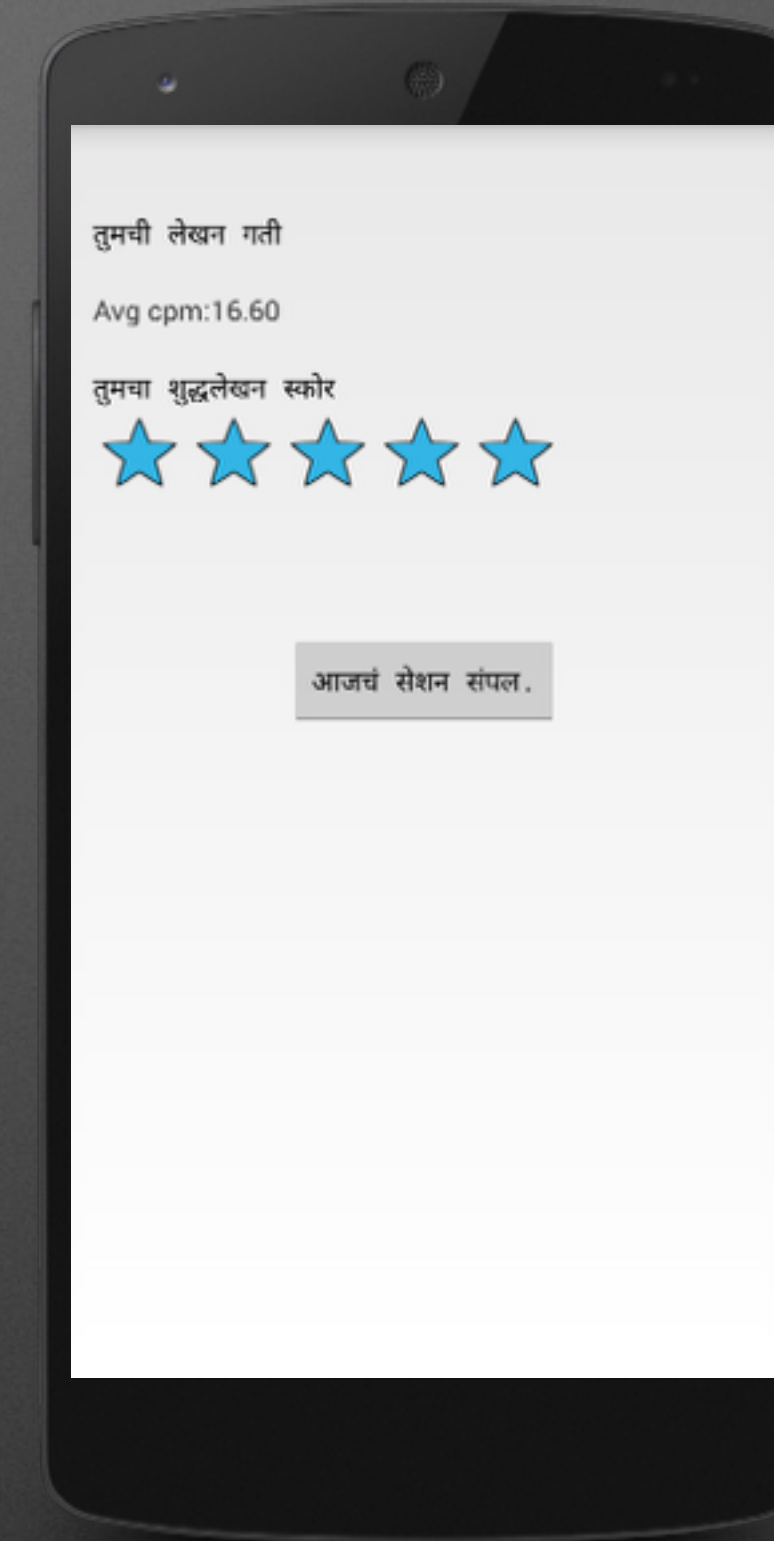
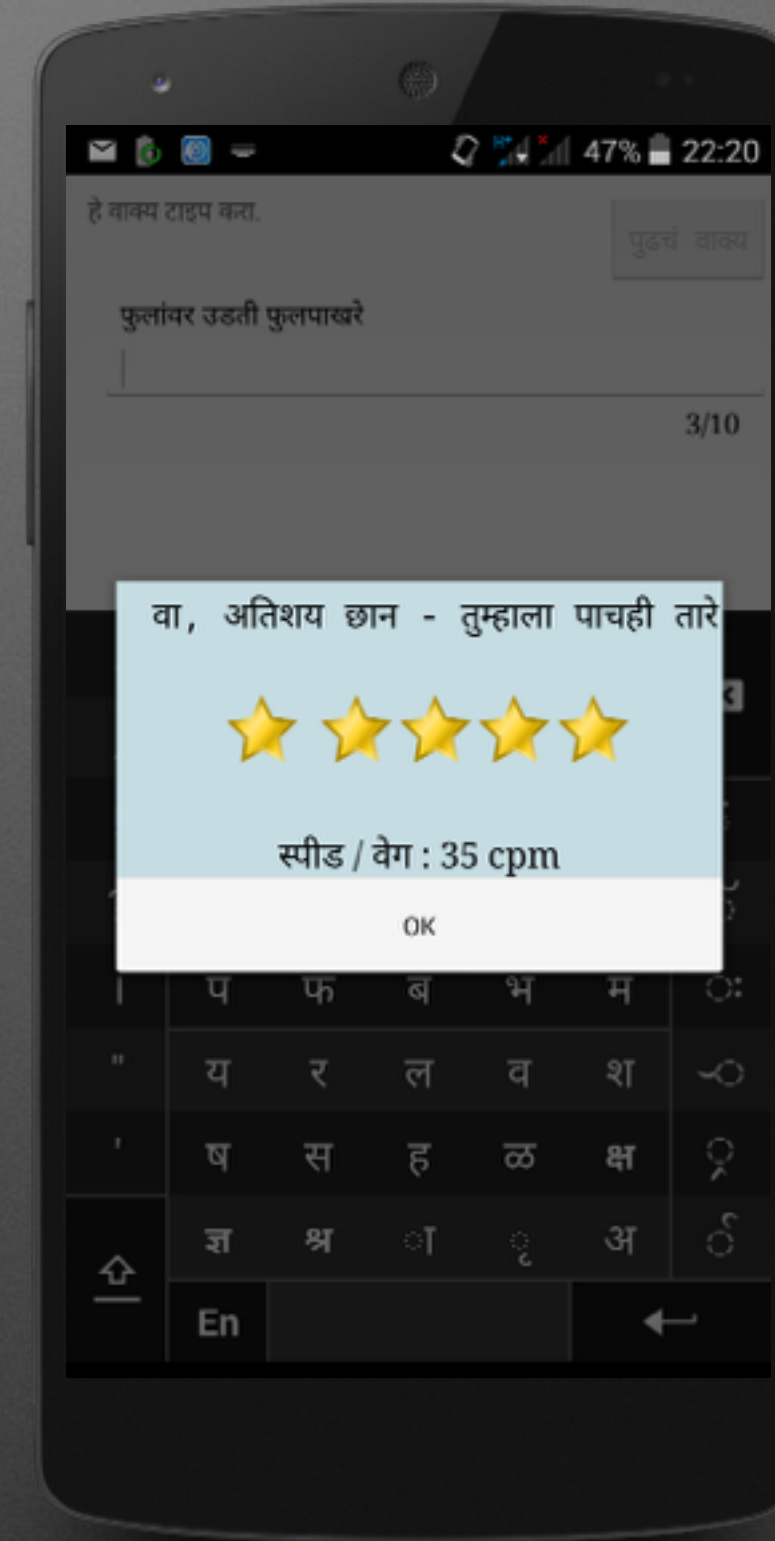
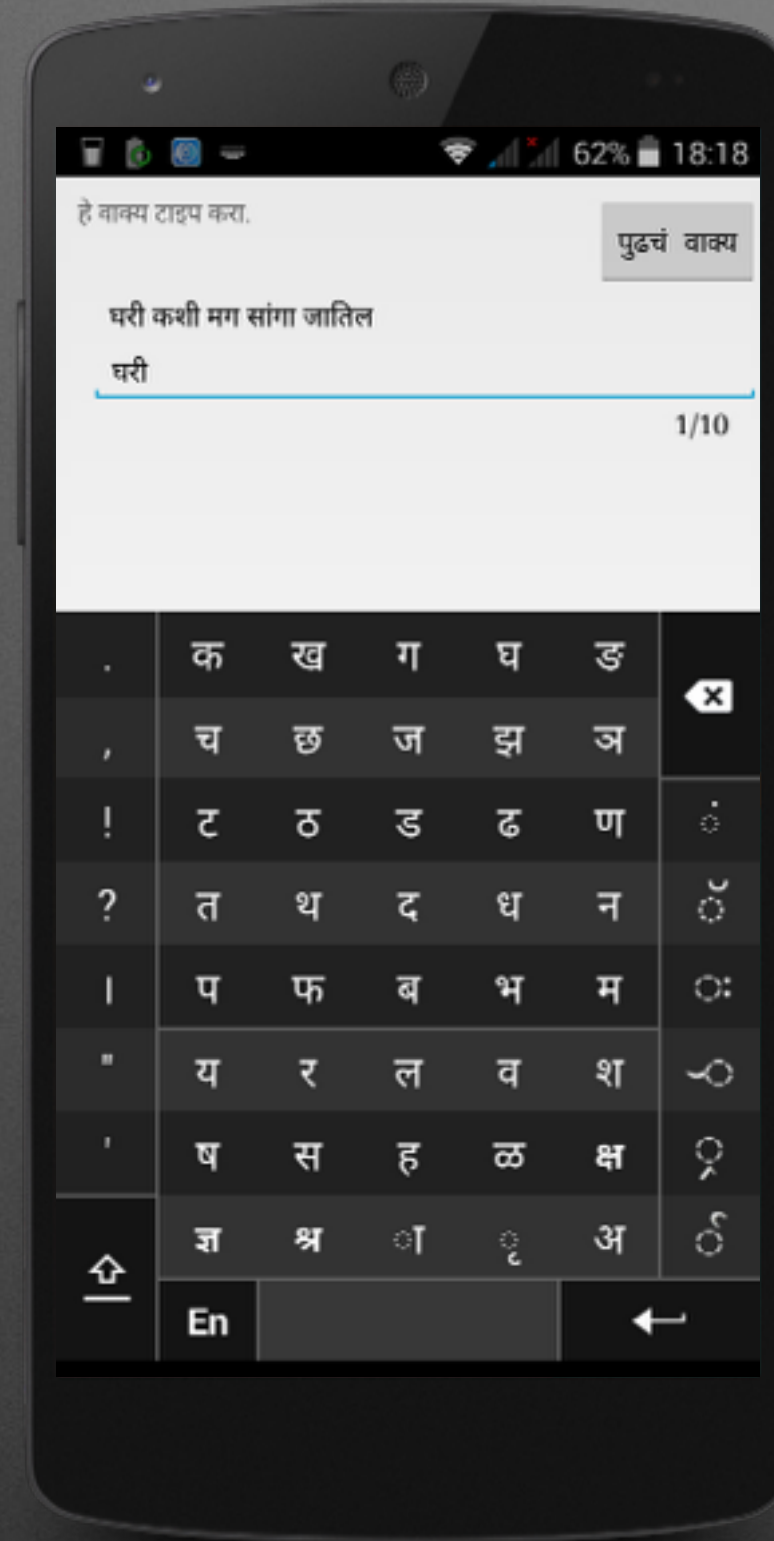
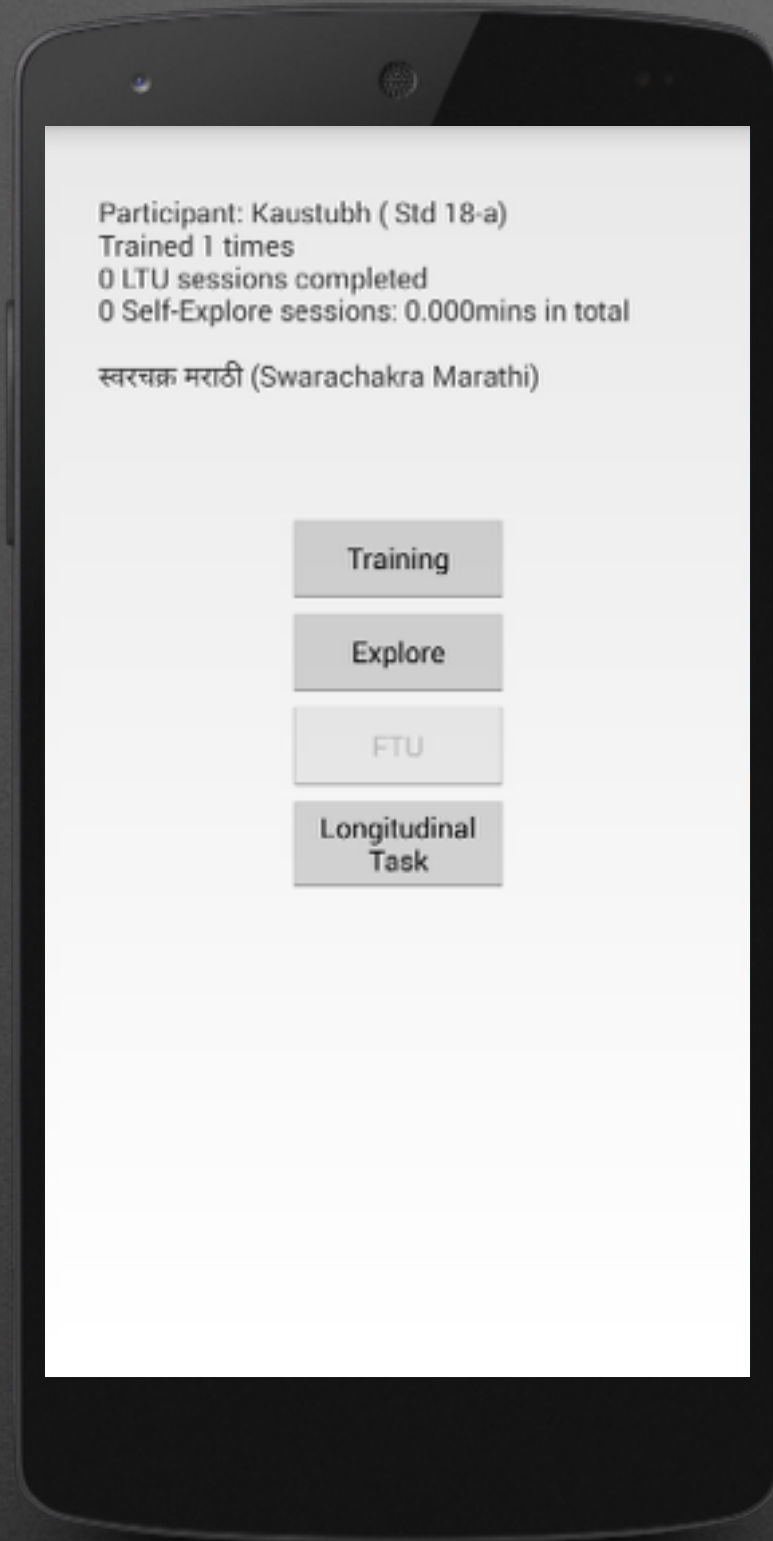


ZP primary school
Kasarkheda, Nanded



3600+ sessions

120+ students

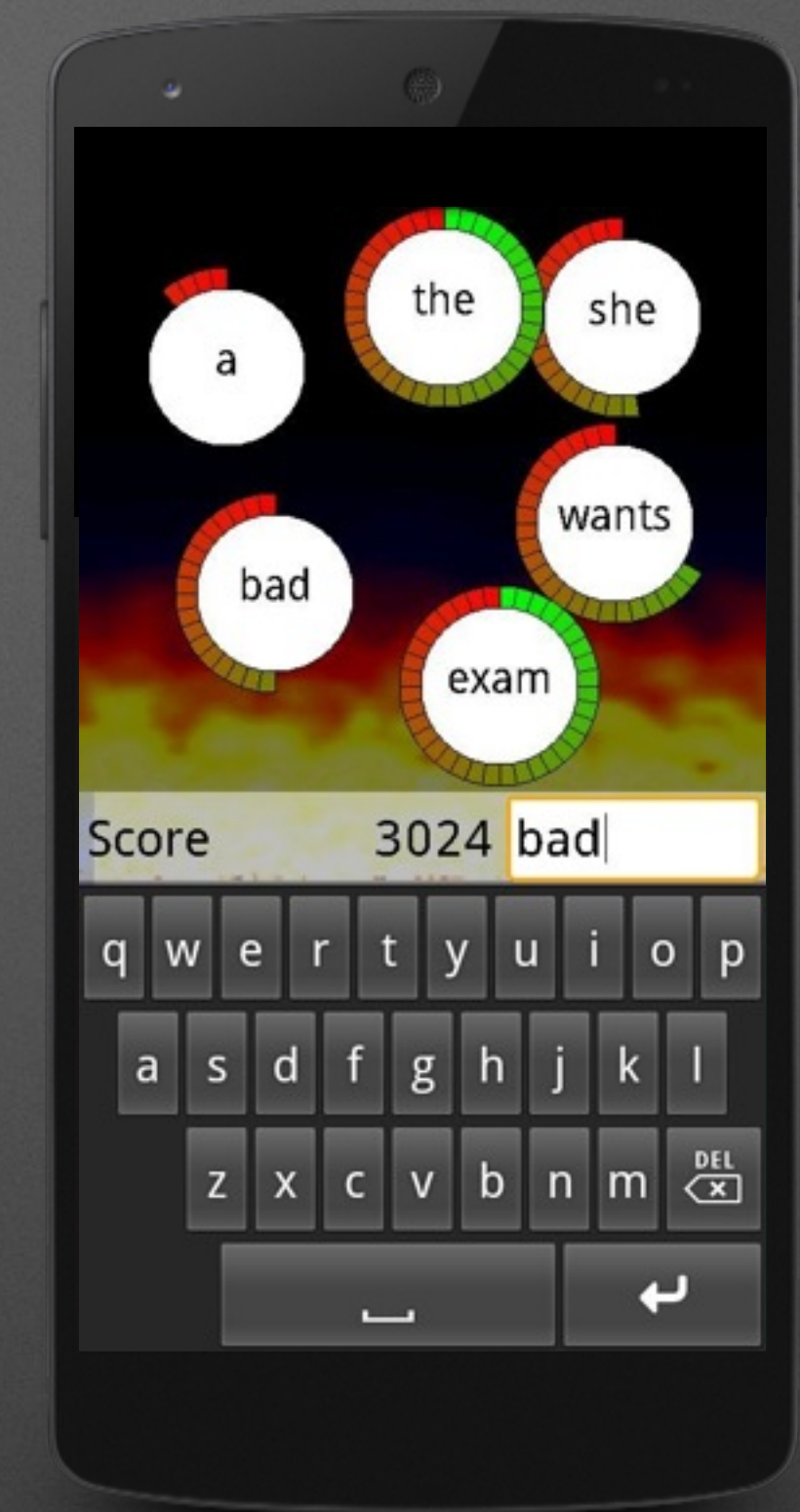
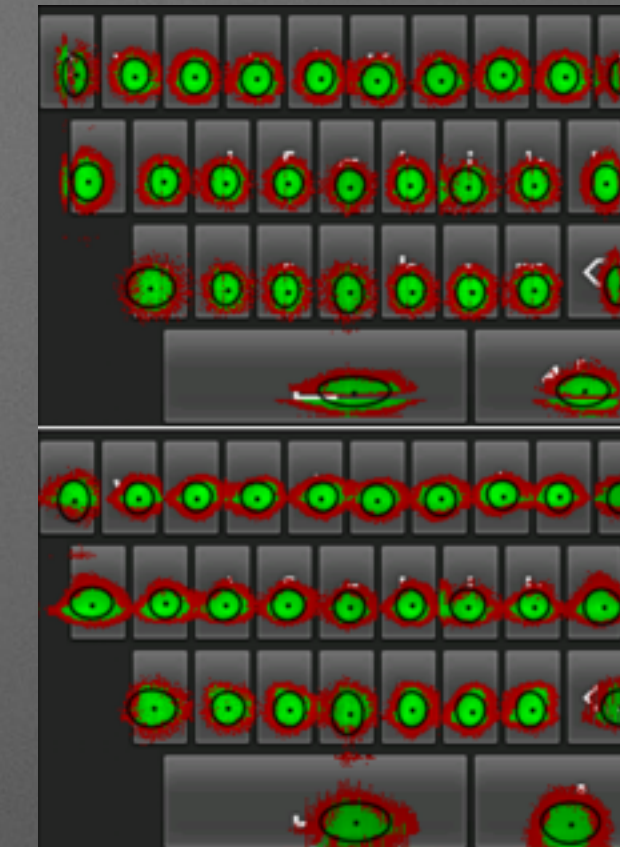


'Type It' Research

Niels Henze, Enrico Rukzio, Susanne Boll

What is it about?

Investigated the touch behaviour on mobile devices' virtual keyboards through a game "Type It"



What data is collected?

Various data about the used devices and the performance of the players.
User location, device name, time zone, width-height of the virtual keyboard

Why a game?

Experimenters control most variables and conduct studies with a small number of participants in a lab (high internal and low external validity).

Downloads
100,000 - 500,000

Gamification

Gamification it typically refers to the use of game mechanics, aesthetics and game thinking to engage people, motivate action, promote learning, and solve problems - *Kapp*

Gamification means use of game design elements in non-game contexts. - *Deterding, S., Dixon, D., Khaled, R., and Nacke, L.*

Gamification for development, and Gamification for enhancement.
- *Korhonen, Montola and Arrasvuori*

Social Motivations to use Gamification

An empirical study of ramifying exercise - Hamari, Juho

Social Influence

Social influence refers to an individual's perception of how important others regard the target behaviour and whether they expect one to perform that behaviour.

Recognition

Recognition fundamentally describes the social feedback users receive on their behaviours.

Reciprocal benefit

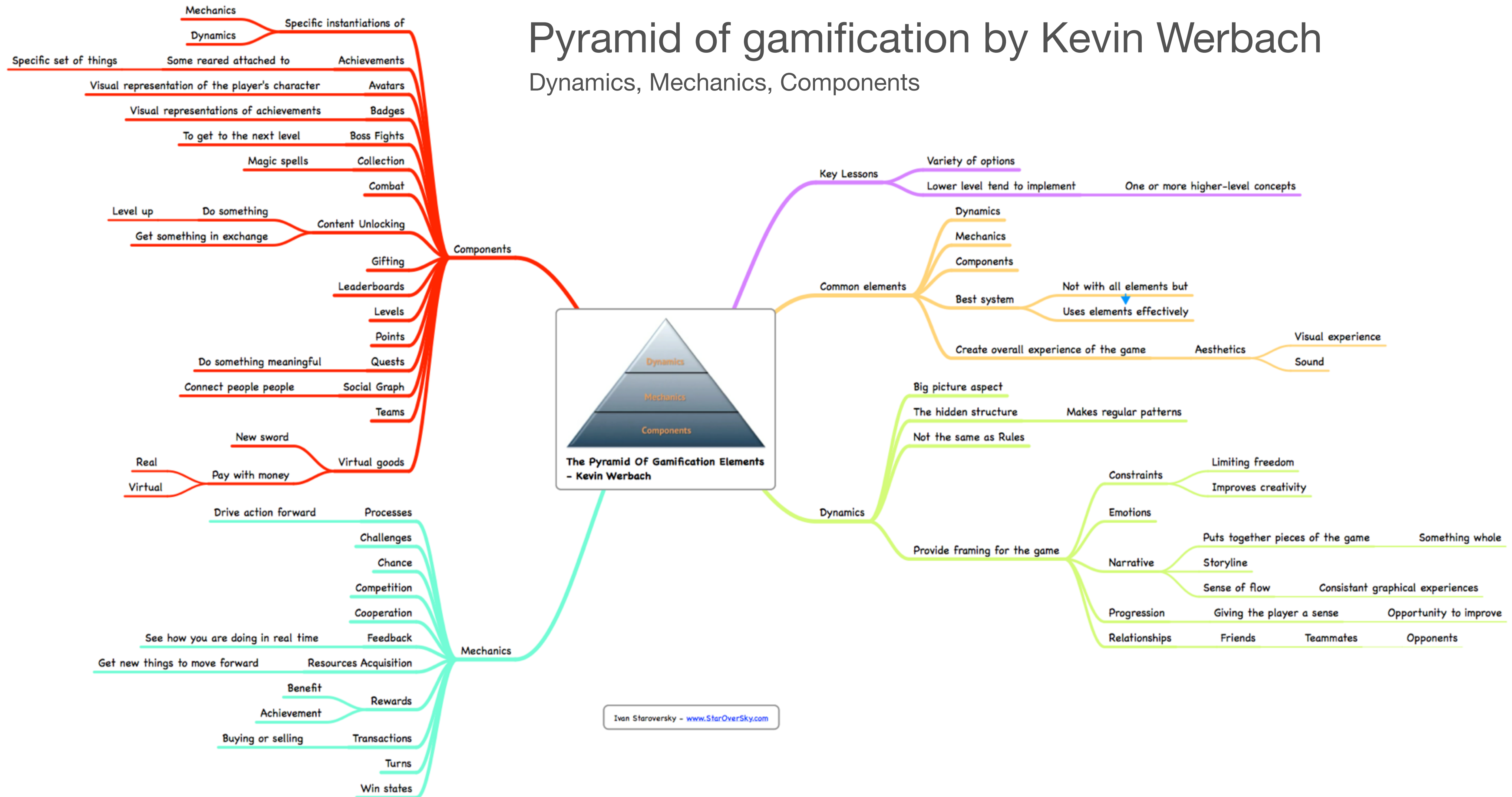
Contributing and, in turn, receiving benefit from the social community

Network exposure

Value from the network depends on the number of other users.

Pyramid of gamification by Kevin Werbach

Dynamics, Mechanics, Components



Ivan Staroversky - www.StarOverSky.com

Pyramid of gamification

Dynamics -

- Constraints
- Narrative
- Progression
- Relationships

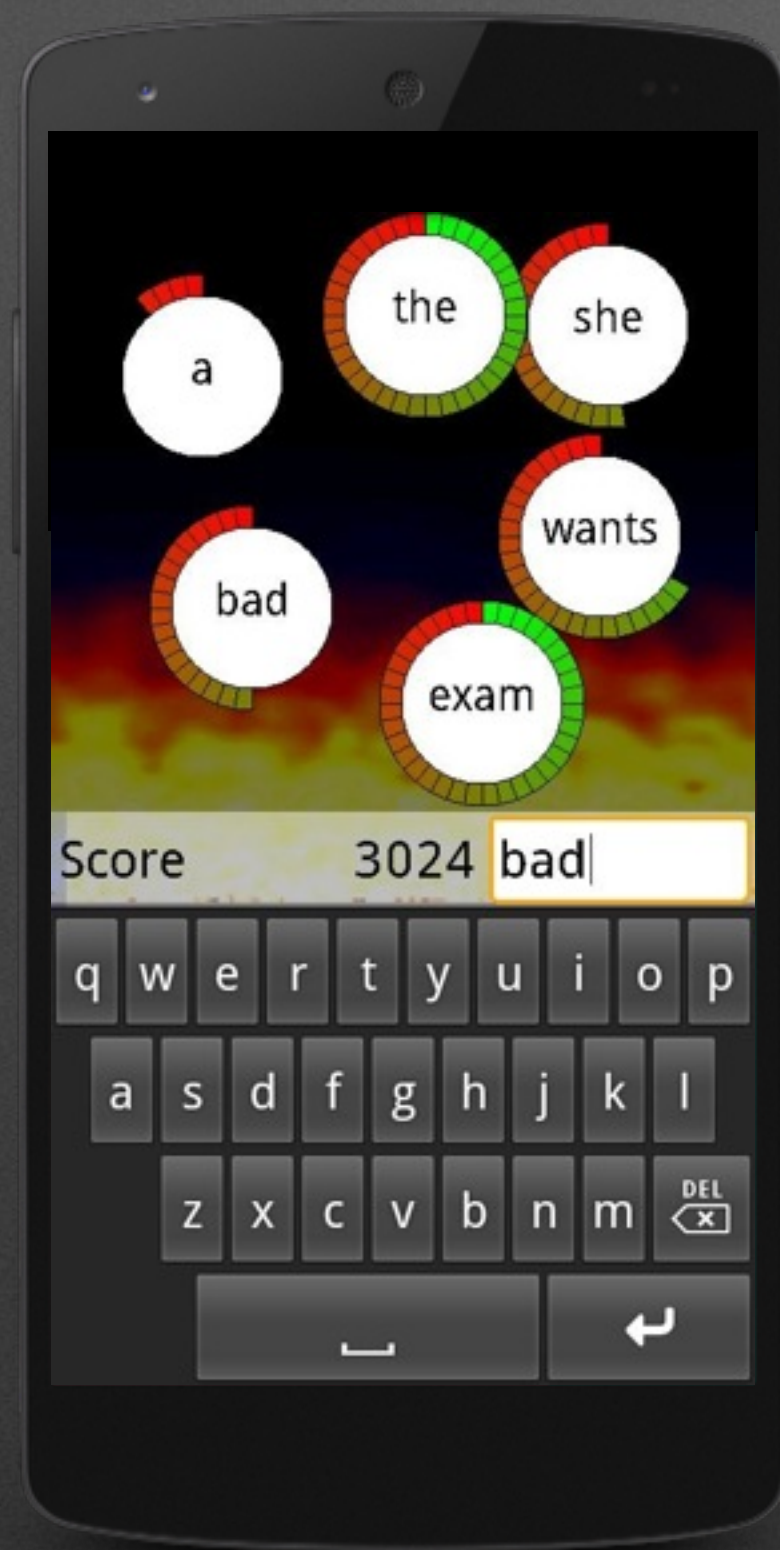
Mechanics -

- Challenges
- Competition
- Feedback
- Resource Acquisition
- Rewards

Components -

- Achievements
- Badges
- Collections
- Combat – competition
- Content Unlocking
- Leaderboards
- Levels
- Points

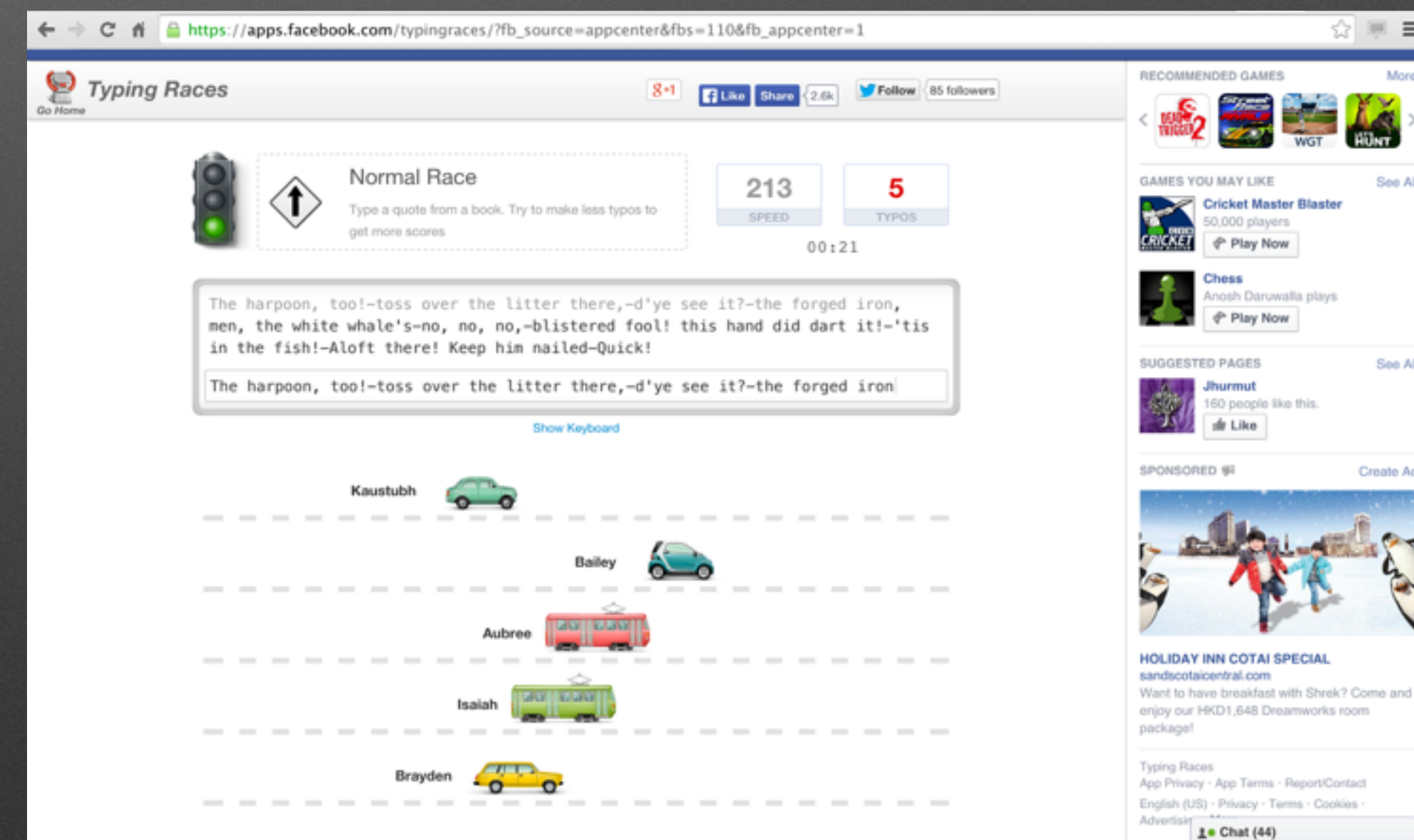
Products reviewed



Type It



Candy Crush



Type Racer

Why to Gamify?

Dustin DiTommaso

1. What is the reason for gamifying your product or service?

Sustain user to complete UT which will facilitate analysis of keyboards with a greater data set.

2. How does it benefit the user?

Ability to type with ease using the desired virtual keyboard.

Gives users a fun experience.

Social dynamics

Design elements in a gamified survey

Effects of Gamification on Participation and Data Quality in a Real-World Market Research Domain - Jared et al

Core task

Image identification

Slogan matching

Quiz

Game mechanic

Theme

Rewards

Challenge

Progress

Gamification Levels

- Survey: Only core task
- Partial Game: Core task, game mechanics
- Full Game: Core task, game mechanics, points, timer, sound effects, or feedback

Design Brief

To gamify the protocol of UT in such a way that -

it facilitates analysis of keyboards
with a greater data set.

gives external validity to the conclusions
of the usability test.

minimal change from the original protocol

Protocol

recruitment

reading test

assigning a keyboard

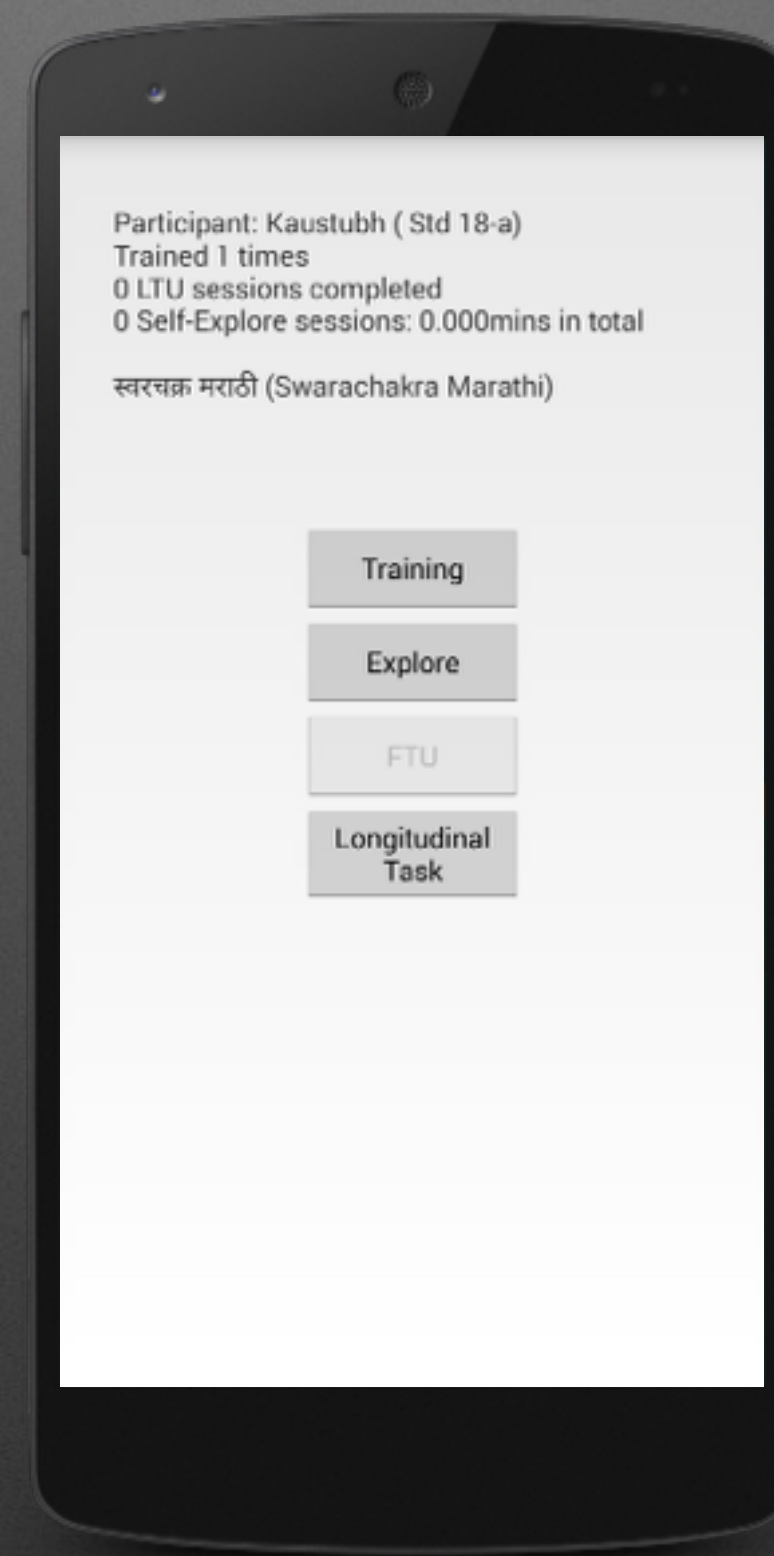
training

FTU

LTU

practice

gifts



Constraints

recruitment	no ICF
reading test	no supervisor
assigning a keyboard	-
training	no moderator
FTU	no specialised help
LTU	no moderator
practice	no moderator
gifts	no physical gifts

Opportunities

recruitment	no ICF	anyone interested
reading test	no supervisor	helps more people to perform the UT
assigning a keyboard	-	allow user to choose any keyboard
training	no moderator	allows to test intuitiveness of keyboards
FTU	no specialised help	track number of hint requests
LTU	no moderator	anytime / anyplace UT
practice	no moderator	accurately record the difficult words
gifts	no physical gifts	gamification elements, social dynamics

No-training-study

8 users
4 keyboards
no training

to observe the requirement of the instruction

when to instruct?
what to instruct?

Instructions

	Swarchakra		C-DAC		Sparsh		Swift-key	
गणपती	chakra instruction	repeat	type as you speak	repeat	press, hold and drag	repeat	type as you speak	repeat
अनिकेत	repeat	none	repeat	none	repeat	none	repeat	none
स्थिती	conjunct instruction	repeat	conjunct instruction	repeat	conjunct instruction	repeat	conjunct instruction	repeat
पृथ्वी	पृ instruction	none	पृ instruction	repeat	पृ instruction	repeat	पृ instruction	repeat
कार्यशाळा	र्य instruction	tays	र्य instruction	tays	र्य instruction	tays	र्य instruction	tays
वऱ्हाड	ऱ्हा instruction	repeat	ऱ्हा instruction	repeat	ऱ्हा instruction	repeat	ऱ्हा instruction	repeat
विश्रांती	श्रां instruction	none	श्रां instruction	repeat	श्र, श्रां instruction	repeat	श्रां instruction	repeat

Instructions

Swarchakra गणपती



Gamification elements

Game mechanic

Levels

Competition

Rewards

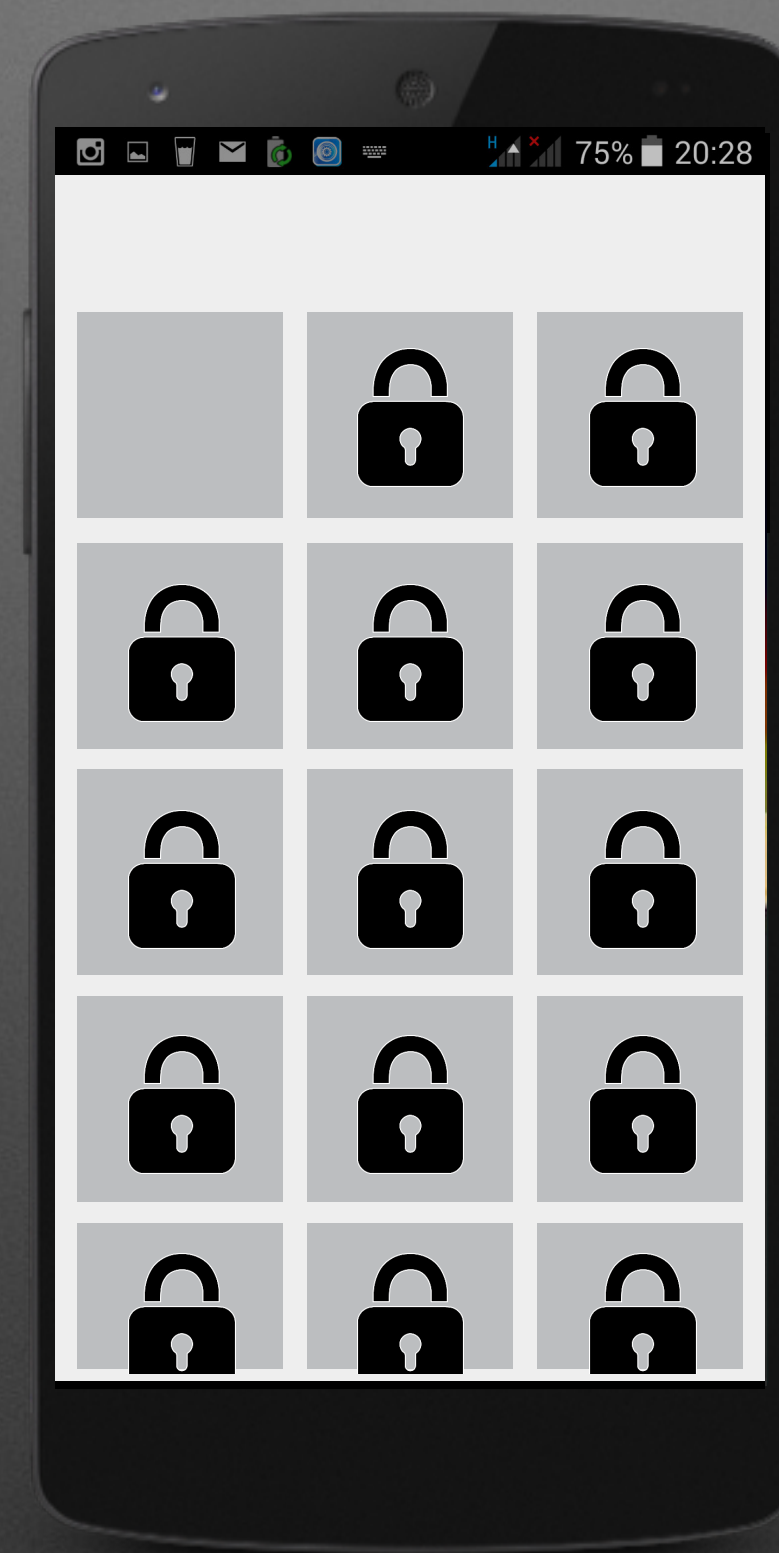
Points

Levels

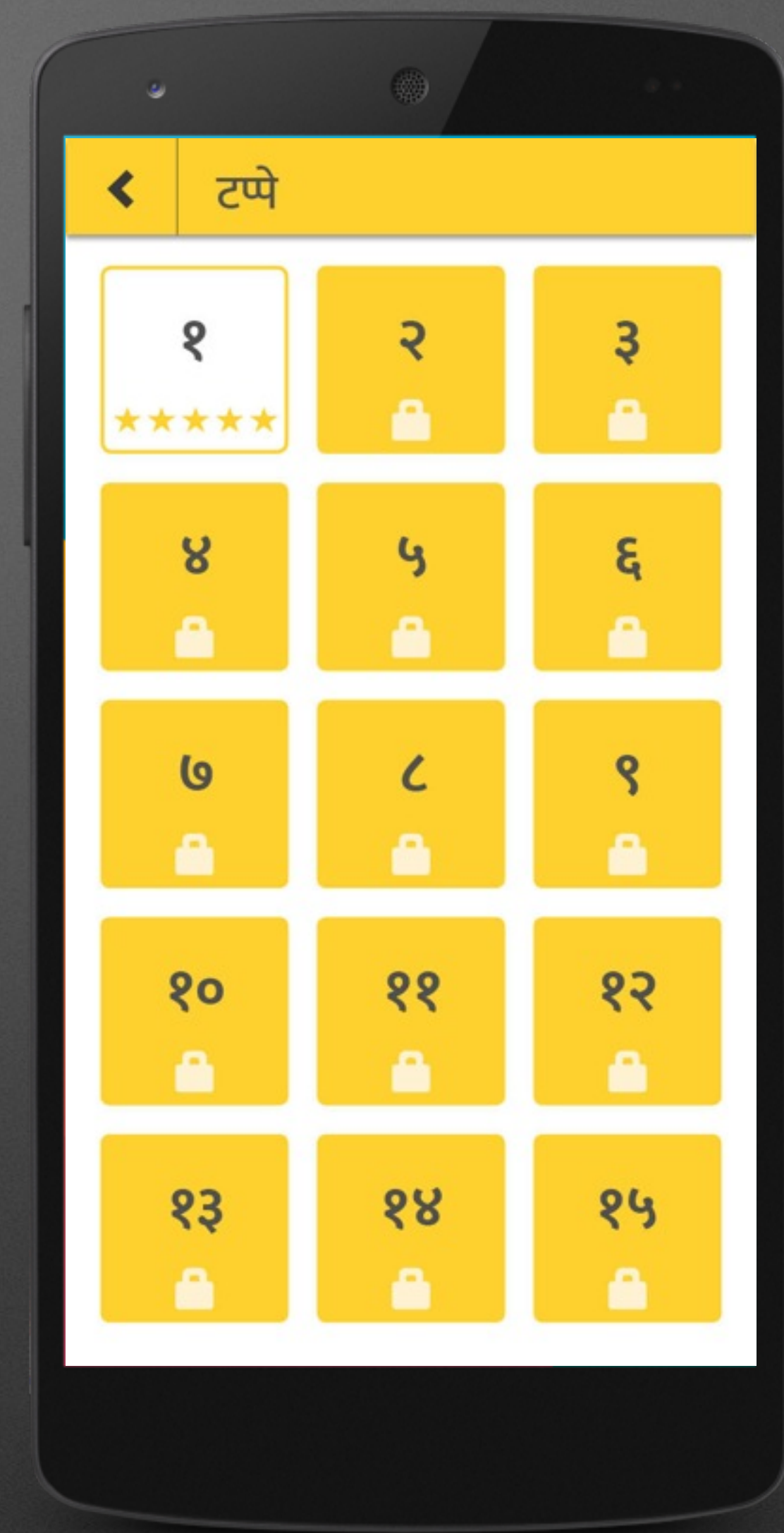
FTU 20 words
Single player
4 levels 5 words each

LTU 10 phrases per session
Single player
2 levels 2 phrases per level
2 levels 3 phrases per level
58 levels 5 phrases per level

Total 66 levels



	UT	Tapaatap
Phrases/Level	10	5
Stage 1	10E 0M 0H (5)	5E 0M 0H (10)
Stage 2	8E 2M 0H (5)	4E 1M 0H (10)
Stage 3	5E 5M 0H (5)	3E 2M 0H (10)
Stage 4	4E 4M 2H (15)	2E 2M 1H (30)
Total	30	60



Levels

Grid based

Ordered Progression

Should there be an unlocking criteria?

Should multiple attempts on levels be allowed?

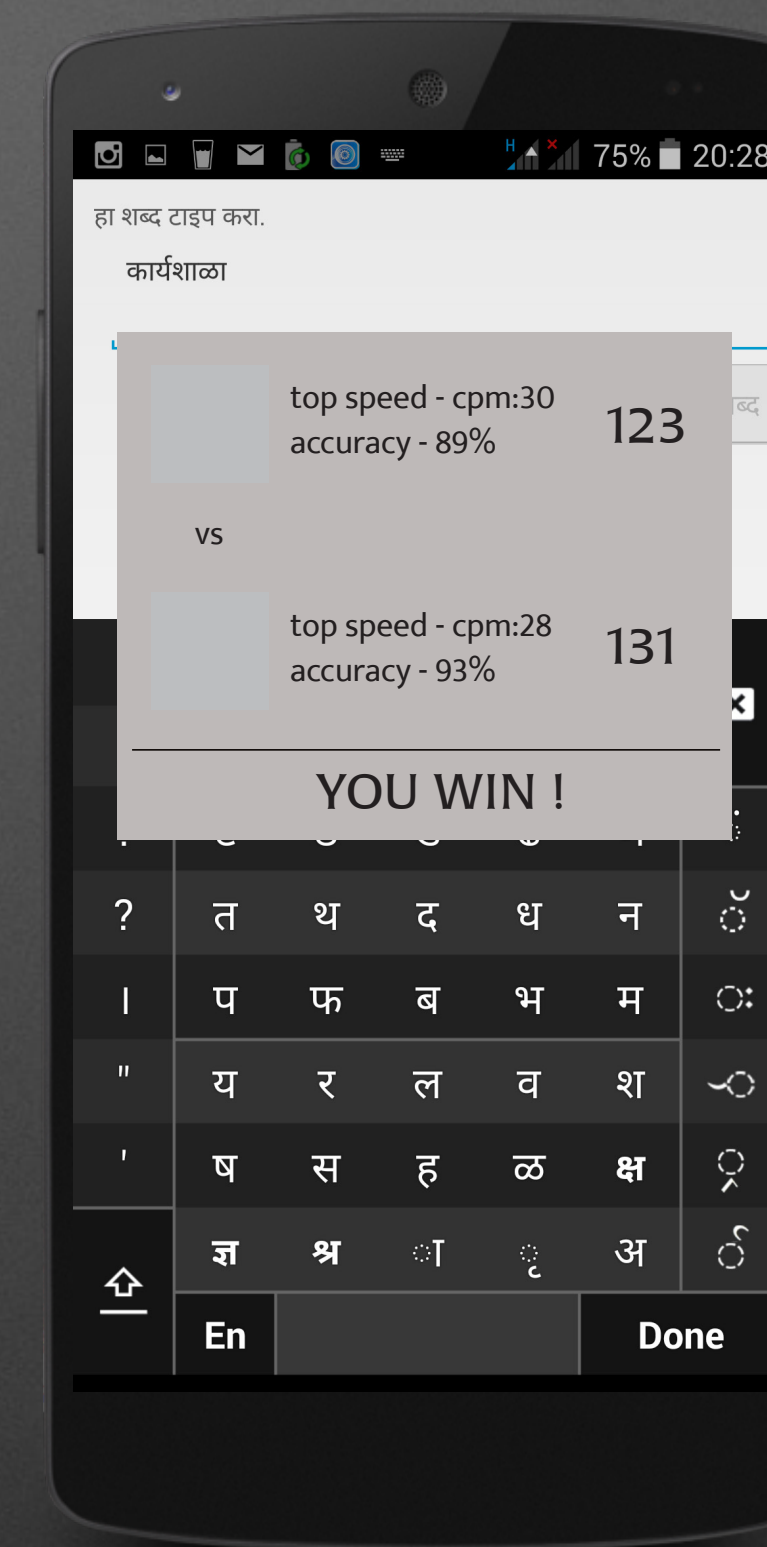
Is order of play important?

play next level

leaderboard

Achievements

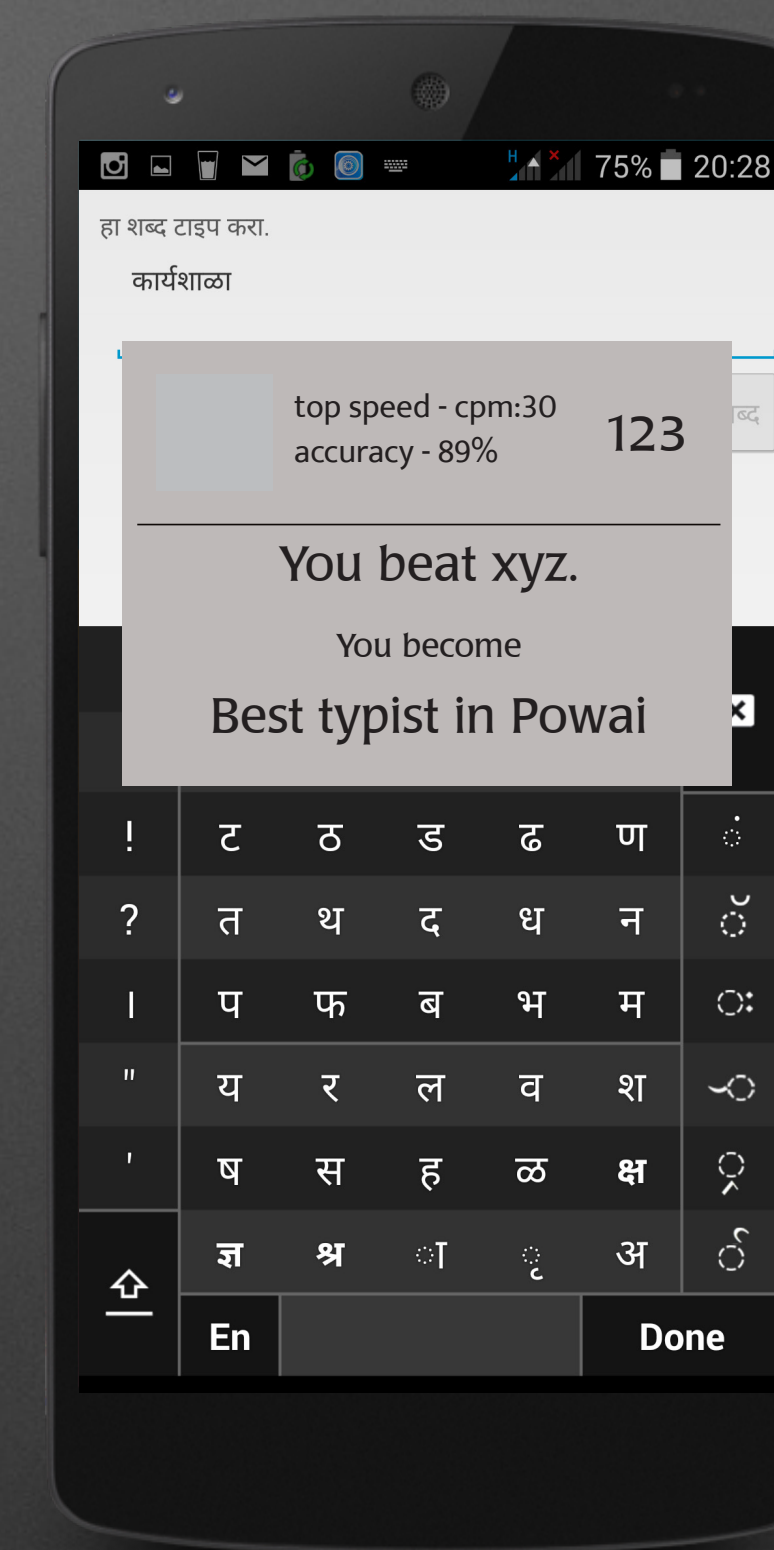
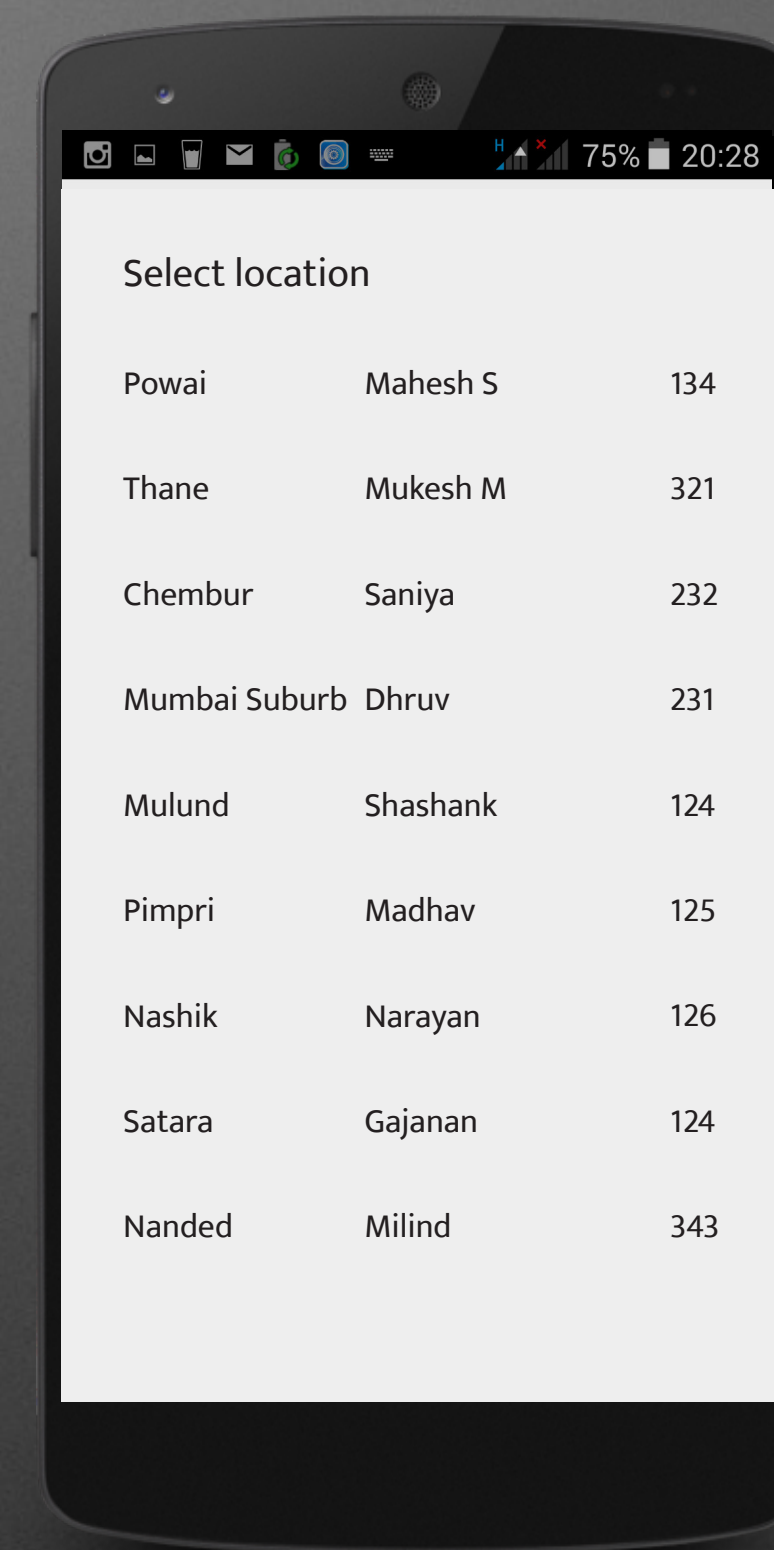
Typing Race



Composition based Race



Location Leaderboard



Rewards

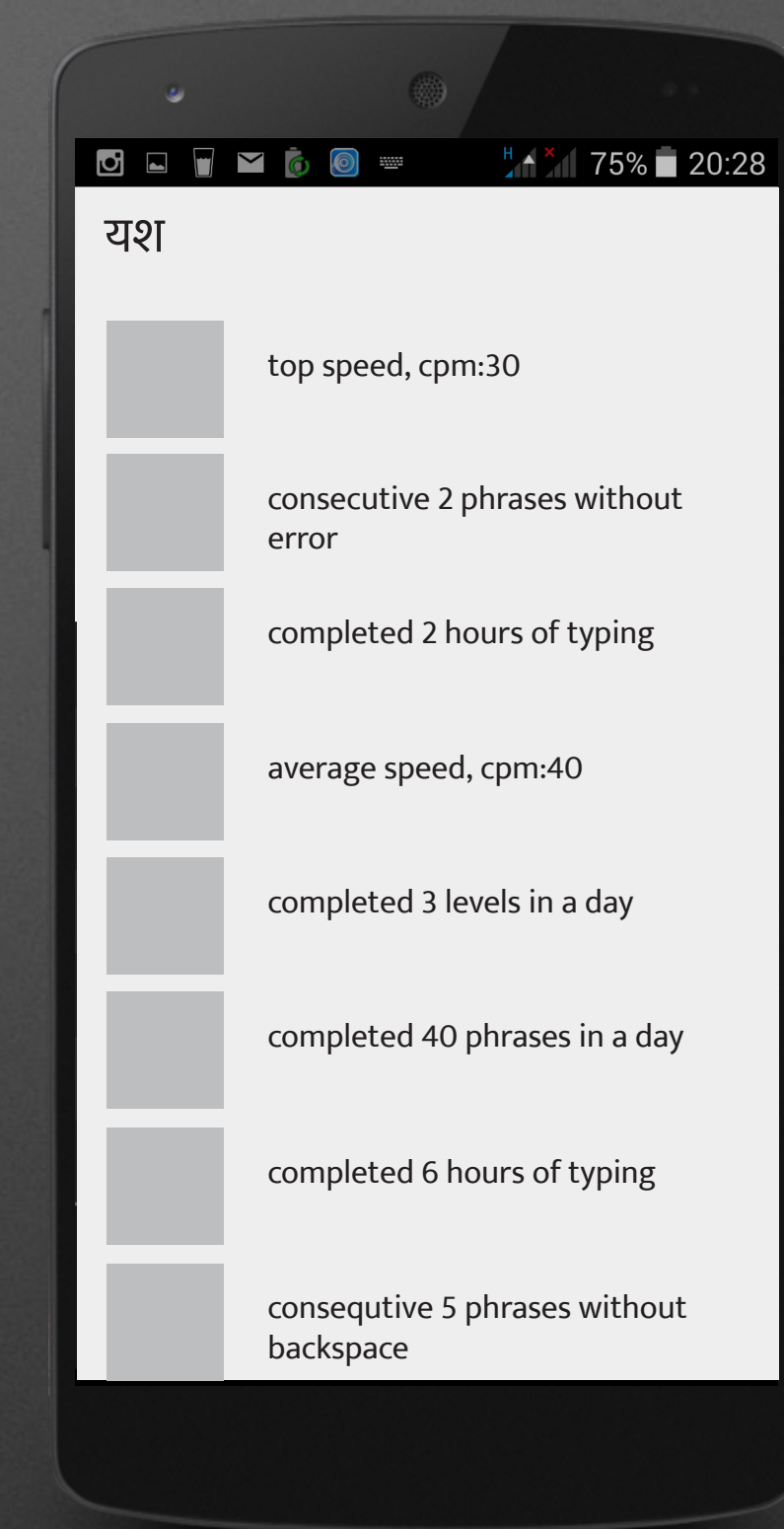
Badges

Conditions

- Typed consecutive 2 phrases without error
- Typed consecutive 5 sentences without error
- Typed consecutive 10 sentences without error
- Top speed crossed 30 cpm
- Top speed crossed 65 cpm
- Typed consecutive 3 sentences without backspace
- Typed consecutive 6 sentences without backspace
- 1 hour of typing at a stretch
- 2 hours of typing at a stretch
- Moving average speed crossed 30 cpm
- Moving average speed crossed 50 cpm
- Completed 30 sentences in a day
- Completed 2 levels in a day

- Speed badges
- Accuracy badges
- Endurance badges

Achievements



Points

Star Rating
Accuracy
Speed

Normalised CPM
One score

Speed vs Accuracy

0 - 40% accuracy - 1 star
41-60% accuracy - 2 stars
61-80% accuracy - 3 stars
81-99% accuracy - 4 stars
100% accuracy - 5 stars

0-20 cpm - 1 star
20-40 cpm - 2 star
40-60 cpm - 3 star
60 -80 cpm - 4 star
80-100 cpm - 5 star

Application Name

झटपट टायपिंग

टाईप मस्ती

टाईप खेळ

बोटांची शरियत

मराठी टाईप मास्टर

टाईप मित्र

टपाल

टिपेकर

टाईप शिवाजी

टाइपेश्वर

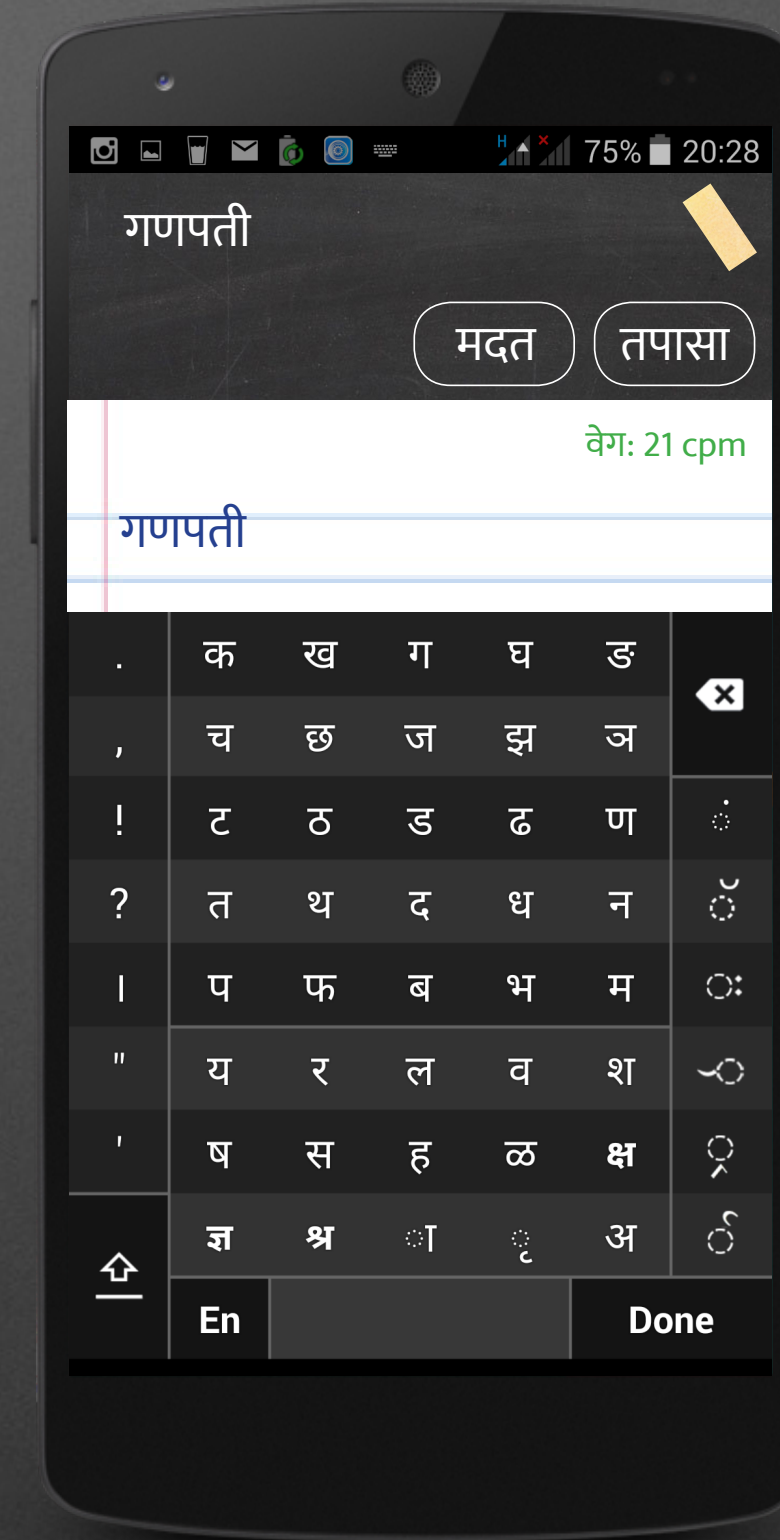
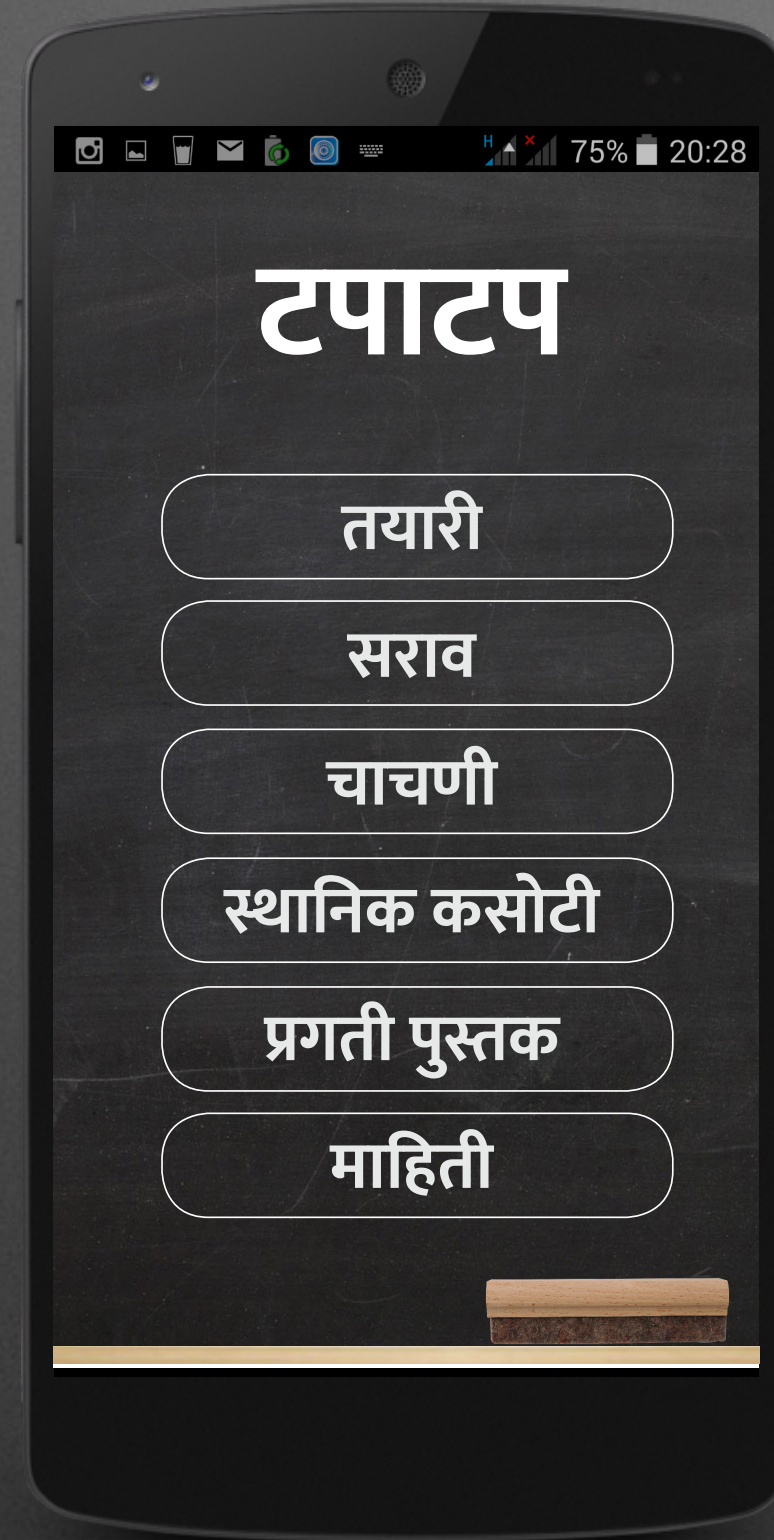
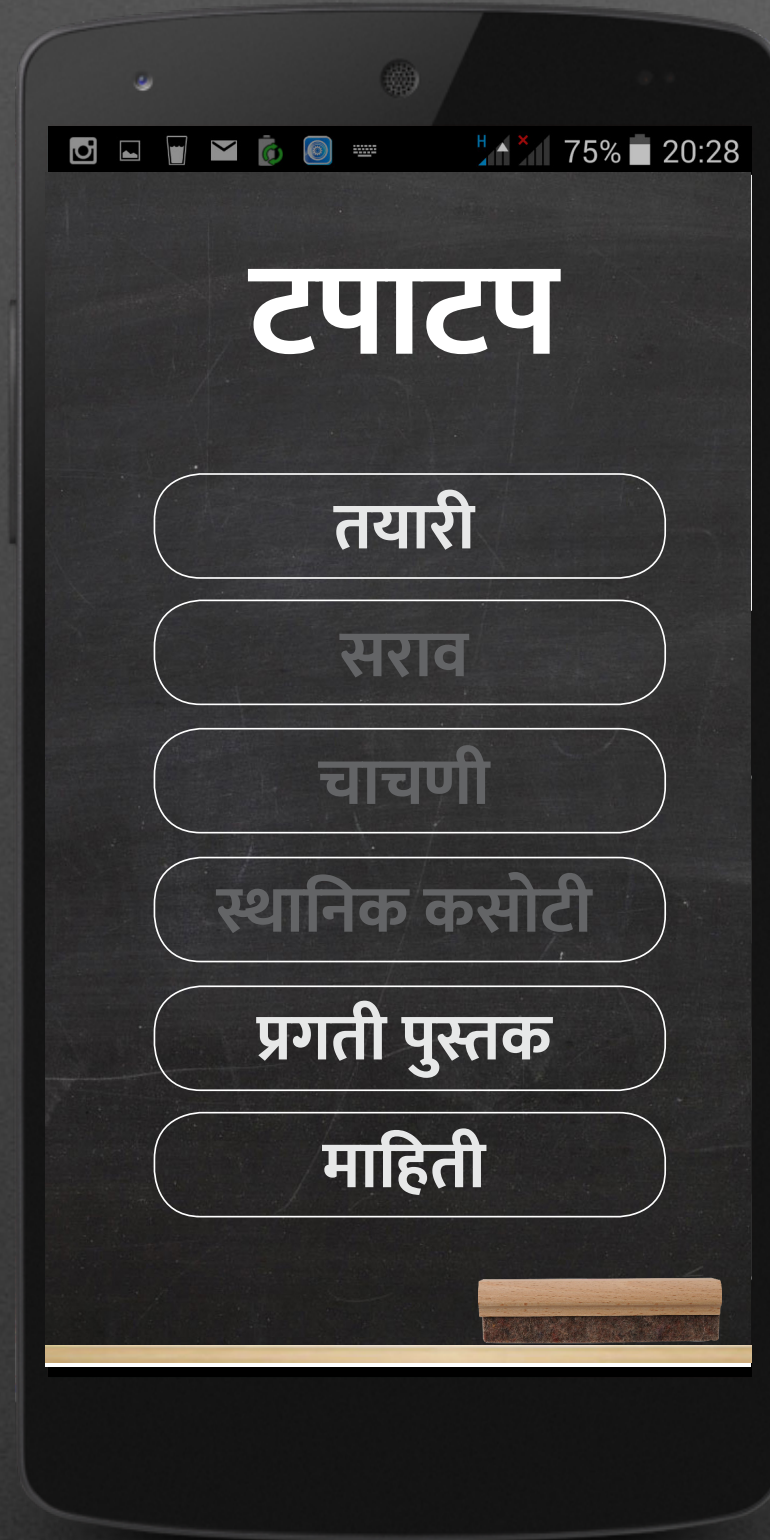
जलद लिपी

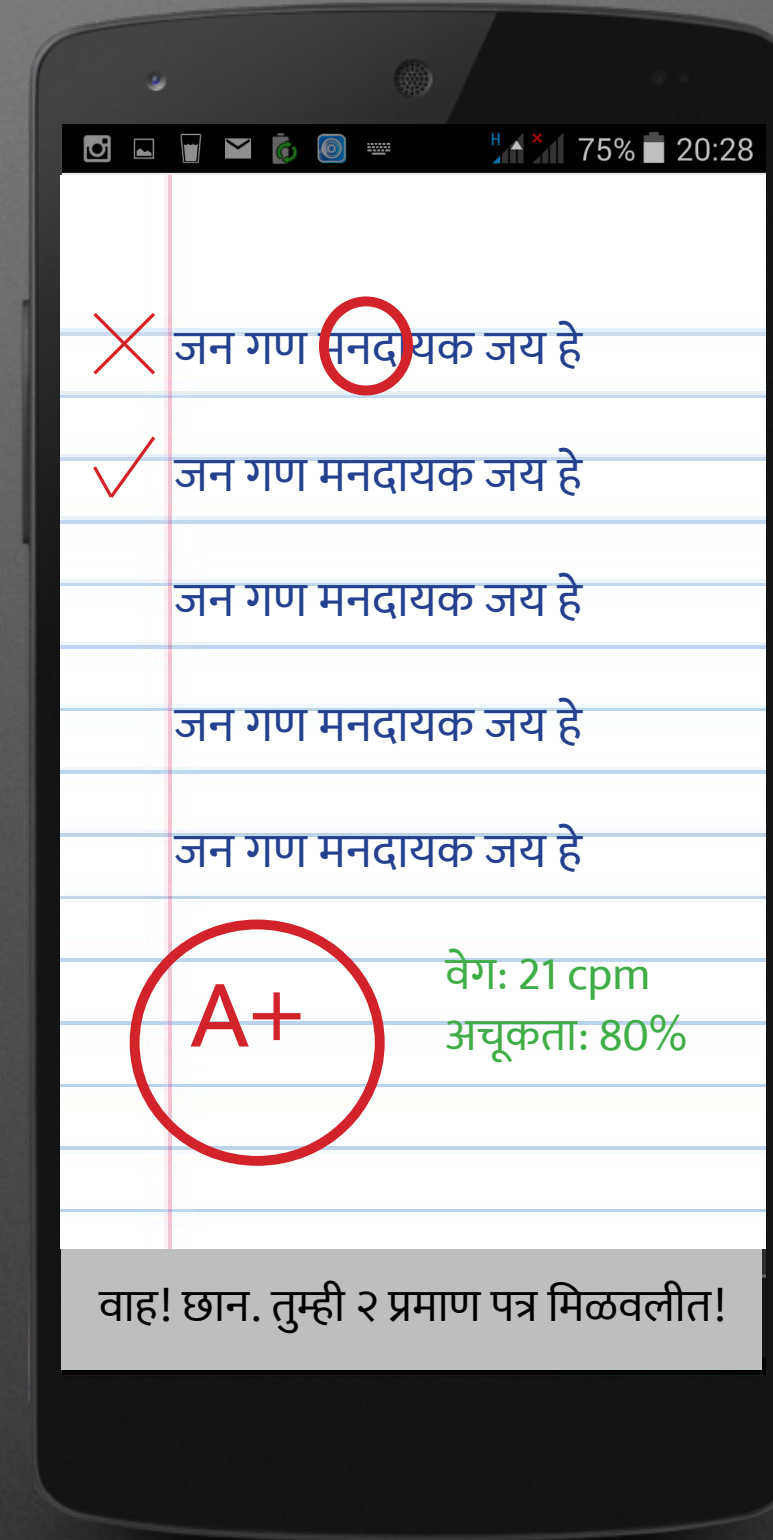
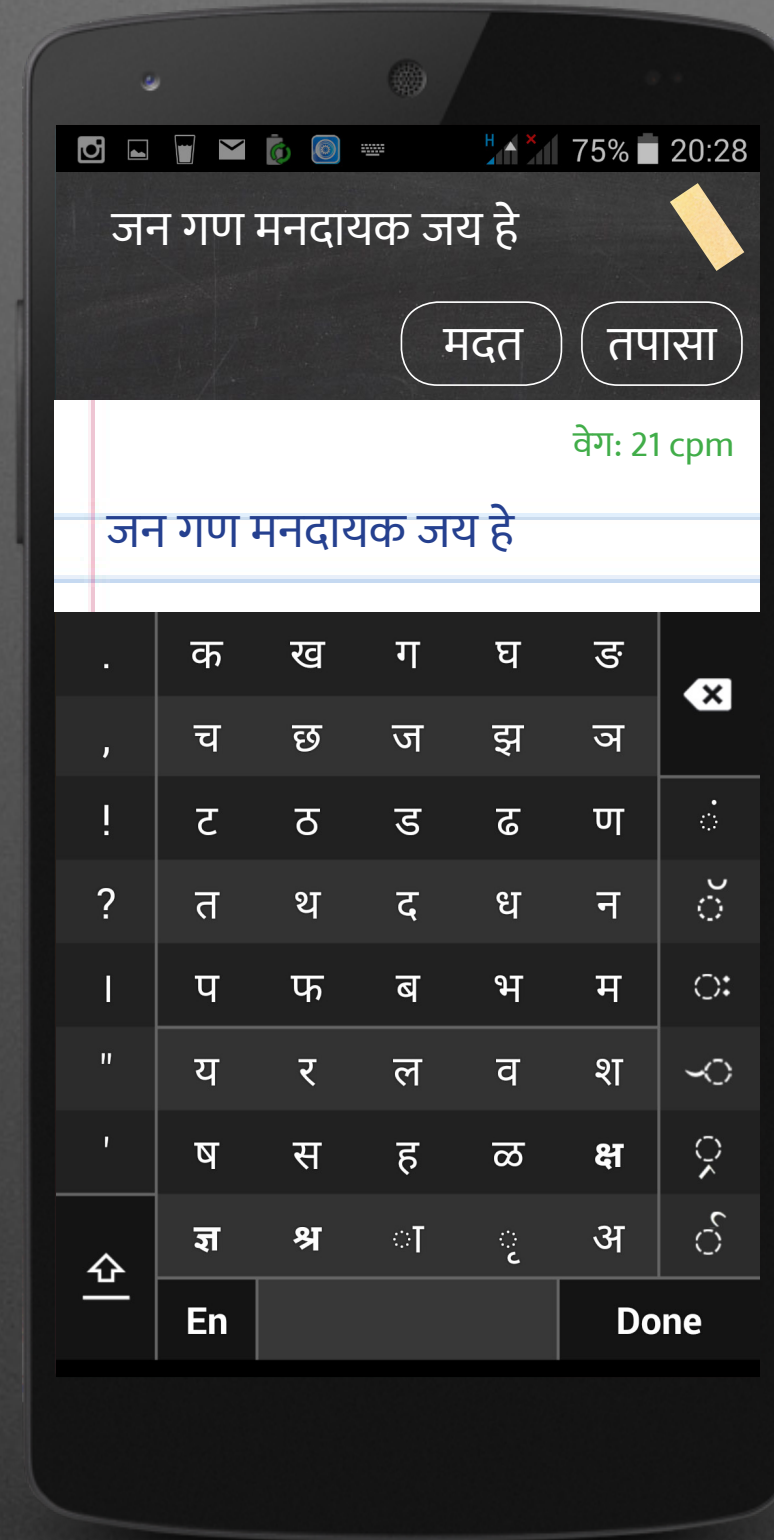
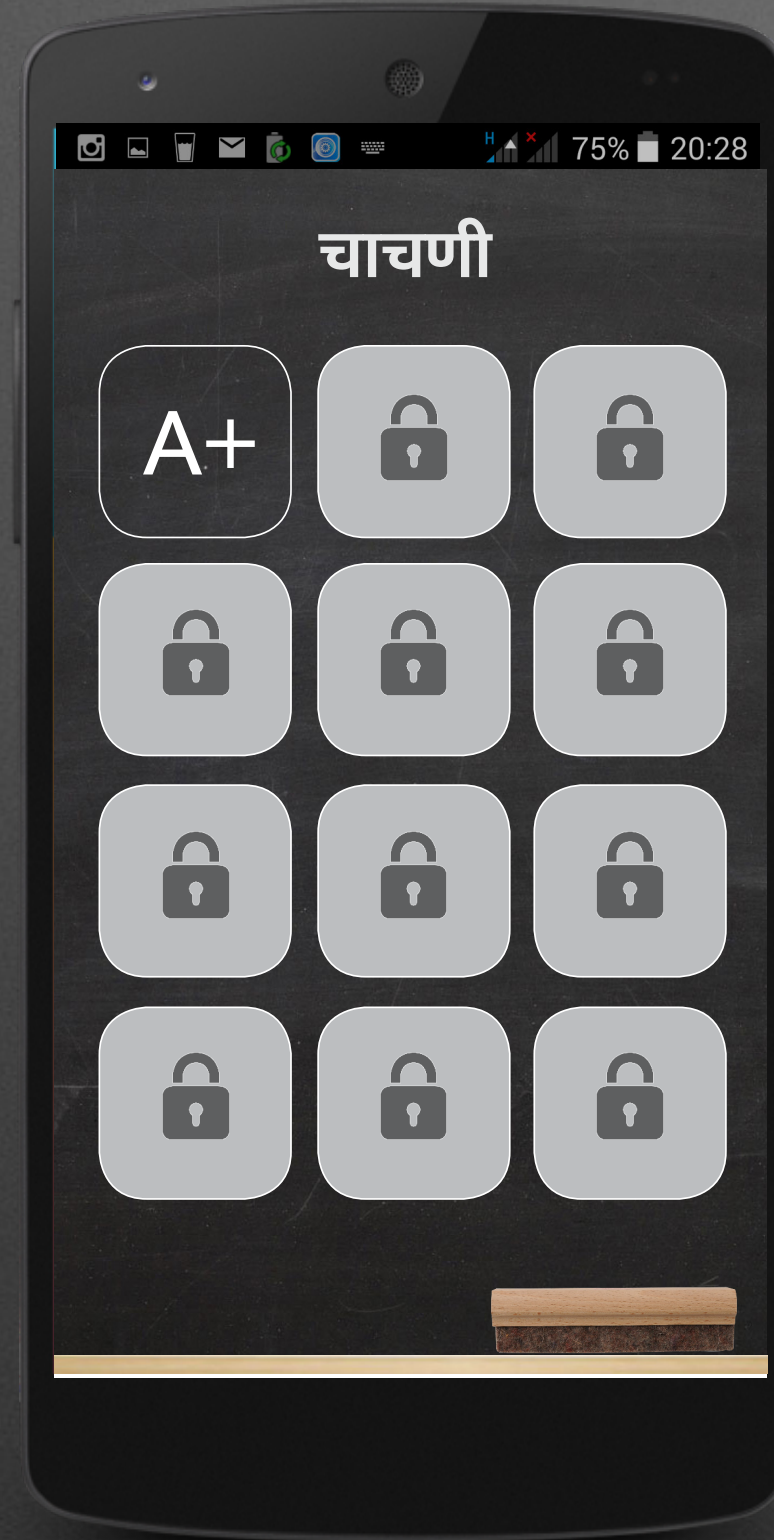
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Game mechanic

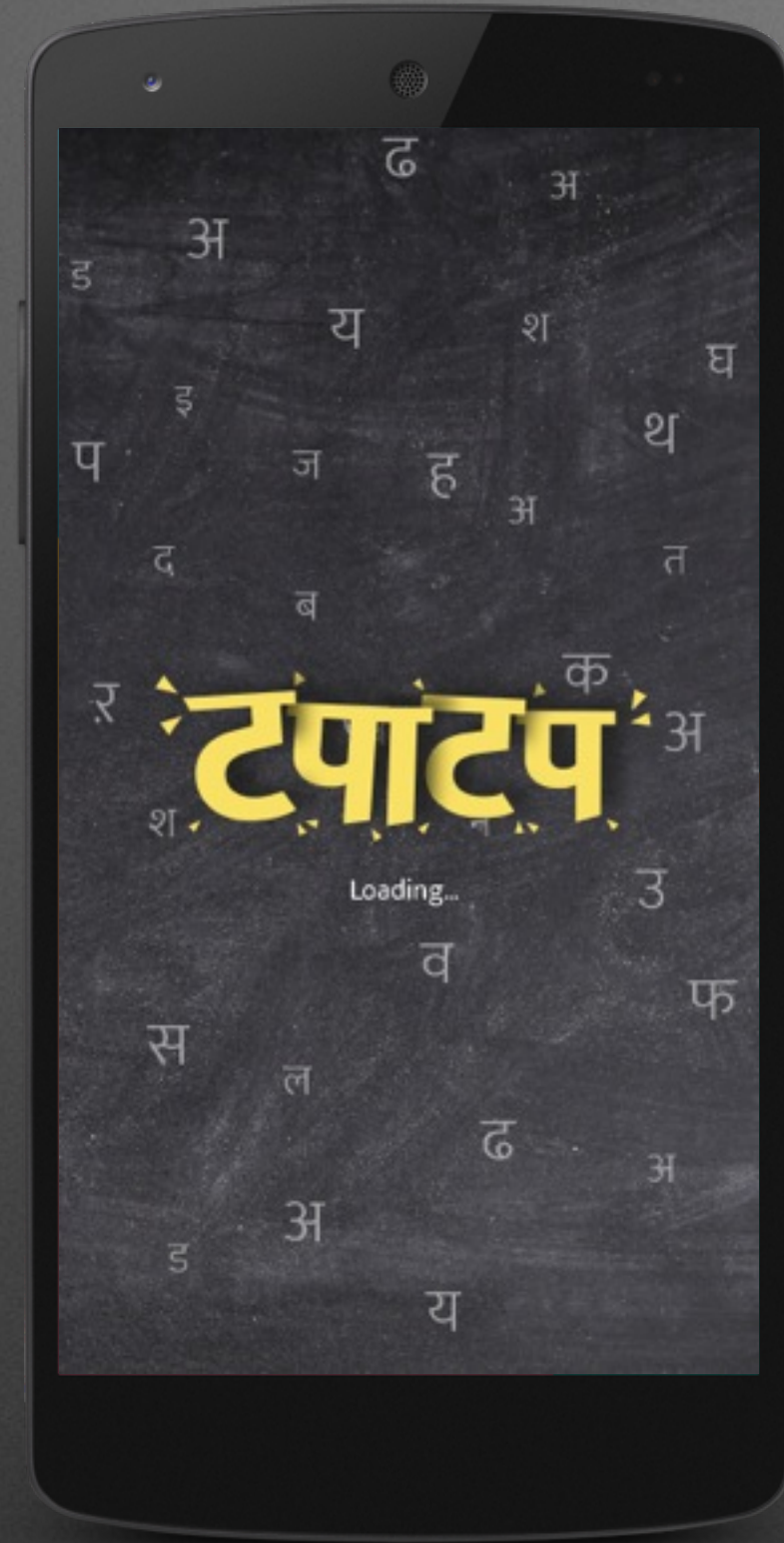
Theme of the application

Major contributor to gamification

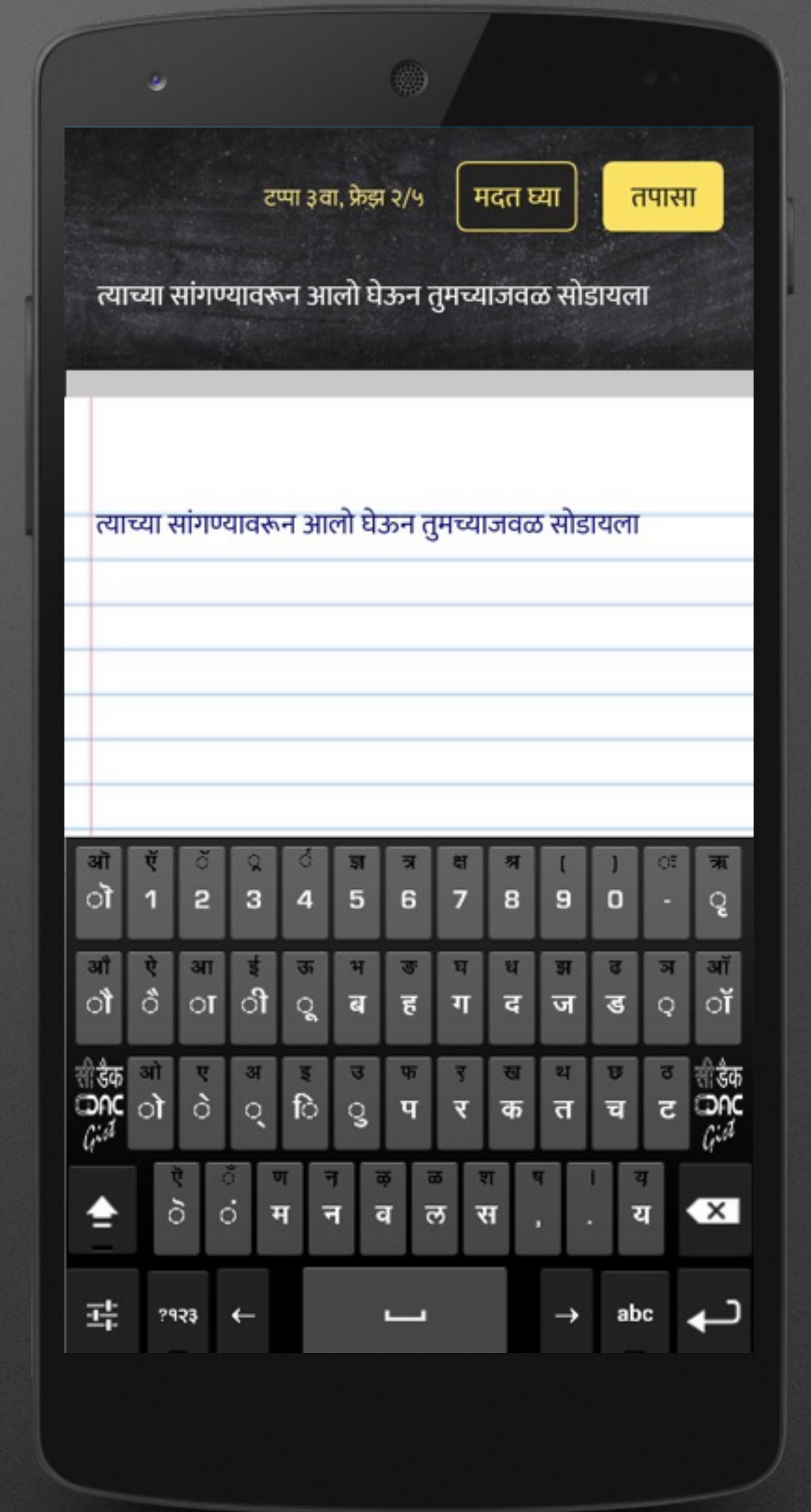
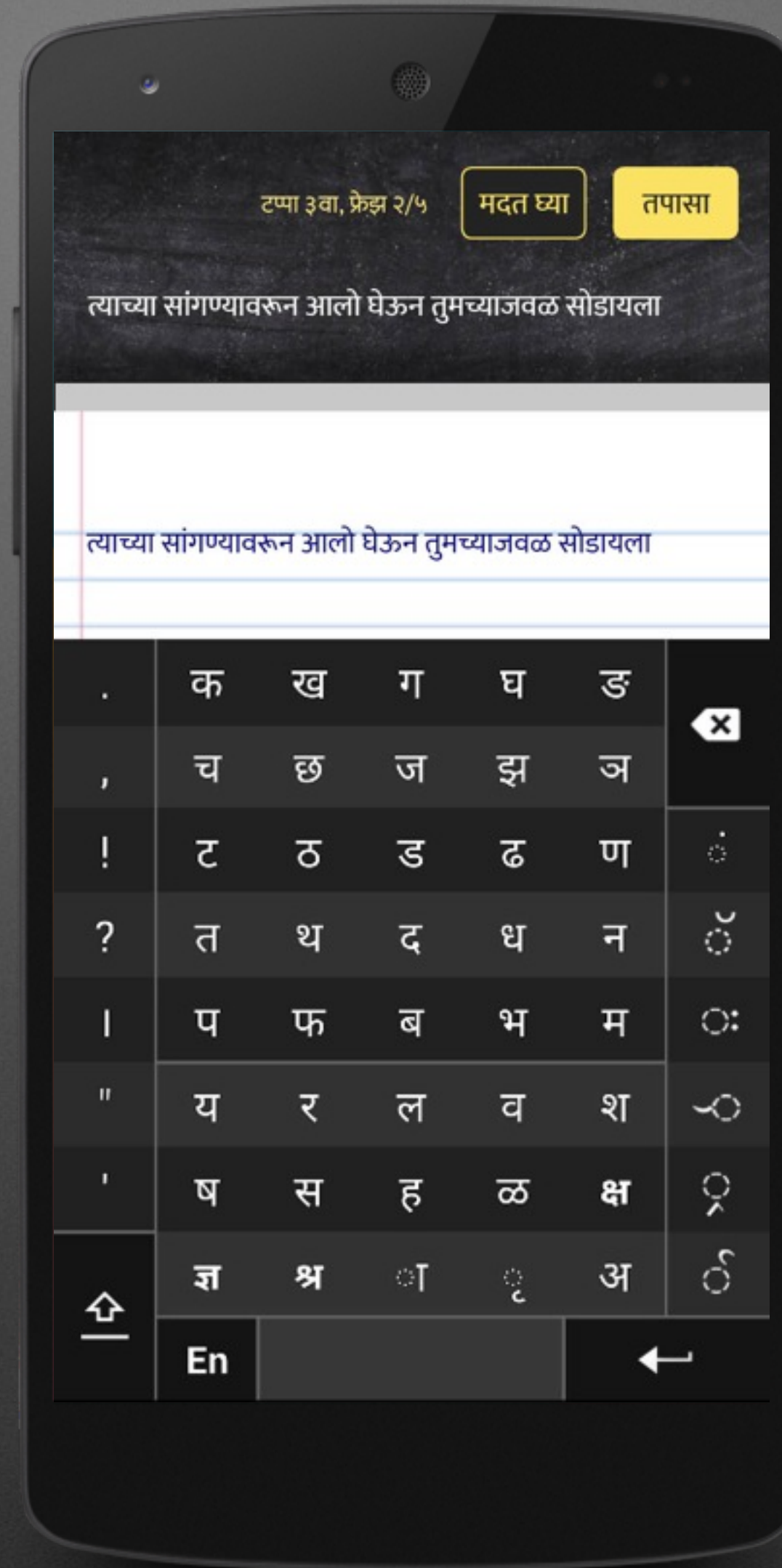


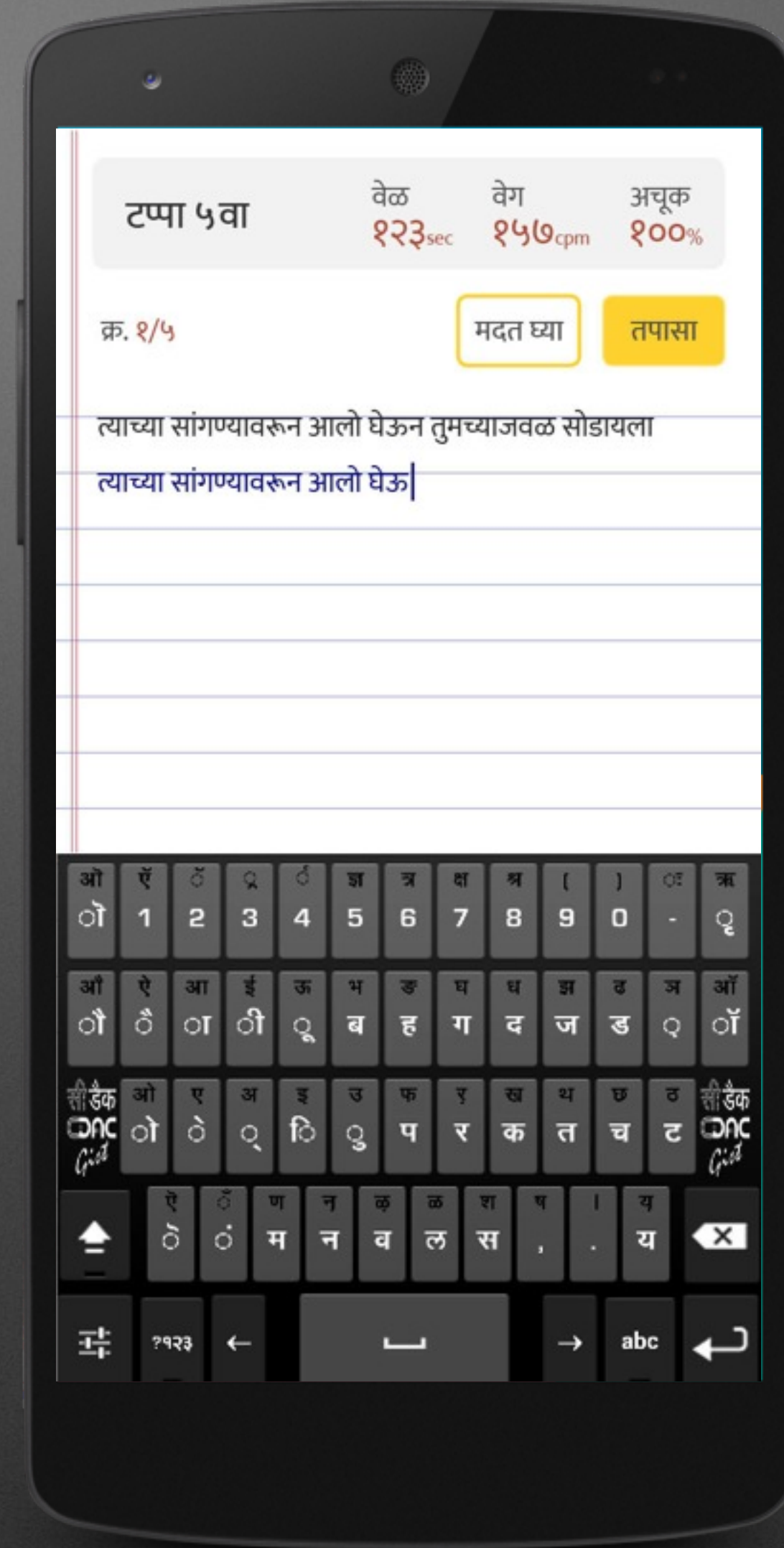
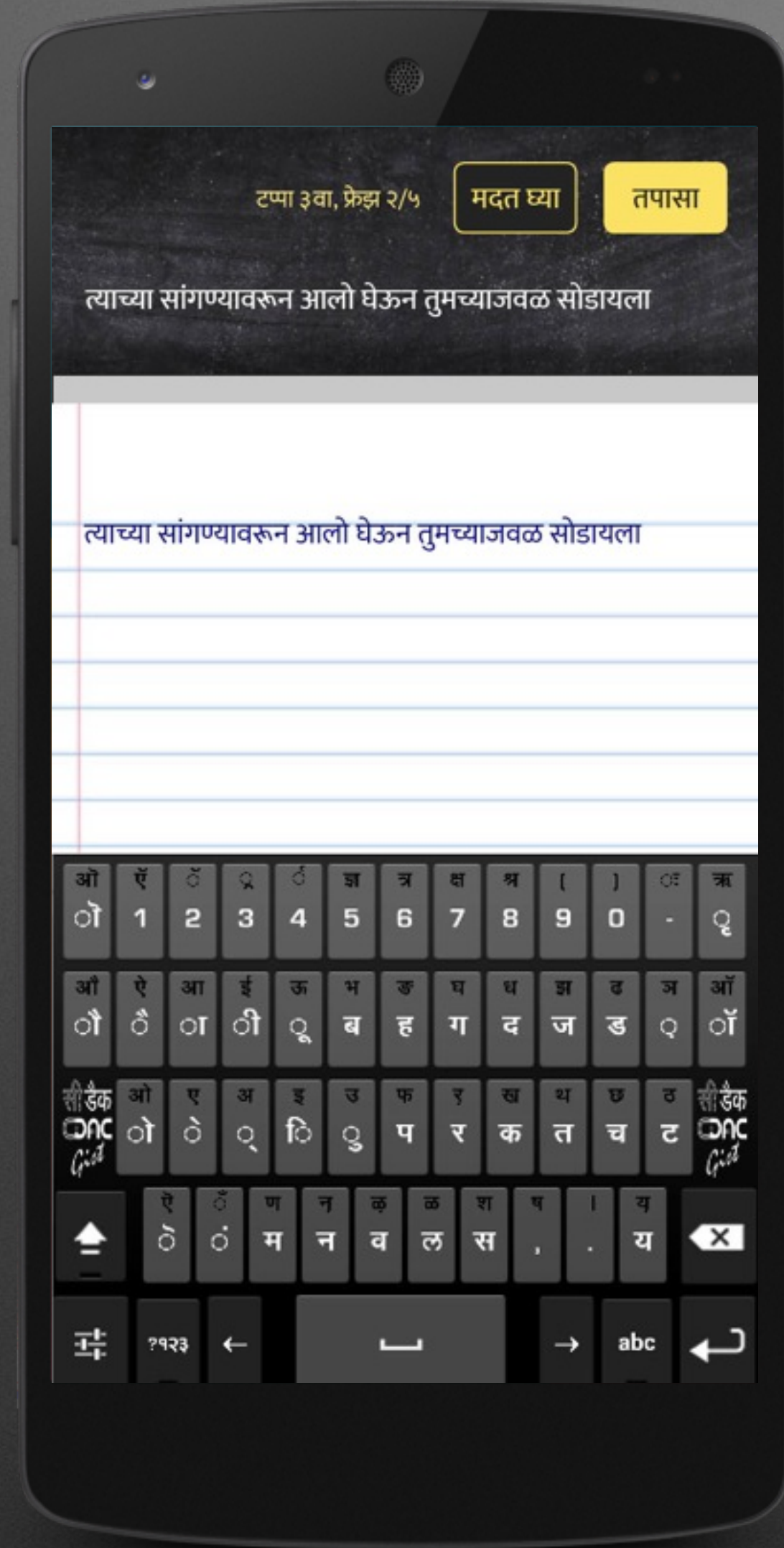


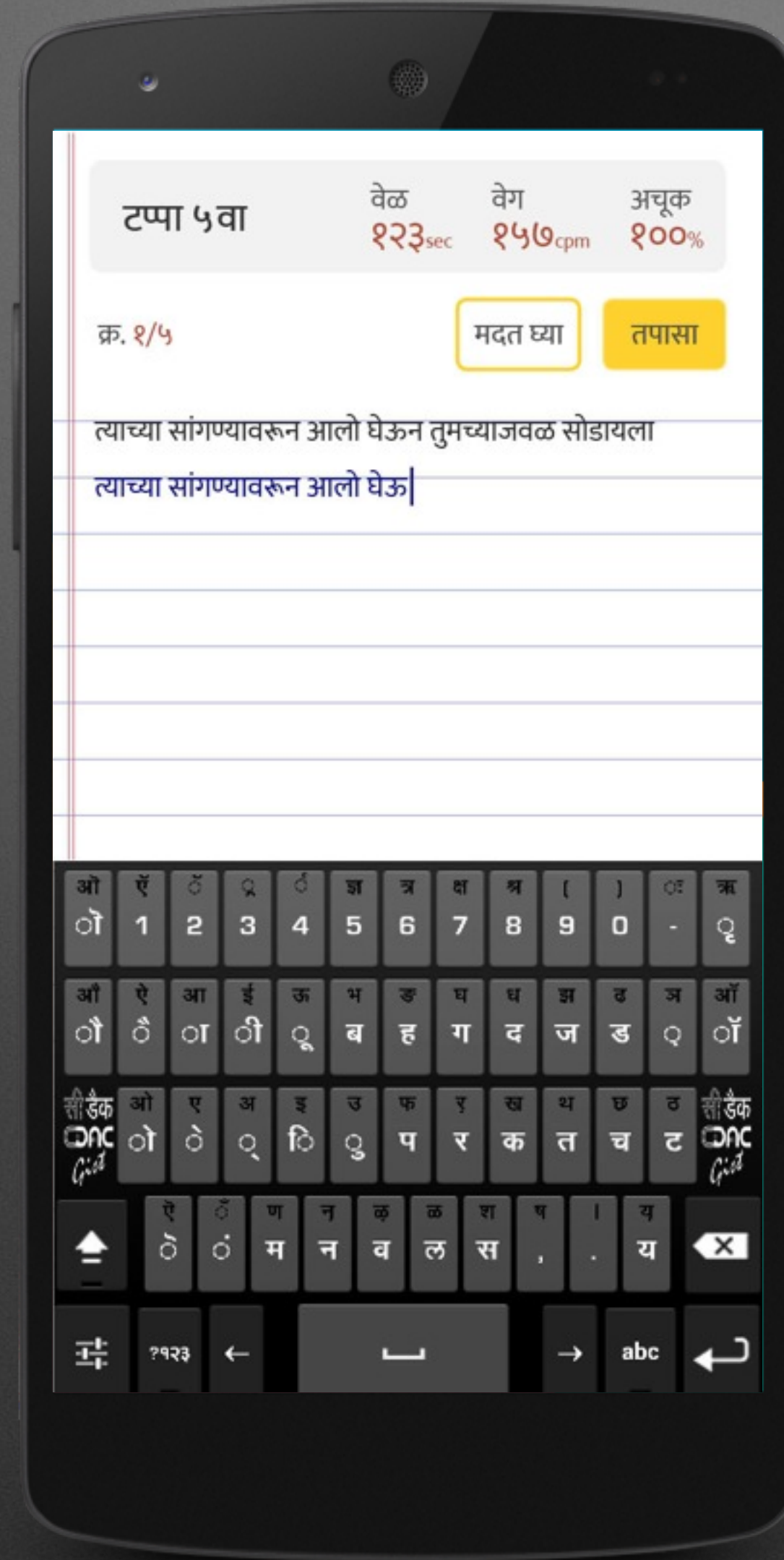
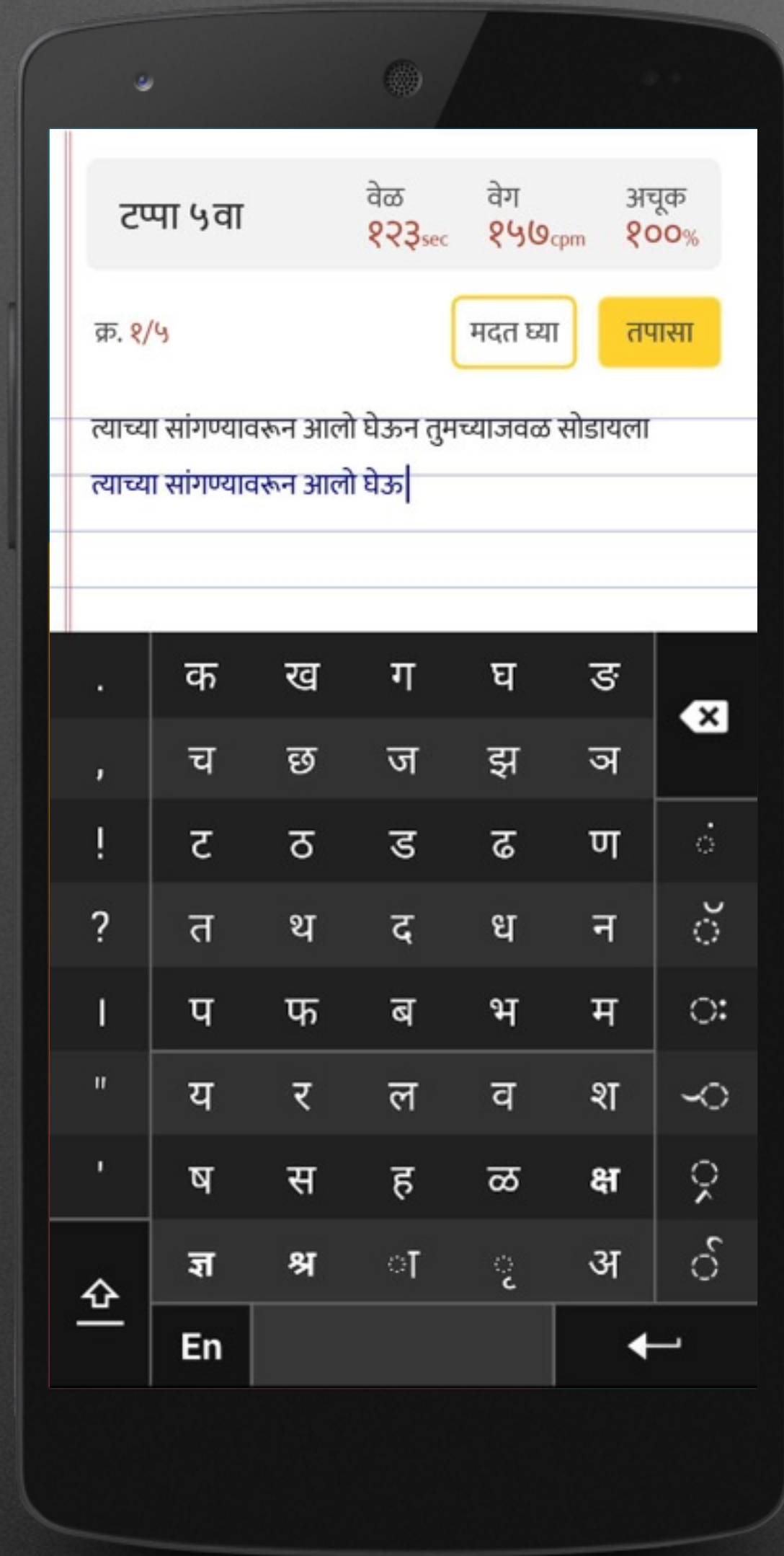
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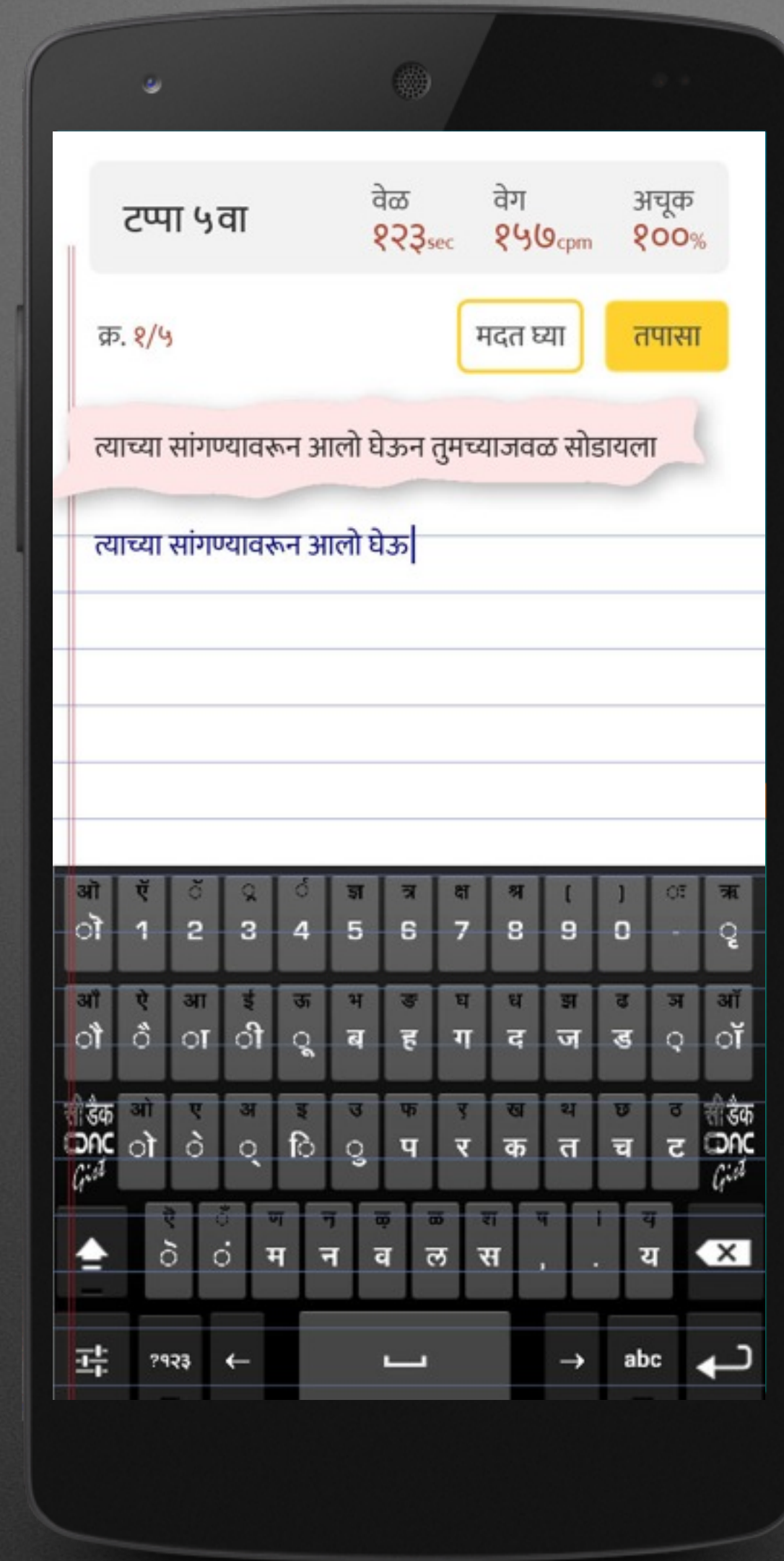
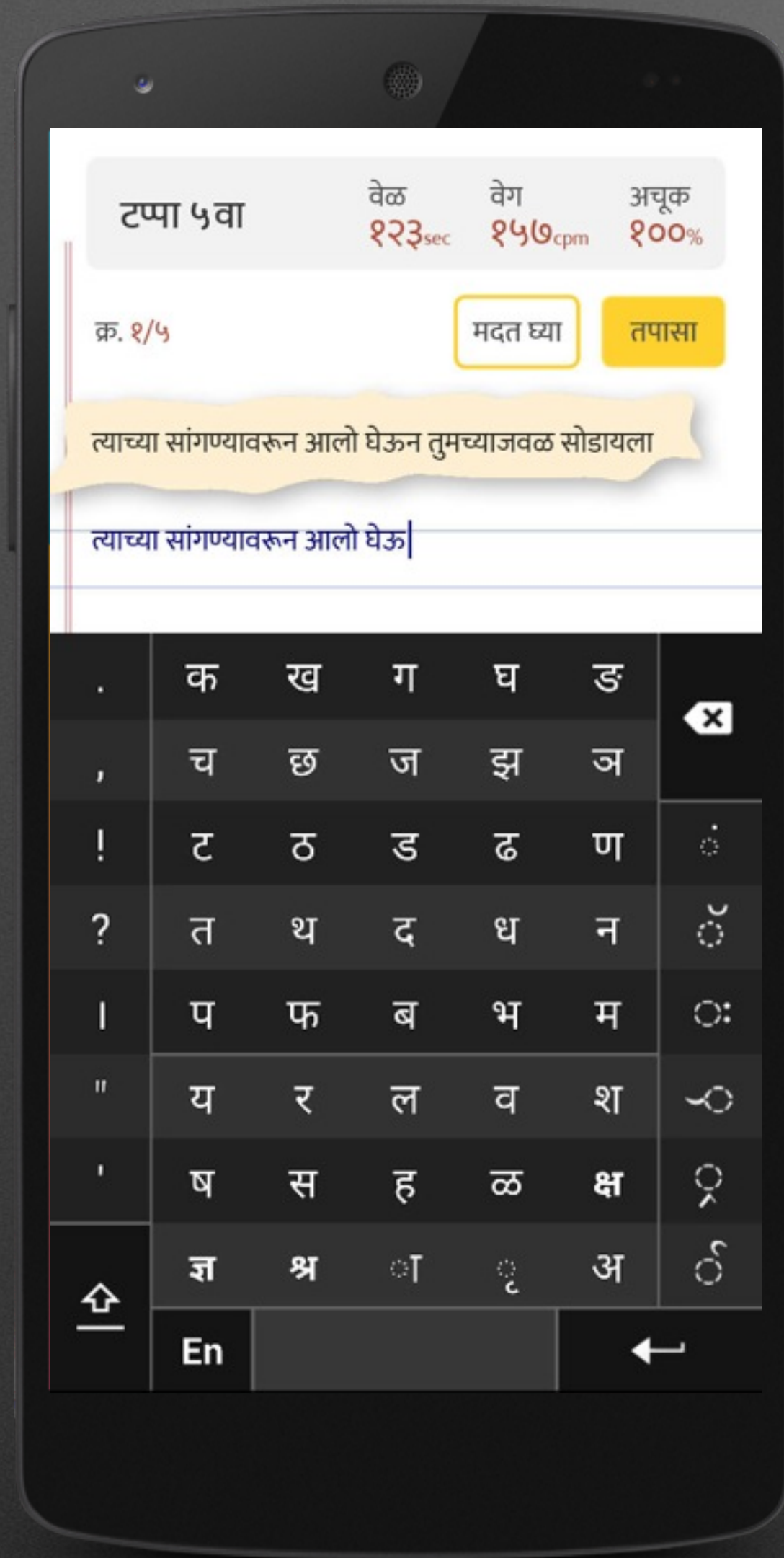
Typing Screen



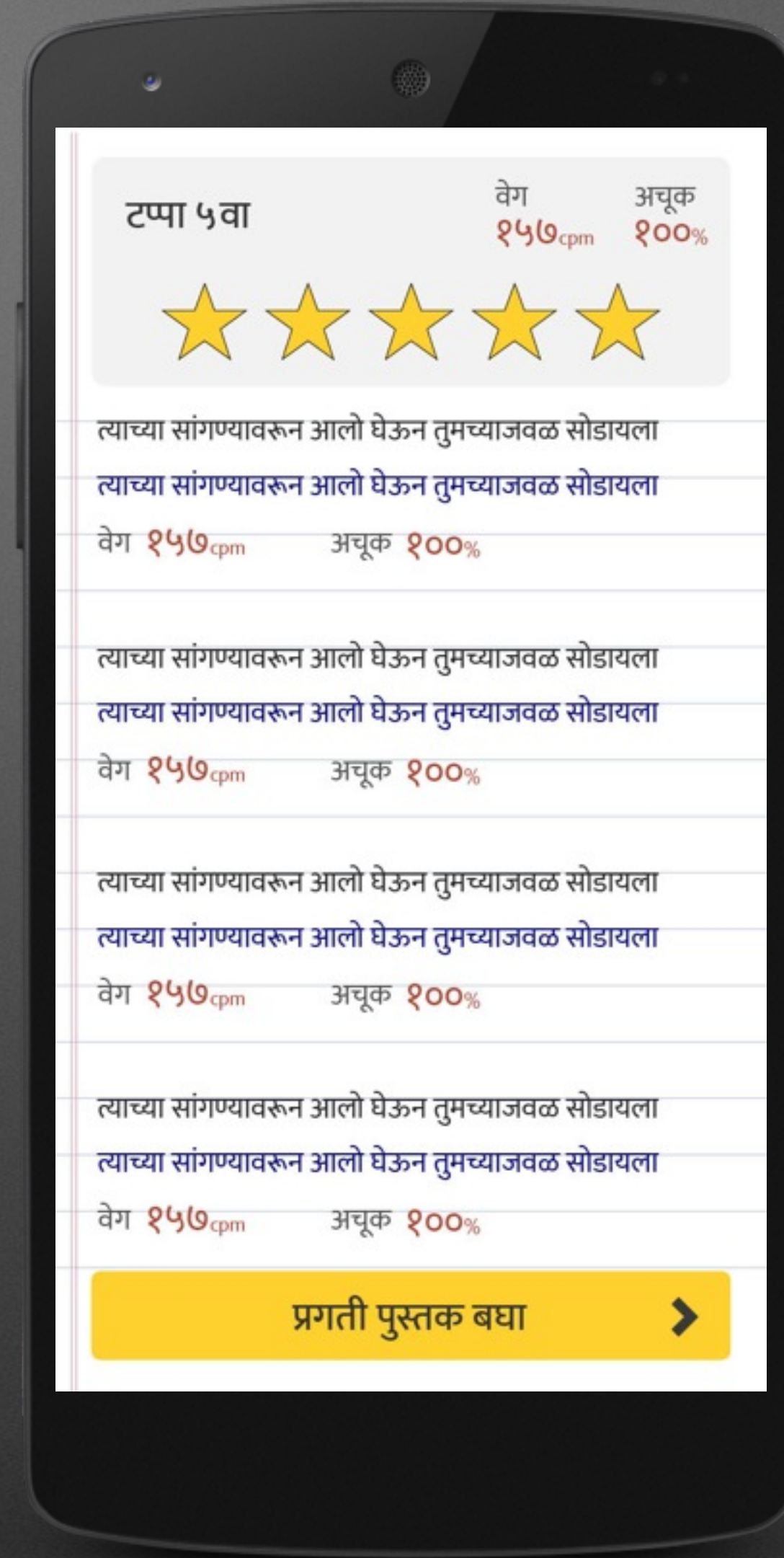
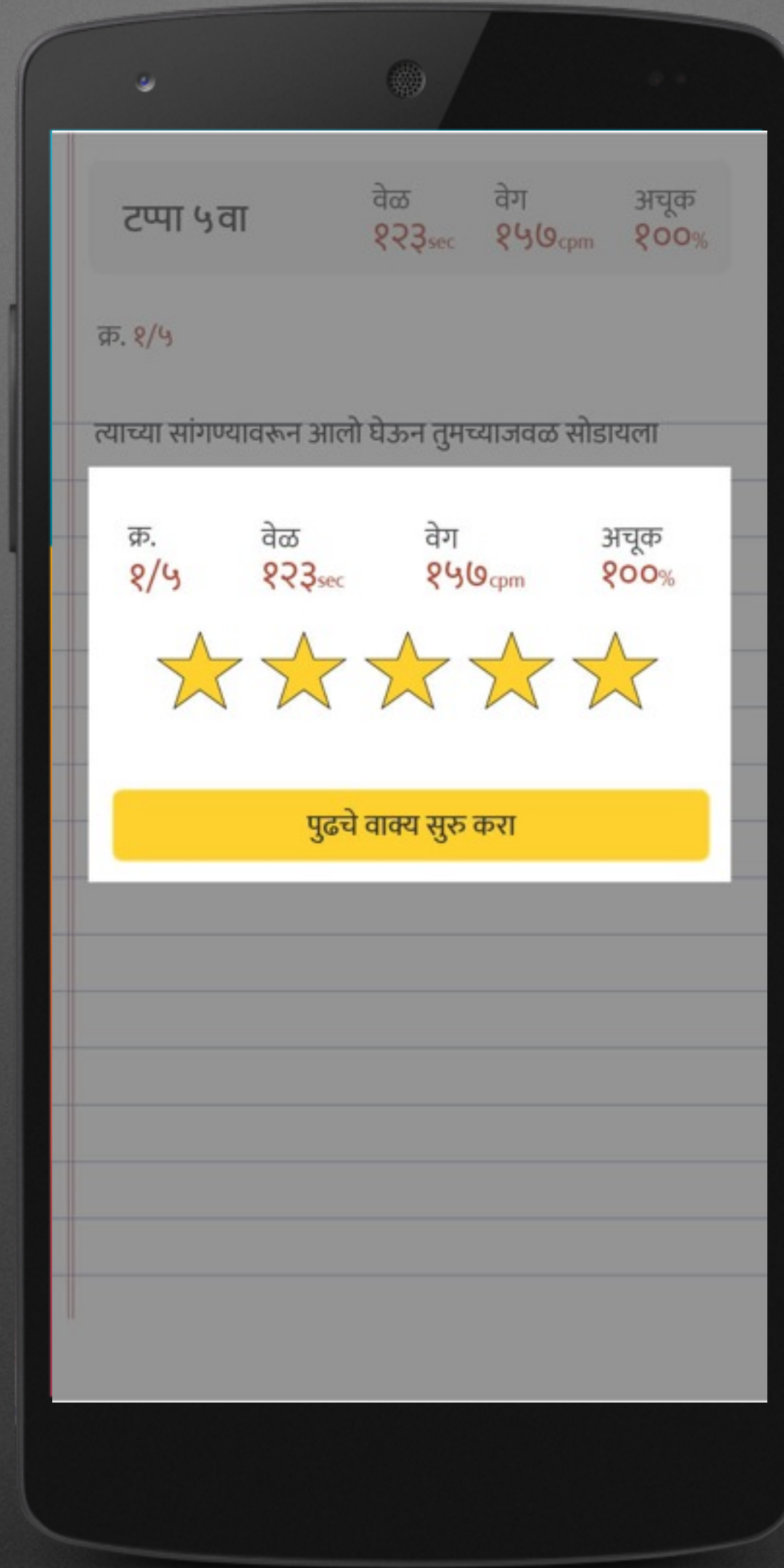
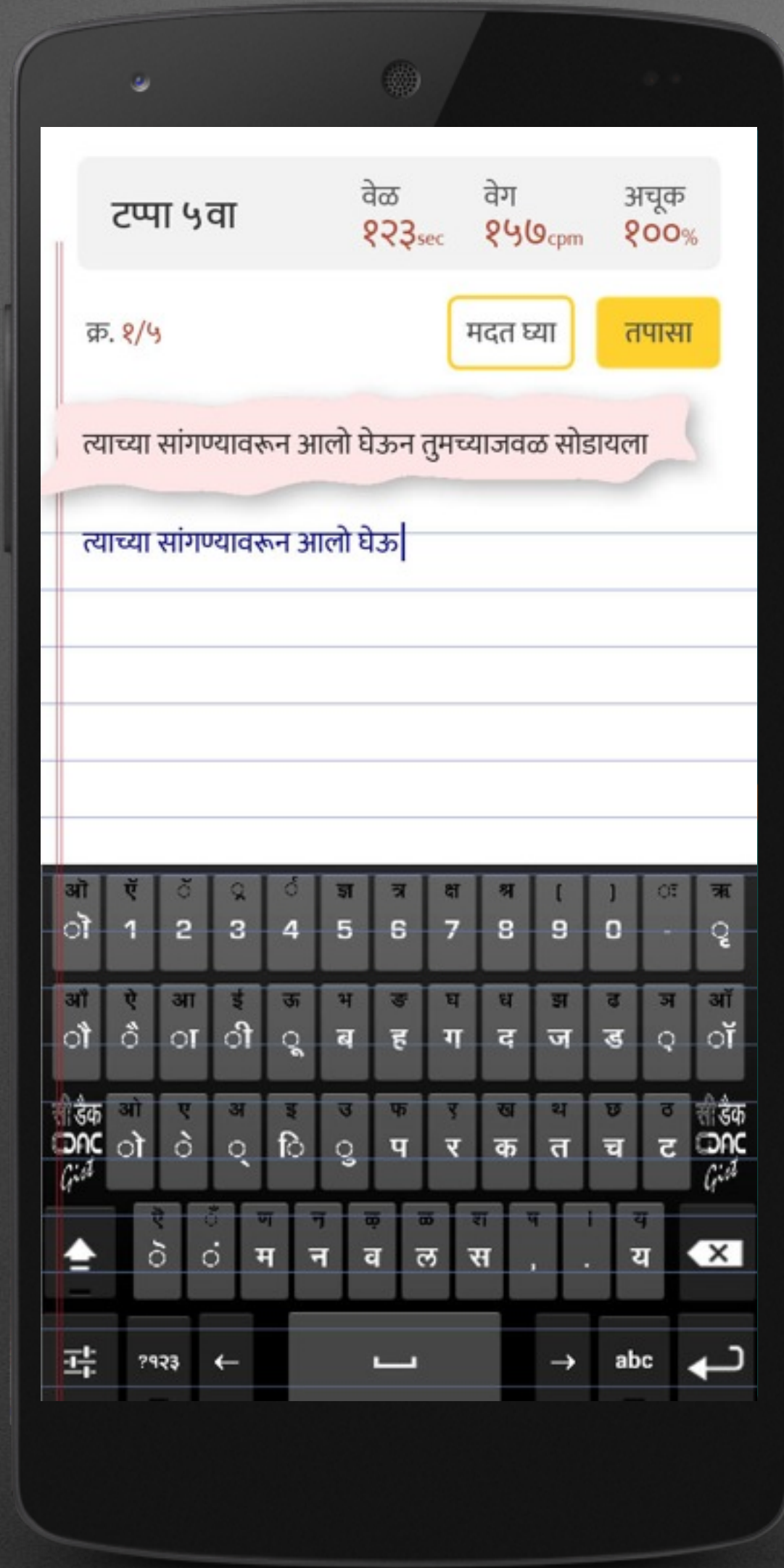


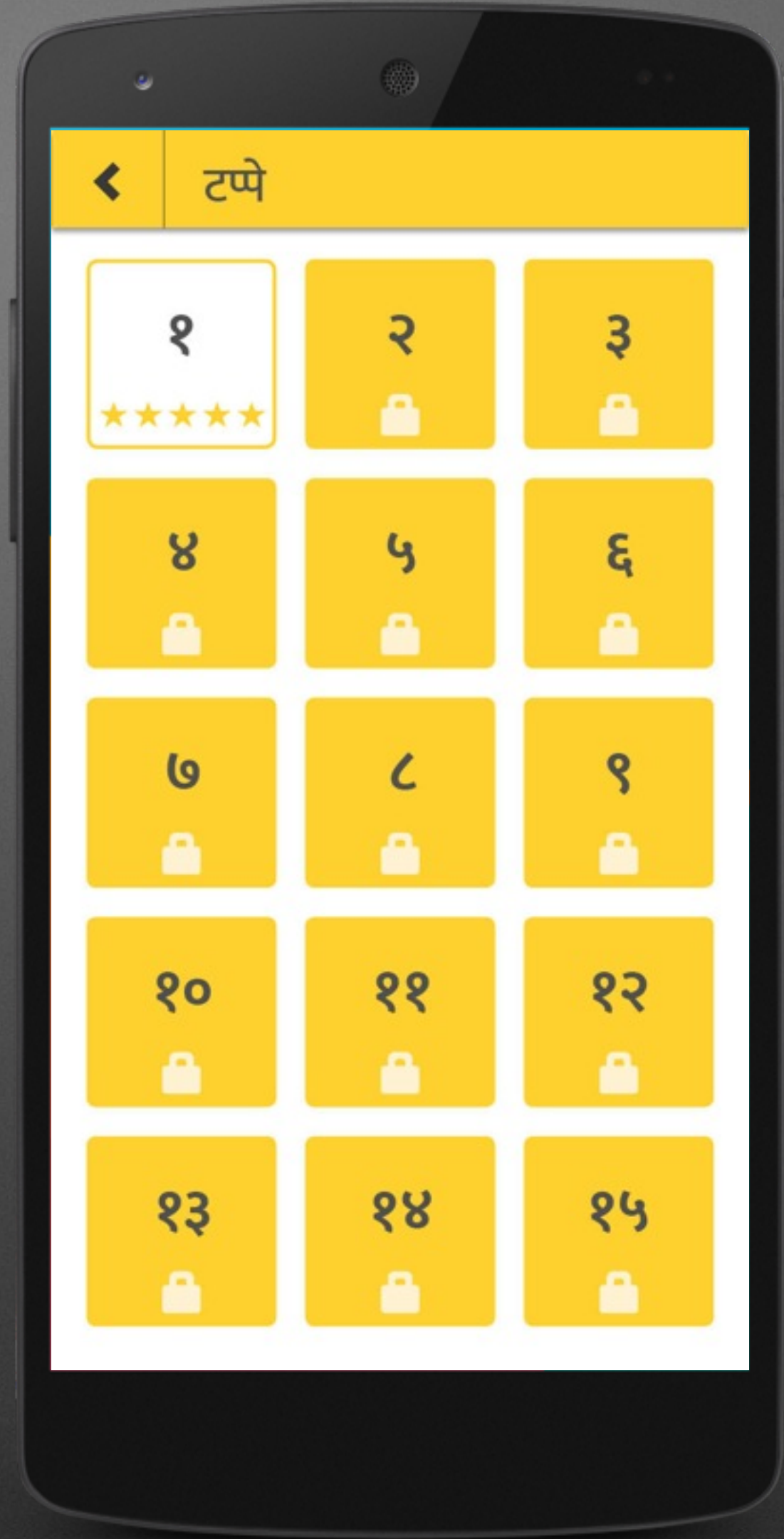


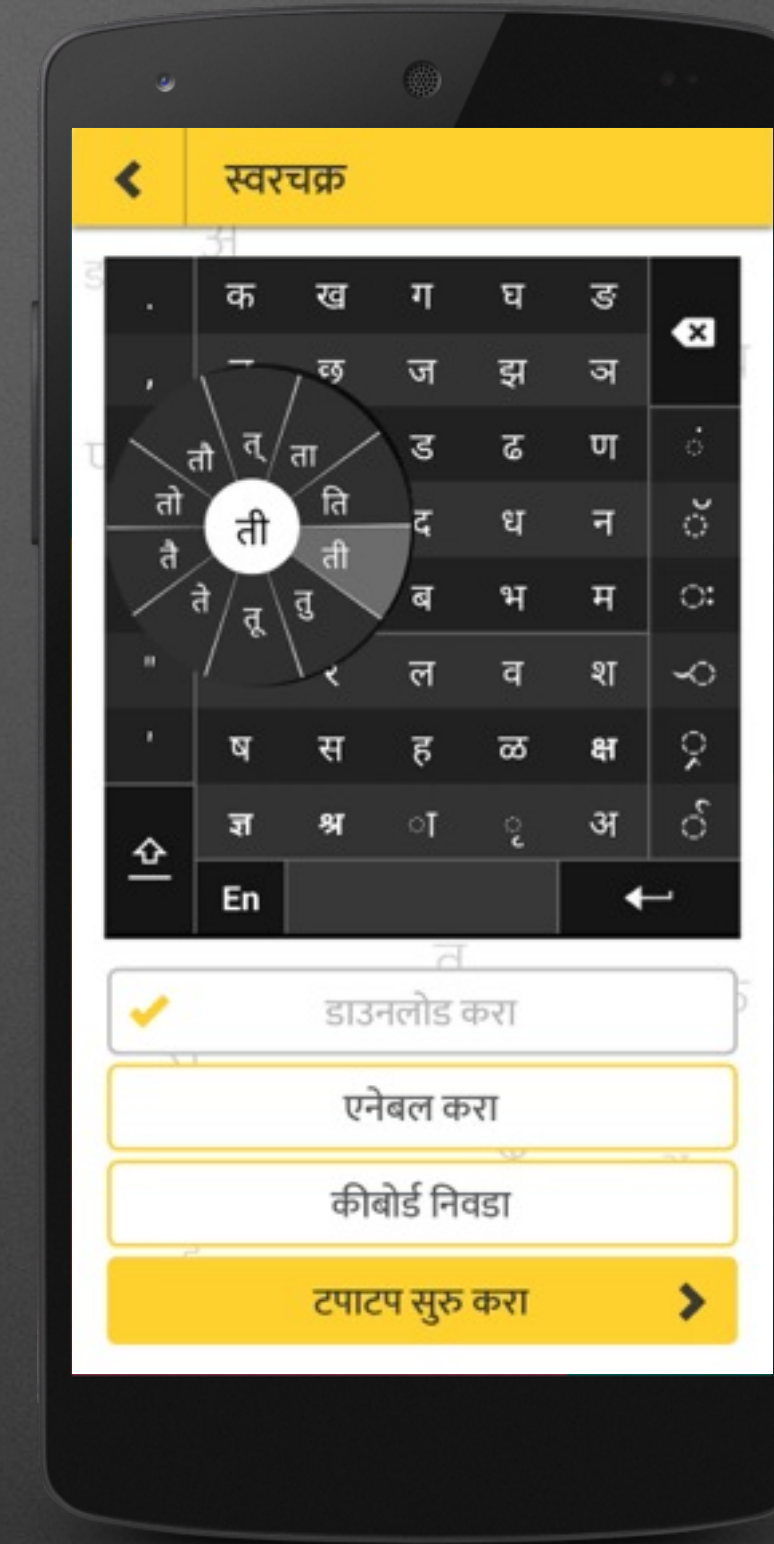
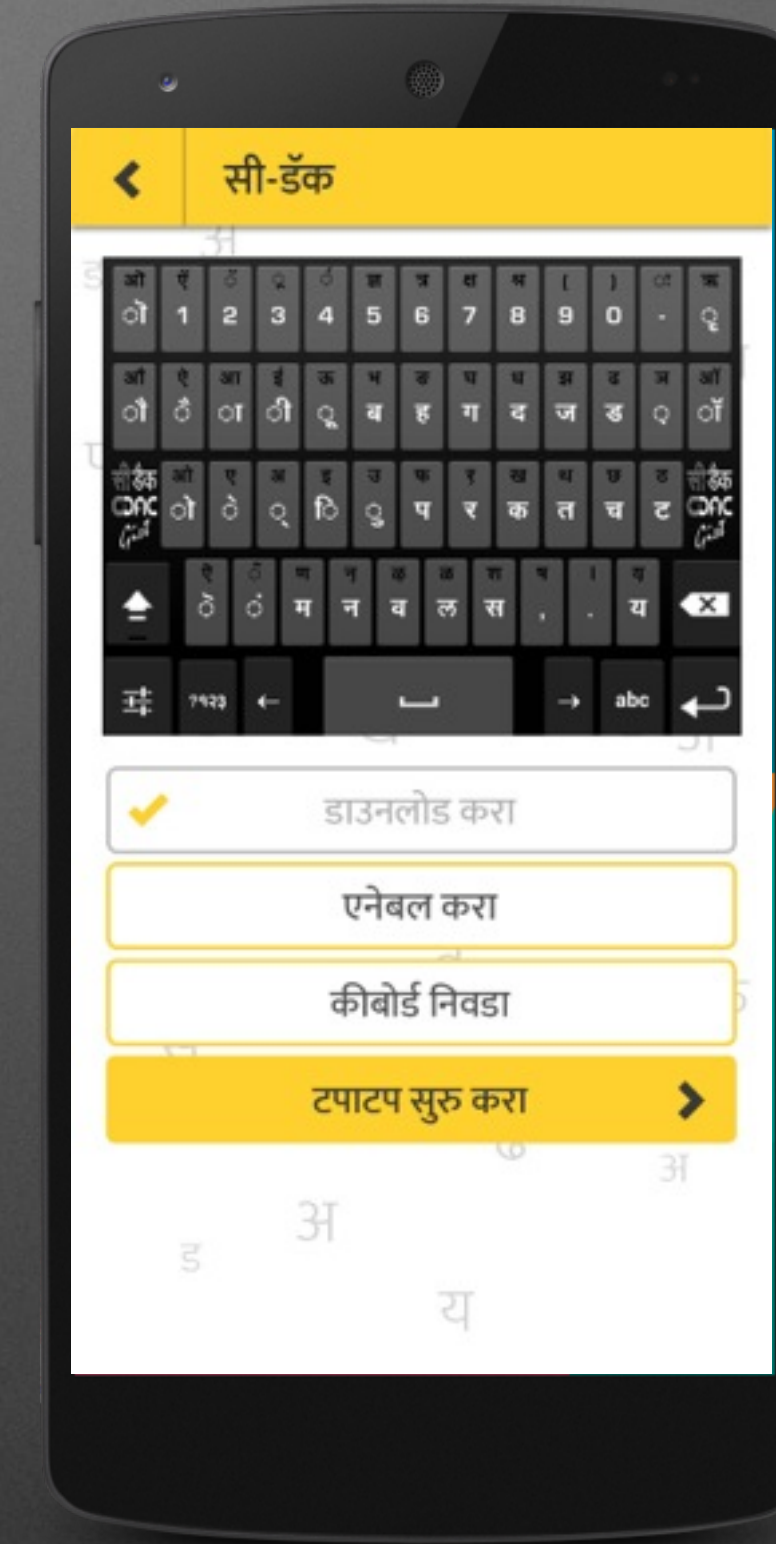
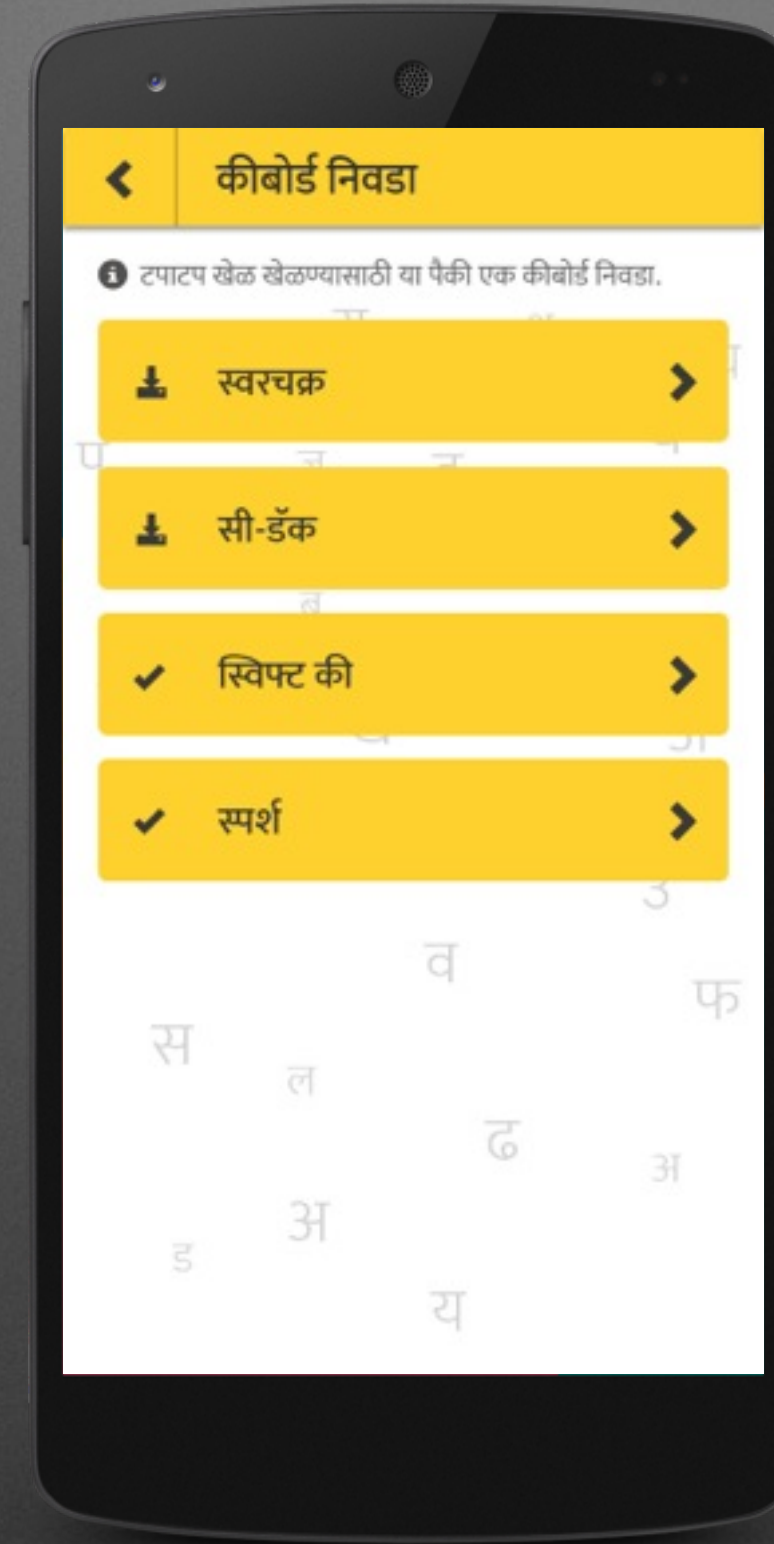
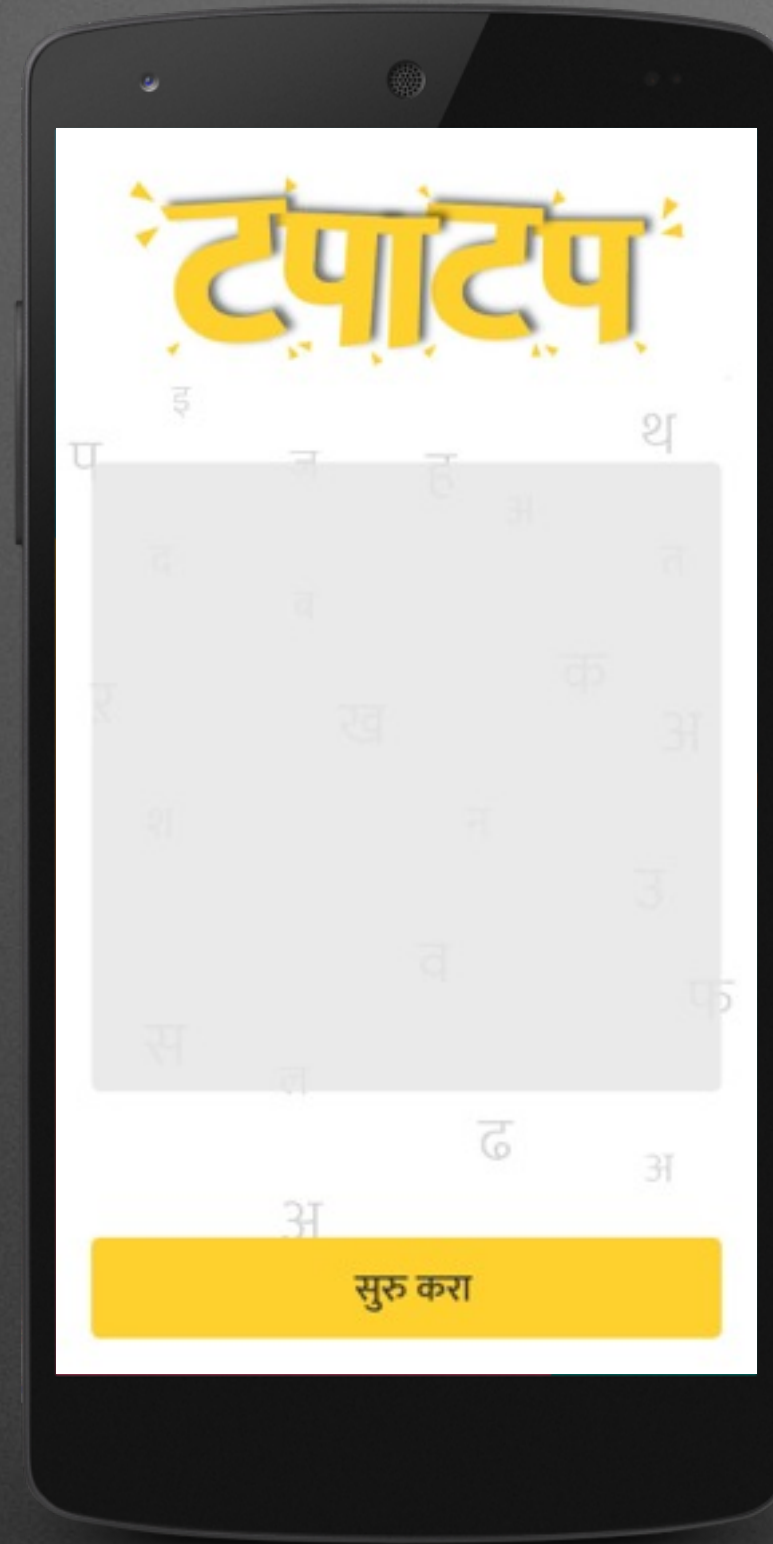
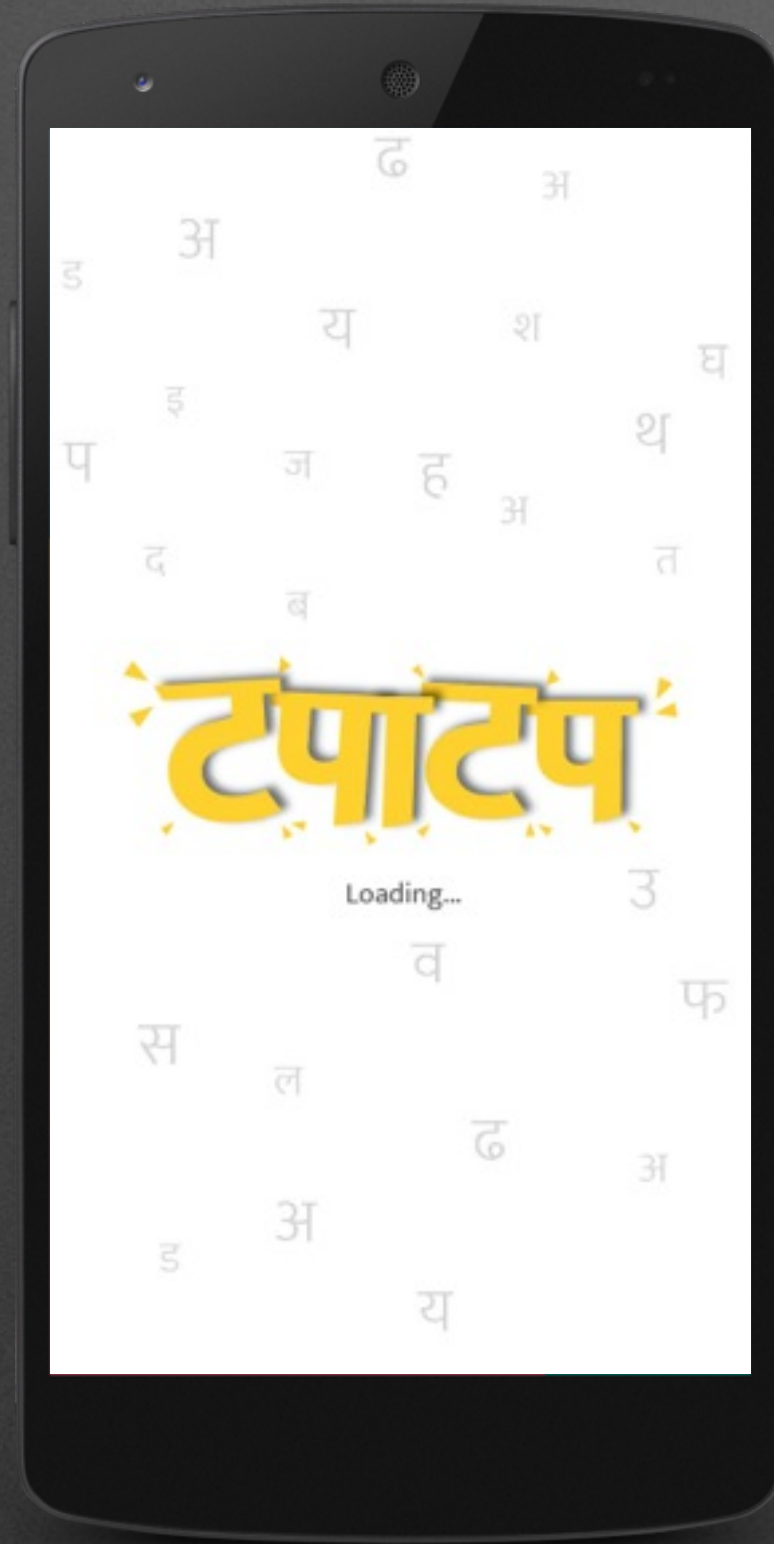
Typing Screen

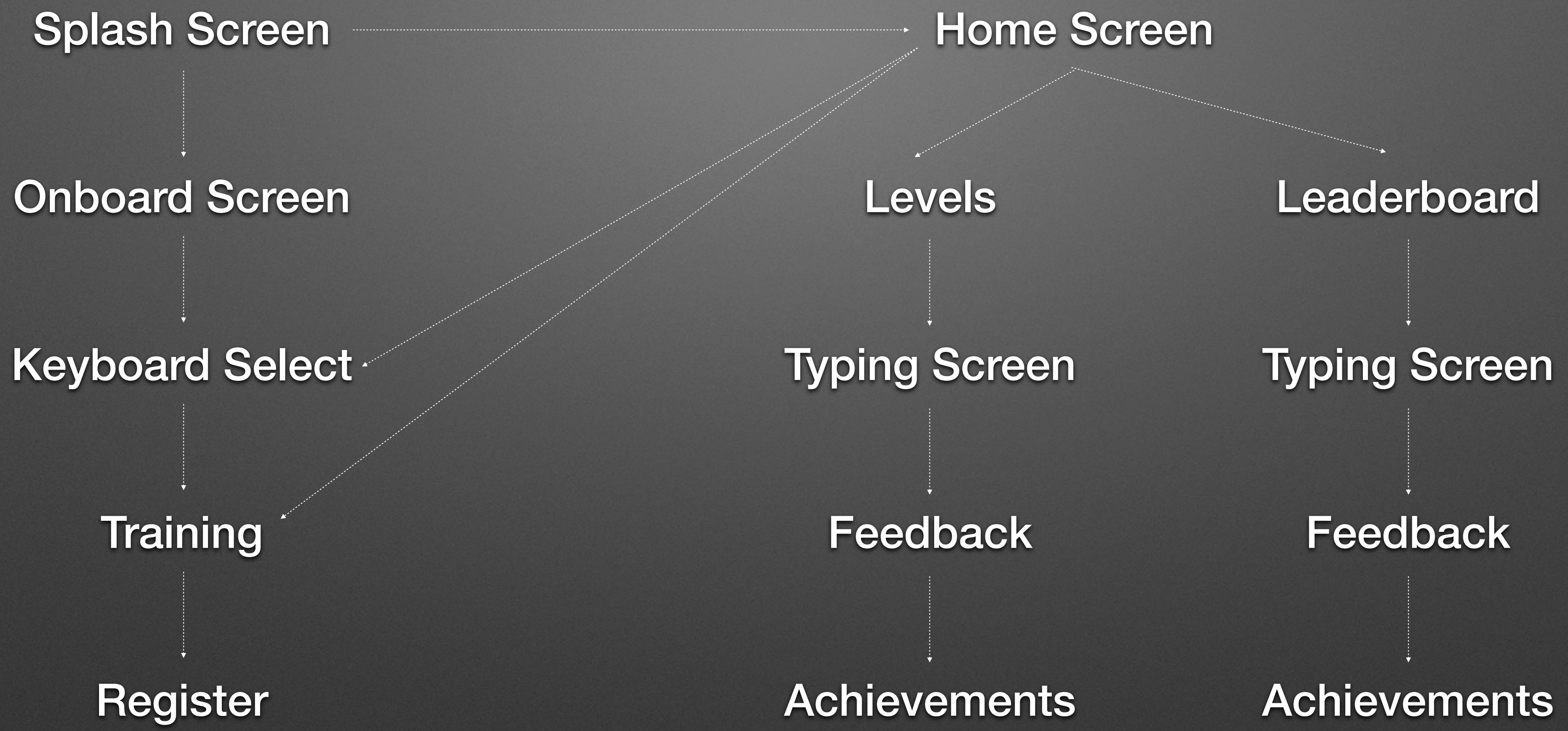


Typing Screen
Chit copying experience









Iterations



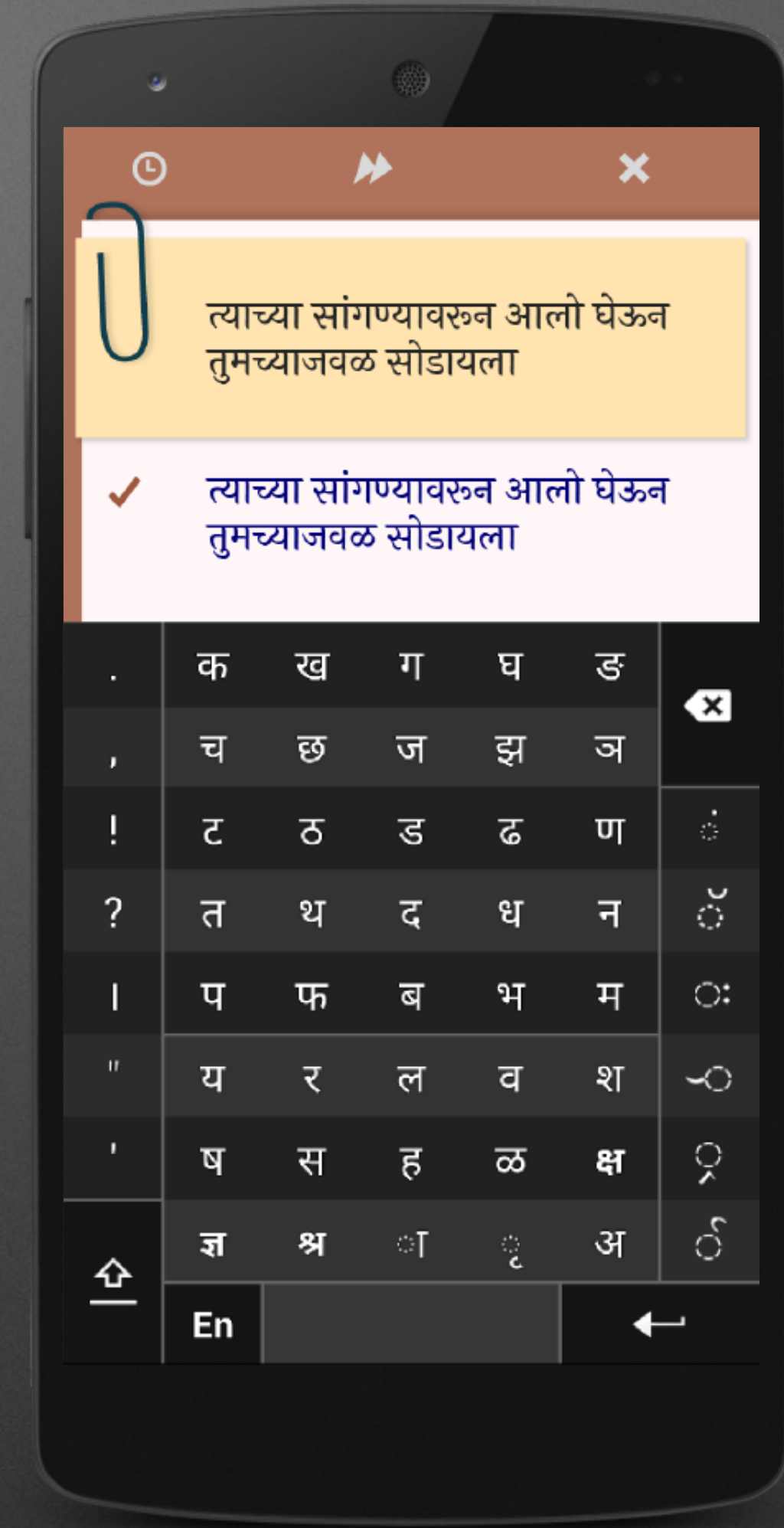
Feedback

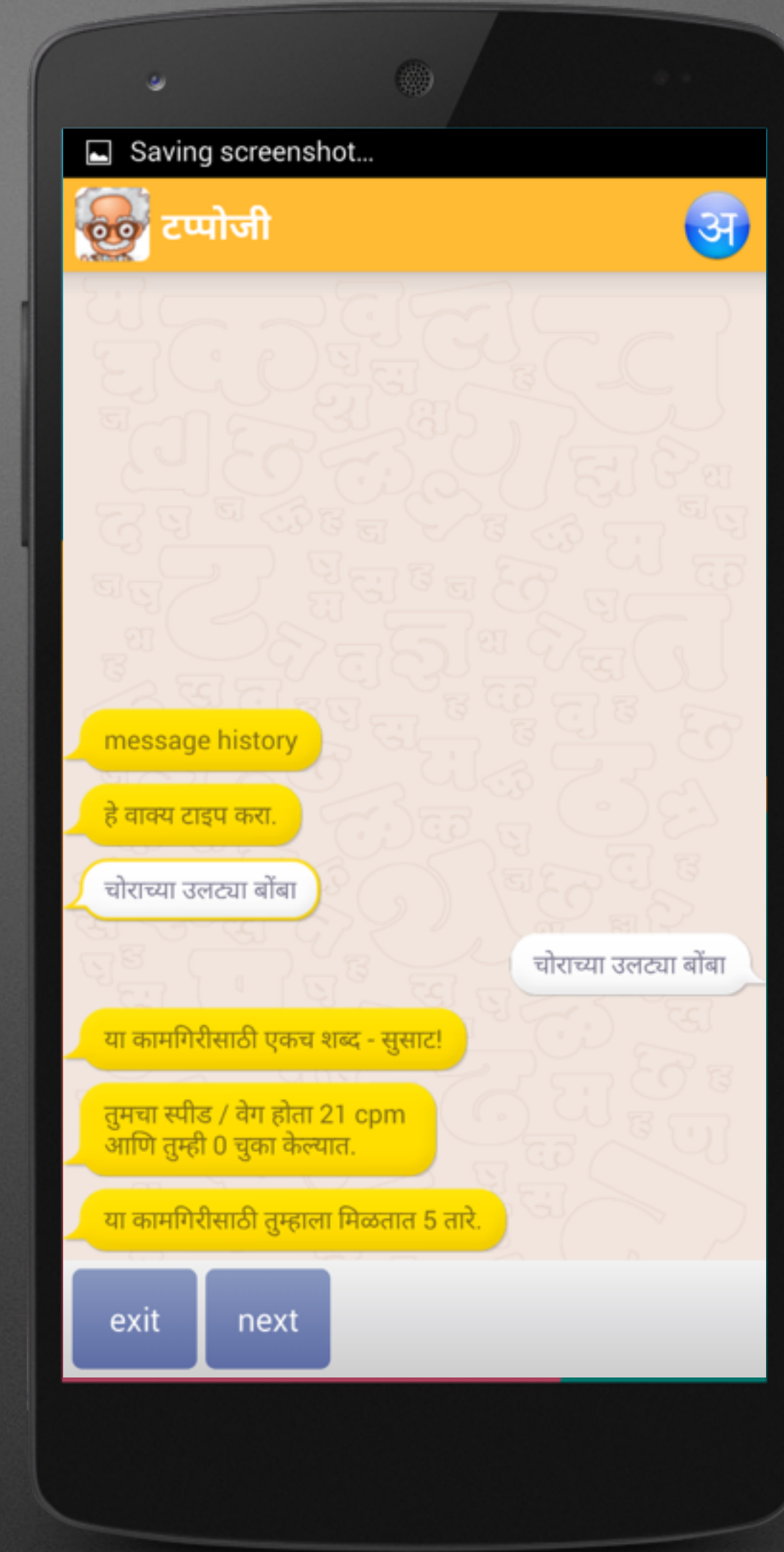
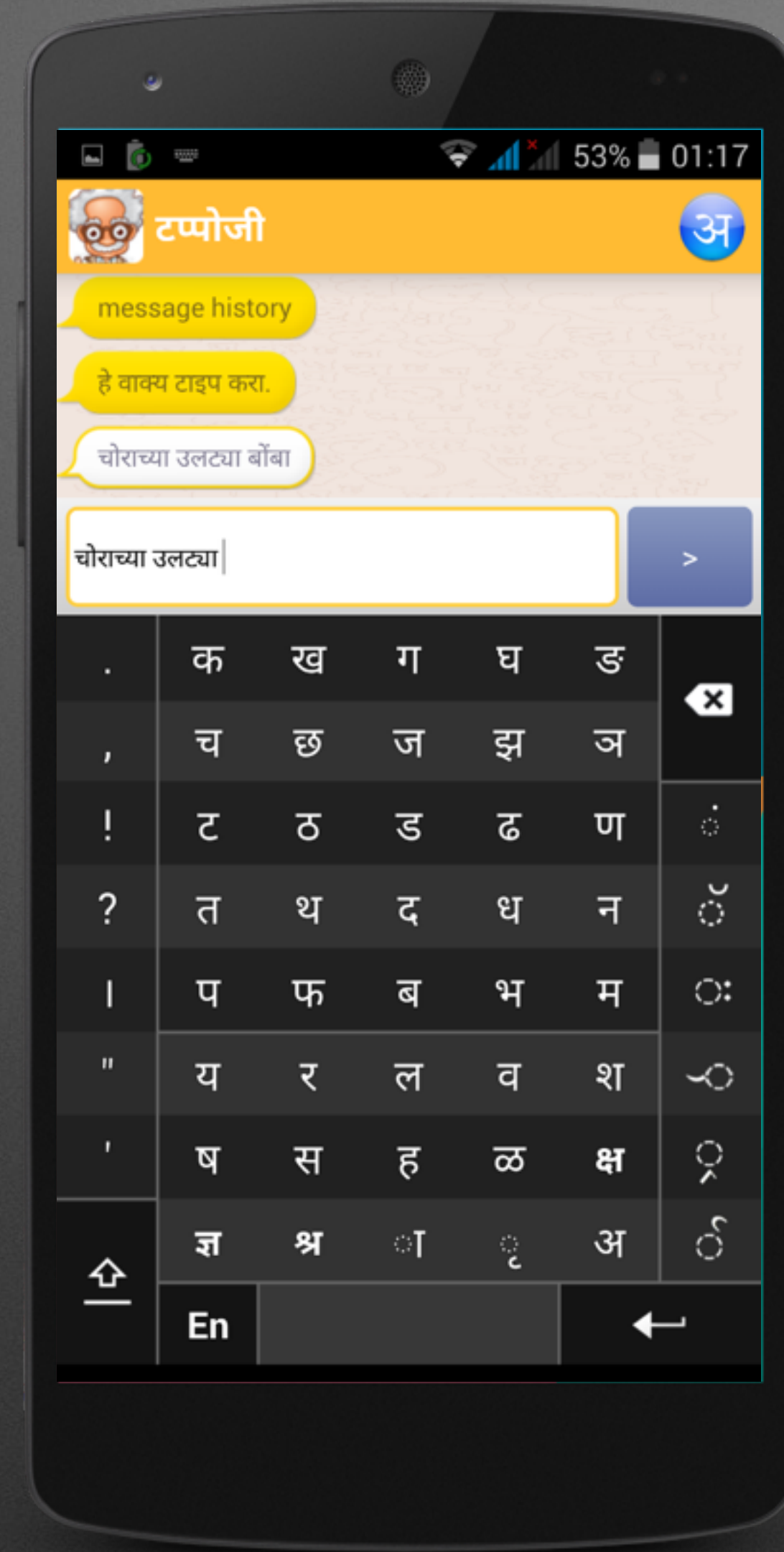
Mundane

“Cannot view my previously typed sentences.”

Different keyboards, variable heights

Cannot relate to chit copying



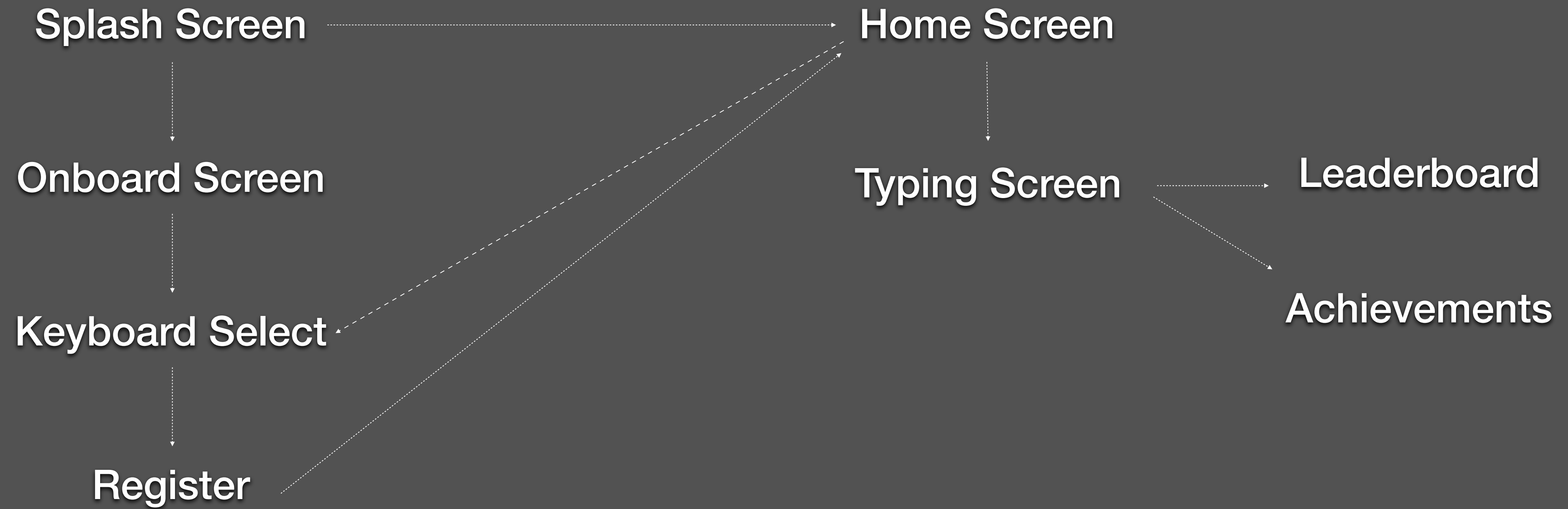




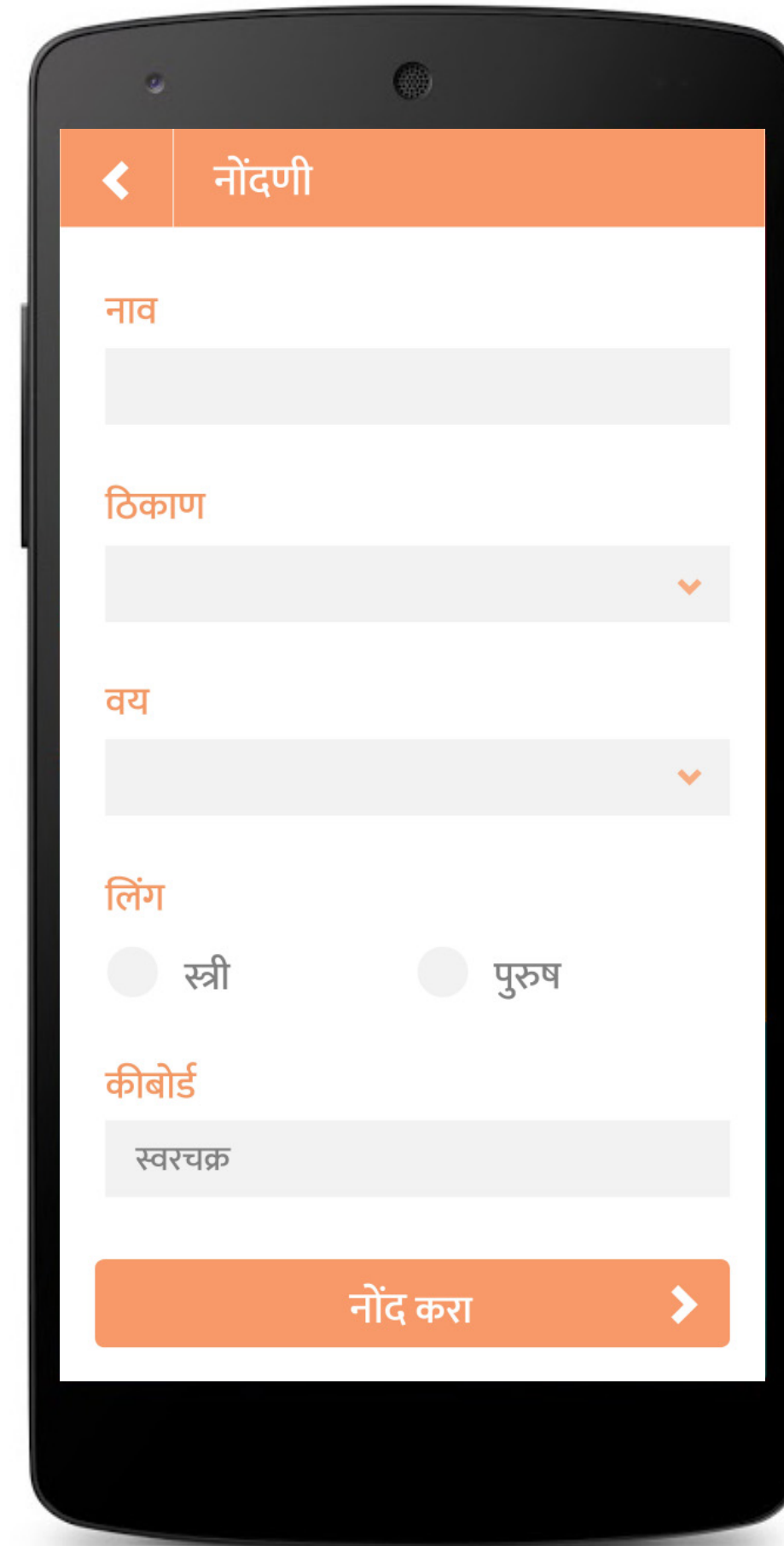
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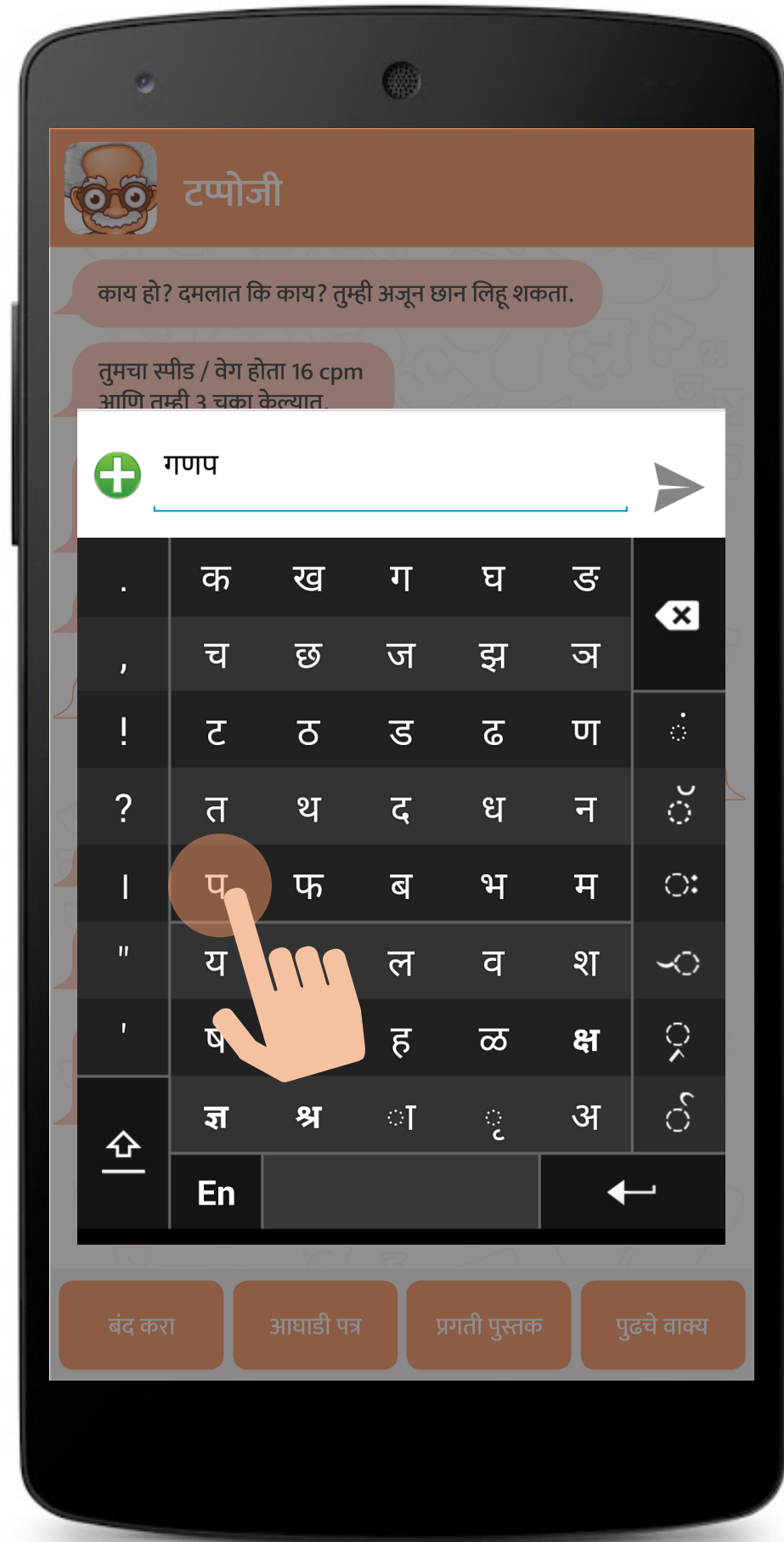
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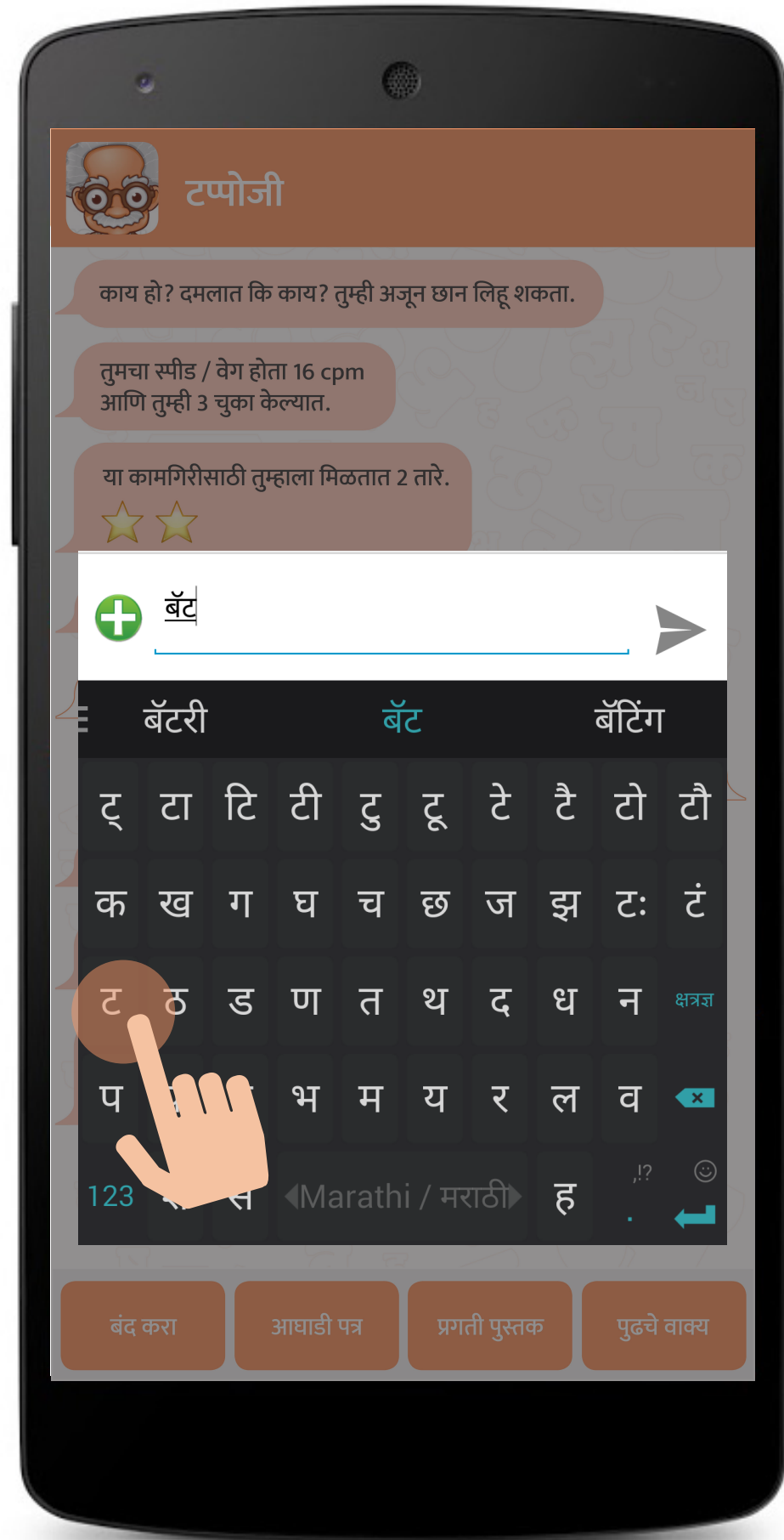
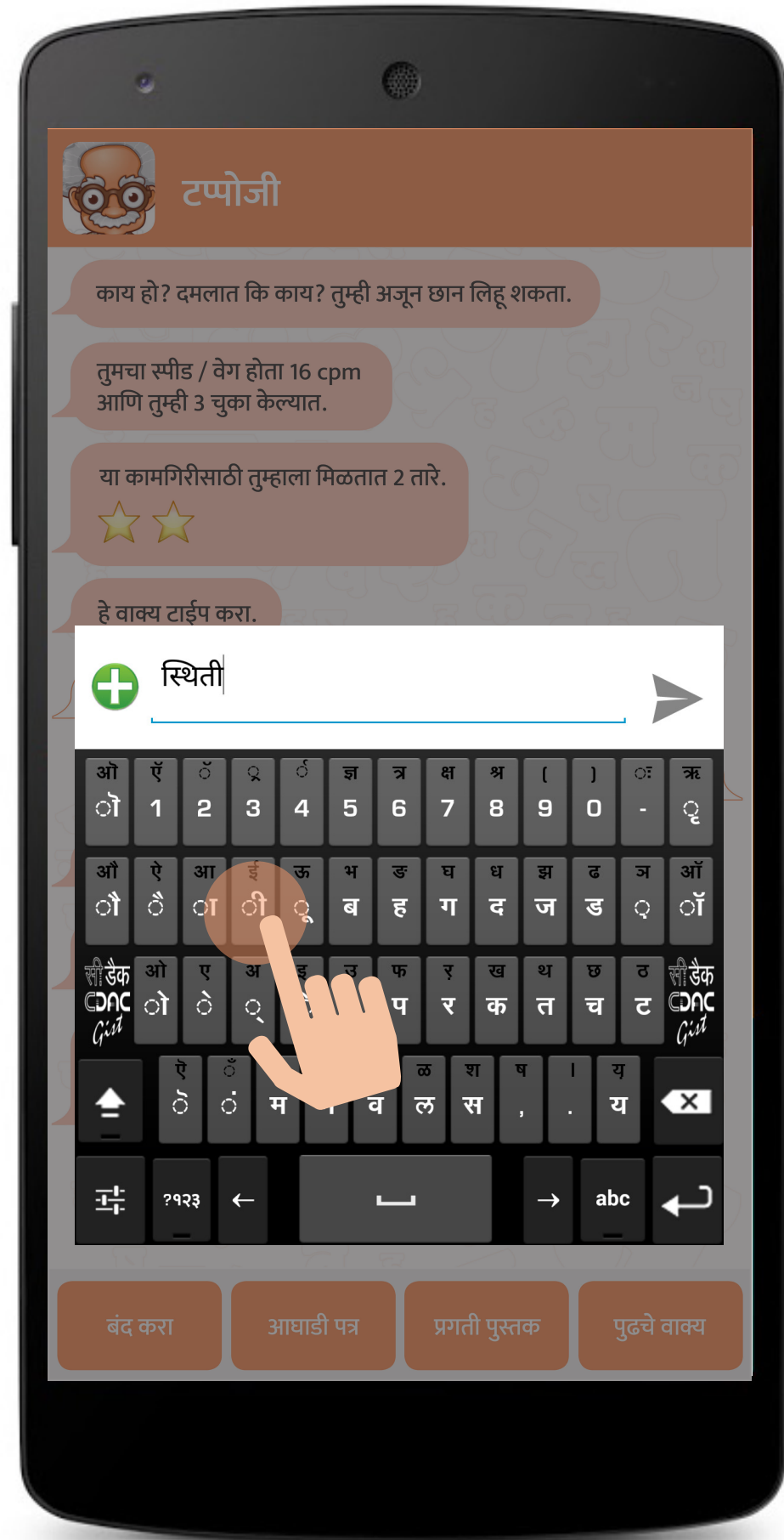




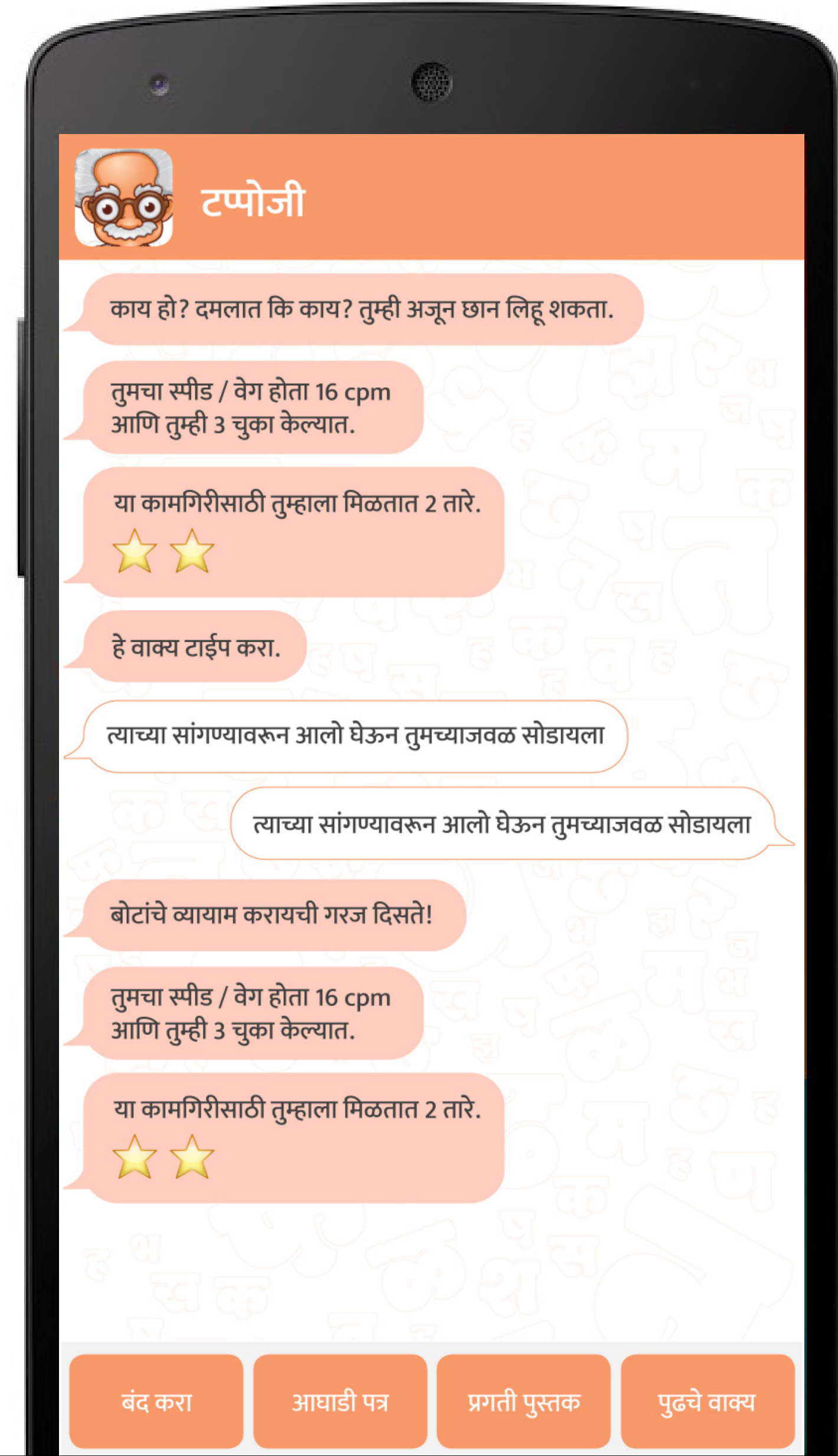








Chat with Tappoji



Replies

- मदत मागा आणि पुन्हा टायपिंग शिका
- मेहनत घ्यायची आवश्यकता आहे.
- अगदी लिंबू टिंबू कामगिरी झाली!
- प्रयत्न सुरु राहूदेत.
- तुम्ही अजून छान लिहू शकता.
- तुम्ही नक्कीच ह्यापेक्षा चांगलं लिहू शकता
- अगदीच काठावरची कामगिरी झाली. पुढच्या वेळी अजून प्रयत्न दिसले पाहिजेत.
- काही हरकत नाही. पुढच्या वेळी अजून लक्ष देऊन लिहा.
- अगदीच वाईट नाही. प्रयत्न सुरु राहूदेत.
- बरी कामगिरी झाल

Replies

- छान
- जरा अजून लक्ष दिलं तर नक्कीच कामगिरी सुधारेल.
- काय हो? दमलात कि काय? तुम्ही अजून छान लिहू शकता.
- बोटान्चे व्यायाम करायची गरज दिसते!
- खूप सुंदर कामगिरी झाली. अशीच कामगिरी सुरु राहूदे!
- वा! छान झाली कामगिरी.
- सुंदर! तुमची बोट पटापट चालत आहेत. मज्जेदार झाली कामगिरी.
- शाब्बास! अजून छान लिहायचा प्रयत्न करा.

Replies

- वा, अतिशय छान
- या कामगिरीसाठी एकच शब्द - सुसाट!
- शाब्बास! तुमची कामगिरी पाहून मला खूप बरं वाटलं.
- भन्नाट झाली कामगिरी. मजा आली!
- एक नंबर!

Badges

Accuracy Badges

- Typed consecutive 2 phrases without error
- Typed consecutive 5 sentences without error
- Typed consecutive 10 sentences without error

Speed Badges

- Top speed crossed 30 cpm
- Top speed crossed 65 cpm
- Moving average speed crossed 30 cpm
- Moving average speed crossed 50 cpm

Endurance Badges

- 1 hour of typing at a stretch
- 2 hours of typing at a stretch
- Completed 30 sentences in a day
- Completed 2 levels in a day



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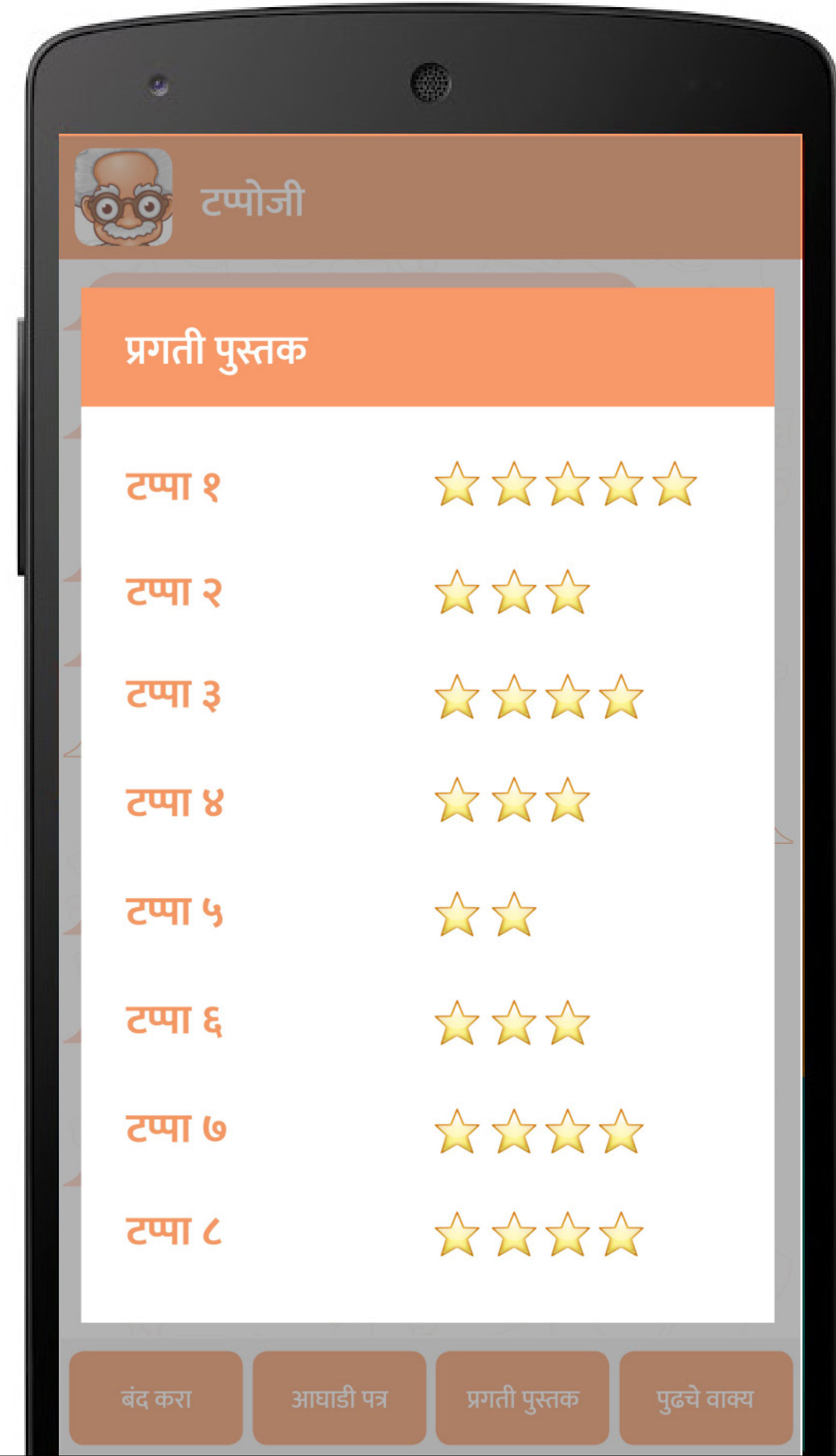
Endurance Badges

- 1 hour of typing at a stretch
- 2 hours of typing at a stretch
- Completed 30 sentences in a day
- Completed 2 levels in a day

Levels

Progression tab

Notification from tappoji about progression



Location Leaderboard

Based on locations from -

List of constituencies of Maharashtra Legislative Assembly



Evaluation Goals

Broadly

To check if users experience fun and engagement with the application

Specific

To check if the on boarding process effects in no levels played on first day

To check if they connect with theme

To check for any difficulties while copying and comparing the phrase

To check which property do user target - Speed or Accuracy

Evaluation Plan

5 Users, 2 Days

Qualitative Evaluation

Wizard of Oz - training hints

Observing motivational levels and boredom

Threshold for 2 days - Training + FTU + 2 LTUs

Users

User 1	F 30	Swift-key	HDPI
User 2	M 23	Sparsh	HDPI
User 3	M 24	Swarachakra	XHDPI
User 4	M 38	Swarachakra	XHDPI
User 5	M 29	C-dac	HDPI



Evaluation Results

	Day 1	Day 2	Total	Threshold
User 1	T + F + 4L	3L	T+F+7L	T+F+2L
User 2	T + F + 1L	2L	T+F+3L	T+F+2L
User 3	T + F + 2L	3L	T+F+5L	T+F+2L
User 4	T + F + 4L	5L	T+F+9L	T+F+2L
User 5	T + F + 2L	2L	T+F+4L	T+F+2L

Feedback

Not getting 5 stars challenges me type faster

Tappojis comments are encouraging

Focus on speed more than accuracy

Expect the UI to have all features similar to other chat apps
(display pic, profile page, selecting bubbles, sharing)

Feedback

Application should communicate that each word appears twice in training

Focus on edit text

Next text button should be disabled until Tappoji replies all his comments

What is cpm?

5 stars, how is it calculated?

Tappoji takes too much time to reply. Slows me down

Tappoji can use smileys while replying.

Tappoji should notice users trying to game the app, reply with relevant comment

Progression is not communicated well

Comments are repetitive

Prototype

Coded in Android
Built over UT tool code.

System

Tapaatap Marathi

Tapaatap Hindi

Tapaatap Gujarati

...and so on

Learnings

Coding = sleepless nights

Estimation of time for various activities

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