

# Jellow Communicator

Design Thinking & Innovation  
Case Study



D'source Project



Open Design School



MoE's Innovation Cell

Section: C1, Week 1



**THINK!  
DESIGN**

# **Design Thinking & Innovation (DT&I)**

Section: C1.0  
Week 1



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DESIGN**

# **Design Thinking & Innovation (DT&I)**

**Prof. Ravi Poovaiah**  
IDC School of Design  
IIT Bombay



# DT&I Case Study

## C1 Jellow Communicator

Module C1:



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C1.1

# Case Study Project 'Jellow Communicator'



Giving a Voice to Speak



# Welcome to Jellow Basic Communicator

1. Introduction to Jellow
2. Iterative Design Journey so far
3. Jellow's Unique Features
4. Interface Walkthrough
5. Outreach
6. The Road Ahead

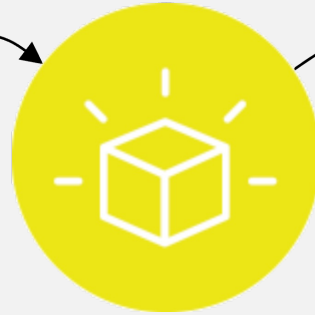
# Design Thinking & Innovation Process for Jellow:



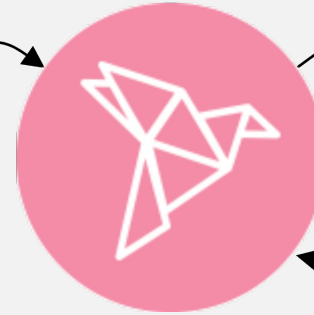
Phase 1:  
- **Research**  
- Observe  
- Study



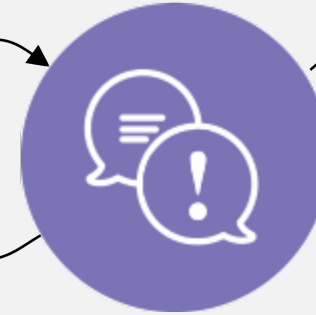
Phase 2:  
- **Analyze**  
- Understand  
- Visualize



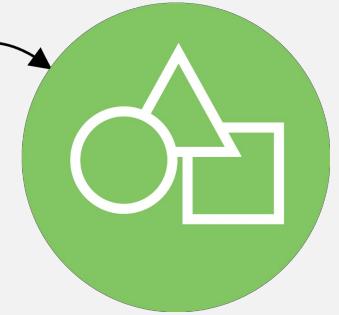
Phase 3:  
- **Ideate**  
- Explore  
- Concepts



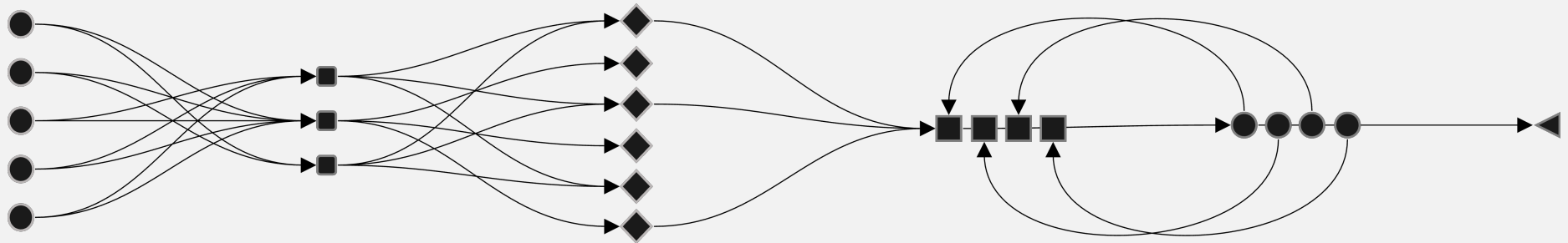
Phase 4:  
- **Build**  
- Mock-up  
- Prototype



Phase 5:  
- **Test**  
- User testing  
- Iterate



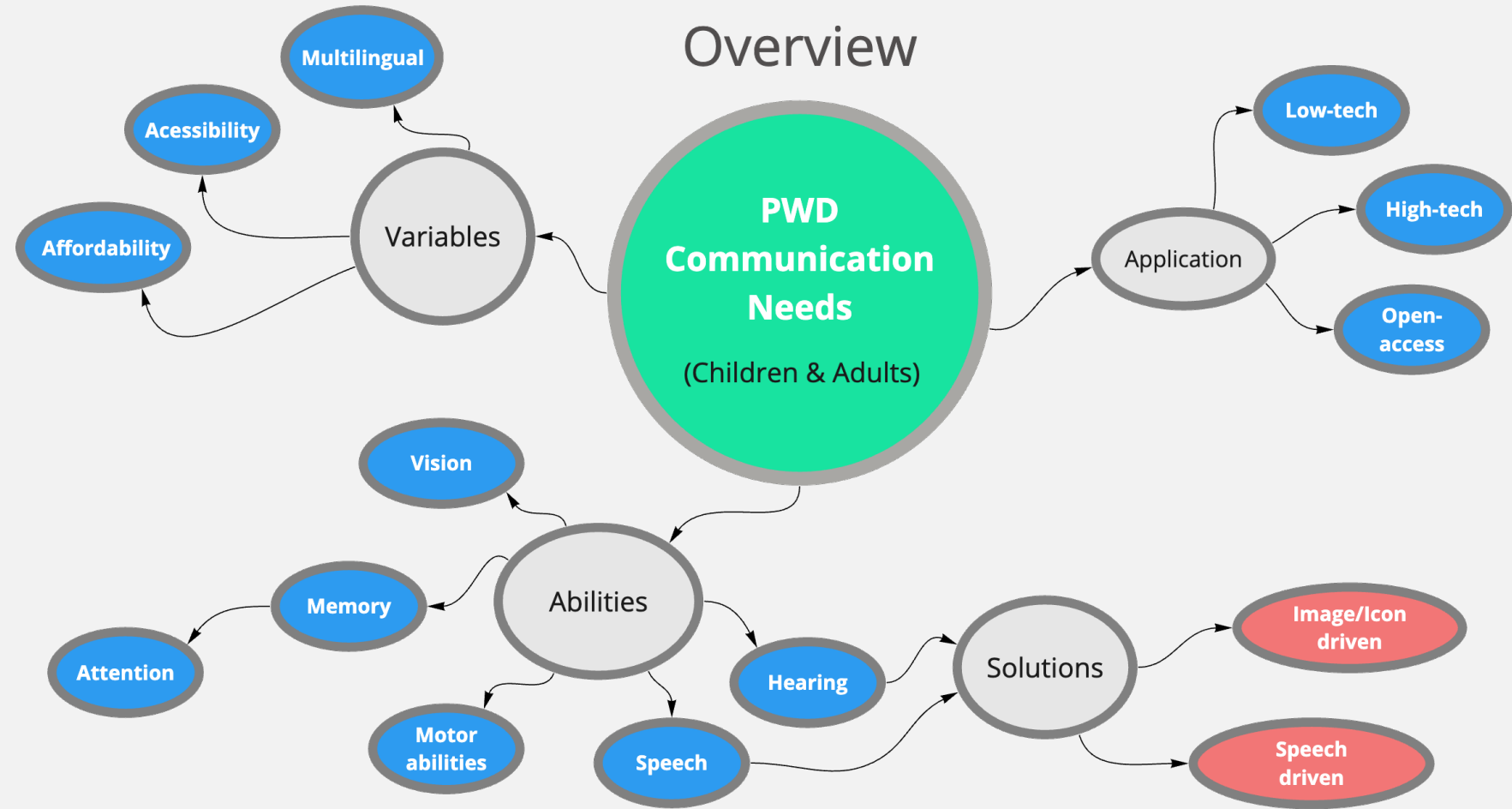
Phase 6:  
- **Implement**  
- Produce  
- Enterprise





Research

# Jellow Problem Space - Mind-map

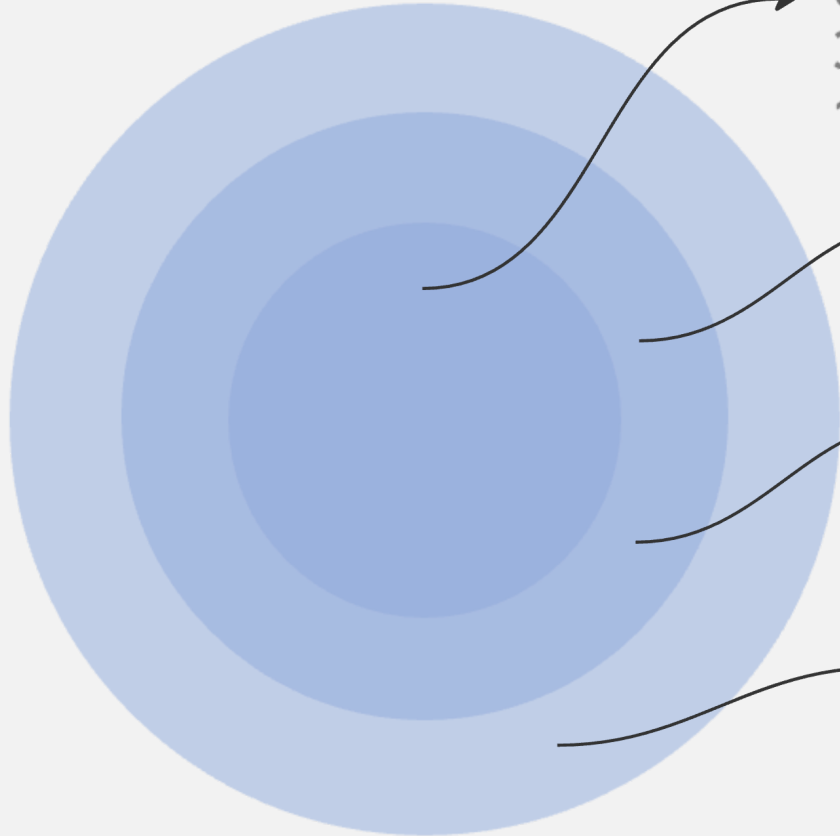


# Users ecosystem

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Research



**CHILDREN WITH AAC NEEDS:**  
30 million children in India  
140 million children world wide

**PARENTS:**  
Similar in number as children

**HEALTH PROFESSIONALS:**  
Approximately 10 million health  
professionals around the world

**INSTITUTIONS:**  
Institutions across the world  
National schemes across many countries

# The Jellow Universe

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Research



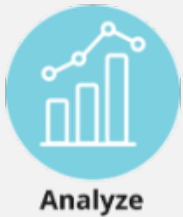
## WORLD:

Worldwide, roughly **140 million children** suffer from communication difficulties.

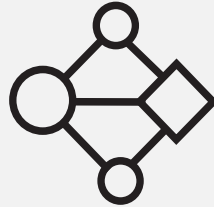


## INDIA:

Over **30 million children** in India have some form of communication problems, much of it being due to Cerebral Palsy, Intellectual Disability, Autism and such disabilities.

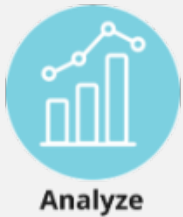


## The Problem and Solution:

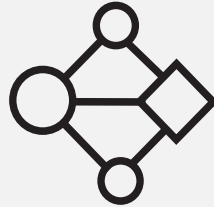


**Need for an AAC Communication System**

- > which is child-friendly
- > designed specific to children (3-9 years)
- > simple, easy and Intuitive to use
- > which is culturally contextual - our food, festival and places
- > with access to multiple languages



## The Problem and Solution:



A solution that

- > has both low and high tech solutions together INCLUSIVE
- > is accessible across all platforms -FLEXIBILITY
- > is a complete communication system - VARIATIONS
- > is FREE to use



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Analyze

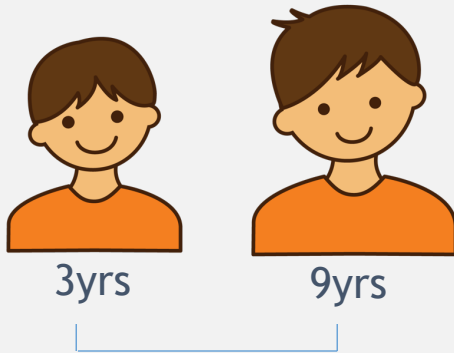


# Jellow Communicator:

an aid for children with speech impairments

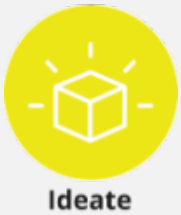
Uses icons/images to aid communication in children learning to speak or with difficulty with speech and language.

Helps non-verbal children to communicate and gradually learn to speak - especially those with Autism, Cerebral Palsy, Down's syndrome



# Jellow: Journey so far

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Ideate

## Jellow 1.0 (2004)



Physical aid



- Physical interactions for communication

## Jellow 2.0 (2008)



Jellow on Desktop



- Desktop/browser-based

## Jellow 3.0... (2016)



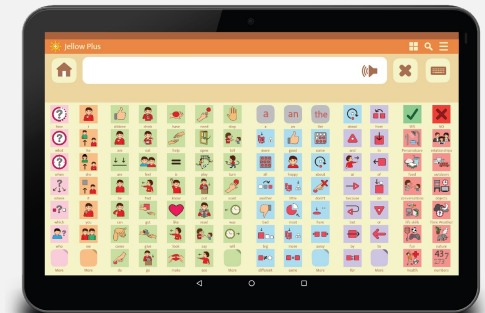
Jellow Basic



- Book/Desktop/Tablet/Mobile

## Jellow 4.0... (2021)

Jellow Plus



- Tablet/Mobile

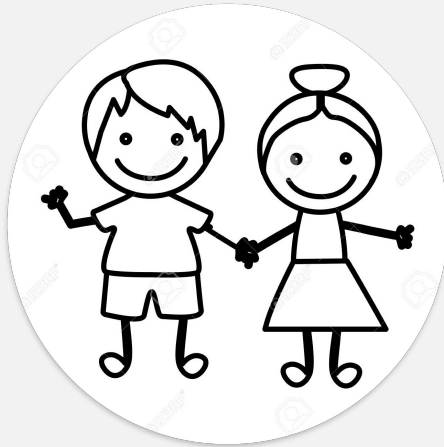


# Icons

## - design considerations

The icons needed to be simple, easy to recognize and cheerful.

These were tested and iteratively designed with feedback from children.

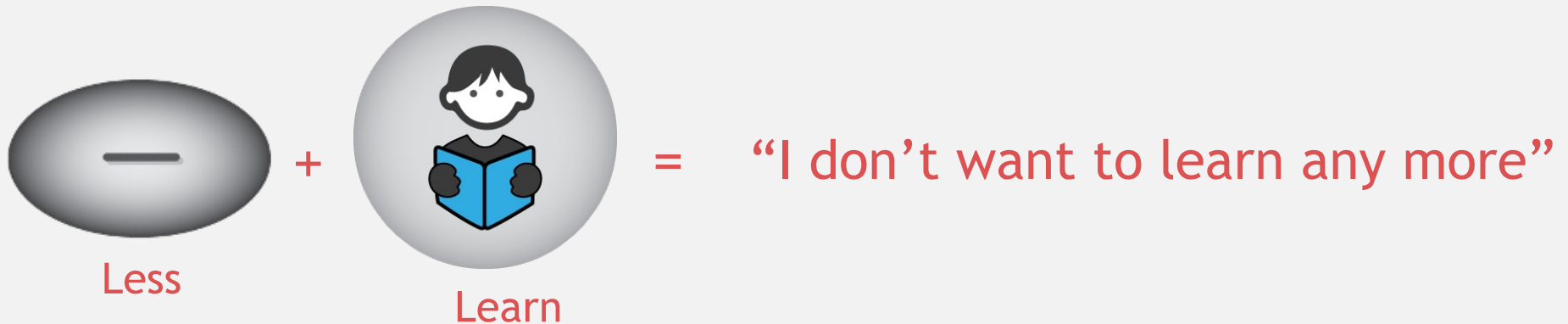


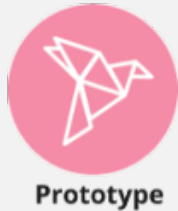


# Icons to Speech - design considerations

The icons trigger speech and hence 'Text to Speech' needed to be of language easy to understand and learn for the child.

These required people translation.  
Using TTS means one saved space.





# Icons directory - design considerations

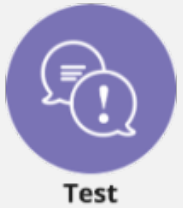
The Jellow has over 1200 icons and over 12,000 premade sentences



# Design Process

Designed Iteratively with regular feedback from users:

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Test

## Children

(Icons)

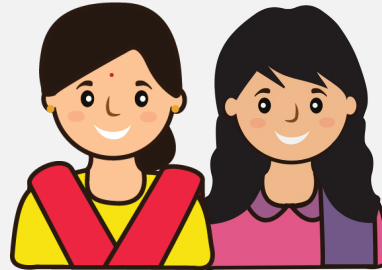


### Usability Feedback

- Demonstration +
- Converse + Identify
- Task Completion

## Parent, Teacher & Therapist

(Icons + Functions)



### Workshop Sessions:

- Demo of Jellow +
- Focus Group Sessions

## Active Users

(Interface + Usability)



### Analytics and Study:

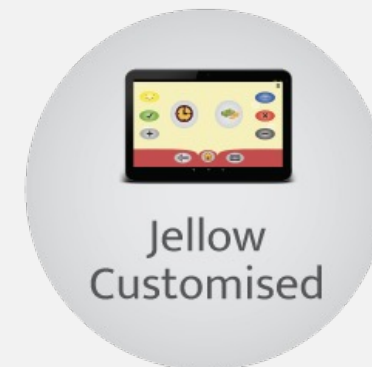
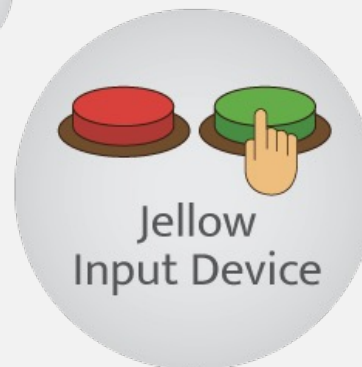
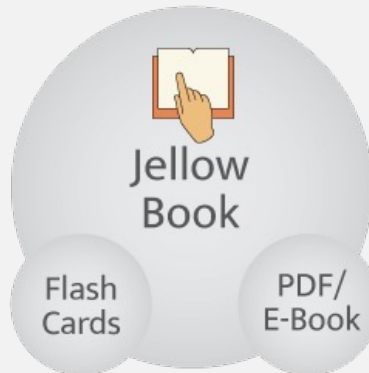
- Longitudinal Study +
- User Data Analytics



# The Solution

- as a system

Jellow is a complete communication system conceived **across the technology spectrum** in the following variations to cater to the needs of a child with a varying range of abilities:





# Jellow Interface

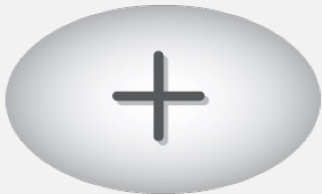
Based on Emotional Language Protocol (ELP)



Like



Yes



More



Learn



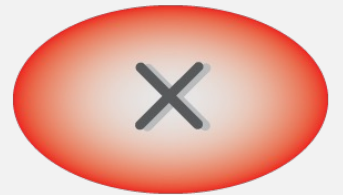
Play



Eat



Don't Like



No



Less



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# Unique Features:

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## Designed for Children



## Easy to Use Interface



## Child Friendly Icons



## Culture Specific Icons



# Unique Features . . .

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## Emotional Language Protocol



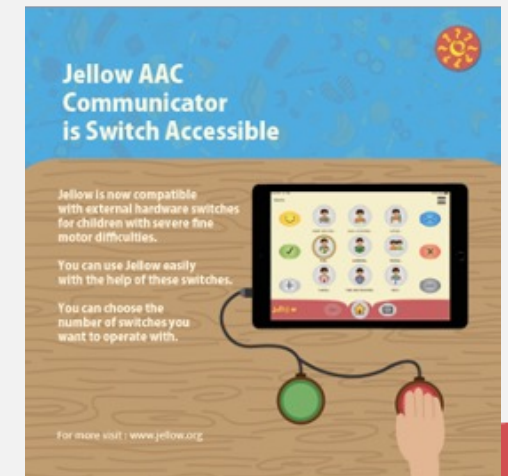
## Multiple Languages



## Customise your board



## Made Accessible



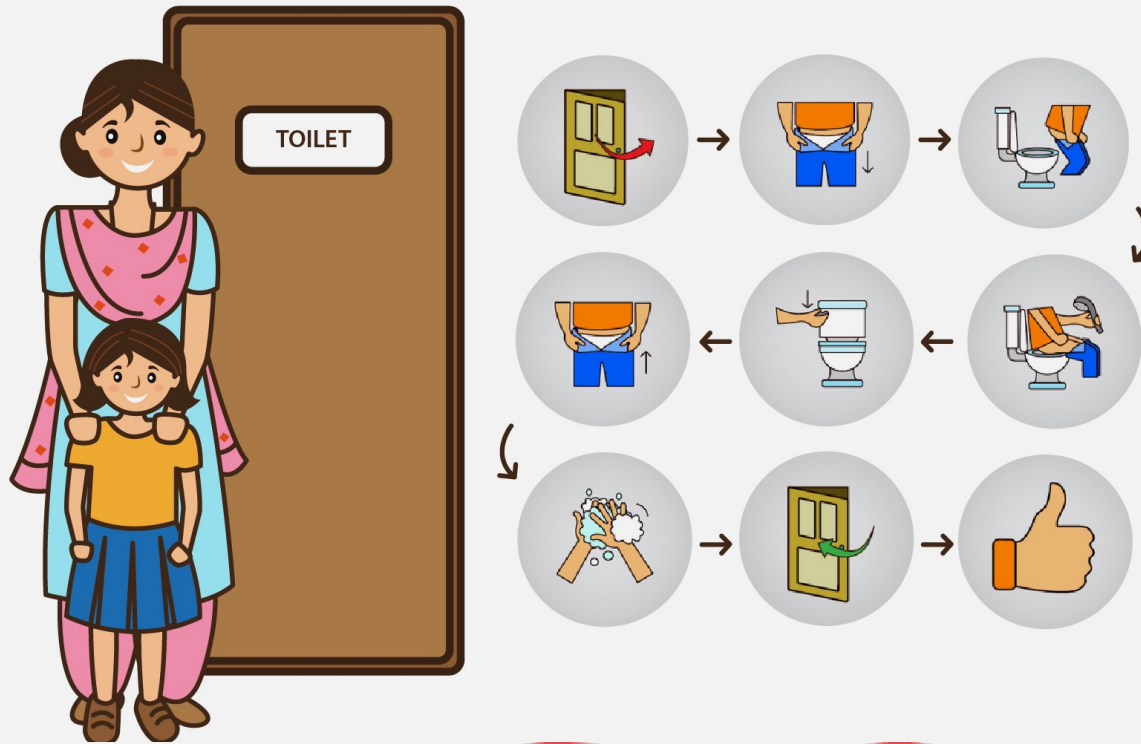
THINK!  
DESIGN



# The User - Story One

## - parent's point of view

Kavita, the child, learned to use the toilet within 2 weeks with help of Jellow Communicator's sequenced daily activities.





# The User - Story Two

## - child's point of view

Jonathan, being quadriplegic, has taken to using Jellow to communicate his needs. This he does with a head-mounted pointer.





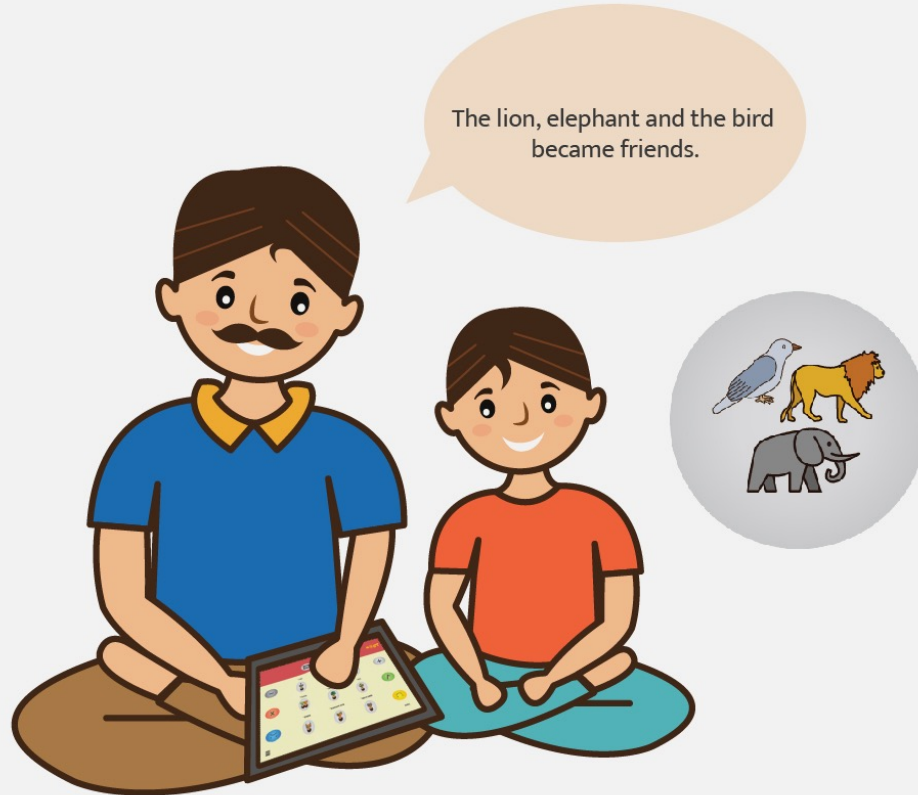
THINK!  
DESIGN



# The User - Story Three

## - therapist's point of view

Ismael, a speech therapist, often uses Jellow's child friendly icons as a learning tool to tell stories.





# The User - Story Four

## - child's point of view

Ankit's parents reported that he always had to change schools within a few months.

However, this chain stopped after he started using Jellow which gave him confidence and now is in the same school for the past three years.



2 months



1 months



3 months



3 years





# The User - Story Four

## - parents point of view

Shantanu's parents had to travel suddenly out of town and for the first time and they had leave him with the grand parents.

Jellow came to their rescue and they could understand Shantanu's needs without any problem..





# Walkthrough

# Communicating using Jellow Basic

- 9 Categories

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# Greetings Category

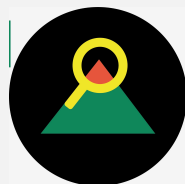
THINK!  
DESIGN



# Daily Activities Category



THINK!  
DESIGN



# Daily Activities Category

## - Using Toilet

THINK!  
DESIGN



# Help Category

THINK!  
DESIGN





# Make My Board

- My Board/Home

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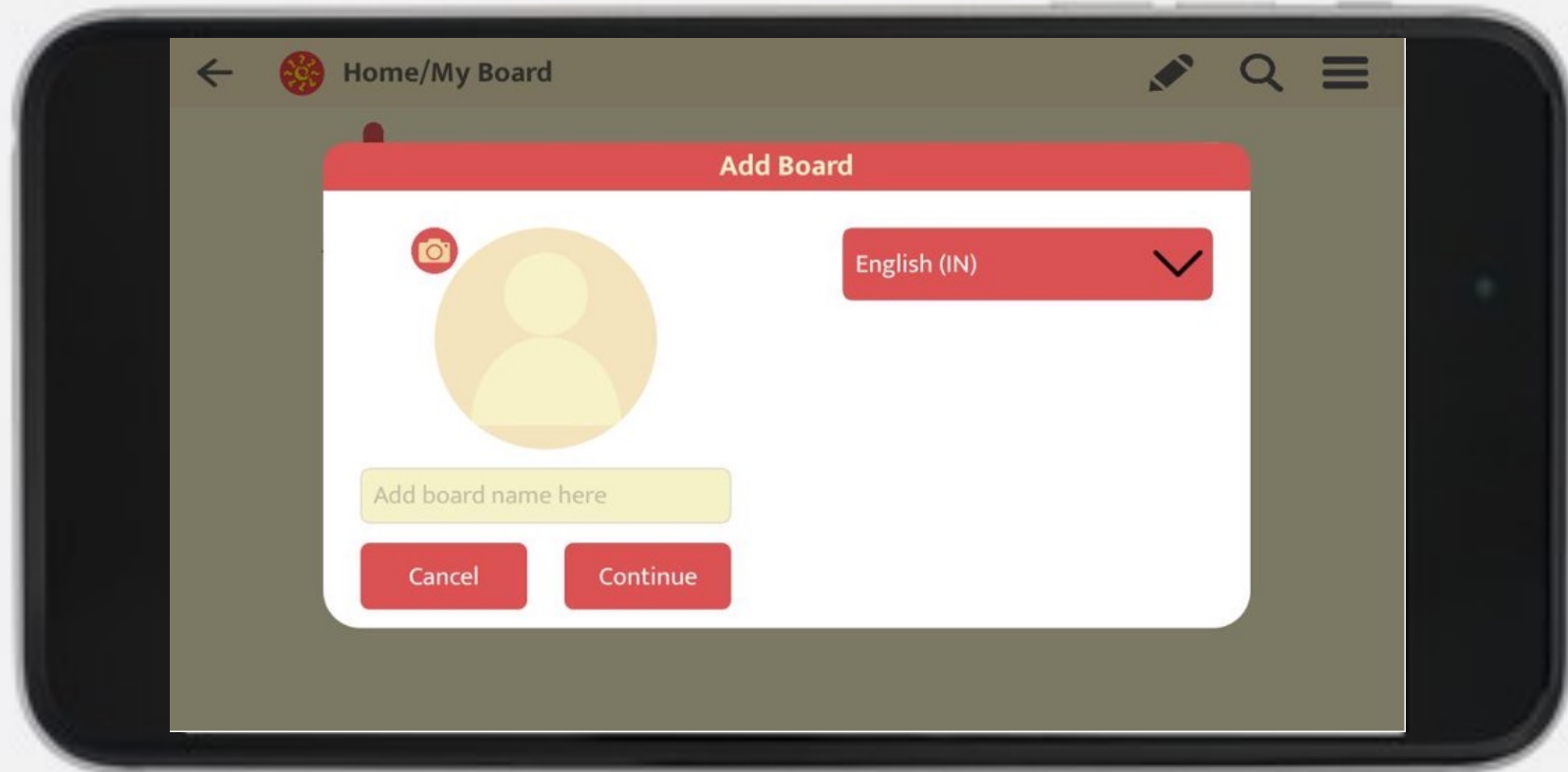




# Make My Board

- select image, text, language, voice

THINK!  
DESIGN



# Make My Board

- select image, text, language, voice

THINK!  
DESIGN



# Make My Board

- My Board/Eggs and Bread

THINK!  
DESIGN



# Number of Icons per Screen

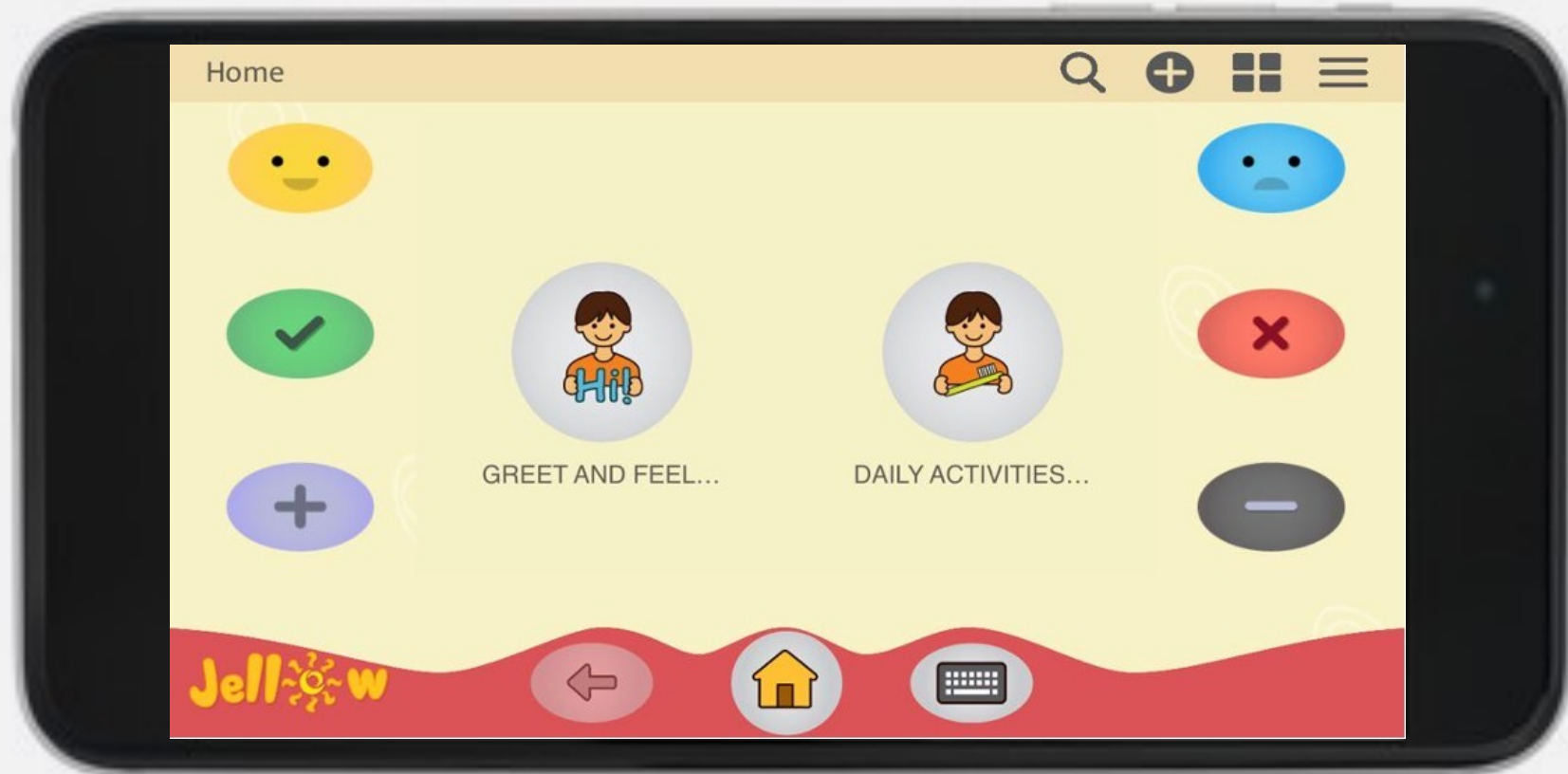
- 1, 2, 3, 4, & 9

THINK!  
DESIGN



## 2 Icons on Screen

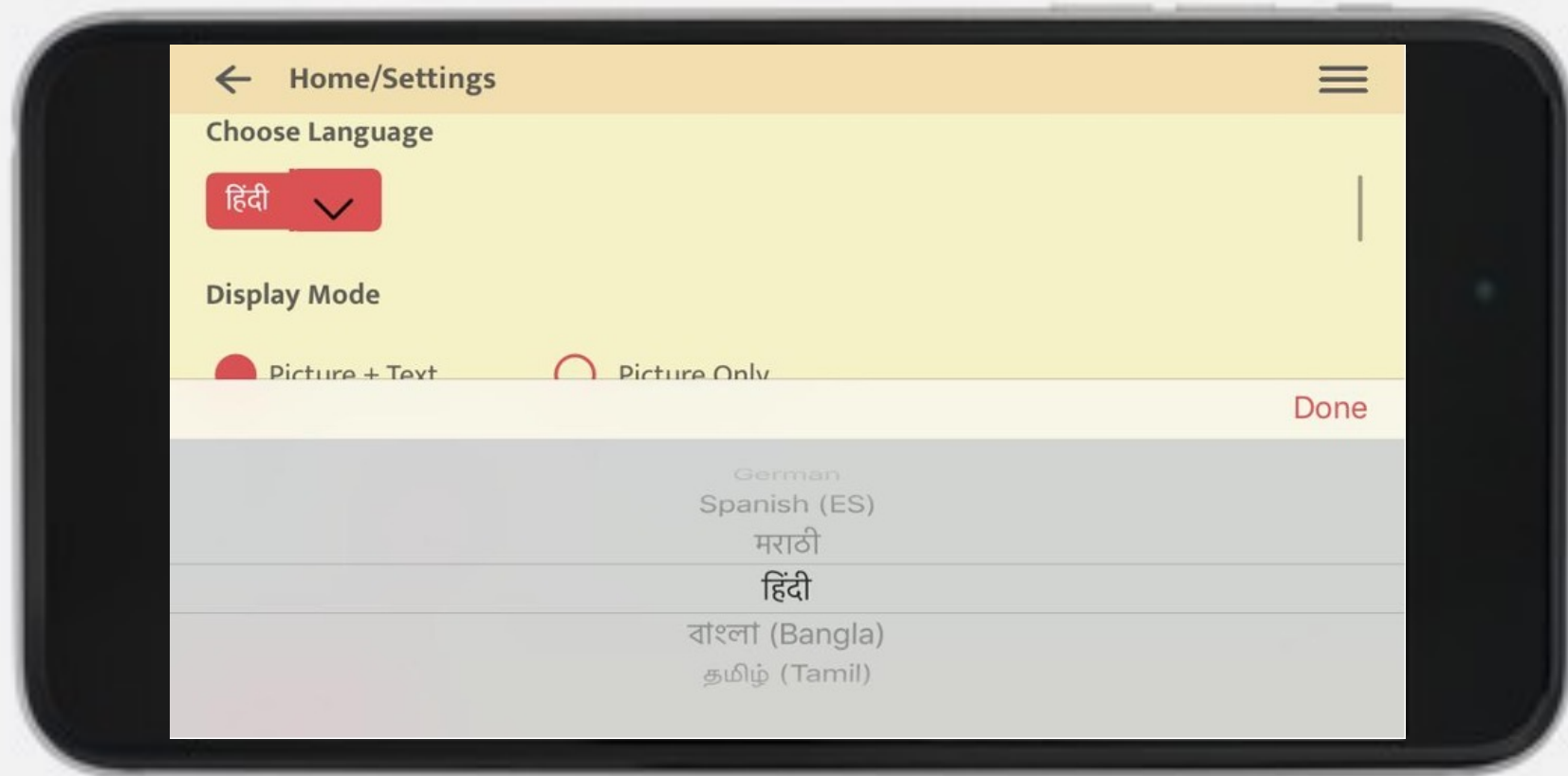
THINK!  
DESIGN



# Selection of Language

- 13 languages + voices

THINK!  
DESIGN

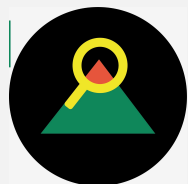




# Home Screen in Hindi Language



THINK!  
DESIGN



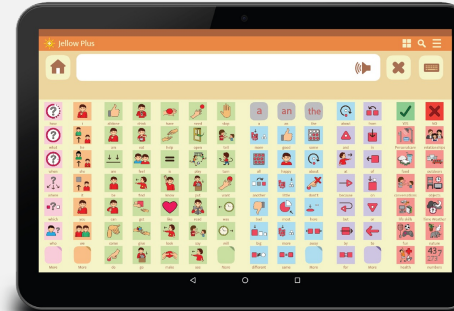
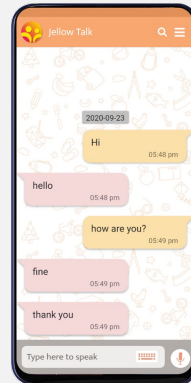
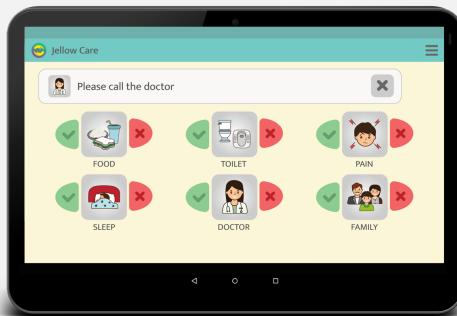
# Jellow Variations

- as a Social Enterprise

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Implement







Jellow Communicator embraces the following UN SDG goals:

(a) SDG goal # 3 on Good Health and Well-being,

(b) SDG goal # 4 on Quality Education, which supports early childhood development, care, and inclusive education and

(c) SDG goal # 10 on Reduced Inequalities, which in turn supports ensuring equal opportunity and reduced inequalities of outcome.

# Jellow's Name

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Giving a Voice to Speak



Jelly Fish + Jolly Fellow = Jellow



Outreach, Events  
Networking and Support

# Outreach

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WORKSHOPS



CONFERENCES/EXHIBITIONS



COLLABORATIONS



DIGITAL MARKETING



WORD OF MOUTH PUBLICITY



CREATING SOCIAL NETWORKS

# Media Downloads

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**Jellow**  
The Communicator

Jellow Communicator is a freely downloadable Android app that uses icons to aid communication in people learning to speak or with difficulty in speech. This app has been developed at the IDC School of Design at the Indian Institute of Technology Bombay. The unique feature of Jellow is that it has a visually appealing and easy-to-learn interface. Moreover, the app has been designed bearing in mind the socio-cultural context of India.

Using Jellow, people with speech difficulties can easily convey their likes, dislikes, needs, and feelings with others. Jellow can also be used to teach children steps of daily activities such as brushing, bathing and going to the toilet.

Jellow has been developed after considerable research and user studies with children, therapists, and parents. The app is currently available in English and Hindi. Jellow Communicator can be downloaded for free on Google play.



Visually appealing Indianized icons



Easy-to-learn interface enables quick communication



Picture sequences to teach children steps of activities of daily living

## TEAM MEMBERS

- |                       |                   |                        |
|-----------------------|-------------------|------------------------|
| ■ Prof. Ravi Poovaiah | ■ Sumeet Agrawal  | ■ Dr. Sudha Srinivasan |
| ■ Dr. Ajanta Sen      | ■ Shruti Gupta    | ■ Vinaya Tawde         |
| ■ Anchal Kumar        | ■ Sachin Sonawane | ■ Dhariya Dand         |
| ■ Samraat Sardesai    | ■ Anisha Malhotra | ■ Pritam Pebam         |
| ■ Peter Joseph        | ■ Roop Sahoo      | ■ Sumedh Garud         |
| ■ Antara Hazarika     | ■ Yogesh Masaye   | ■ Nikita Iyer          |
|                       |                   | ■ Ganesh Gajjala       |



For more information visit  
[www.dsourc.in/tool/jellow](http://www.dsourc.in/tool/jellow)

**Jell~O~w**

Badge



Jellow Team  
IDC School of Design  
Indian Institute of Technology Bombay  
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Phone: 022-25767820  
Email: [jellowcommunicator@gmail.com](mailto:jellowcommunicator@gmail.com)  
Download at: [www.dsourc.in/tool/jellow](http://www.dsourc.in/tool/jellow)



Visiting Card



Bookmarks

Jellow communicator  
uses icons to  
enable speech.  
Ideal for people learning  
to speak or with  
difficulty in speech.  
Currently available in  
English and Hindi.



Download print at:  
[www.dsourc.in/tool/jellow](http://www.dsourc.in/tool/jellow)  
Email us at: [dsourc.in@gmail.com](mailto:dsourc.in@gmail.com)  
IDC School of Design, IIT Bombay

## Workshop on

**Jell~O~w**  
The Communicator

**Shraddha  
Special school**

Venue:  
Plot No. 1-10-119 Mayuri  
Marg, Begumpet  
Hyderabad 16  
Date: 22nd June'18  
Timings: 9 am to 1 pm

## Workshop details:

Jellow Communicator is a freely downloadable Augmentative and Alternative Communication (AAC) app that aids communication in children who have speech difficulties. The app has a child-friendly, easy-to-learn interface and uses icons to help non-verbal or minimally verbal children communicate with caregivers and peers.

The workshop will provide a detailed overview of the application and its functionality including the different customization options available within the application. Participants will also be provided hands-on experience using the application. We will also install and activate the application on devices of interested participants and troubleshoot any problems they may be facing.

## Who should attend?

- Caregivers, parents, and family members of children with speech difficulties
- Speech therapists, occupational therapists, physiotherapists, and other health care providers working with children with special needs
- Special educators and teachers working with children with speech impairments

**Nayi Disha**  
Inform · connect · empower

# Jellow.org

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04 Apr, 2024 | 10:18 AM

Screen Reader: Contrast: A A Readability: R Text Size: A<sup>-</sup> A A<sup>+</sup>



Products ▾

About ▾

Outreach ▾

Language ▾



## Communication system

- Events
- Collaborate
- Videos
- Blog
- Testimonials
- Papers



App's Content also available as  
**Flashcards**



App's Content also available as  
**Booklet**



Available as a  
**Desktop Version**



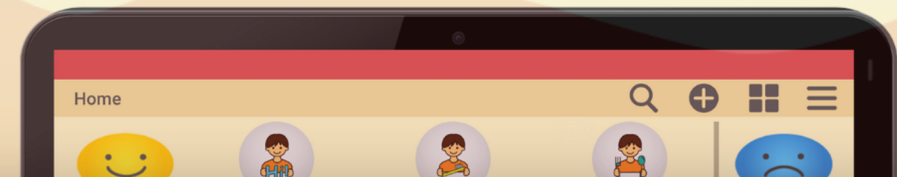
Available on Android and iOS as  
**Mobile/Tablet App**



Can be used using  
**Switch Accessibility**



customisation feature  
**Jellow Customise**





# Future Plans (wish list) for Jellow Basic

-  1. Incorporate Schedule
-  2. Incorporate into Jellow:
  - > all major languages in India
  - > major languages from around the world
-  3. AI Enabled to make it smart
-  4. Include Foundational Learning with Play



# Awards

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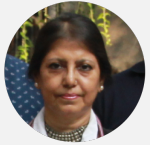
# The Team

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**Prof. Ravi Pooviah**

Founder Member, IDC School of Design,  
IIT Bombay and Ninaad



**Dr. Ajanta Sen**

Founder member, Jellow Labs  
and Ninnad



**Mr. Roop Sahoo**

M.Des, IDC, IIT Bombay,  
Project Manager



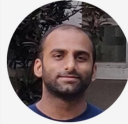
**Dr. Sudha Srinivasan**

PhD, Assistant Professor, Researcher  
University of Connecticut



**Ms. Vinaya Tawde**

Graphic Designer



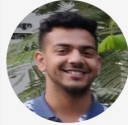
**Mr. Rahul Jidge**

Software Engineer



**Mr. Yogesh Masaye**

Software Developer



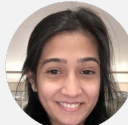
**Mr. Pushkar Deshpande**

Research Associate



**Ms. Sakshi Pal**

Research Associate



**Ms. Siddhi Patel**

Speech Therapist



**Ms. Shweta Pathare**

Graphic Designer



**Mrs. Vidya Upadhyay**

Outreach Program



**Mr. Sachin Sonawne**

Sr. Project Assistant



**Mr. Laxman**

Software Developer



**Mr. Saurabh Jain**

Software Developer



**Mr. Ayaz Azam**

Software Developer



**Mr. Gautam**

Software Developer

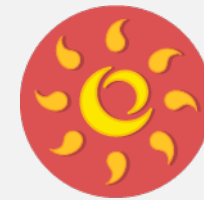
# In Conclusion

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*“You can count the number of  
seeds in an apple  
But you can never count the  
number of apples in the seeds.”*

Stewart Brand, MIT, Media Lab, USA  
Author “Inventing the Future”



[www.jellow.org](http://www.jellow.org)

Thank You



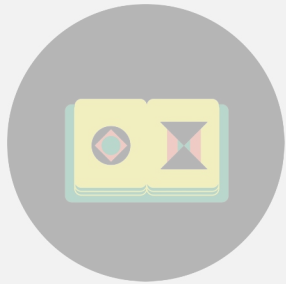
**Thanks for  
Listening**

**DT&I Case Study**  
**Section: C1**  
**Week 1**

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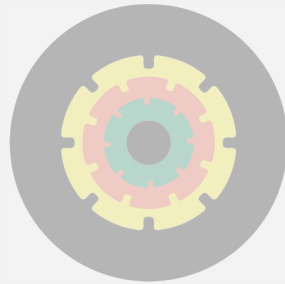


# DT&I Course - Week 1:



DT&I  
Process  
(20%)

- > Structure
- > Intro to DT&I



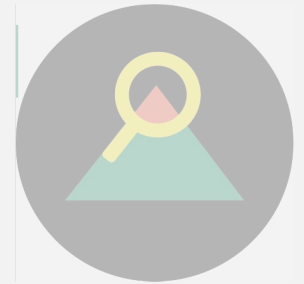
DT&I  
Tools  
(20%)

- > Brain Storming
- Key-words +  
Sorting + Linking



DT&I  
Project  
(50%)

- > Select your Topic  
for DT&I project +  
Do Brain Storming  
& Sorting

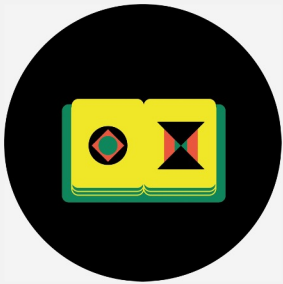


DT&I  
Case Study  
(10%)

- > Case Study  
Project Jellow

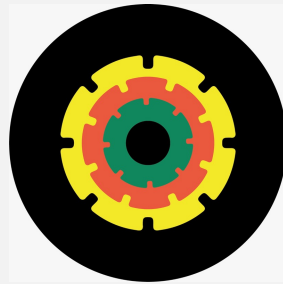
THINK!  
DESIGN

# DT&I Course – Week 2:



DT&I  
Process  
(20%)

- > What, Who, How
- > Models of DT&I



DT&I  
Tools  
(20%)

- > Mind-Maps +  
Affinity Links



DT&I  
Project  
(50%)

- > Finalize Topic  
for DT&I project +  
Do Mind-Mapping



DT&I  
Case Study  
(10%)

- > Case Study  
Project Smaran



## Supporting Organizations:



D'source Project



Open Design School



MoE's Innovation Cell



**Credits:**

**Presented by:**  
Prof. Ravi Poovaiah



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## Credits:

Camera & Editing:  
Santosh Sonawane



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## Credits:

Think Design Animation:  
Rajiv Sarkar



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## Credits:

Graphic Icons:  
Shweta Pathare



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## Credits:

End Title Music:  
C P Narayan



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## Credits:

Produced by:

IDC School of Design

IIT Bombay



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