Connecting people to people

The world of the cerebral palsy

Design Expo ‘04,
MicroSoft Research (MSR),
Redmond, USA

Indian Institute of
Technology (IIT) Bombay,
Mumbai, India

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Why Cerebral Palsy as user group?

- 1 million people affected in India
- very few product solutions in this area
- design opportunities and challenges
- focused on children between age 9-12 yrs

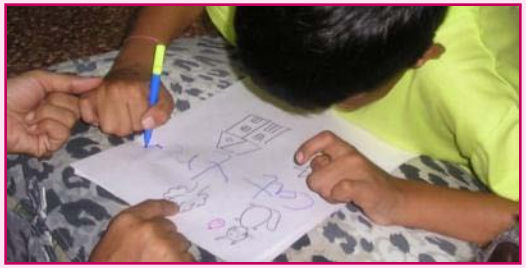
What is Cerebral Palsy?

- affects the control of the muscles and coordination of movements
- have no problems with thinking, comprehending information and feelings

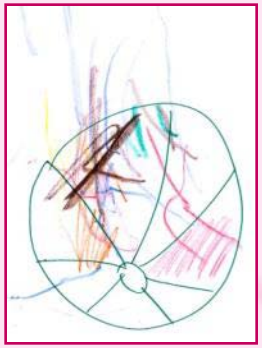
- Types of CP:
  - Ataxia
  - Athetosis
  - Spasticity

Lack of communication ability

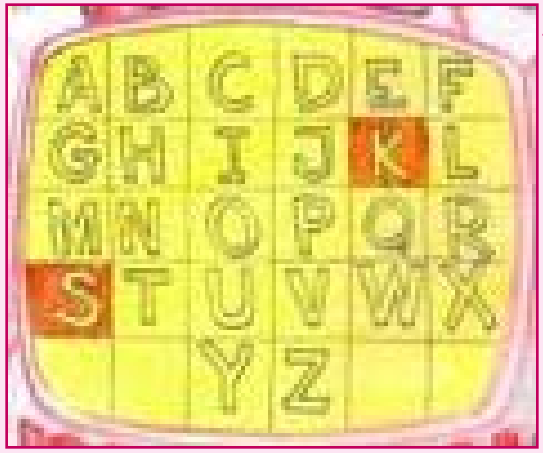
- lack of control over motor responses = difficulty with speech and writing
- problems with fine movements - better at gross, rough movements



Drawing sample



Writing sample



Alphabet board

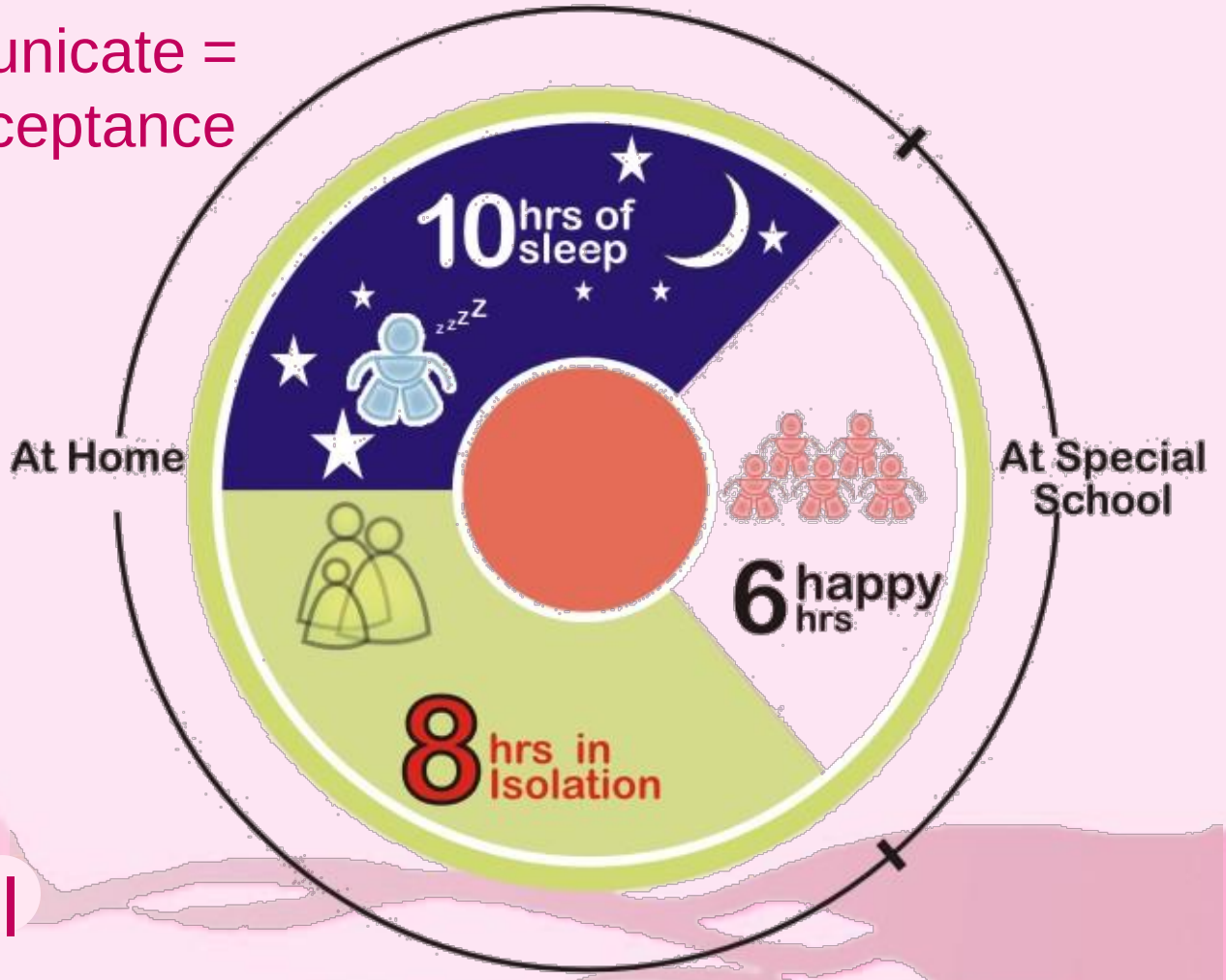
Isolation – a major fallout:

inability to communicate = reduced social acceptance = social isolation

- isolation at home (8hrs + sleeping hrs)

Vs.

a lively six hours at special school



Need to express emotions:

- Isolation connected to
(i) physical aspects
(ii) **emotional aspects**

- Frustration at expressing emotions through strenuous physical movements

- Lack of product initiatives to facilitate non-physical/intangible communication

Design Goals

To design a product that

- does not use speech and writing
- uses gross, tactile movements for interaction
- is able to express emotions (through a mapping of expressions onto objects)
- connects up with remotely located friends and family
- has an an interface that is also physically therapeutic

Product inspirations:

Stars

A sign of affirmation

Flowers

Freshness, colorfulness

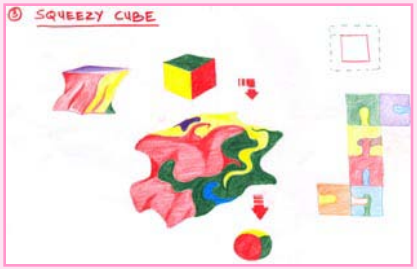
Jellyfish

The physical comfort of squeezy toys

Comfort blanket

Evolution of design ideas:

Communications Board - to converse with



Squeezy Cube- purely haptic with change in form and colour

Sharing Companion - an interactive pet

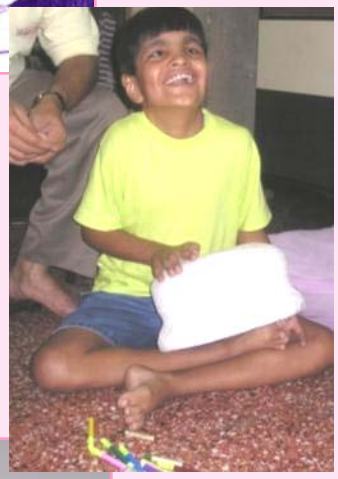
Emotional Balls - conversing through different stories

Jelly fish – a squishy device

Product Iteration One

Jelly fish

a translucent squishy ball with tentacles to play and communicate with



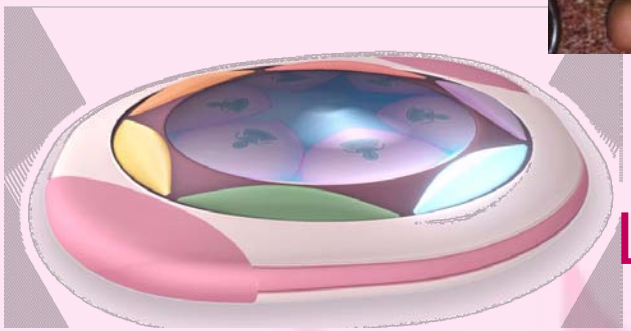
- User feedback:
  - surface area comfortably large
  - too jelly like
  - not much to interact with
  - tentacles look dangerous
  - need for a communication protocol

Sunflower

Product Iteration Two:

Sunflower

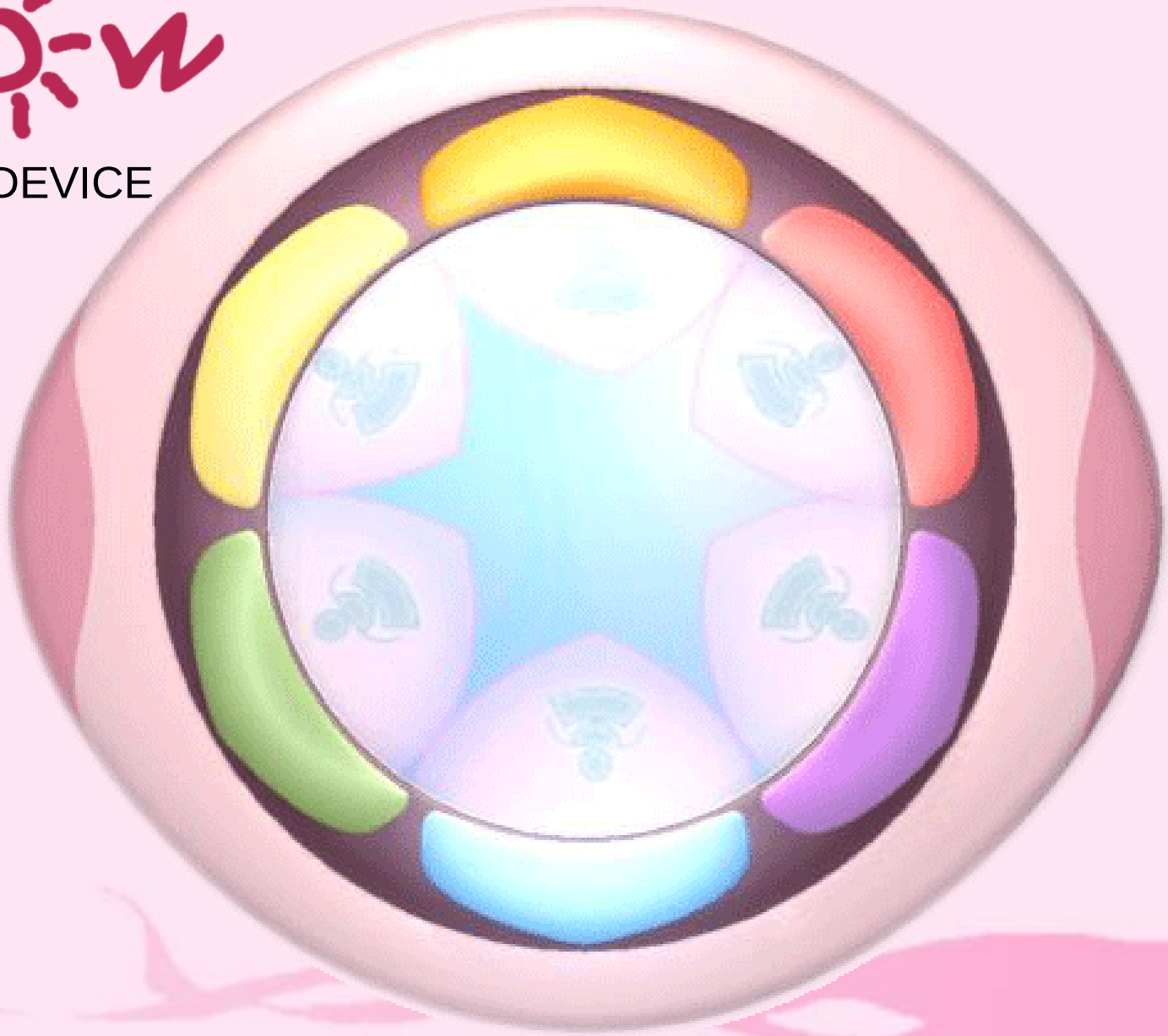
- User Feedback:
- petals as memory units appreciated
- tearing out petals too violent
- handling the device was cumbersome
- need for further development of emotional language
- need to make it more lively



Lotus

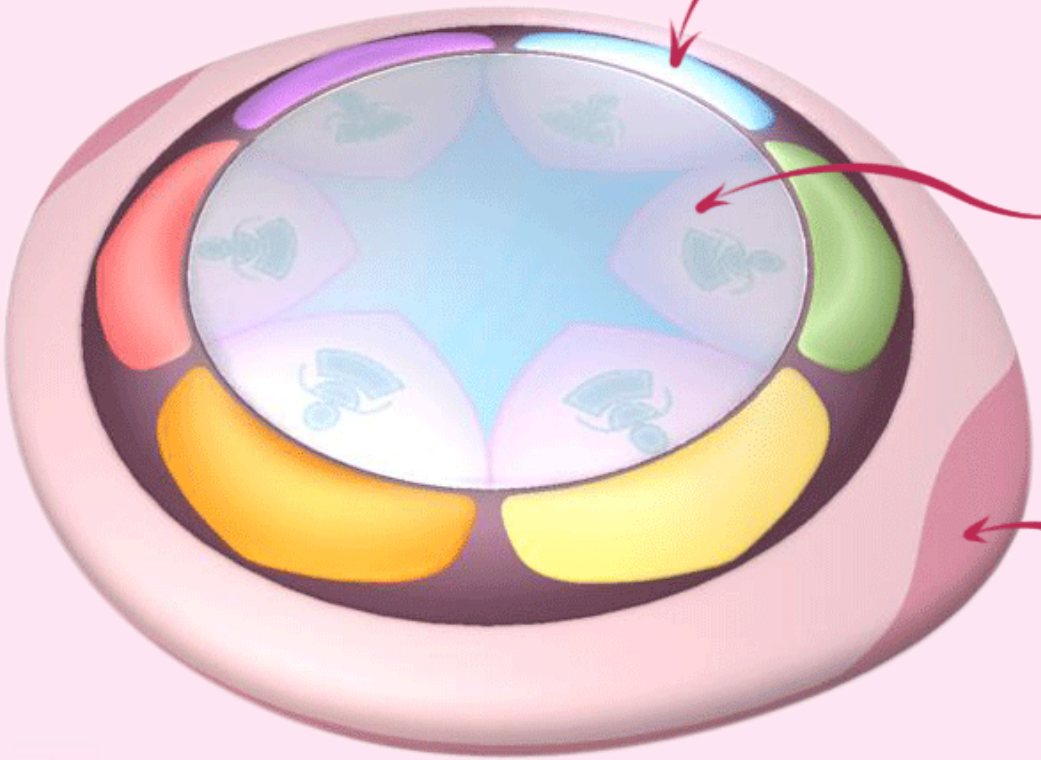
Jellow

A HAPPINESS DEVICE



Jellow – features(1):

Jellow is made up of three concentric rings:



six buttons with different emotions mapped on to them

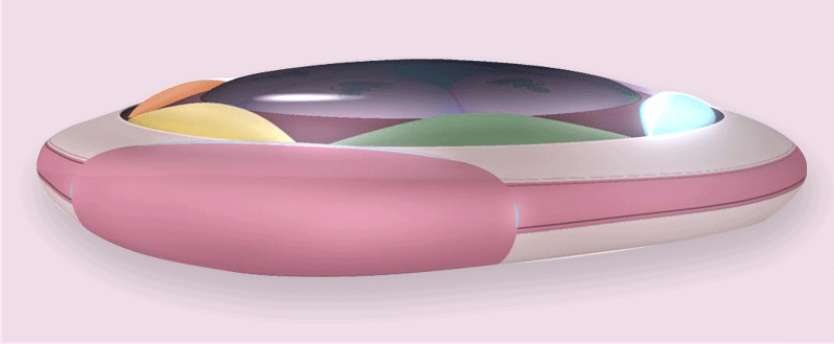
touch sensitive screen to enable selecting and navigating through different menus and aid interaction on the screen

provides the grip for holding product and has pressure sensors located within to aid in exaggerating emotions

Jellow

A HAPPINESS DEVICE

Jellow – features (2):



- capable of loading special environments such as festivals, outings, etc.
- navigation is also possible by tilting and rotating the product (with the aid of balance sensors).

- mobile connectivity
- exchangeable memory units containing information about identity of users

Jellow
A HAPPINESS DEVICE

Jellow – interaction and interface:

Interaction:

driven by – squeezing, thumping, steering and touching
(non cerebral palsy may use other modes such as speech)

Interface:

based on an emotional language protocol (elp) and represented by color, shape, motion and sound to facilitate communication

Jellow
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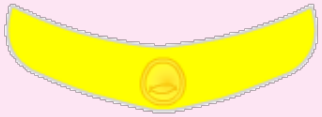
"elp" - Emotional Langauge Protocol:



Emotion	Colour	Shape	Motion	Sound
Happy			Hearts spreading away from object	Stars in sparkles forming a pixie effect
Anger			Fiery lightning bolts & agitated character	Fast and aggressive sound
Affection			Hearts spreading away from object	Soft and soothing sound
Sad			Drooping elements which fade off	Slow and dull sound
Fear			Hair elements stand up on feeling scared	Very slow or no sound
Hate			A cactus with thorns showing hatred	Sharp and cranky sound

Jellow – its interface

Jellow
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Scenario:

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Jellow
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