Degree Project-2

Playful Device for Elderly to help them to Exercise

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Interaction Design (2008-2010)

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Approval Sheet

The Interaction Design Project-2 entitled '**Playful Device for Elderly to help them to Exercise**' by Miss Shalini Tripathi, Roll No. 08633805 is approved in partial fulfillment of the requirement for the Masters of Design degree in Interaction Design

Signature:

Project Guide: _____

Chairperson: _____

Internal Examiner: _____

External Examiner: _____

Declaration

I declare that this written submission represents my ideas in my own words and where others' ideas or words have been included, I have adequately cited and referenced the original sources. I also declare that I have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/ source in my submission. I understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

Signature: _____

Name of the student: _____

Roll No.: _____

Date: _____

Acknowledgements

I would like to express my gratitude towards my guide, Prof. Ravi Poovaiah who guided me at every step of my project. My sencier thanks to my co-guide Prof. Phani Tetali and Prof G.G. Ray for their valuable guidance and feedbacks. My thanks to the IDC, IIT Bombay for allowing me to take this project.

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My special thanks to all who helped to make my project successful and complete.

I am grateful to my family and my Almighty God who are always there with me at every step to help and support.

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Abstract

My project aimed to develop an interactive playful device for elderly which will invisibly help them to exercise. The mechanism involved in interacting with the device incorporates some form of body movement which exercises elderly's body parts. The user (elderly) is not burdened with the exercise element of the device, for him/her it is just a playful/useful device. The body movement and entertainment elements are mapped on the daily life & activities of elderly.

Different tools are used to create interactivity in the product. The device is singly/collaborative operable depending on the need. The purpose is to make elderly experience excitement and fun and at the same time making them exercise without the burden of the word exercise.

There are two design for two different type of Personas. Design 1 is called " e-mote ", which is a playful basic remote control for television with a proper developed prototype. The Design 2 is at more concept and exploration stage, it is a game called " s-tory ", which is a action based story making/telling game based on augmented reality principles.

Introduction

Change is a inevitable law of nature, whatever is created get destroyed. Similarly our human body goes through lots of changes in its journey to old age. The process of building takes place for some part of lifespan and then disintegration of the same start.

Aging is said to be: ' A normal process that begins at conception and ends at death'. (Mahan & Stump, 2000). The functional fitness for geriatric (old age) group is having the physiological capacity to perform everyday activities safely and independently without undue fatigue. (Rikli & Jones, 1999a)

Formal physical fitness in India was mostly famous among young generation. But with the improved medical facilities and longevity the awareness has grown amongst old age group too. There are lots of physiology expert center available now for special exercise for elderly. There are other devices developed which help in the passive exercise of elderly with certain clinical problems. But there is hardly anything available for elderly who are clinically fit/ with some minor problems to motivate them to exercise without the burden of formal exercise regime. The available alternatives are either very complicated or not affordable by most.

Though in India elderly who live with their family and kids help their kids in their daily work, and those living alone help themselves. With the growing urbanization individuals have become more busy and less collaborative work happen now. Hence these work get them more fatigue as they are drab in
nature.

Therefore aim of my project is to bring in playfulness in the daily activity which will also help elderly to move around / move body parts leading to some amount of exercise. The other aim is to make it collaborative too to involve other members which will increase the happiness of elderly.

Process

The process followed to reach the solution was cyclic with iteration in understanding of the problem, design brief and design concepts, in the continuous guidance and feedbacks.

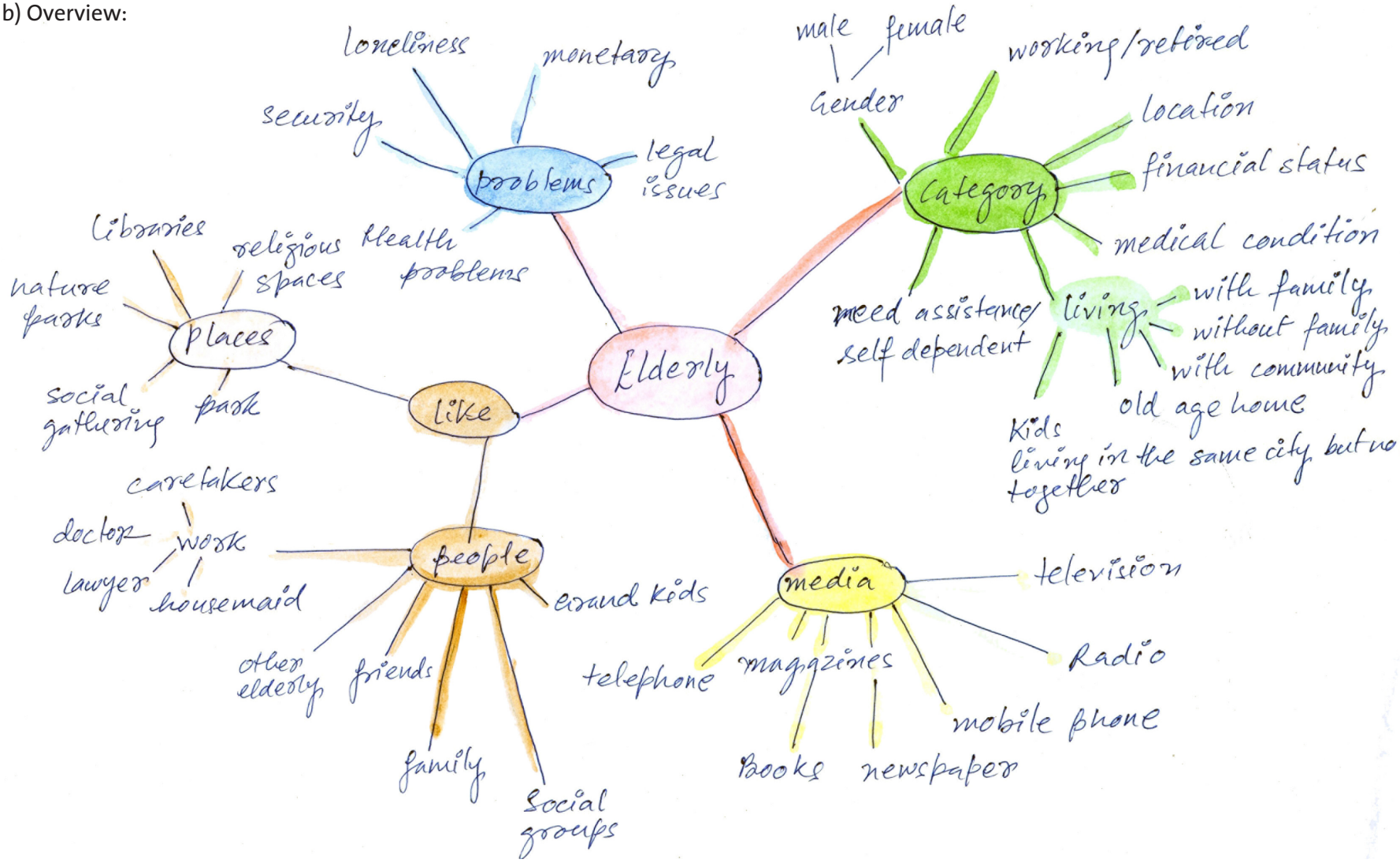
1) Identifying the problem : observation & some literature studies
2) Understanding user group : literature studies, observation, user studies, talking to experts
3) Understanding the problem : User studies, Meeting doctor, Meeting Physiotherapist, researches
4) Parallel research and parallel solutions : Research paper, parallel design solutions, market research
5) Drawing inferences(cyclic)
6) Generation of design Ideas
7) Evaluation of Ideas
9) Iteration of Ideas
10) Working on the final Idea
11) User testing
12) Conclusion
13) Knowing future possibilities

Elderly

a) Technical Definition:

1) old or aging
2) Geriatric
3) 65 above - 65-74: young old
- 75 above : old old (Nishijama et al, 2006)
4) The group of people characterized by significant variation in physiological, mental and functional capabilities

b) Overview:


Elderly
problems
loneliness
monetary
security
legal issues
health problems
category
male
female
Gender
working/retired
location
financial status
medical condition
living
with family
without family
with community
old age home
Kids living in the same city but no together
need assistance/ self dependent
like
Places
Libraries
religious spaces
nature parks
social gathering
park
people
caretakers
doctor
work
lawyer
housemaid
other elderly
friends
family
social groups
errand kids
media
television
Radio
mobile phone
magazines
Books
newspaper
telephone

Elderly

a) Demographics:

Total Population of India: 1,147,995,904 (July 2008)[15]

Age wise distribution of Indian population:

- 0-14 years: 31.5% (male 189,238,487/female 172,168,306)
- 15-64 years: 63.3% (male 374,157,581/female 352,868,003)
- 65 years and over: 5.2% (male 28,285,796/female 31,277,725)

Every year the percentage is increasing

As the elderly population is growing more due to increase in life expectancy, more research and works are taking place in design for elderly. Few research work and products which are similar/ parallel to my project area are discussed here:

1) DanceAlong: Supporting Positive Social Exchange and Exercise for the Elderly Through Dance [1]
In this project the problem identified was serious social, environmental, and physical constraints faced by elderly, that impact their well-being.

The goals decided for DanceAlong was
(1) to provide entertainment and exercise for each individual user
(2) to promote social engagement within the group

The idea is an augmented dancing environment that allows elders to select dance sequences from well-known movies and dance along with them. The idea was tested with the users from Pittsburgh, the number of user is not mentioned. It was a exploratory project and was concluded with the thought to built several other projects like this which will provide community interactions amongst elderly.

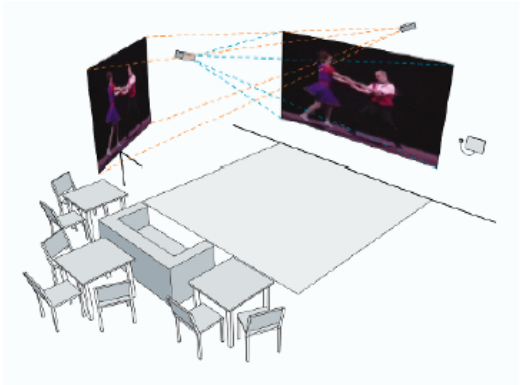


Figure 1. DanceAlong system.

Figure 3. First user testing.

2) An Exploratory Study on Senior Citizens' Perceptions of the Nintendo Wii: The Case of Singapore [3]

The paper aims to assess the efficacy of the Nintendo Wii, popular in the United States and Japan, to promote regular exercise among senior citizens in Singapore (aged 65 years and above).

Twenty eight (28) user participated for the pilot test. Data was collected through self-reported questionnaire and video observation. The data was analyzed using Technology Acceptance Model (TAM) (Davis, 1989) and was tested with a method called Chi-square test.

Experiment finding showed that senior citizens found the Nitindo Wii usable with realistic depictions of games and were positively engaged with the Wii games. However, on the other hand and differing the prior belief, findings did not show that perceived usefulness has a significant influence on senior citizens' intention to use the Wii for improving social interaction, health and exercise. Hence the final conclusion derived from paper was a suggestion to make it more simpler and realistic. The game should mimic the real life situations. It ended with a discussion on the design and impact of digitally mediated games for elderly users.

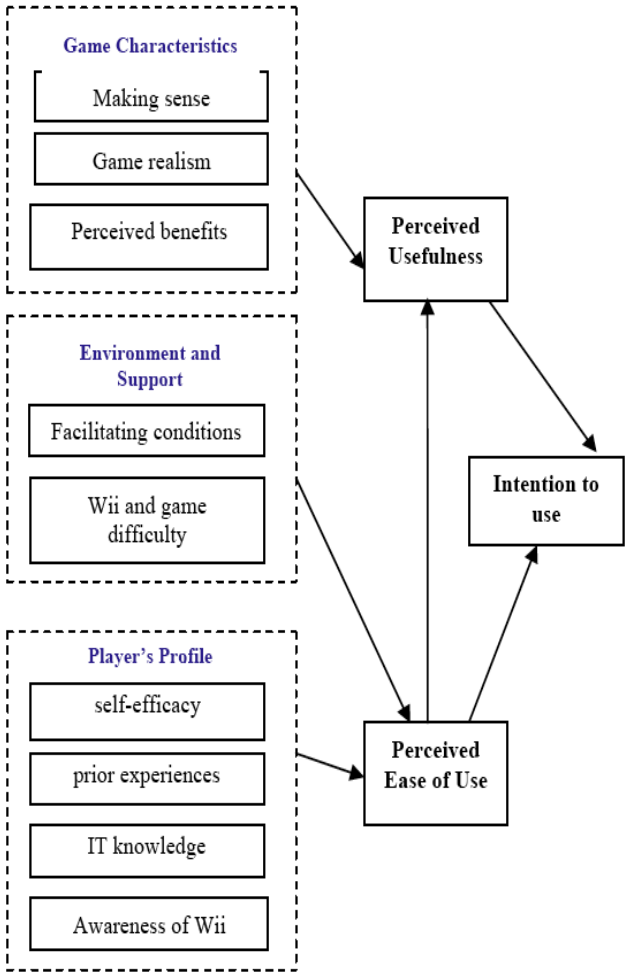


Figure 1. Research Model

3) Other products:

Yorisoi ifbot [15]:
The robot can talk to the user.
Designed as a companion for elderly.
Works on voice command. Performs 15 different activities.

Taizo: Demonstrate exercises [15]:
The Taizo demonstartes step by step exercises recommended for elderly. He is a non human instructor for elderly.

User studies

User studies was performed in two phase with two different sets of users:

Phase 1 :
Elderly already doing exercise daily were observed for few days and then contextual enquiry was done. Participatory approach was followed in order to understand them better. There were approx. 25 elderly who participated for group task and 2-3 were enquired.

Experts were also consulted. One physiotherapy doctor was interviewed and two research experts working in the field of elderly were consulted.

Phase 2 :
Contextual Inquiry was done with 6 users, both male and female who may or may not do exercise daily. Living with family and alone both types were Inquired.

User studies

Opportunities and insights obtained from phase 1 user observation and interview:

Observation/statement/comment	insight	opportunity
It's a necessity to do exercise for me that's why I come to the park daily	Exercise seems burden but still important to do	To make exercise as play
In group it is easy to exercise	Collaborative task makes exercise easier to do	Collaborative tasks
E-mail is better than mobile as there is no time constraint	Time should not bound	Time independent design
Want simplicity in the exercise process	Complexity should be avoided	The design should not have many things at the same time

User studies

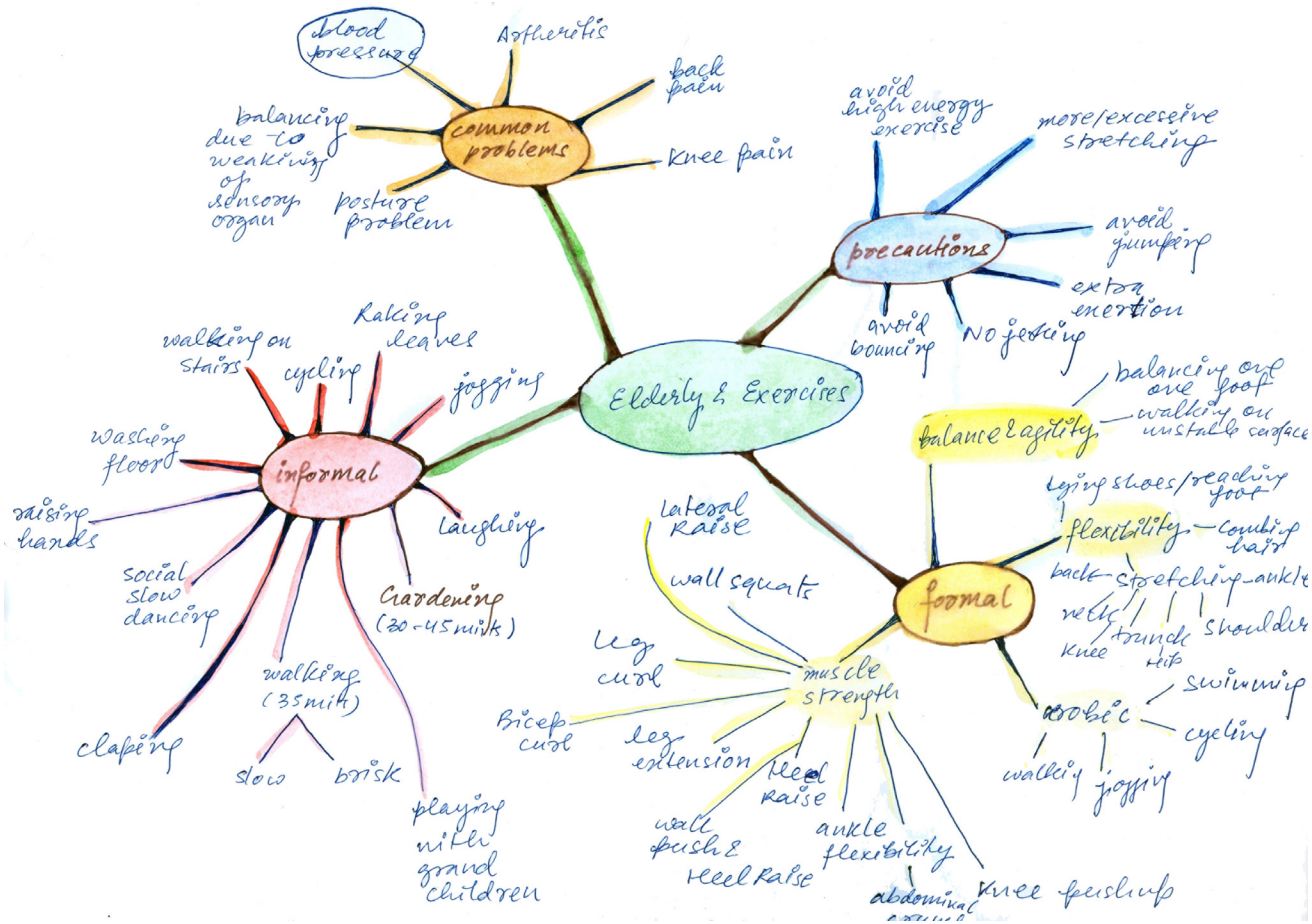
Opportunities and insights obtained from phase 1 expert interview & feedback:

statement/comment	insight	opportunity
Precautions should be taken while exercising	Either there should be assistance or limitation	Collaborative tasks or task with provided barrier
The common problem of blood pressure/ arthritis etc should be considered while designing exercises	There should be a flexible range in the exercise to cater people with problems	To have levels
Lots of motivation is required for even going on walk irrespective of economic difference	To bring in motivation/ to tempt/ make playful	To make it playful
Household activities are important to perform	To map the ideas with some simple household activities	For example making gardening playful & collaborative

Top observations/insights/opportunities from both phase 1 & phase 2 user studies:

1) Collaborative task makes exercise easier to do
2) To bring in motivation by making exercise playful
3) Complexity should be avoided, things should be simple
4) To map the ideas around some daily household activities
5) Cultural aspect should be considered, like yoga, time spent with family etc
6) To incorporate liking of religious activity, mythology and nature in design solution
7) The non acceptance of computer amongst Indian elderly should be considered

Overview of elderly & exercise by a mind map :



a) Common problems:

Human body performs major three types of function:
1) Bio-mechanical: bones and muscles
2) Physiological: Blood pressure and heart
3) Psychological/neural: nerve cells & sensory organs

As we go old our body start weakening resulting in the weakening of these functions

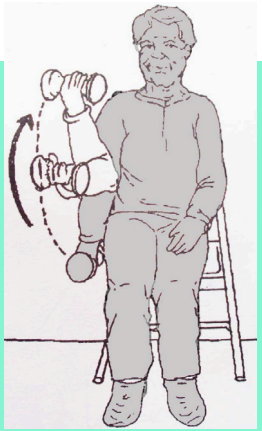
Hence the common problems which is seen in most of the elderly due to the above reasons are listed here

Common Problems

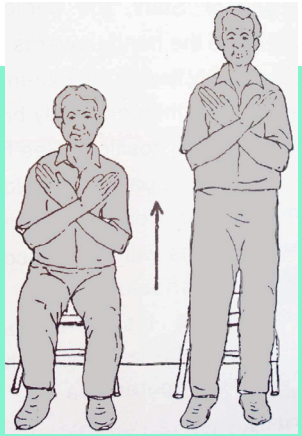
- Back pain
- Knee pain/joint pain
- Posture problem
- Arthritis
- Weakening of sensory organs
- Balancing problem
- Blood pressure
- Diabetes
- Heart problem

b) Suggested Fitness tests [5]: According to the Geriatric Fitness Manual(Kasturi Sen Ray, 2009) made for Indian elderly the following tests judge the fitness level of different body parts

1) **Arm Curle test:** This helps in assessing upper body strength
2) **Chair stand test:** This helps in assessing lower body strength
3) **8-feet up and go test:** This helps in assessing coordination and balance of the body
4) **6-minute walk test:** This helps in assessing aerobic endurance
5) **2-minute step test:** This is alternate test to assess aerobic endurance
6) **Back Scratch test:** This helps in assessing upper body flexibility
7) **Chair sit and reach test:** This helps in assessing lower body flexibility
8) **Reaction time test:** This helps the reflex action



1)



2)

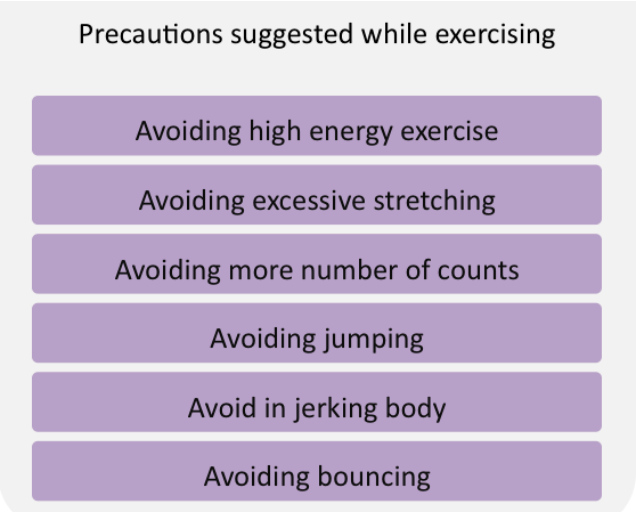
3)

6)

c) Suggested Exercises [5]: According to the Geriatric Fitness Manual(Kasturi Sen Ray, 2009) made for Indian elderly the following exercises should be done by elderly in order to remain fit. They are categorized in three parts:

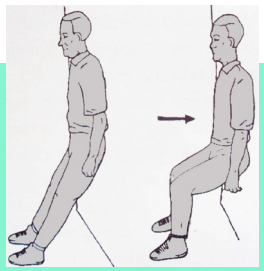
1) Muscle strengthening exercises/ Flexibility exercises
2) Aerobics
3) Exercise for balance and agility

Lots of precautions needs to be taken by elderly while exercising. They are:



1) Muscle strengthening exercises/ Flexibility exercises[5]

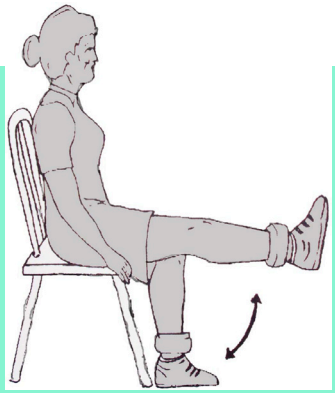
a) wall squat,
b) Leg curl,
c) Leg extension,
d) Heel raise,
e) Ankle flexibility,
f) Bicep Curl,
g) Wall push up,
h) Knee push up,
i) Tricep extension,
j) Lateral raise,
k) Abdominal crunch



a)

e)

b)



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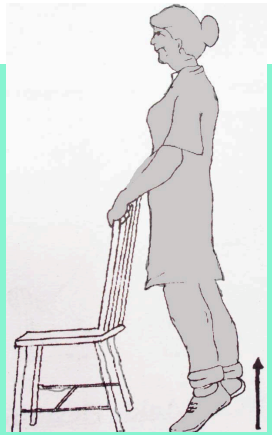
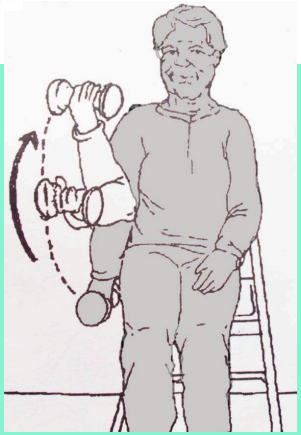


d)

i)



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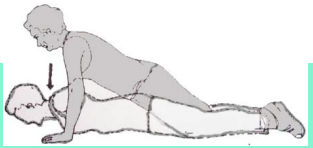


h)

k)

Exercise for balance and agility

- Balancing on one foot
- Walking on unstable surface
- Walking and doing some cognitive task together
- Balancing with eyes closed and open

Aerobics

- jogging
- swimming
- Slow dancing
- cycling
- walking

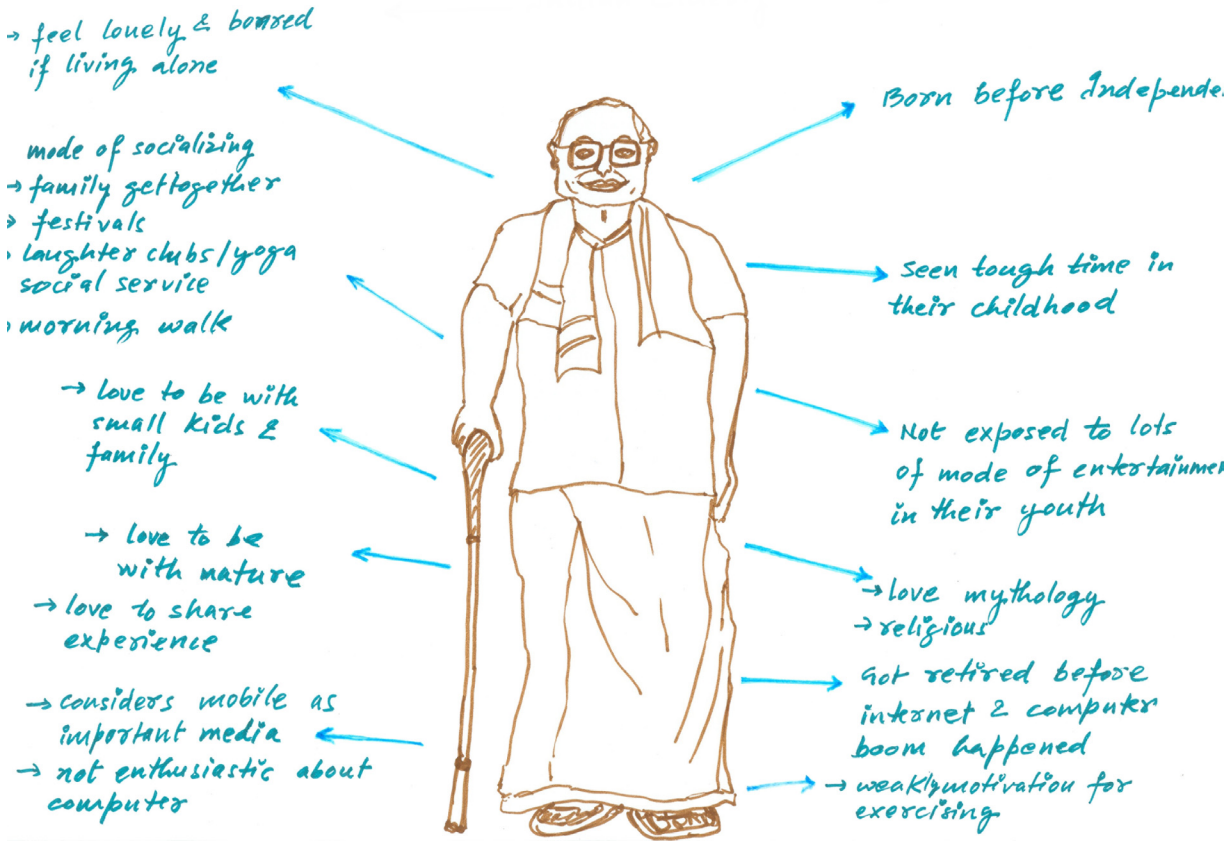
Informal activities suggested & performed as exercise

- Walking slow
- Playing with grand children
- Gardening
- laughing
- clapping
- slow dance
- Raising hands
- Washing floor
- Raking leaves
- jogging
- Cycling
- Walking on stairs

Elderly & Playfulness

a) An Indian Elderly: The common findings for an Indian elderly found in user studies are:

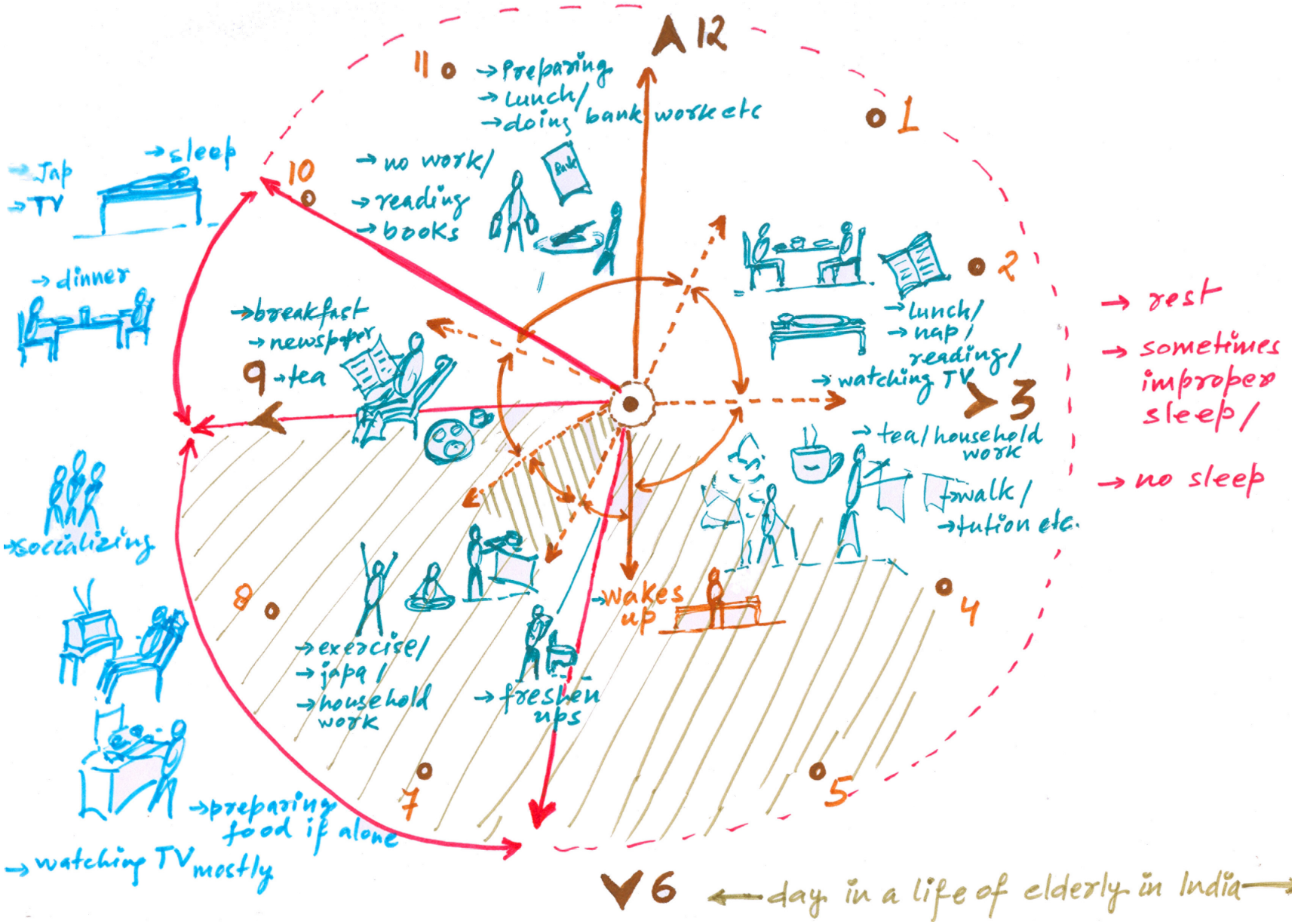
1) Born before Independence , have seen tough time in life and less entertainment trend
2) Got retired before internet and personal computer boom
3) Weak motivation for doing exercise
4) More religious/ love mythology/ like to be with nature
5) Like to be with kids/ family/ share experiences
6) Want simple products in economical range



b) A day in a life of indian Elderly: The whole day activity is mapped according to the time in the picture

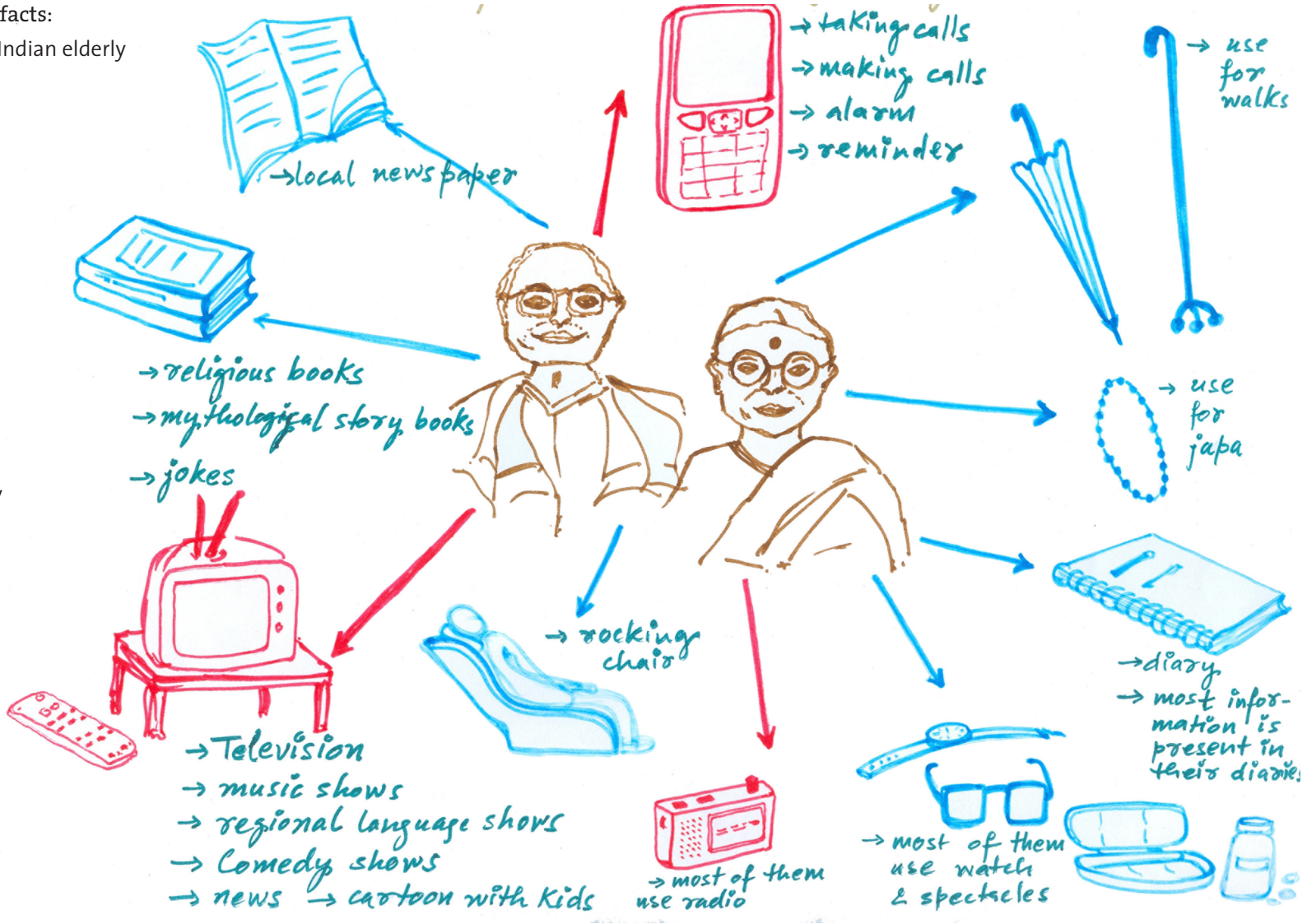
Main activities from the whole day comprises of:
1) Eating
2) Sleeping
3) Watching TV
4) Help in cooking/arranging clothes
5) Bank/market
6) Walk/exercise/social gathering
7) Reading
8) Performing religious chores
9) Taking tuition/some other work

*4:30pm to 9pm is a major chunk of free time with most of elderly


12
1
2
3
4
5
6
7
8
9
10
11
→ Preparing → lunch/ → doing bank work etc
→ no work/ → reading → books
→ sleep
→ Jap → TV
→ dinner
→ breakfast → newspaper → tea
→ lunch/ → nap/ reading/ → watching TV
→ tea/ household work
→ walk/ → tution etc.
→ rest
→ sometimes improper sleep/
→ no sleep
→ socializing
→ exercise/ → japa/ → household work
→ freshen ups
→ wakes up
→ preparing food if alone
→ watching TV mostly
day in a life of elderly in India

c) Elderly & Artifacts:
Artifact used by Indian elderly in daily life

1)Books
2) Newspaper
3) Television
4) Umbrella
5) Walking stick
6) Rocking chair
7) Spectacles
8) Wrist Watch
9) Radio
10) Medicine
11) Personal diary



d) Elderly's Aspiration:

The things that elderly wishes to have in their old age

1) Simple life style
2) Less hectic life/more rest
3) To keep connected with friends and family
4) To spend quality time with their Grand kids
5) To get involve in more of religious activities
6) To have simple fun in life
7) To be able to visit the places they have not
8) They also want to try new things but sometimes feel shy in doing that
9) To get respect from people around
10) To be able to contribute to the society by the gained experience

Inferences Drawn

The inference drawn from all the studies and data is are:

1) The design should be simple for elderly to operate
2) It should be intresting enough to engage and motivate them
3) It should be more focused towards their daily activity and likings
4) The cost should be taken in consideration so that it is affordable by masses
5) It should give them new & good experience, should fullfil their aspirations
6) It should connect them to their loved ones and themselves too, directly or indirectly

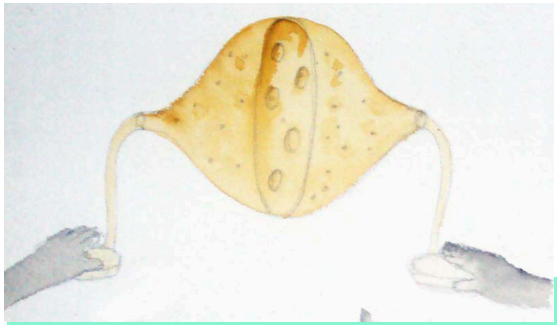
Design Concepts

a) Design brief:
The first design brief was to create device which will be operated in the way exercises are recommended for elderly. The idea will have a game play involved in it which will make the whole process playful. The simplicity of the interaction with the device and game play design was kept in mind.

b) Phase - 1 concepts: Few concepts were developed on the above design brief

1) Ball game: This was based on the wall push exercise. In this game there was an hour glass for measuring time, a ball in a pipe with markings. The player need to push the wall and reach highest point maximum no of times at one time to win.

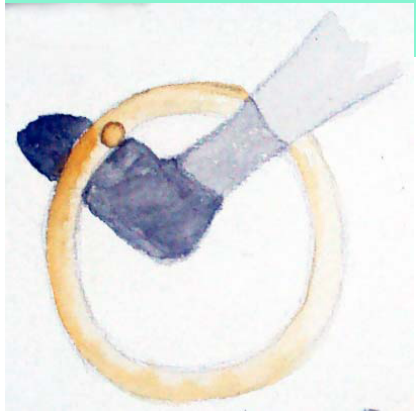
2) Musical wall: This was based on the ant crawl exercise. In this the user can create and play music white moving fingers up and down. The condition was that, that user need to de it in consecutive rows so that the crawl exercise happens and user enjoys playing music at the same time.



3) pressure balloon: This idea was based palm pressure exercise. The one who presses and throws more particle on opposite side wins

4)Grab chair: This idea was based on balancing exercise. The user needs to reach to the chair sit and come back in time in order to win.

5) Loop: This idea was based on the ankle rotation exercise. The idea is to rotate the ball in the loop and in order to do that user need to keep his feet intact with the ball or he/she will loose.



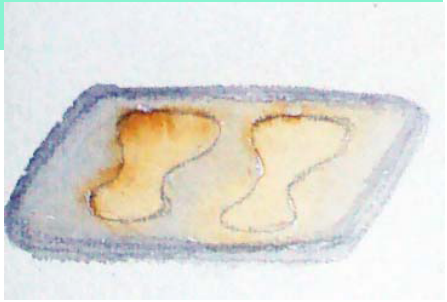
6) reach out: This idea was based on the stretch exercise. The idea is a pendulum as a marker to reach the stretch point. The pendulum will go to the same limit as the users in opposite direction.

7) musical pillow: This idea was based on the sit up and down exercise. The pillow will sing different with different pressure on it.

8) squat meter: This idea was based on the squat exercise. The idea was to win when reach the maximum limit and number of times. the loop will go to the mark till where user will squat.

9) Squeeze remote: This idea was based on the palm exercise. The idea was t use this as a TV remote for controlling different functions on squeezing. THIS IDEA WAS TAKEN FORWARD TO MAIN DESIGN DEVELOPMENT

10) Lawn sprinklers: This idea was based on the heel raise exercise. On pressing the mat with the heel the lawn sprinklers will move in order to water garden.



11) leg puppet: This idea was to move the legs while telling stories to small children. Different up and down movement can happen.

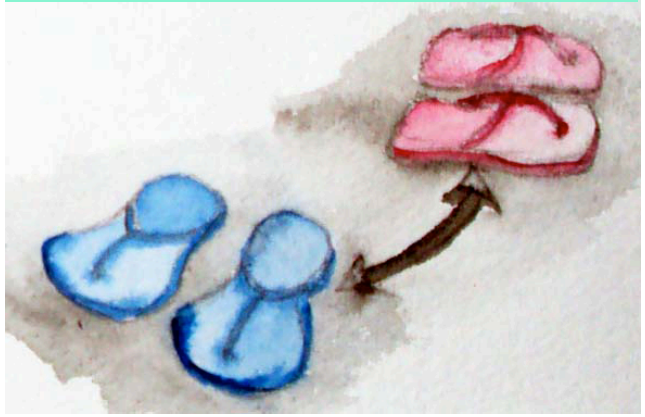
12) Dancing wall: This idea to repeat the dance action as done by the other partner on the wall remotely or near.

c) Redefining Design brief:
Most of the design concept from phase 1 looked drab and the game play involved was not strong enough to engage elderly every day or for long time. The mistake was in my approach I was concentrating more on the correctness of exercise but after talking to experts I again redefined my brief. This time my approach was to get design which involve daily activities performed by elderly to see the opportunity of exercise & fun part in that. Also I took the elderly's aspirations and things they enjoy doing as my starting point.

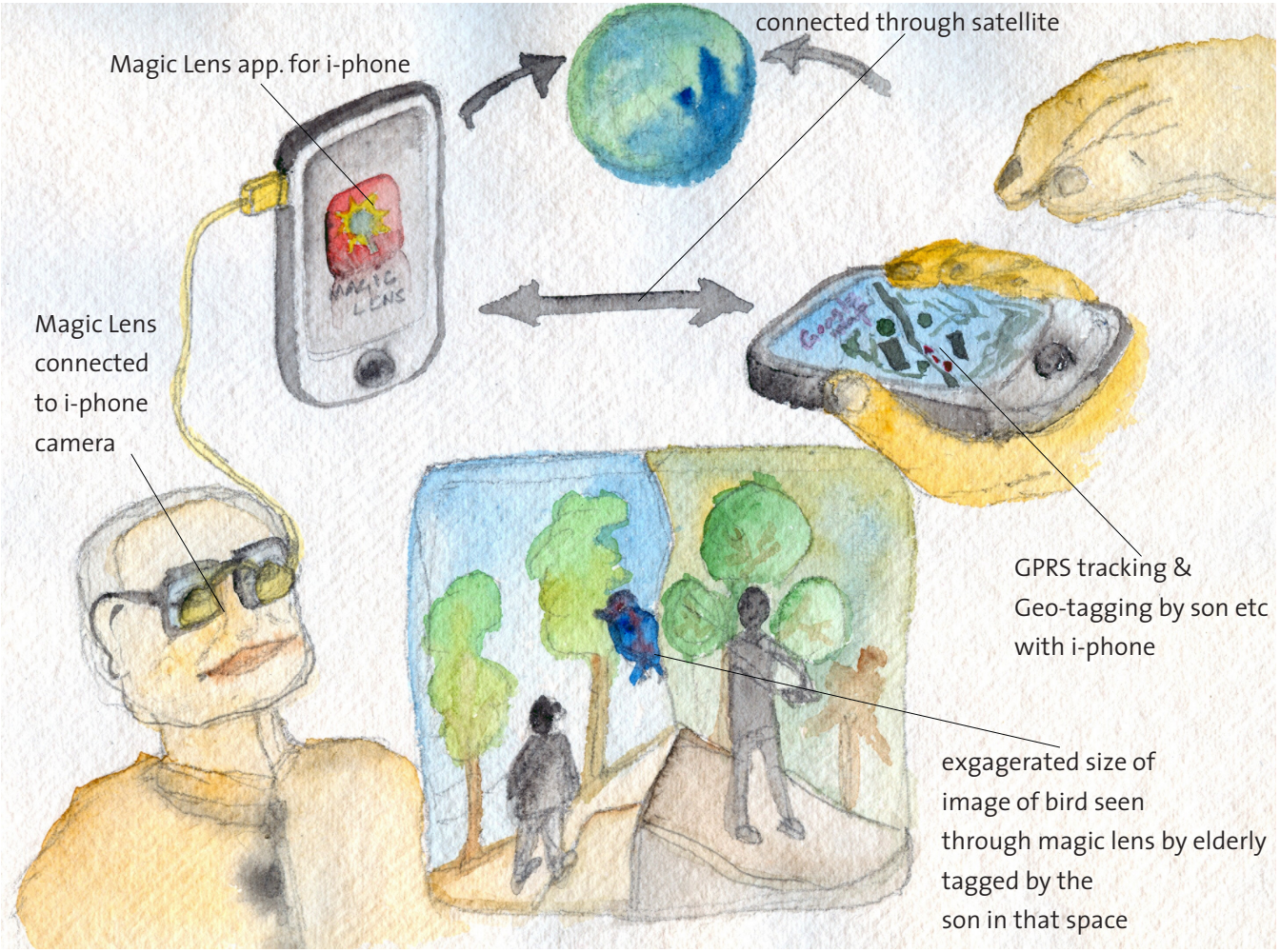
d) Phase - 2 concepts: Few good concepts from all the concepts developed for above design brief

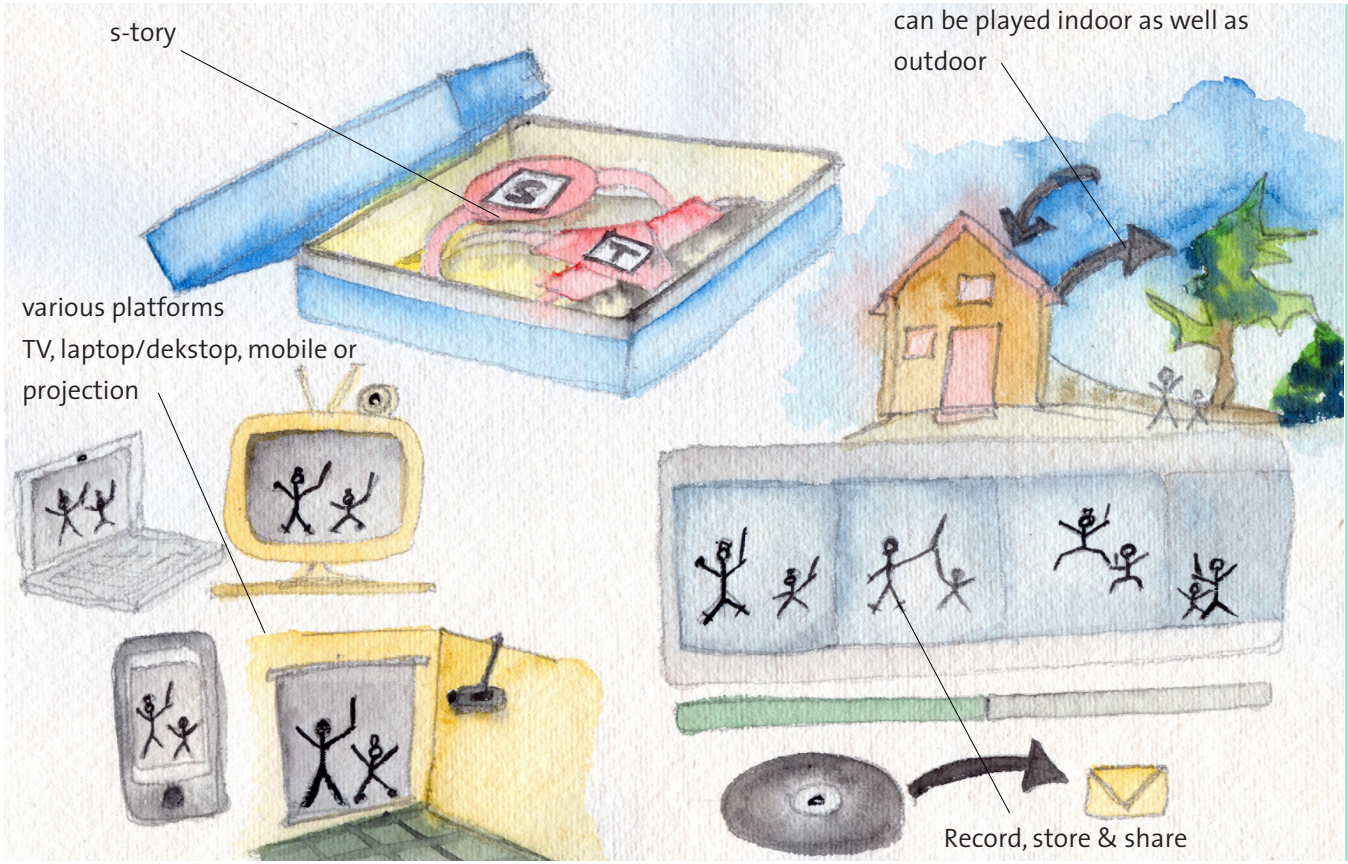
1)Tickle jacket: In the jacket the message from different family members can be stored living far or near. The message can be heard only when the jacket is worn. When buttons are pressed the jacket blow and gives tickle sensation and reads the message for the elderly.

2) Companions Sleeper : This was designed to keep check on the partner if he/she is moving while on walk. The confirmation will be through different interactive modes. It will be a surprise factor. for different pressure applied by partner on his/her sleeper the out put on other partners will be different. Like different kind of sounds, or slight change in temperature or colour of the sleeper. This will keep them connected and motivated.



3) Magic Lens:
The idea is to motivate elderly to move out and walk, the motivation will be generated by loved ones by keeping connected remotely while the elderly is walking. The elderly can also be tracked if he is actually walking or not.
The loved ones are suppose to tag some real-time or saved images on the path of the elderly and hence to make them feel as if they are walking together. The 2-3 common path can be saved on the google map. Also this tagging will generate interest for the elderly to go out and see what new is tagged for him, hence the app will keep the motivation on everyday.
The i-phone features that will support this app apart from other regular features are:
Camera
Sensors:
Accelerometer
Proximity sensor
Ambient light sensor
There will be an extra attachment to the spectacle with the i-phone camera





3) S-tory:
S-tory is a collaborative story making and telling game. This game is specially designed for elderly as it will be simple, they will not have inhibition in playing it and it will keep them moving. They can collaborate with their grand kids, friends, partners etc. It needs a
camera and a screen. It can be played inside as well as outside. The story can be created on different platforms i.e. mobile phone, laptop, television or even at a projection. User can create lots of possibilities on there own.
The game will have wearables and will be augmented when viewed through camera users can see there new avatars and create numerous amount of stories. It can also be shared with others

c) Analysis:

From all the design concept of phase 1, the concepts which is based on daily activity is given preference.
The activity which most elderly do daily is watching TV. Hence the “squeeze remote” concept is finalized and further iterated and developed as final design-1

From concepts of phase 2, the magic lens & s-tory got good feedback, are more interesting and motivating but the magic lens is technically bit complicated hence the s-tory is taken further for the exploration as final design-2

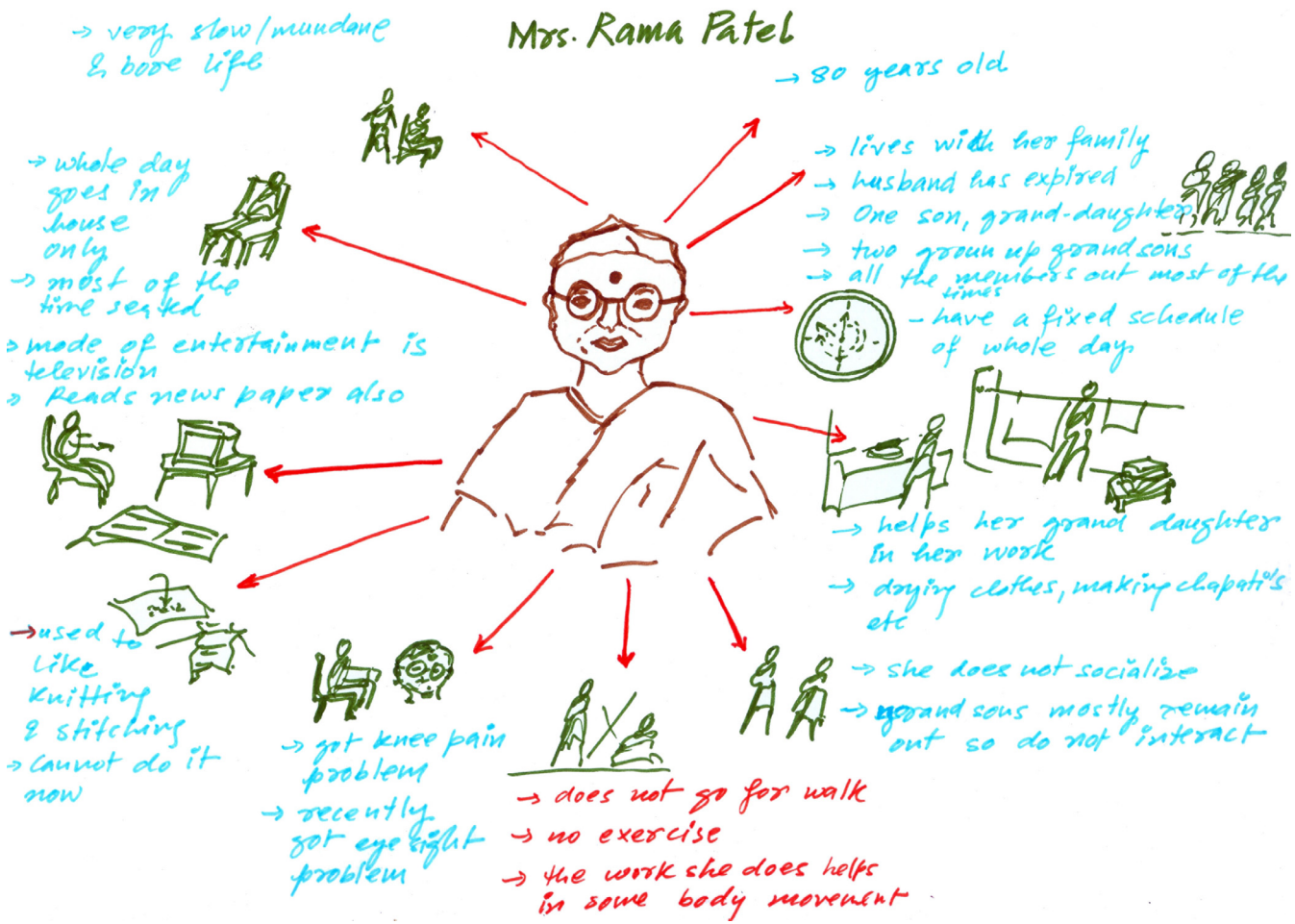
Persona is developed for both the design ideas derived from the Contextual Inquiry

Personas

There are two personas for two different design solutions

Persona 1 - Mrs. Rama patel:

1) She is 80 years old women, lives with her family, husband has expired.
2) She has one son, one daughter- in -law, two grand kids (above 16)
3) Except Rama all family members are out of the house most of the day
4) She has a fixed schedule of whole day
5) She helps her grand daughter in making chapati, drying clothes etc.
6) She do not like to socialize, remains in home only.
7) She does not go for any walk, her daily work, works as exercise for her.
8) She has got knee joint pain and slight eye problem
9) She watches television and reads local newspaper
10) most of her time she remains alone and without anything to do



Persona 2 - Mr. Rajan kapoor:

1) He is a 70 year old retired bank manager from Mumbai

2) He has two sons, he and his wife lives with younger one the elder lives in the same city visits him on weekends. Have a small grand son (6yrs)

3) He has got blood pressure problem but no other clinical problem

4)He is very particular about his whole day activities, sleeps on time

5) He feels less motivated for doing exercise some times goes for walk

6) He used to go for trek and bird watching in forest with his elder son which he misses a lot

7) He plays with his grandson and feels that there should be something for elderly to play to

8) He says even simple jokes makes happy, so things designed should be very simple from front end

9) He liked to act and wants to experience mythology

10) he has mobile phone common between husband and wife, only use it for calls, don't want to use computer

Final Design

e-mote:
It is an interactive, playful, gesture based TV remote control designed for elderly. It will bring a special fun experience for elderly as well as exercise their hands and upper body while they are operating it.

a) Scenario - Design 1

- Like Mrs. Rama Patel, Jitu bhai & Mr. Chopra also love watching TV
- Mrs. Rama Patel, Jitu bhai & Mr. Chopra got e-mote as a gift from their kids
- The e-mote brought a new experience of viewing TV for them
- Watching TV was so much fun
- They realized that it is also helping them to exercise with the movement in the hands and upper body
- The color changing surface of the e-mote engaged them to compare what color comes when he/she presses the e-mote and when his son or grand son does that
- They can also play around with the e-mote even if they are not watching TV
- They found it very simple to use and maintenance free
- The cost of the e-mote is also reasonable
- They suggested their other friends to buy e-mote
- They feel special as the product is designed for them and are happy to possess e-mote

Mrs Rama patel got e-mote as a gift from her son

e-mote Development

a) System Detailing:

The e-mote works on different gestures which help elderly to exercise their body parts. There are three function which it performs

1) Switching TV on and off
2) Increasing or decreasing channels
3) Increasing or decreasing volume

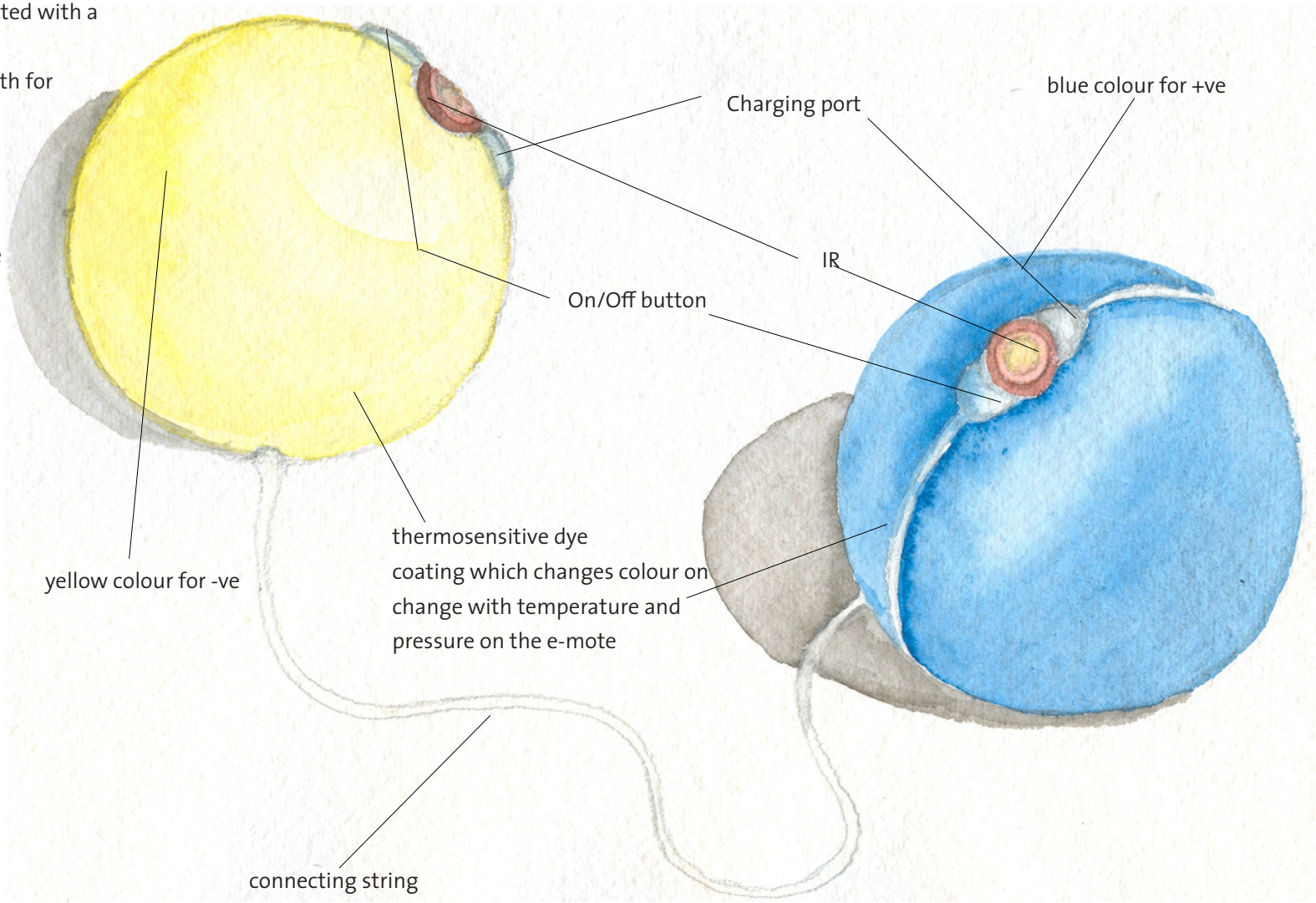
It also changes the colour on temperature difference ranging from 30-40 degrees

All possible gestures are mapped for each function and best ones are chosen out of it:

Gesture mapping for e-mote			
Gestures	TV on/off	Channels +/-	volume +/-
Squeezing the ball	Not required to make it complex as one time function	**best (left for channel -, right for channel +)**	Good but volume change will happen less
Shaking one ball	do	Good but not much movement will happen	Good but not much movement will happen
Shaking both the balls together	do	Confuses the user	Not a good mapping with two balls
Moving one ball at a time in different direction	do	Good but irritating if more channel needs to change	**best (left for volume -, right for volume +) +/-2 points at a time**
Moving both ball up and down at the same time	do	Confuses the user	
Pressing button	**best**	No exercise	No exercise

b) Idea Sketch and features:

- The e-mote has two parts connected with a stretchable string
- yellow part is for moving back both for channel and volume where as the blue part is for moving up
- It has an on and off button
- The outer cover of the parts are made up of material which can be pressed, a spongy material
- There is a charging point for charging the battery
- The surface is coated with a temperature/pressure sensitive dye which changes color
- The sensors used are pressure sensor and accelerometer



c) Prototype:

High fidelity prototype is developed for e-mote keeping the following features in mind:

1) Functionality - on/off, volume +ve/-ve, channel up/down

2) Interaction - between user and e-mote & between e-mote and TV

3) Gestures - Squeezing, moving hands, pressing button, stretching

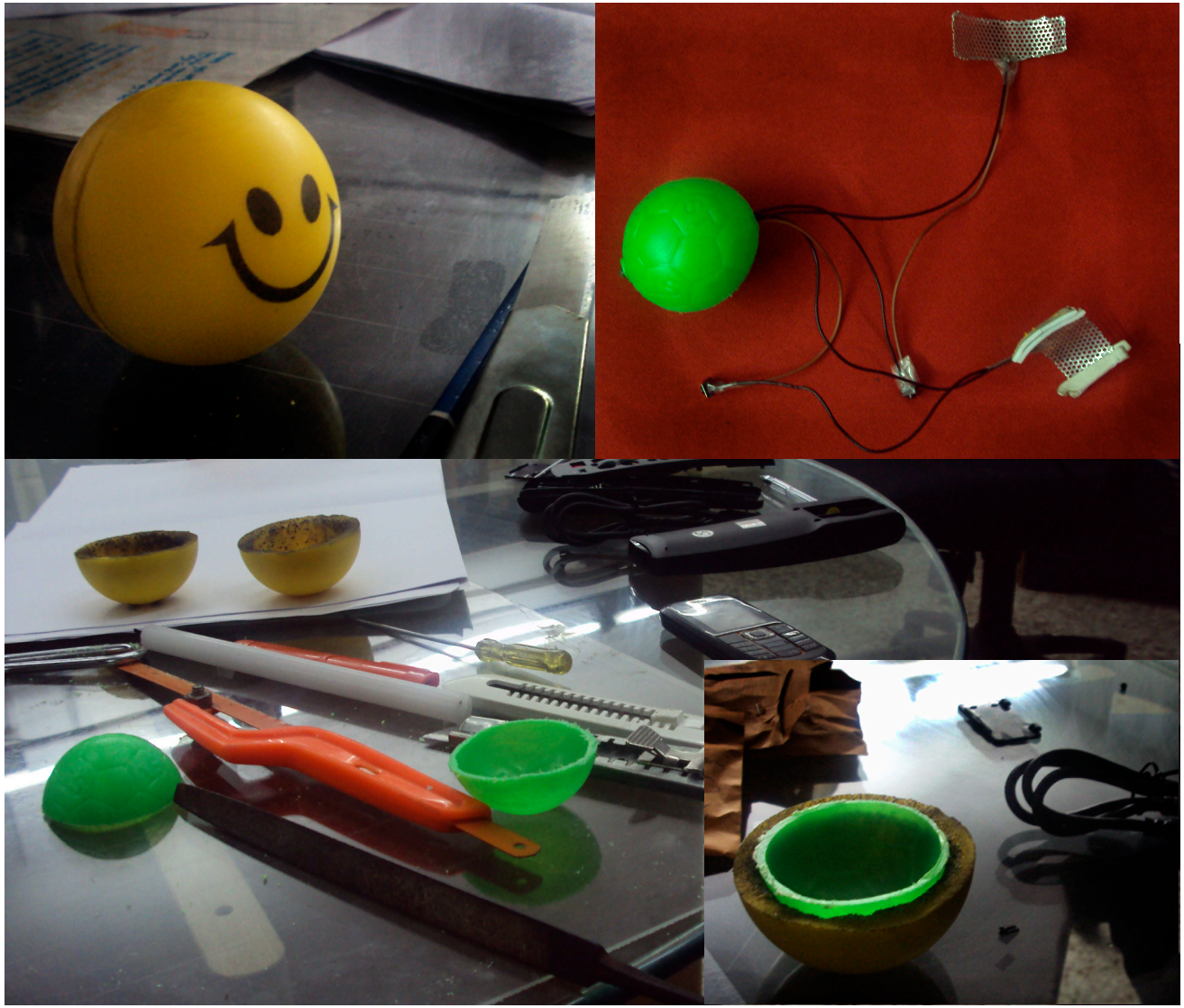
4) Product - shape, size, material, colour, graphics

Lots of permutation and combinations were tried to get the right gesture and interaction. Innovative ways were used to get the right shape, size, touch of the product. Prototype making required many iterations.

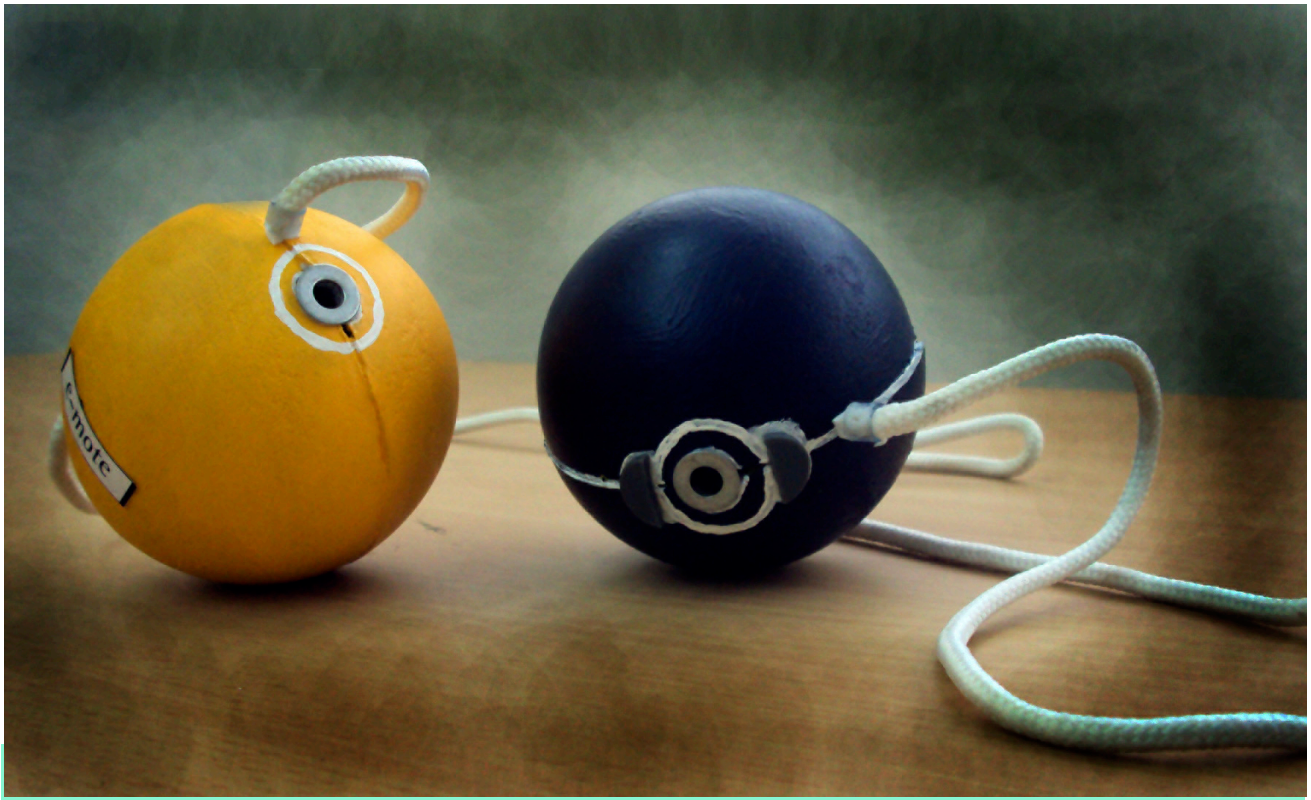
The prototype required the skill of:

- Interaction design
- Product design
- Electronics (assistance taken)

c) Prototype:



d) Final Product:



User Testing

Usability Testing - Performance Test of e-mote:

Performance Test was conducted with 6 - users to test the e-mote. The prototype prepared was used in the usability environment created for the user. Users were recruited and called one by one to the place for evaluation of the e-mote.

Performance Test:

Performance Test is a rigorous usability evaluation of a working system under realistic conditions to identify usability problems and to compare measures such as success rate, task time, user satisfaction with requirements as per goal of the project

Steps involved in the test:

- Setting up Goal and its prioritization
- listing Target user
- Preparing Screener
- Specifying Protocols
- Tasks setting
- Observation while performance
- Analysis
- user comments
- Conclusion

Goal Prioritization[16]:

The Goals questions are rated under two columns ‘importance’ (1-nice to have.....5-must have) and ‘severity’ (1- good to know.....5-bad problem/severe need) on the scale of 1-5 and are multiplied to get the ‘priority’ order in third column. It helps in deciding which problem/need should be investigated first/preference wise. It gives an order for the study of user experience.

Goal Prioritization			
Goal	Importance	Severity	Priority
To give elderly new, playful & fun experience while using TV remote control	5	5	25
To exercise elderly palm, hand, upper body movement while using the remote	5	4	20
To have a very simple operational interface	5	5	25

Target Users:

Age - 65 and above

Education - Preferably educated

Economy - Middle class and above

Like watching TV

Have personal TV

User Testing

Screener:

Hello my name is **Shalini Tripathi** from IDC, IIT Bombay. I am seeking few people who are interested in participating in evaluation of a product. This is strictly a part of course study and I will be testing only the product and not your skills or intelligence.

The evaluation will consist of a one on one interview on___/06/2010 at IDC, IIT Bombay. It will be at your convenience and will last for maximum 30 minutes. The interview will be strictly for research and all of your comments will be confidential. If you are interested in participating, I would like to ask you a few questions.

Sr. no.	Questions	Answer Condition	Instructions
1	What is your name?		Go to Question 2
2	What is your age?	If 65yrs or above	Go to Question 3, Otherwise Terminate
3	What is your educational and professional background?	If educated retired/working male middle class or above economic strata, or female with monetary support	Go to Question 4, Otherwise Terminate
4	Do you like watching TV?	If yes	Go to Question 5, Otherwise Terminate
5	Do you do any kind of exercise, if yes are you regular?	If no	Go to Question 6, Otherwise Terminate
6	Do you watch TV daily, how many hours?	If yes & more than one hour	**Recruit** him/her if you think he is **articulate** enough, Otherwise Terminate

User Testing

Protocol:

1) You will be provided with a product, TV and a chair to sit for performing the test
2) This is not a test of you, but a test of the product
3) You can ask questions at any point of time, only relevant answers will be given
which will help you to proceed further
4) You can talk aloud your thoughts and experience if you want to
5) Try to explain what was frustrating you
6) You can stop and tell if you are getting any kind of pain or inconvenience while using the product
6) Please be honest in your answers, all negative & positive comments are welcome

Tasks:

A scenario was given and then tasks were given to be performed

Scenario:

You are sitting in your drawing room/lobby/bedroom and your son brings you a new remote control for your television specially for you. Use your gift to let your son know if it is working for you

The task was asked to be performed twice:

a) Without showing how it works
b) By showing how it works

Task 1:

Switch on/off the television

Task 2:

Change the channel of the television

Task 3:

Change the volume of the television

User Testing

Observation while performance: Pictures taken while conducting performance test

User Testing

Observation while performance:

Users were observed during the performance, their questions were answered between the task.

Different problems and ways of usage or each unique user was noted down.

The factors that were considered:

1) Qualitative factor like number of smiles/frowns/frustration/enjoyment

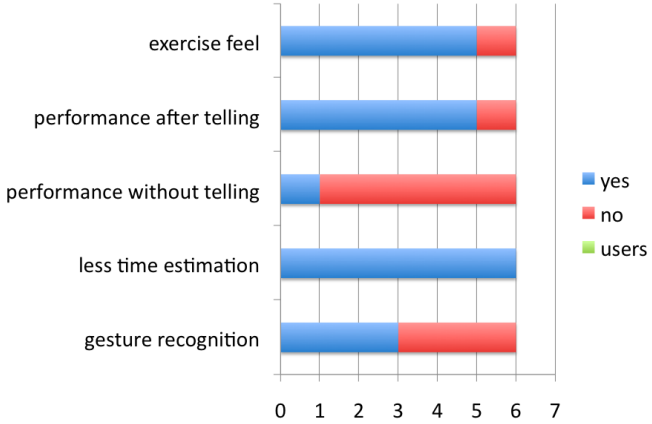
2) The usage of right gestures or interaction modes without telling how to use

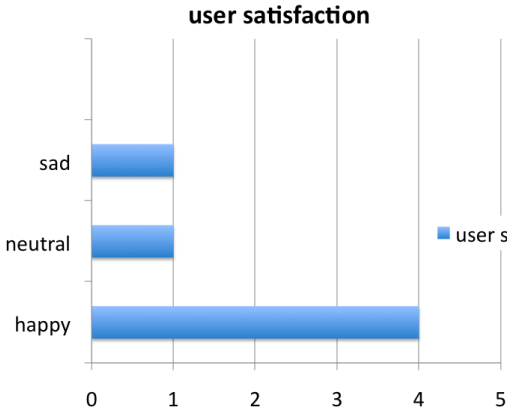
3) Number of errors before and after explaining the product

Analysis with 6-users:

Analysis						
Tasks & Factors	User 1	User 2	User 3	User 4	User 5	User 6
Smiles/ frown/ neutral during the performance						
User estimated time less than the time he sat/ user was not getting bored	✔	✔	✔	✔	✔	✔
Recognized gestures – squeezing/moving hands without telling	✗	✔	✗	✔	✗	✔
User was able to change channel/change volume without telling how to do it	✗	✗	✗	✗	✔	✗
User was easily able to change channel/change volume after telling how to do it	✔	✔	✔	✔	✔	✔
User agreed to the fact that it is helping them to exercise too and were happy about it	✔	✔	✔	✔	✔	✗
User found the product useful for them	✔	✗	✔	✔	✔	✗

User Testing





User Comments:

User gave certain feedbacks and comments on the e-mote:

1) The two parts should be designed for different pressure strength
2) The product seems useful and fun to use
3) It can be of different sizes
4) It should not be very hard to press

Conclusion:

1) Need to work on the different small user group amongst elderly
2) The strength need to be calculated and worked for two different hands
3) The goals are almost achieved
4) Gesture matrix can be made more predictable

Conclusion

Conclusion drawn from whole project was that elderly is an important user group to understand. Their needs differ from what we predict. The absence of playfulness and fun in their life needs to be catered. This is their hidden desire which I found during my research and contextual enquiry. They want simple things. Things elderly find hard and boring to do, they ignore doing it like doing exercise daily. Hence it is important to club their regular activities with play factor.

Lots of area can be looked upon for this purpose which can motivate elderly to do those activities which they find burden otherwise. The back end can be technologically complex but front end should be kept simple.

Future works

Future works with the e-mote:
- Solving problems found after usability testing
- Their can be many other functions in the dalily activity of elderly where e-mote can be mapped other than watching TV
- Exploration for the others function e-mote can do

Future works with the s-tory:
- making prototype for the concept
- adding more storytelling to it

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