

## Case Study Project

Design Thinking & Innovation  
Case Study

Section: C15, Week 15



D'source Project



Open Design School



MoE's Innovation Cell



**THINK!  
DESIGN**

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

Section: C15

Week 15



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

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



# DT&I Discourse

**C15 Expert Discourse:**  
Affordable Design Model  
Module C15:



# Expert Discourse:

## Affordable Design Model - *focus on India*

by

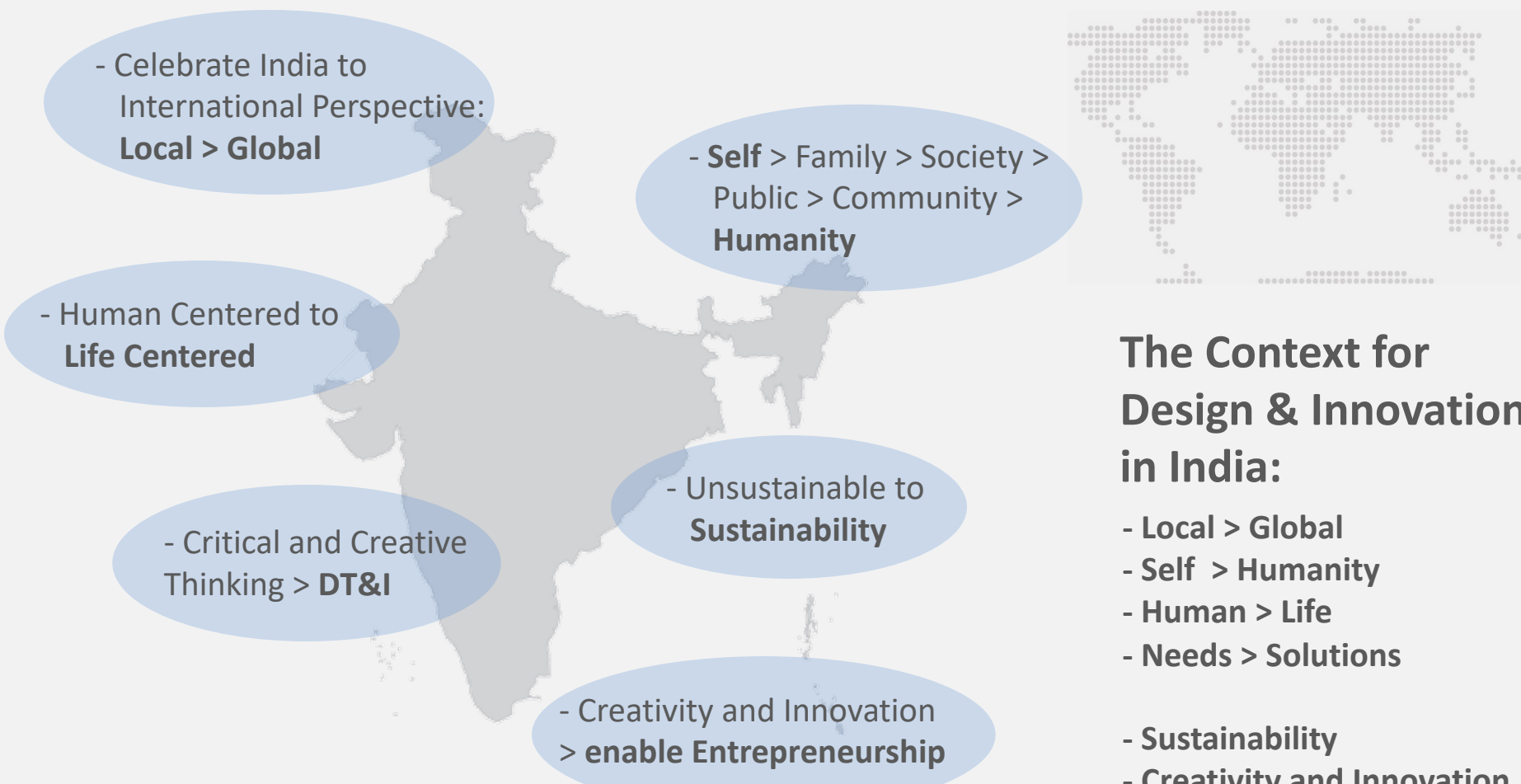
Prof. Ravi Poovaiah

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C16.1

# Context in India



- Celebrate India to  
International Perspective:  
**Local > Global**

- **Self > Family > Society >  
Public > Community >  
Humanity**

- Human Centered to  
**Life Centered**

- Critical and Creative  
Thinking > **DT&I**

- Unsustainable to  
**Sustainability**

- Creativity and Innovation  
> **enable Entrepreneurship**

## The Context for Design & Innovation in India:

- Local > Global
- Self > Humanity
- Human > Life
- Needs > Solutions
- Sustainability
- Creativity and Innovation

# Context for India: - trying to understand:

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India Population  
1.2 billion



Rural - 72%  
Urban - 28%  
641,000 villages



Literacy rates  
74%  
82% males  
66% women



Languages  
22 official  
1576 others



Newspapers - 60,000  
**Films produced - 1300**  
Tv Channels - 850  
Mobile - 1billion (80%)



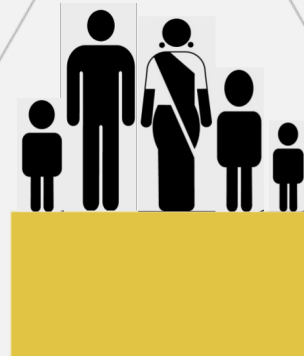


# Context for India: - trying to understand:

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Affordable Design  
for  
Social-Economic-Cultural Relevance?



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C15.2

# Contextual Efforts in India

# Initiatives in India – National Innovation Foundation:

- making a difference:

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► Professor Anil Gupta, IIM Ahmedabad

**National Innovation Foundation:**  
- analyzing the indigenous knowledge of farmers, artisans, and pastoralists, building bridges to science-based knowledge, and to ensuring that grassroots innovators are both encouraged and given credit for the results of their initiative and creativity.

- database of 225,000 innovations

# Initiatives in India – Navnirmiti:

- Making a difference:

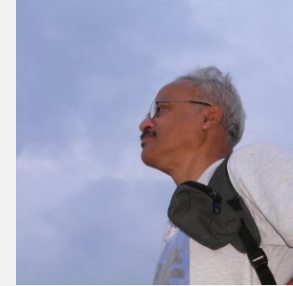
THINK!  
DESIGN



Maths kit



Activity kit



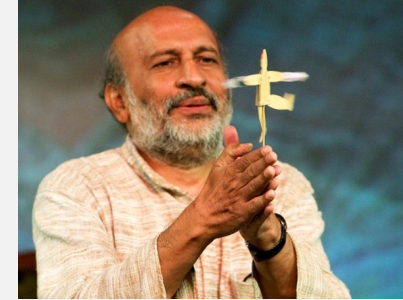
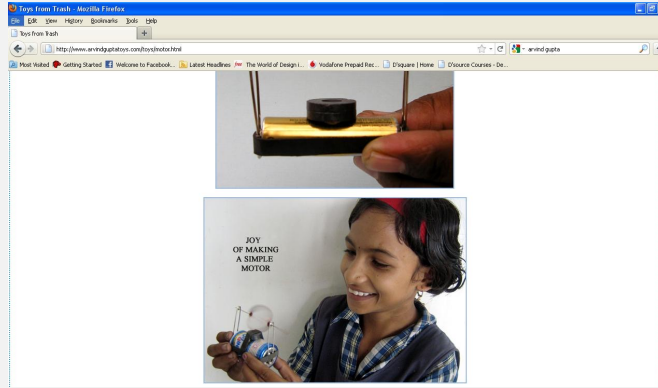
► Vivek Monteiro, Navnirmiti

- dedicated to acquiring, developing, innovating, producing and disseminating high quality, low cost/no cost (LCNC) learning methods, tools and systems to bring about universalisation of elementary mathematics and science skills and competencies.  
- being implemented in 6000 government schools



# Initiatives in India – Arvind Gupta Toys:

- making a difference:



► Professor Arvind Gupta, Toymaker

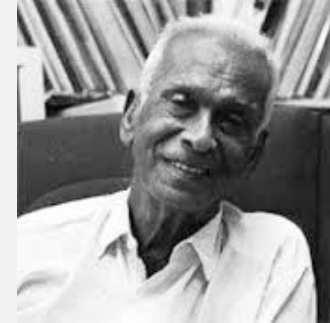
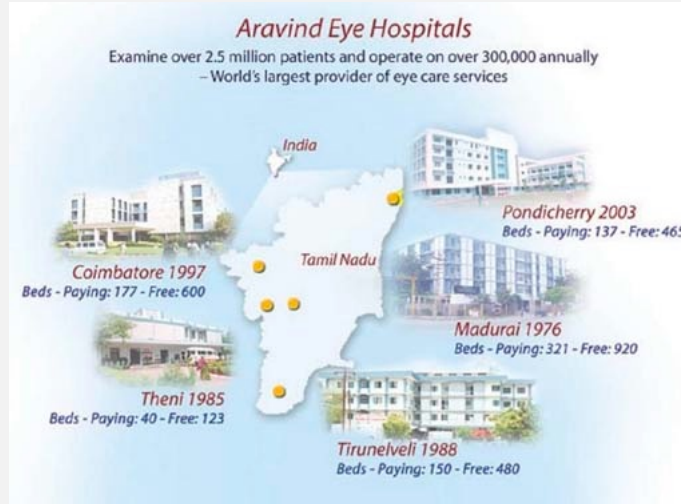
**Arvind Gupta** is an Indian toy inventor and populariser of science. Knowledge.  
- known for simple educational toys made from trash or articles of day to day use.

At present, he works at the Children's Science Centre located in the Inter-University Centre for Astronomy and Astrophysics (IUCAA) Pune, India.  
- 700 projects, 3000 schools



# Initiatives in India – Arvind Eye Care System:

- making a difference:



4 Dr. V (Venkataswamy), Founder

## Arvind Eye Care System

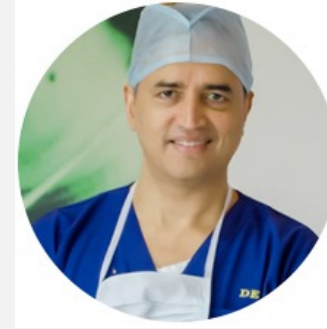
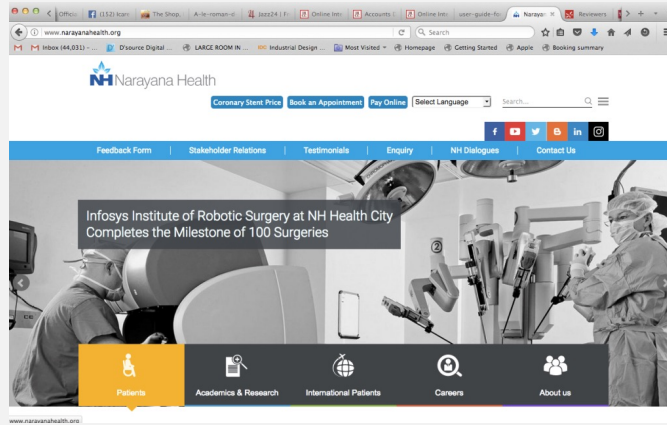
- performs 350,000 eye operations in a year
- has treated over 34 million patients (1976 .)
- 60% at no cost
- Excellent quality of care
- Rigorous performance management
- Highly standardized care delivery
- High staff productivity
- Willingness to innovate at all levels
- Inspiration -standardization and efficiency

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# Initiatives in India – Narayana Hospitals:

- making a difference:



► Dr. Devi Shetty, Founder and Chairman

## Narayan Hospitals

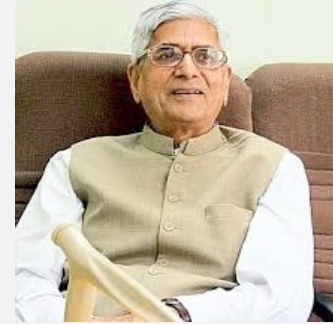
‘Hands that serve are more sacred than lips that pray’ Mother Teresa

- 100,000 operations
- \$1500 for open heart surgery
- marry affordability and quality
- 26-hospital network with 6,900 beds across 16 cities employing 13,000 people and 1,500 doctors
- profit making listed company



# Initiatives in India – Jaipur Foot:

- making a difference:



► R. Mehta, Founder

## Jaipur Foot

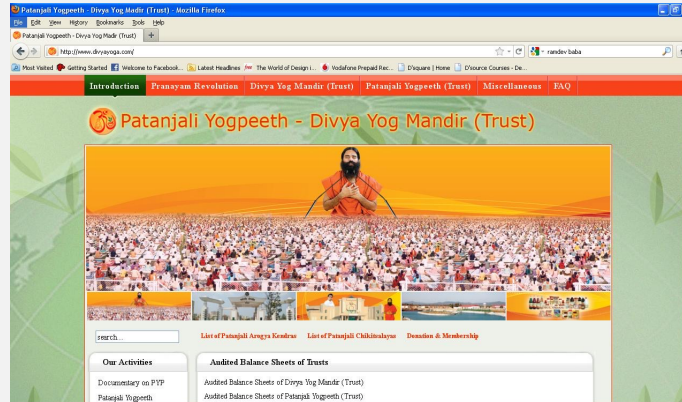
- 1.55 million users
- conceived by R C Sharma and Dr. P.K. Sethi
- with support from IIT's and MIT
- made of polyurethane
- Free



# Initiatives in India – Patanjali Yogapeeth:

- making a difference:

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► Baba Ramdev, Health and wellbeing

## Patanjali Yogapeeth

- His mission is to promote yoga, pranayam and rid people of their dependence on expensive modern medicines.

Tv viewership: 25 -100 million

Live participants: 5000 - 100,000

Patanjali: Claims cure for many diseases

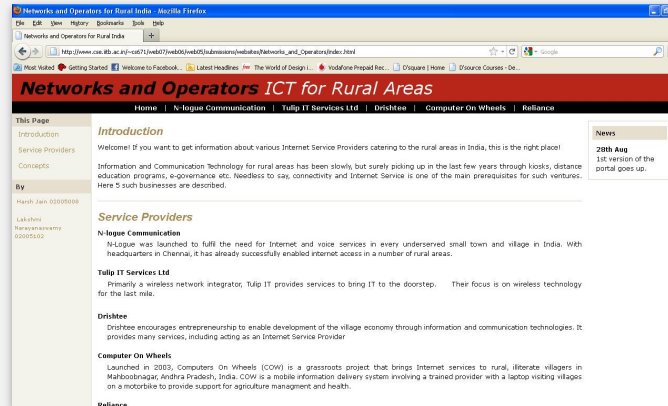
- 10,000 crore sales, 30 Billion Dollar Value

# Initiatives in India – ICT for Rural Areas:

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- making a difference:



► Ashok Junjunwala, IIT Madras

**We could put Internet in every village but for its cost?**

- TeNeT / VorTex develops ATM
  - » Finger print detection
  - » Internet kiosk based or Stand alone
  - » Deliver even soiled notes
    - » Single denomination today
    - » Can be extended to multiple denomination
  - » Electronic Lock operated using finger print detection
  - » Cost about Rs 60K for kiosk ATM / Rs 75K for stand alone

Vortex GramaTeller initiative, reducing the cost of ATM to 1/15th

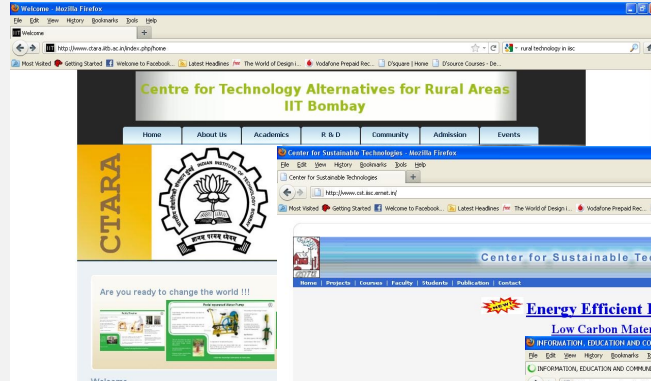
- Dr. Jhunjunwala leads the Telecommunications and Computer Networks group (TeNeT) at IIT Madras. This group is closely working with industry in the development of a number of Telecommunications and Computer Network Systems. The group has also incubated a company which aims to install and operate telephone and internet in every village in India.

# Initiatives in India – Focus on Rural sector: - making a difference:

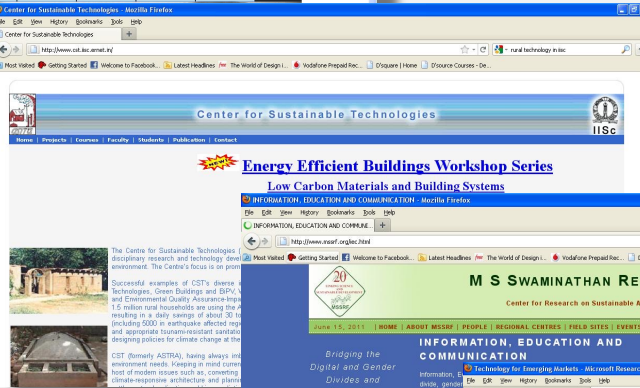
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CITARA, IIT Bombay



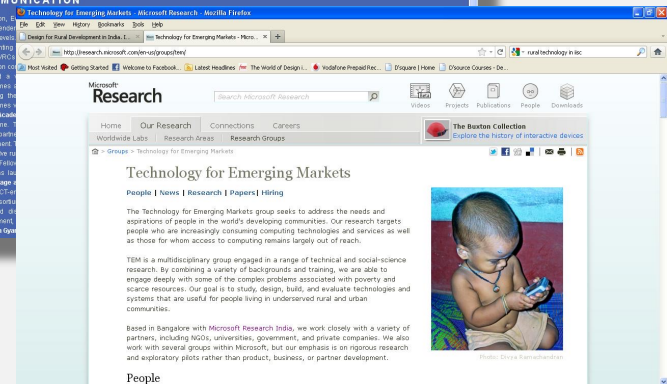
CST, IISc Bangalore



MSSRF, Chennai



MSR, Bangalore, India



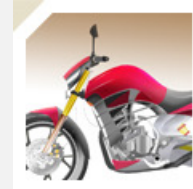
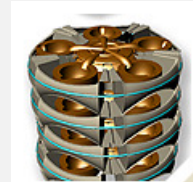
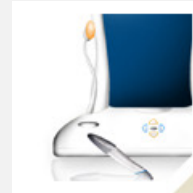
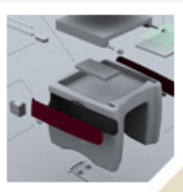
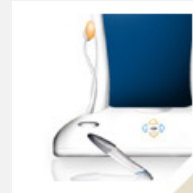
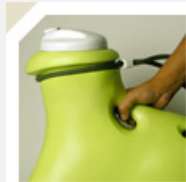
# Initiatives in India - Design for Social Needs:

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## IDC at IIT Bombay

1969 to present:  
Design for Unmet Demands



# Initiatives in India – Amul Co-operative:

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Gujarat Co-operative  
Milk Marketing  
Federation Ltd

Milk Co-operative

- Owner producers: 2.9 million
- Milk Produced daily: 9.1 million ltrs
- Turnover: 7 billion US \$



# Initiatives in India – tata Swach:

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Tata Swach Nanotech Water Purifier - Mozilla Firefox

Tata Swach Nanotech Water Purifier

http://www.tataswac.com/

Tata Swach\* Toll Free: 1800-2-585858

About Us | Available in Cities | Downloads | FAQs | Contact Us

For the First time in India Buy Tata Swach online...

Special introductory offer

TATA swach®  
NANOTECH WATER PURIFIER™  
VAADA SWACH PAANI KA, VISHWAS TATA KA

Special Offer Tata Swach family Awards

TATA Swach + extra TATA Swach Bulb Only ₹ 1498/- ₹ 50 OFF BUY NOW

TATA Swach Smart + extra TATA Swach Bulb Only ₹ 1213/- ₹ 35 OFF BUY NOW

No need to boil

Features Technology My Tata Swach Water Zone Media Center Track your Order

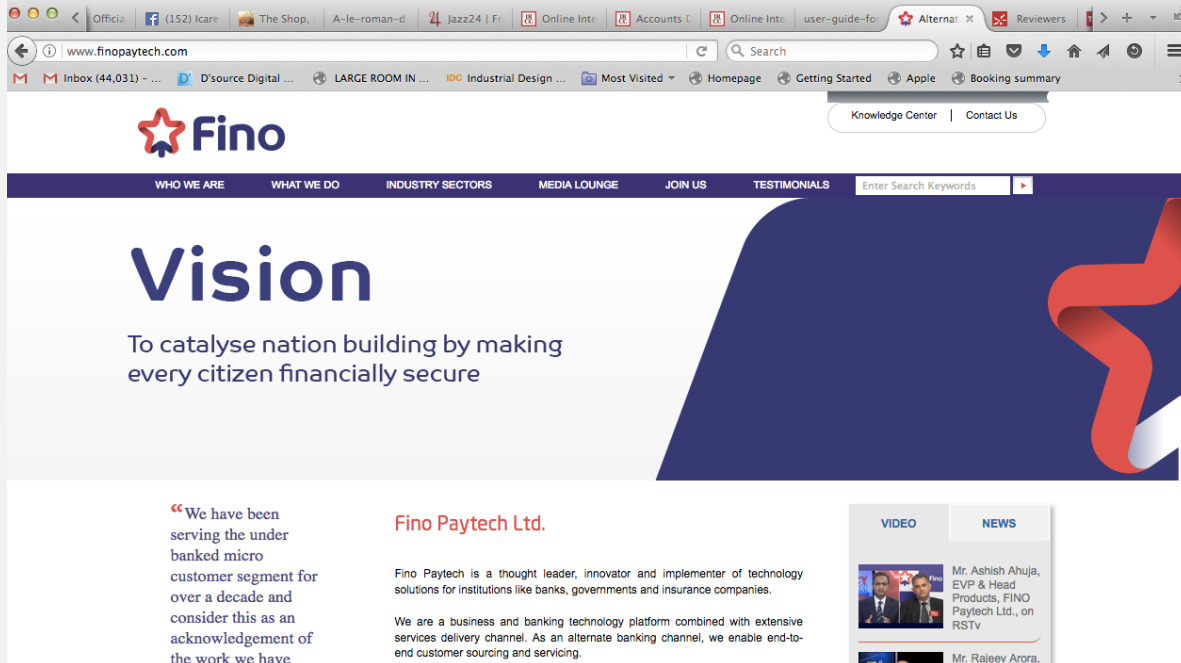
## Water Filter

- Rice Husk Ash as filters +
- Using Silver Nano particles
- No electricity
- Aims to market 3 million a year

THINK!  
DESIGN



# Initiatives in India – Fino finance Solution:



FINO solutions are anchored around using biometric smart card, hand-held devices and Micro Deposit Machines to perform field operations and biometric authentication.

- States covered: All
- Villages covered: 50,000
- Customer base: 10 million
- Employees: 25,000

# Initiatives in India – Fino finance Solution:

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Unified Payments Interface (UPI) is a system that powers multiple bank accounts into a single mobile application, merging several banking features, seamless fund routing & merchant payments into one hood.

- Number of Banks: 622
- Villages covered: 15,000 million
- Value of transaction: 20,64,000 crores in Sept 2024



THINK!  
DESIGN

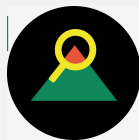


# Initiatives in India – tata Nano:



- Small Car (started in 2003)
- Economical Engineering
  - Young Team of 500, 25 -35 years
  - Bottom upwards
  - Retails at US \$ 3000/-

THINK!  
DESIGN



# Initiatives in India – Sakshat Tablet:

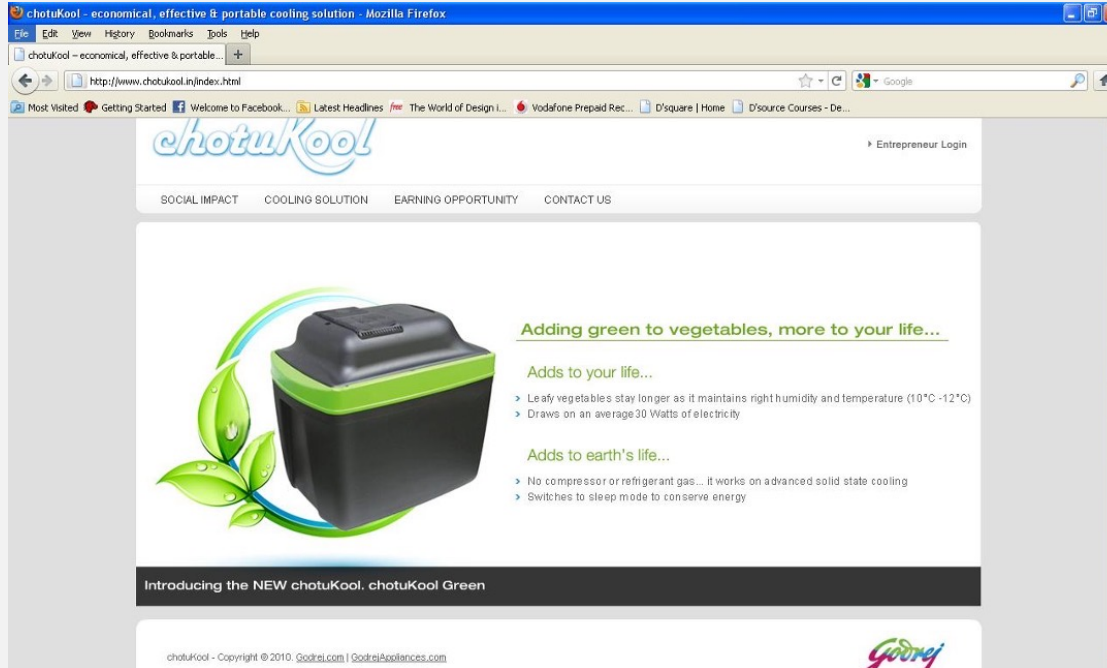


## Tablet PC

- Cost US \$ 30, 2GB Ram, 32 GB Hd
- Using Linux and Andriod - open source
- Partnership with IIT's for applications

# Initiatives in India – Chotu Kool:

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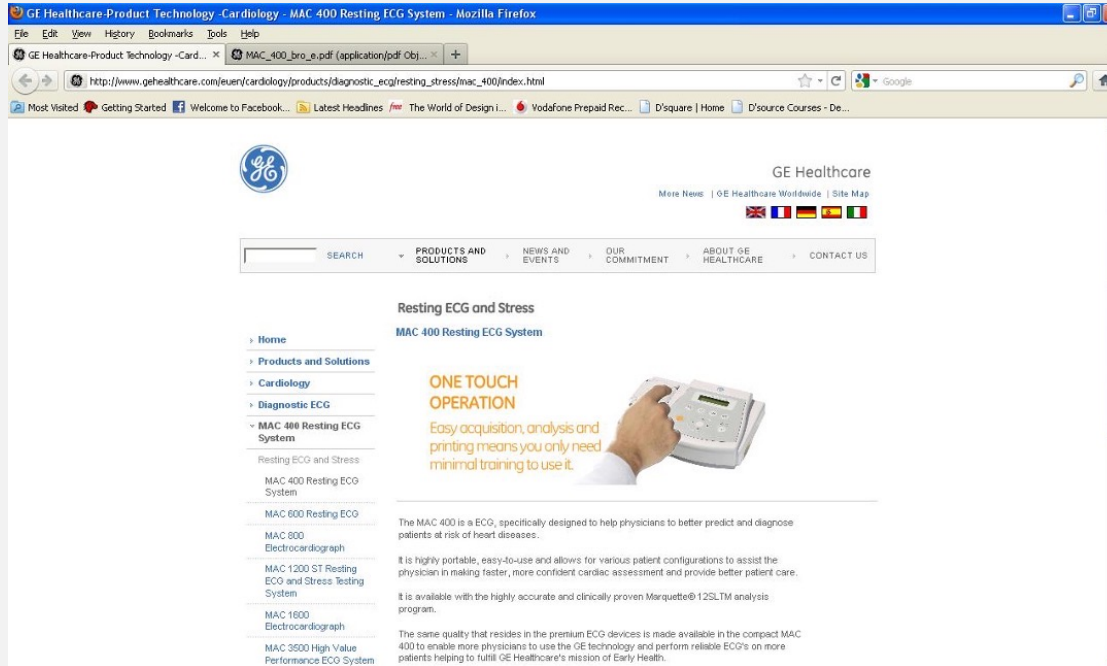


## Refrigerator

- cooling chip along with a fan
- Runs on Dual supply 230V AC & 12V DC
- Co-created with Village women
- Retail at Rs 3500/-

# Initiatives in India – Hand held Cradiogram:

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Hand held Cardiogram

- Efforts by GE India
- ECG test cost Rs 100/-
- Retails at Rs 65,000/-

THINK!  
DESIGN



C15.3

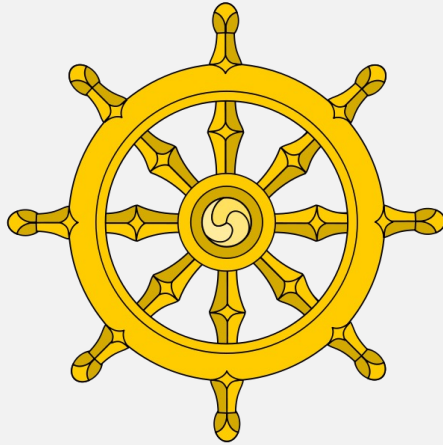
# Factors for Affordable Design

## Factors for Affordable Design:

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- Minimalism - less is more:



► Buddhism

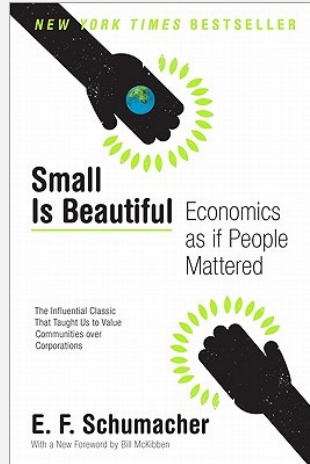


► Gandhism

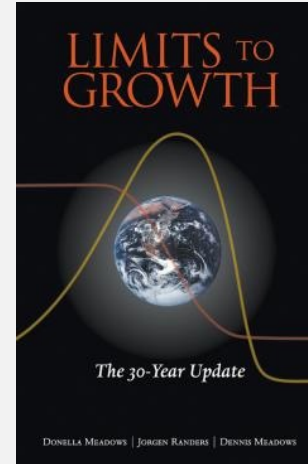
- Sustainable practices - cultural

## Factors for Affordable Design:

- Influences - 2 books in the 70's:



- Small is Beautiful  
- Schumacher



- Limits to Growth  
- VW & Club of Rome

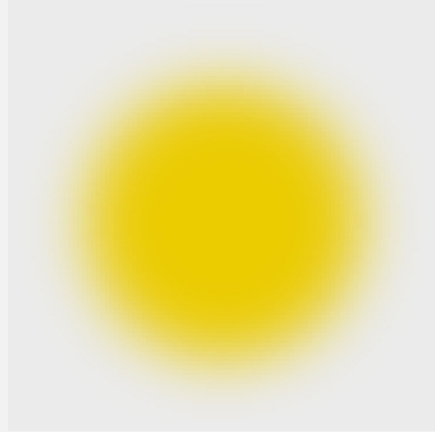
THINK!  
DESIGN



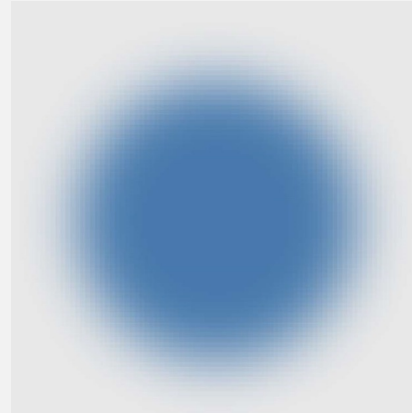
## Factors for Affordable Design:



- Sustainable - Footprints:



▸ Energy



▸ Space

- Consumption
- Environment



# Factors for Affordable Design:



- Cultural - Belief Systems:

- Storytelling > Myths > Iconography > Symbols > Rituals > Sacred Spaces > Belief Systems > Practice



▸ Sacred Groves



# Factors for Affordable Design:

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DESIGN



- Structure to Variations:



- Rangoli patterns . . .  
Textile Patterns,  
Classical Music,  
Temple Architecture,  
etc.

# Factors for Affordable Design:

THINK!  
DESIGN



- Modular + Do It Yourself:



► IKEA Furniture Ideas

- DIY Kits



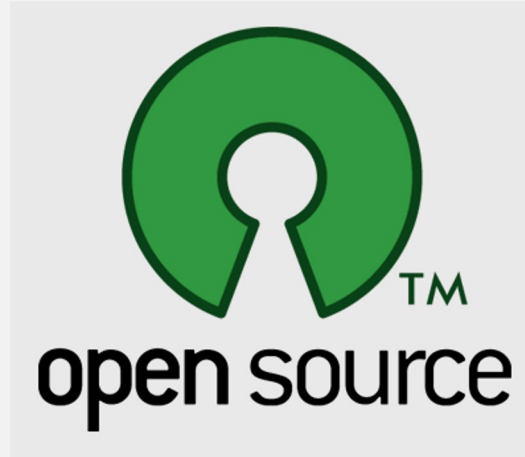
## Factors for Affordable Design:



- Knowledge Shared is Knowledge gained:



► Traditional Knowledge



► Sharable knowledge

- Traditional knowledge systems
- Strong belief in open source
  - free to be used
  - generated by people

# Factors for Affordable Design:

THINK!  
DESIGN



- Innovations around real needs:

1

**Start from user insights**

- Through social, cultural, economic factors
- MOP/BOP as user segment

2

**Start from the bottom**

- Minimum requirements/constraints
- and design upwards

3

**Apply Economical Engineering Techniques**

- Adopt, Reduce, Combine, Repeat, etc.
- Mass produce, Out-source, Open Source, etc.

4

**Tweaking of existing technology**

- Mobile + Tv, Mobile + Banking, Phone + Email, etc.
- Pulp + Filter,

# Factors for Affordable Design:



## • Bootstrapping of Resources:

- ▶
  - Social Design
  - Reverse Innovation
  - Constraint based Innovation
  - Tweaking of Technology
  - Frugal Innovation
  - Affordable Design
  - Jugaad

### ▶ Insights:

**Middle and Bottom of Pyramid are important sectors**  
- not just socially but economically




**Apply bootstrapping techniques in the process of design and engineering**



**Jugaad as a management technique**  
- questionable ???





**Thanks very  
much for  
Listening**

**DT&I Expert Discourse**  
Section: C15  
Week 15



# DT&I Case Study – Week 1-8:



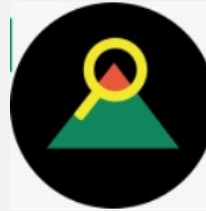
## Week 1

> Jellow  
Communicator  
(CD + IxD)



## Week 2

> Smaran for the  
Elderly  
(PD + IxD)



## Week 3

> Learning Culture  
through Stories  
(CD + IxD)



## Week 4

> Solar Powered  
Pesticide Sprayer  
(PD)

## Week 5

> Smart Device for  
Bedroom  
(IxD + CD)

## Week 6

> Lap Crate: a  
Takeout Box  
(PD + Packaging D)

## Week 7

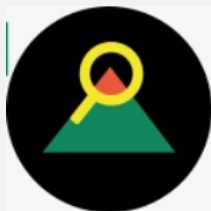
> Sustainable Housing  
Society +  
Coffee, Tea and Spice  
Stories  
(Service D)

## Week 8

> The Indian  
Medicine System  
(PD + CD + IxD)

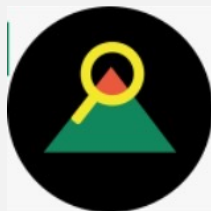


# DT&I Case Study – Week 9-16:



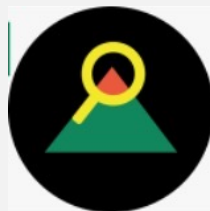
## Week 9

> Geo-Lights  
(PD + Space Design)



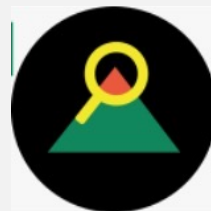
## Week 10

> BPCL Retail Vision  
& Identity Design  
(CD + PD + Service D)



## Week 11

> Marbo – sharable  
data units  
(CD + IxD + PD)



## Week 12

> Storage Design to  
reduce Post-harvest  
loss of Vegetables  
(PD + Packaging D)

## Week 13

> Design Of Bamboo  
Sliver Furniture  
(PD)

## Week 14

> Redesigning a Solar  
Powered Cookstove  
(PD)

## Week 15

Expert Discourse:  
> Affordable Design  
(All disciplines)

## Week 16

Expert Discourse:  
> Innovation and.  
Creativity  
(All disciplines)

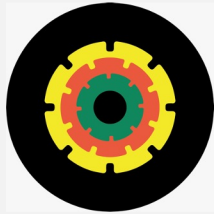
THINK!  
DESIGN

# DT&I Course – Week 16:



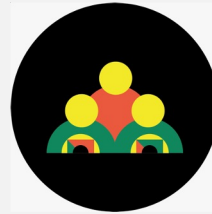
DT&I  
Process  
(20%)

- > Final Design
- > Report
- > Presentation



DT&I  
Tools  
(20%)

- > Report
- > Presentation Tips



DT&I  
Project  
(50%)

- > Final Report Submission
- > Final Presentation Submission



DT&I  
Cast Study  
(10%)

- Expert Discourse:
- > Innovation and Creativity



## Supporting Organizations:



D'source Project



Open Design School



MoE's Innovation Cell



## Credits:

Introduction by:  
Prof. Ravi Poovaiah



D'source Project



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## Credits:

### Expert for Discourse:

Prof. Anil Gupta

Founder,

The Honey Bee Network, National Innovation Foundation, , SRISTI and GIAN



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<http://nif.org.in>

<https://www.sristi.org>

<https://gian.org>



## 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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