

# Reaching the Un-reached:

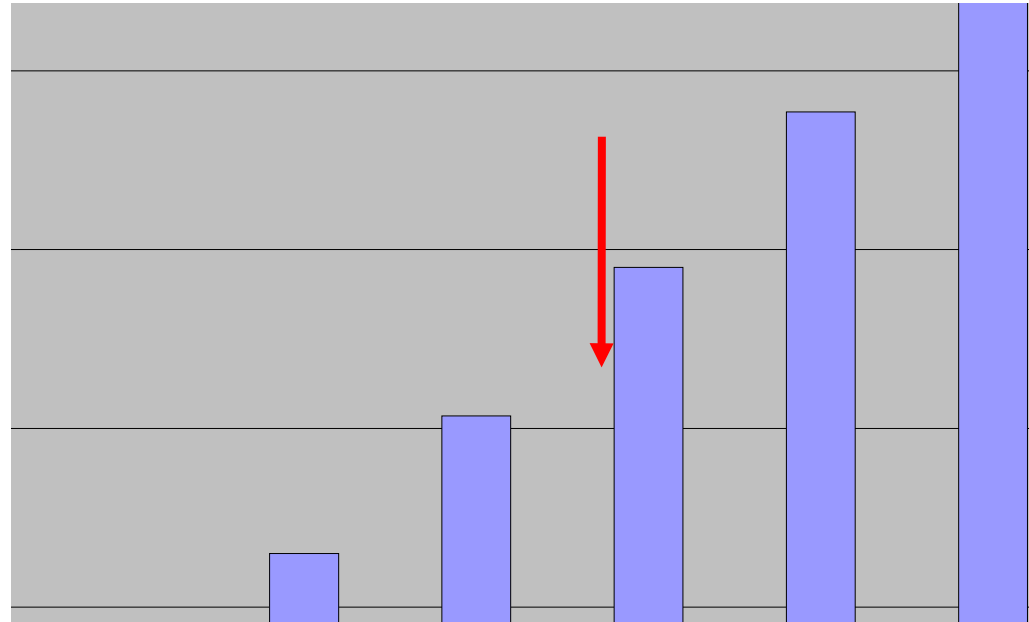
## Innovations and Policies accelerating India's march

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# Mobile Market in India boomed

5 million  $\Rightarrow$  50 million  $\Rightarrow$  150 million  $\Rightarrow$  400 million

- ♦ Not just because of right policy, but also
- ♦ with handset price of US\$30 plus
- ♦ Infrastructure cost reduces to enable
  - service at 1.5 cents per minute
  - and ARPU of \$ 7 per month



- ♦ Need a different price point for the next 300 million rural subscribers
  - Service at 0.5 cents per minute
  - ARPU of US\$ 2 per month

# Tasks ahead

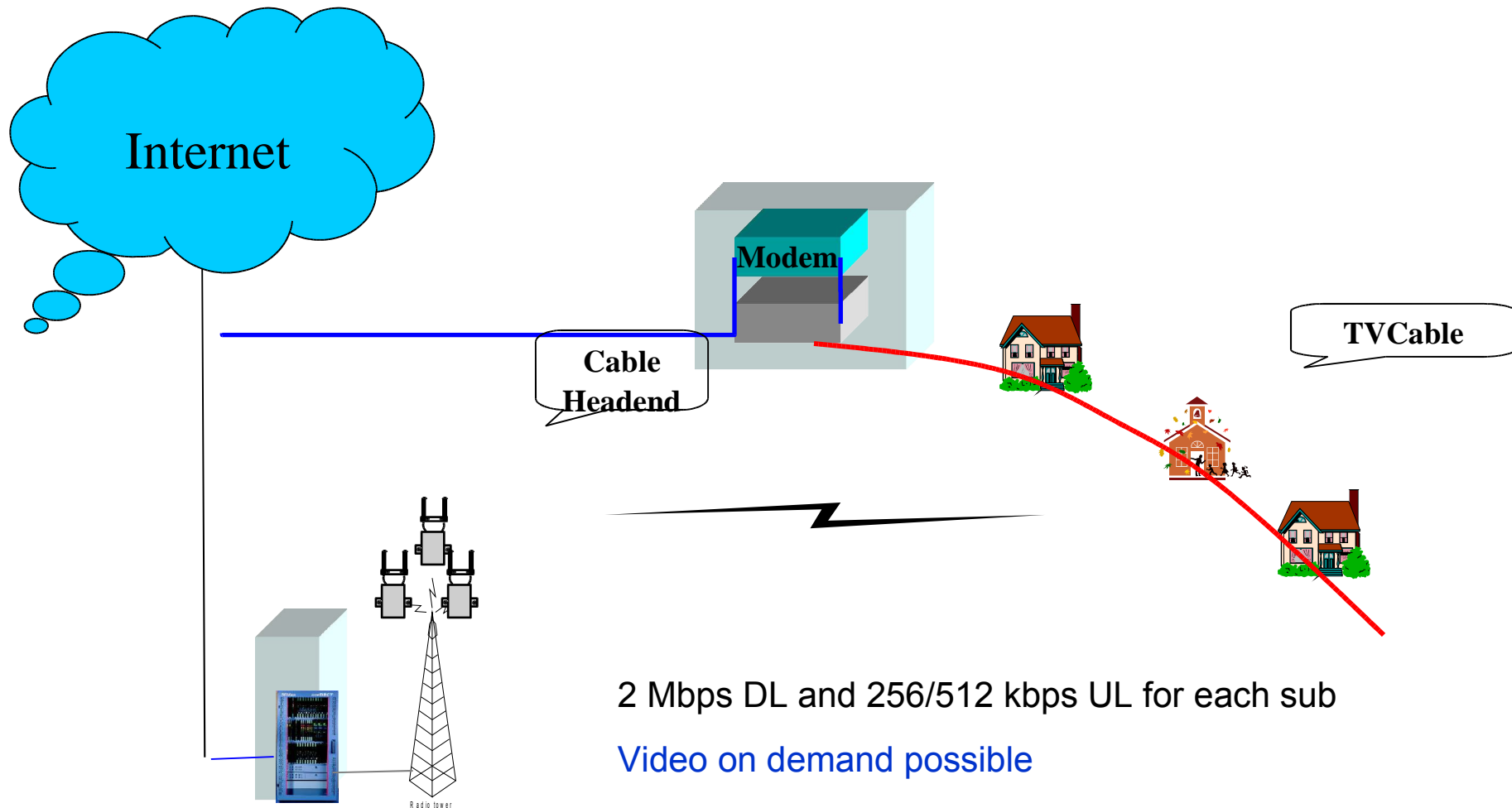
- ♦ Broadband: 50 million in next five years
- ♦ Rural
  - expand mobiles to rural areas
  - Internet in each village

# Broadband Connectivity

- ♦ India has less than 1 million Broadband Connection
- ♦ DSL being made available by incumbents (BSNL / MTNL)
  - Tariff falls to US\$ 6 per month: has happened
- ♦ New Carriers are at a disadvantage
  - needs Broadband Wireless to compete with incumbent
  - Needs 9 bits per second per Hz to compete with low-end DSL
    - UMTS/ EVDO: 1.8 bps per Hz mobility Today
    - Flash OFDM: 4 bps per Hz mobility Today
    - BB corDECT: 10 bps per Hz LoS Today
    - 802.16E (WiMax): 4 bps per Hz mobility 2007

# Cable Wireless

Down Stream on Cable Upstream on Wireless  
shares infrastructure with BB corDECT



2 Mbps DL and 256/512 kbps UL for each sub

Video on demand possible

Broadband expansion will however be limited

- ♦ Till we get the right Access Device
  - Today's PC Cost about US\$ 350 with SW
  
- ♦ NetPC (Multimedia Network PC)
  - Connected to a PC Server on LAN or Broadband
    - No virus, no back-up required
    - no upgrade every four years
    - Management at server
    - Software costs shared
  
  - Target price: US\$ 80 plus monitor
    - Works with Windows, Solaris, Unix and Linux Servers



# Rural India has 700 million people

- ♦ in 600,000+ villages (about 1000 people per village with per-capita income of US\$0.50 per day)



135 million rural households



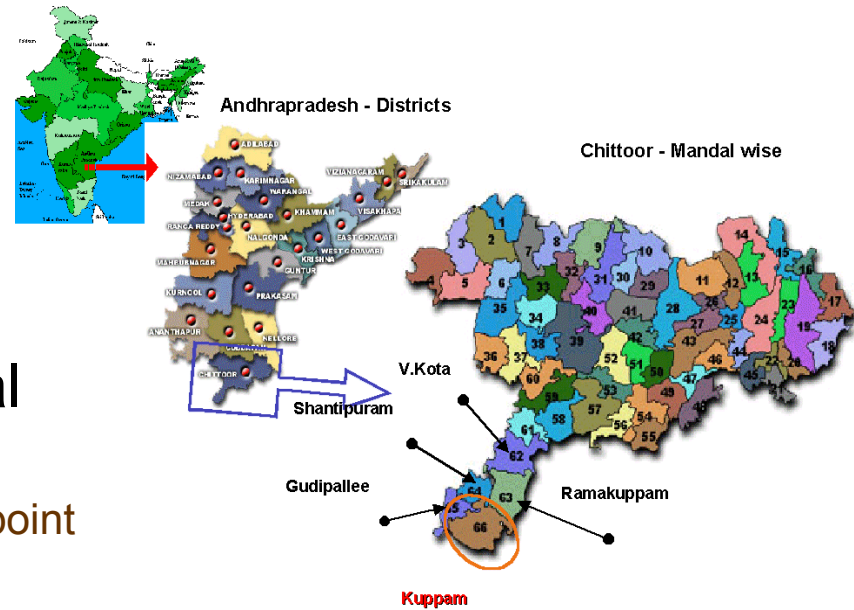
1,30

840

- ♦ In addition to telephony, Internet plays a great role to bring in Education, Health & Micro-enterprises
- ♦ To scale to 600K villages
  - Technologies
  - Sustainable Business Model
  - Organisation which thinks and acts Rural

# Backbone Connectivity

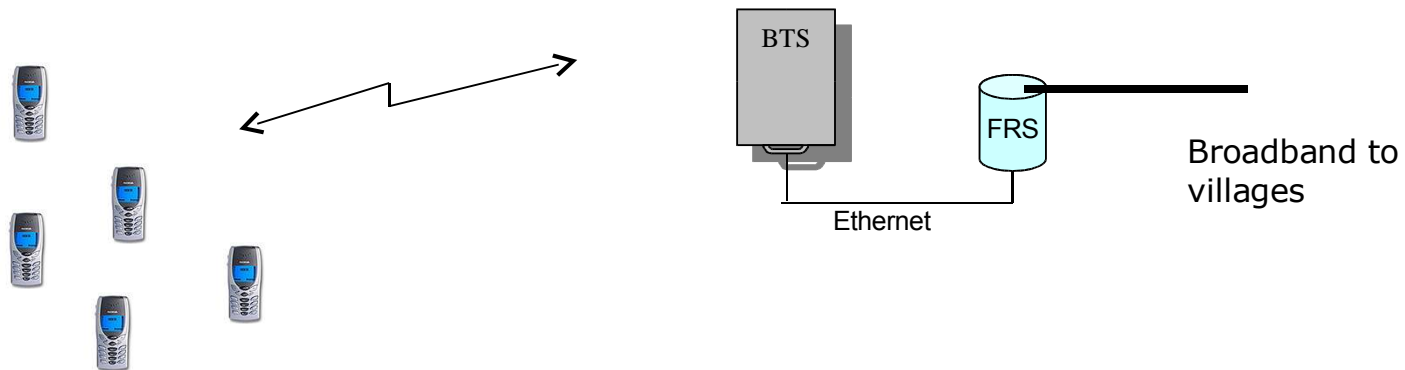
- BSNL, Tata, Reliance, Bharati, Railtel, others have fibre to each taluka
- ♦ Lease Bandwidth to make a Rural backbone
  - ▣ Serve 300 villages around each fibre point



- ♦ Wireless technologies are continuously evolving
  - costs come down and bit rates go on increasing year after year
    - ▣ GSM / CDMA
    - ▣ BB-corDECT
    - ▣ WiMax, Flash-OFDMA

# GSM/ CDMA for Rural connectivity

- ♦ Rural GSM Base Station in each village
  - Enables differential tariff for phones registered in the village and making calls from the village
  - Enables Rural affordability to not affect urban ARPU



# Business Model:

- ♦ Entrepreneur-driven operator assisted telephone booths introduced in 1987
  - 950,000 such PCOs covering every street
  - generate 25 % of total telecom income serving 300 million people
- ♦ Lesson for Rural India:
  - To serve Rural people with incomes less than \$ 1/day, aggregate demand at every village and let Entrepreneurs drive it
    - No one should have to walk more than 500 m to access services
    - Provide as many services as possible

Aid/ Grant does not scale  
Successful Enterprises can scale to all villages



# Education: Remote Tutorials

## SECTION

Short Question  
Synonyms  
Antonyms  
Prefix & Suffix  
Passage  
Questions  
Phrases &  
Idioms  
Quotes from  
Memory  
Poetry I  
Poetry II  
Composition  
Rewrite  
Passage  
Dialogue

And as my fingers pressed it, still  
It moved and yielded to my will.

This is from the poem "The Sculptor"

**1**. What does 'it' refer to ?

'It' refers to the plastic **clay**

**2**. Was the clay flexible ?

Yes, The clay was **flexible**.

ed it, still  
my will.

The Sculptor"

**களிமண்**

Poetry I  
Poetry II  
Composition  
Rewrite  
Passage  
Dialogue

**2**. Was the clay flexible ?

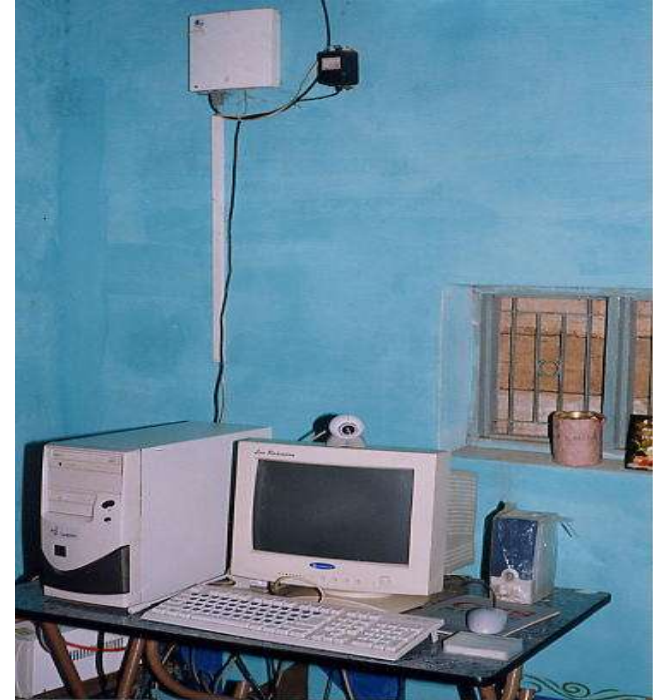
Yes, The clay was **flexible**.

# Innovative approach

## ♦ n-Logue : A Rural Service Provider

- aggregate demand into a kiosk
- and get an entrepreneur to drive it
- ITC e-choupal and Drishtee following similar models

- US\$ 1200 per Kiosk providing telephone, Internet, multimedia PC with web-camera, printer and power back-up for PC
  - plus Indian language software, video conferencing software, training and maintenance
- set up by a village entrepreneur on the lines of urban PCOs
  - provides telephone, stand-alone Computer and Internet services
  - needs US\$ 80 per month to break even



# Outsourced Production enabled by Internet

## ♦ Embroidery for Life

- Women embroiderers trained by designer entrepreneur in villages
- An emerging business model for entrepreneur and kiosk operator



## ♦ Bags for Life

- Training in handmade paper bag, organizing production, quality control
- Quality products for the domestic and export market



# IT enabled Services:

Job work performed at the kiosk



# ReMeDi™ Tele-medicine solution



Tele Diagnostic Kit-Version 0.9

Settings Connect Record Help Tools Audio

Patient Details

ID: 2  
First Name: Rajan  
Last Name: M  
Age: 24  
Sex:  Male  Female

Send Create

Measurements

Case ID: 1 For:

Stethoscope

Close

Blood Pressure

Current Pressure

Systolic: 101 Diastolic: 76 Pulse: 96

Control

Stethoscope: Start Stop Close  
Blood Pressure: Start Stop Close  
Electrocardiogram: Start Stop Close  
Thermometer: Start Stop Close  
Control: Delegate Grabback  
Result: Get Result

ElectroCardioGram

Print Close EnableFilter

LEAD I

Vert: 0.1mm/mV, Horz: 25mm/Sec

B: Doctor | 49.38 Kbps / 4.41 fps

Temperature (Deg F) 97.6

symptoms

Symptoms Diagnosis Prescription

Send

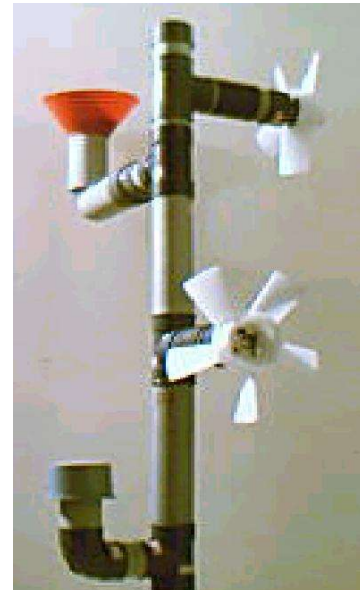
B: Patient | 51.29 Kbps / 3.43 fps

For Help, press F1

Start Connected t... B: Doctor [ 4... B: Patient [ 5... NUM 6:27 PM

# Micro-weather prediction

- ◆ Collect weather data at each village
  - Temperature, humidity, pressure, wind speed, wind direction and rainfall
  - Can one use micro-weather prediction systems?
  - Use village data for weather insurance
- ◆ Weather Monitoring Kit : US\$ 200
  - Remote Measurement of each of these parameters at each village multiple times a day and recoding at some central server



Huge potential Impact on crop insurance, micro weather models, prediction, disaster management

# Financial Services

- ♦ Can kiosks be mini-banks?
  - Can they facilitate agricultural loans?
  - Can money transfer from cities/ urban areas be facilitated?
- ♦ Can kiosks facilitate micro-finance?
  - Can the interest rate be significantly brought down?
- ♦ Can kiosks carry out credit-rating of rural people?
- ♦ What about Insurance?

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



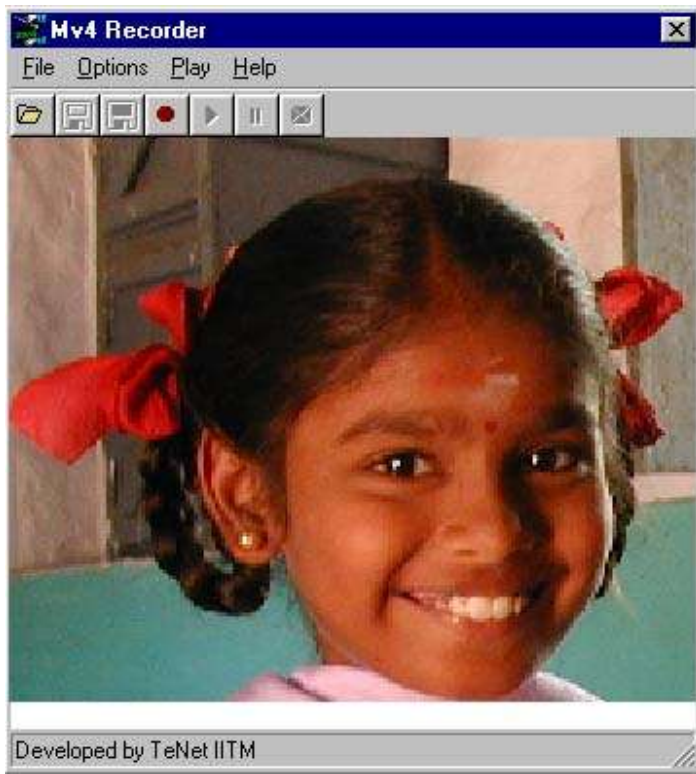
# Services Status

- ♦ Infrastructure 3+
- ♦ Capacity Building 2+
- ♦ End to End Services using ICT 4
  - Basic Services (email, browsing, games, DTP, astrology, matrimonial, photography)
  - Communication Services (VoIP, Mobile) 3
  - Education 3+
  - Micro-franchise 2+
  - ITeS 2+
  - Telemedicine 2+
  - Agriculture 2-
  - Financial Services 2-
  - Jobs 0
  - Buying and Selling 1-
  - E-governance 1+
  - Micro-enterprise 0+
  - Online Games 0

- ♦ How do we drive each of these to 4+ in the next two years?
- ♦ How many companies does each require?
- ♦ What about community oriented services?

# To Sum Up

- ♦ Internet technologies can impact lives provided there is a big enough Vision
  - 50 million Broadband Connections by 2010
  - Dream of Doubling per capita Rural GDP



- Lots of Innovations required
- Agriculture Support key to Rural Wealth
- Power Supply will be key bottleneck
  - Entrepreneur sets up (20-50KVA) back-up power plant and distribute in the village