

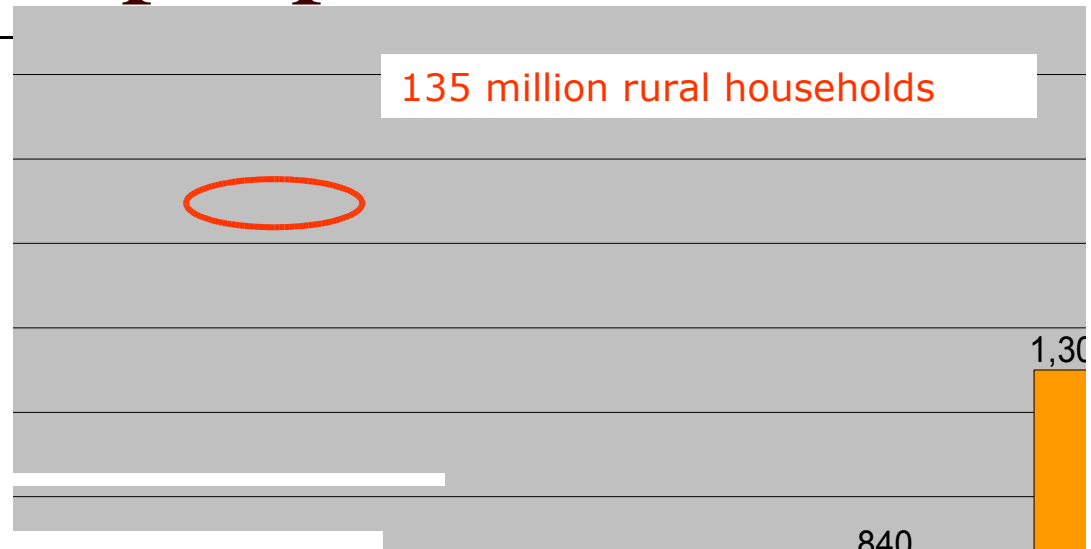
Leveraging India as India Stands up

ashok jhunjunwala,
TeNeT Group, IITM, Chennai
ashok@tenet.res.in



Changing India

India has billion people, but...

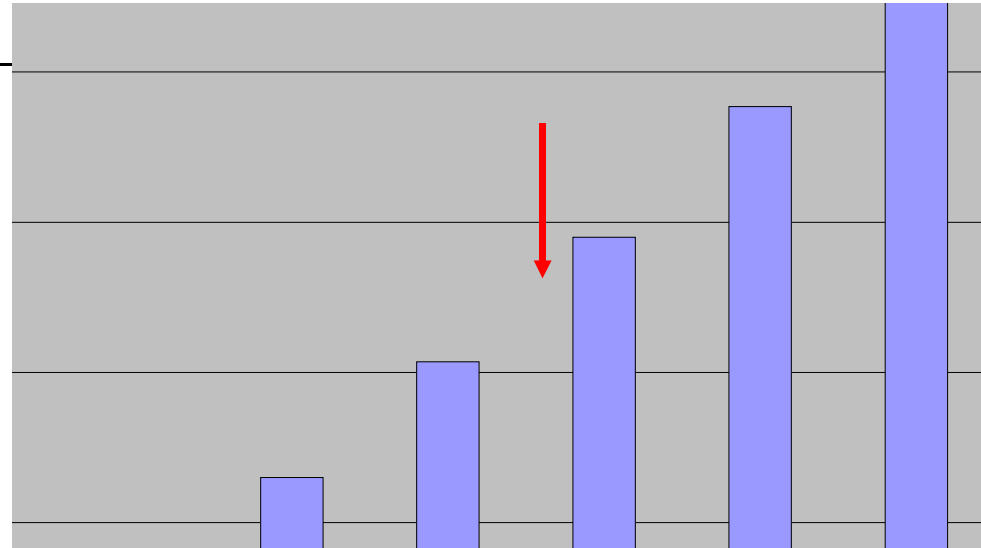


65 million urban HH in India

Mobile Market in India boomed

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

TENET
IIT Madras



- ◆ Not until Mobile Infrastructure Capex < US\$ 100 per line
 - ◆ and with handset price of \$ 50 onwards
 - ◆ service available at 2 cents per minute
 - ◆ ARPU of about US\$ 7
 - ◆ 5 million subscribers added last month



- ◆ Just Like number of TVs in India rose from 10 million to 100 million in 90's when prices became \$50 onwards and cable TV tariff fell below \$2 per month
 - Number of TV channels boomed
 - Entertainment industry in India one of the biggest

Airline Industry

- ◆ Is booming in India
 - ◆ doubled its passenger carrying capacity in two years
 - ◆ Average tariffs have fallen by half making it affordable to middle class Indians
 - ◆ In spite of rising petrol prices

The only limitation to growth is the airport infrastructure

-
- ◆ Growth of IT and IT enabled services is legendary
 - ◆ Crossed \$28 billion this year
 - ◆ Likely to reach US\$ 50 billion revenue by 2008

The World is Flat

But you aint seen nothin yet

for the changes has not yet touched Rural India



The not so visible

Engineering Education

- ◆ 400K engineering students graduate every year from 1500 engineering colleges
 - ◆ Up from 25,000 in 100 schools in early eighties
- ◆ Uneven quality is a major problem
 - ◆ was foreseen and resulted in reluctance to expand

But it is this human resources which has driven growth

“Our politics is obstacle to growth!”

- ◆ License fee bids in 1994 was astronomical
 - ◆ Operators soon found that they were chasing a mirage
 - ◆ Privatization was caught in legal quagmire

- ◆ Democratically elected Government changed the ground rules completely in 1999
 - ◆ Agreed to forego the large license revenue
 - ◆ And entered into revenue share agreements with NTP99
 - ◆ Quite unlike what European Governments were able to do with 3G license

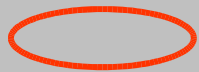
We make plenty of mistakes, but we correct them in nick of time

Rural India has 700 million people

- ◆ in 600,000+ villages (about 1200 people per village with per-capita income of **US\$0.50 per day**)



135 million rural households



1,30

840

Even in Rural India early signs of changes taking place

- But a long way to go

Distributed Production enabled by Internet

◆ Embroidery for Life

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

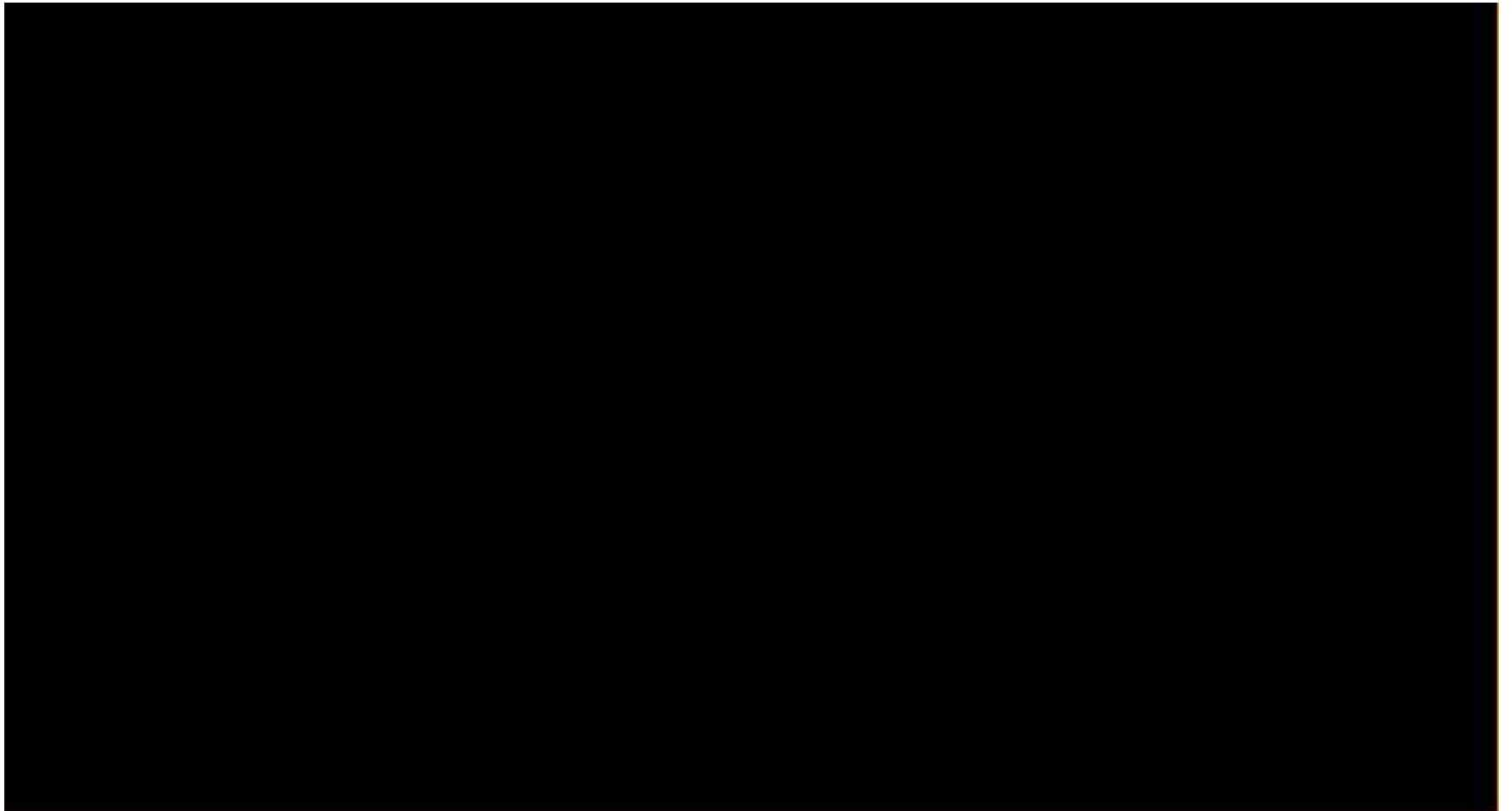


◆ Bags for Life

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



Job work performed at Rural kiosk



Innovation

The Story of TeNeT Group

Incubating Entrepreneurs in a University

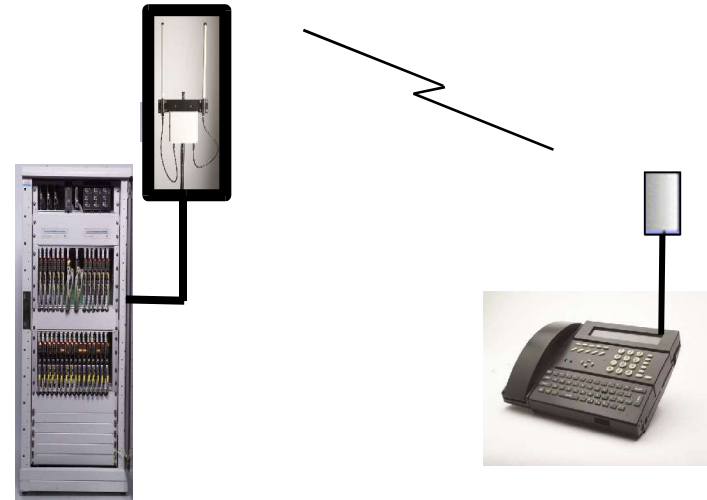
Balancing Economic Growth & Social Development

A group of 16 faculty members at IITM and about 14 companies incubated or nurtured by it with about 1400 engineers

TeNeT Learnings

- ◆ Successful Business is the best way to drive development dreams of a country
 - ◆ Let entrepreneurs flourish
 - ◆ Examples:
 - ◆ Entrepreneur lead PCOs (STD) brought in telephony to 300 million middle and lower middle class Indians
 - ◆ Local Cable TV operators brought in cable connection to homes at US\$2 per month
 - ◆ Telecom/ airline / IT and ITeS
- ◆ India is a large market at the right price point
 - ◆ Nirma, sachet shampoo

1994TeNeT Vision:
Connect India with 100
million telephones



Identify Local Loop Capex as
primary bottleneck:
Incubate **Midas**: help develop
Wireless in Local Loop
technology

- ◆ 2005
 - ◆ India crosses 100 million telephone lines
 - ◆ corDECT WiLL sales cross US\$ 200M (Rs 1000 Crore)

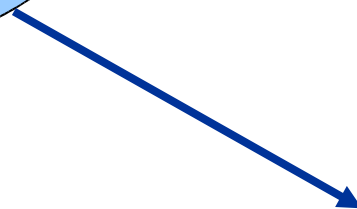
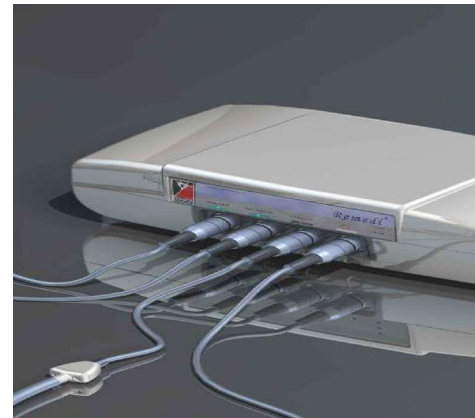
TeNeT 2001 Vision:
Connect every village
of India



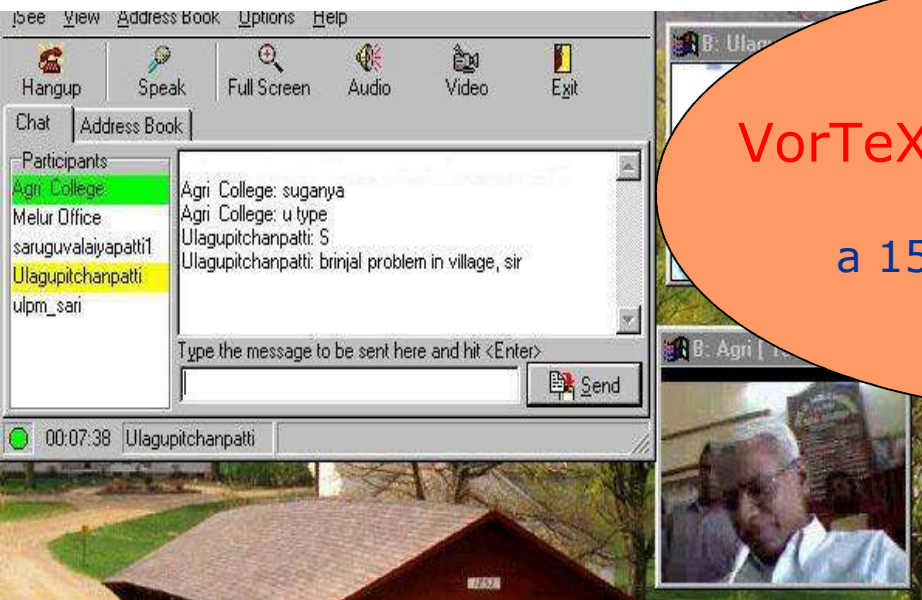
n-Logue focuses on
Internet Connection to each
village and drive education,
health and microenterprises
Double per capita
Rural GDP using ICT

- ◆ aggregate a village demand into a kiosk owned & driven by a local entrepreneur
 - ◆ US\$ 1200 (Rs 55,000) Kiosk providing telephone, Internet, multimedia PC, printer and power back-up, plus Indian language software, video conferencing software, training and maintenance and 6 months unlimited Internet

TeNeT Vision:
Double per capita
Rural GDP using ICT



VorTeX designs a Rural ATM
at US\$ 1200
a 15th of prevalent cost



50 Million Broadband Connections in India by 2010

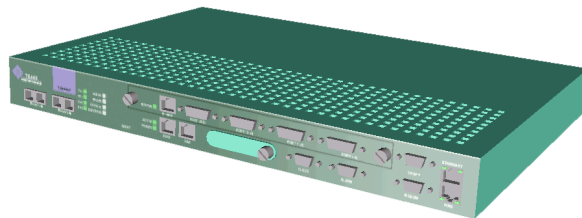
- ◆ Midas drives the Broadband connectivity Solution
 - ◆ From wireless, DSL and cable wireless
 - ◆ Introduces disruptive technologies like Cable wireless leverages existing coax infrastructure

- ◆ Novatium introduces NetPC at US\$ 80 plus monitor
 - ◆ Lower maintenance as all data stored in servers

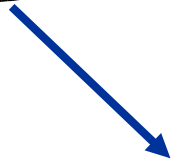


As Telecom Product companies in West Recede

- ◆ and as Chinese companies try to fill in the void
- ◆ Imperative for India to build Billion Dollar product companies
- ◆ Midas and Tejas (with leadership in Optical Products moving towards such dreams



Aggregating
companies: Telecom
Products and Applications



NMSWorks
Building Network
Management Software
for efficient Management
of Large Networks

Network Space

Can India become

- ◆ Technology leader in one or two areas?
- ◆ TeNeT helps India Create a public-private Partnership toward leadership in Wireless Technology
 - ◆ Center for Excellence in Wireless Technology (CeWiT)

IITM Research Park

- ◆ IITM in process of building 1 m sq ft Research Park
 - ◆ for industry to work closely with IITM





Leveraging this Changing India

Europe has not leveraged India

- ◆ US companies has some of their key products being developed in India
- ◆ IBM is slated to employ 50,000 people in India by mid 2006

- ◆ UK Companies need to do much more

Make India a Product House

- ◆ Conceptualize, build and drive new products from India
 - ◆ use India talent
 - ◆ use Indian academia

- ◆ Develop products for Lower Income Emerging Markets like India
 - ◆ Conceptualize and develop them in India
 - ◆ Capitalize on Indian talents and low costs

India is a confident country

- ◆ Indian universities will no longer accept a junior partnership role
- ◆ Requires much larger give and take than has been done in the past

R&D Cooperation between UK and India

- ◆ India today has several world class Research group at its Universities
- ◆ Indian Market is large
 - ◆ Serving such market at its price point, can enable one to become technology leaders and serve world market
 - ◆ India as a Standards Partner would be key to develop acceptable World Standards

To Conclude

- ◆ India is changing rapidly
- ◆ India can and needs to be leveraged
- ◆ UK and India Research Partnership can leverage this changing India