

TeNeT Group's Learnings

Venture Business Originating from
Universities

Summary

- Identification of a 'Major need' – Transform into 'Vision'
- Translation of 'Vision' to 'Venture opportunities'
 - Midas
 - Banyan
 - NMSWorks
 - Tejas Networks
 - N-Logue
 - Chennai Kavigal
 - Neurosynaptic
 - Vortex
 - Novatium
- Critical Lessons from TeNeT experience
- Experiences around the World – similarities with TeNeT
- What more can we do ?

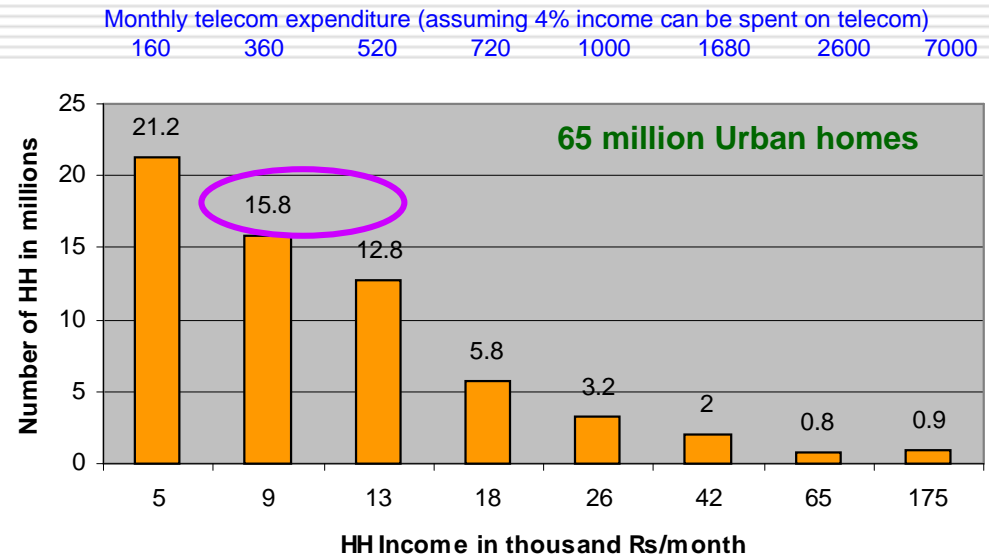
1. Identify a 'major need' – Transform into 'Vision'

- TeNeT group, a **faculty group** at Indian Institute of Technology, Madras (IITM) identified a major **need** that could be addressed through **technology**
- **Fulfilling** this need forms the basis of TeNeT's **Mission**
- Passion for the '**mission**' was generated: trade off of academic **publications** versus commercial **R&D** ?

1. Identify a 'major need' – Transform into 'Vision'

- Telephone infrastructure cost about **Rs 40,000 per line** till 10 years back
 - Requires **Rs 14,000 per year** or over **Rs 1000 per month**
 - **affordable to no more than 2 - 3% of Indian households**

- households can spend less than **Rs 300 / month on Telecom**
 - **India needs Telecom CAPEX to go down to Rs 8000 per line**
 - **required disruptive technologies**



2. Translation of 'Vision' to 'Venture Opportunities'

- TeNeT group **initiates / supports** a number of ventures over a decade
 - Midas
 - Banyan
 - Tejas Networks
 - N-Logue
 - Chennai Kavigal
 - Neurosynaptic
 - Vortex

CorDECT Wireless in Local Loop



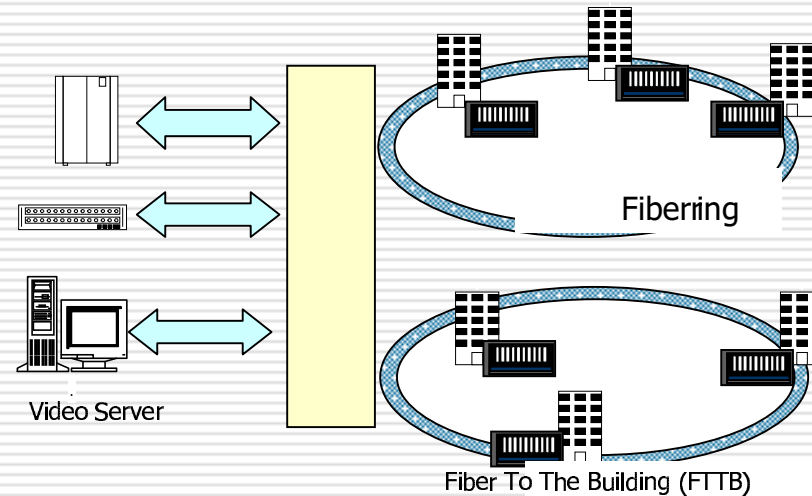
35/70 kbps Internet plus simultaneous telephone

- Rs 7000 per line price
- 100/200 kbps in near future with 2.5G corDECT
- 802.16 like solution in future

Fibre in the Loop

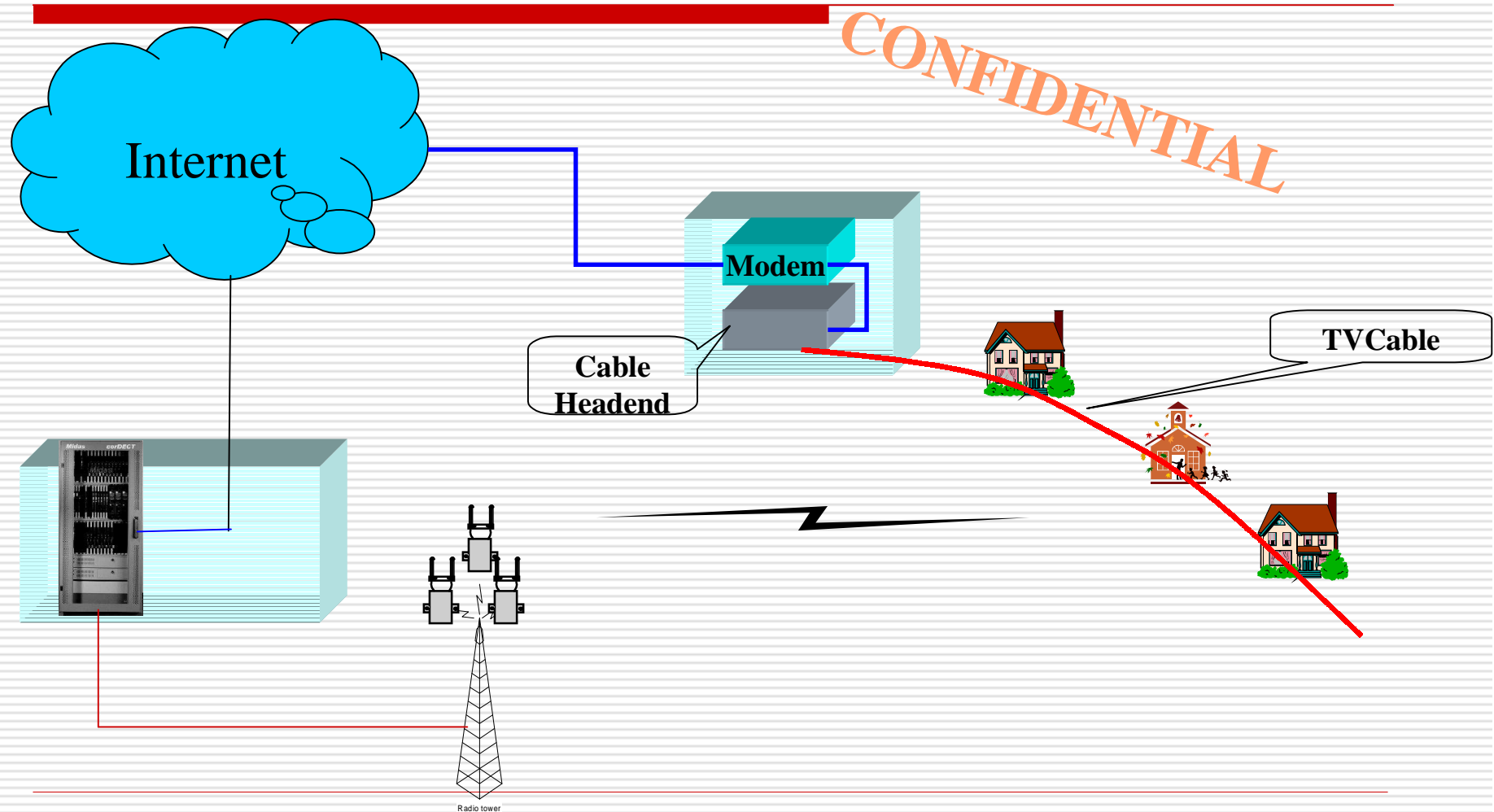
Last meters on copper

Broadband in Urban Areas

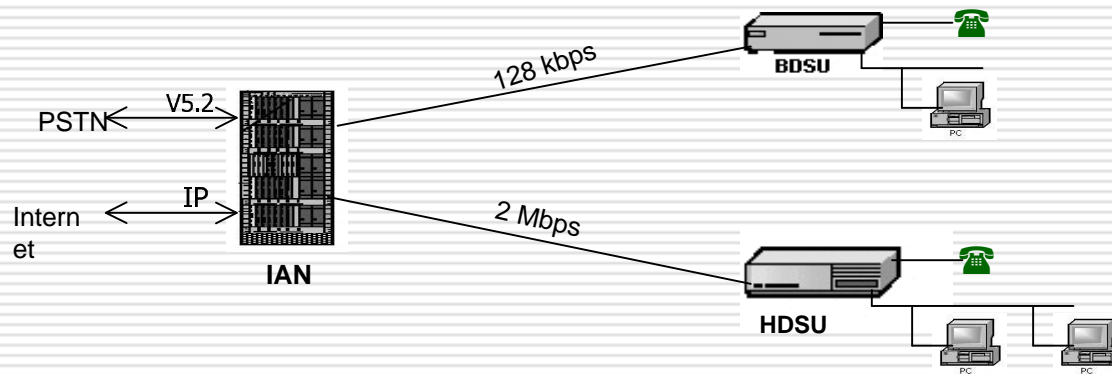


Cable Wireless :

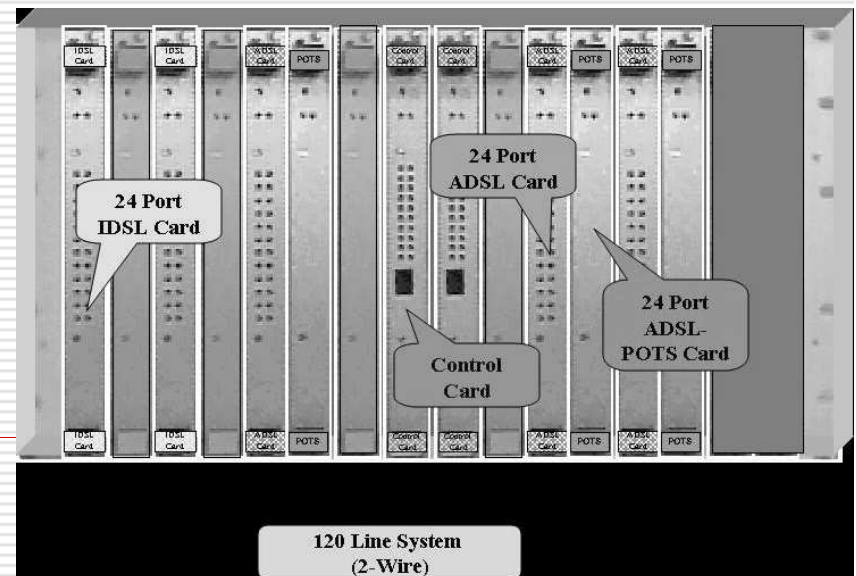
Down Stream on Cable Upstream on Wireless



DIAS (DSL on copper)

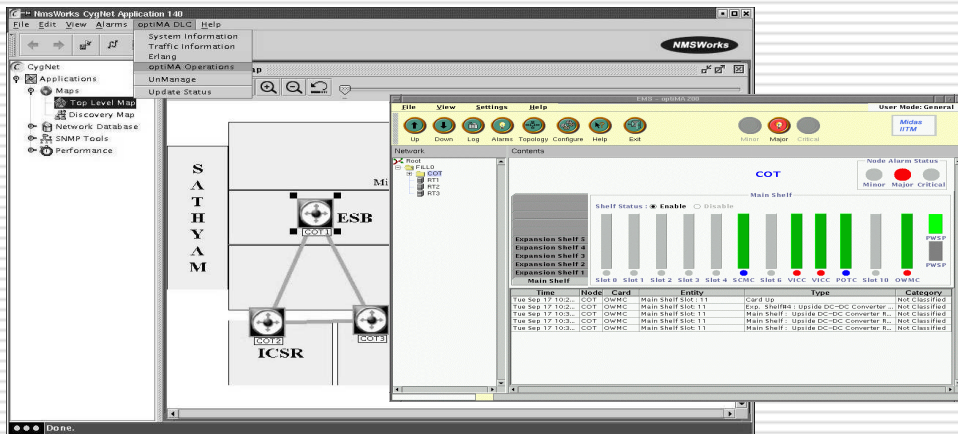


- ❑ Always ON Internet connection on not-so-good-quality existing copper lines
 - BSNL providing 128 kbps connection in 90 cities at Rs 850 pm
- ❑ ADSL / VDSL Solution for better quality copper lines



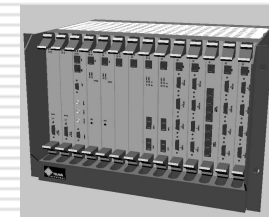
Network Management System

- ❑ A must with **distributed deployment** of Intelligent nodes
- ❑ **Convergence** of Telecom and Internet management
- ❑ **Manage** traffic, subscribers, subscriber equipment and network health from management centers



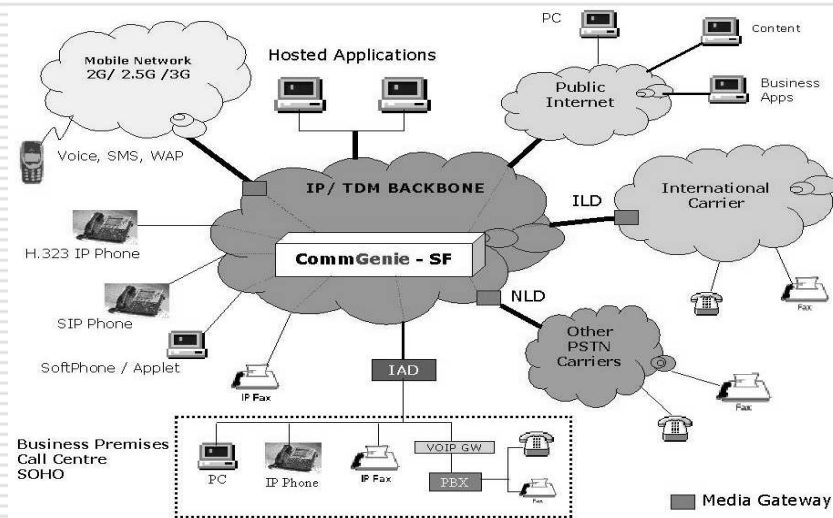
Next-Generation SDH Transport

- ❑ cost-effective transport network for **voice as well as Internet traffic preferably on Ethernet**
 - Advanced software for **easy management of networks and providing bandwidth-on-demand**
 - Advanced software features such as auto-discovery and point-and-click provisioning



Softswitch Technology

- ❑ Full suite of 100% J2EE powered, Communications Convergence Infrastructure
- ❑ Packet-Switching technology in Carrier Grade & Enterprise Grade
 - H.323 Stack and H.323 Gatekeeper
 - SIP Stack and SIP Proxy

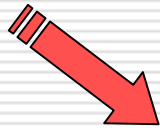


Enabling wireless Internet

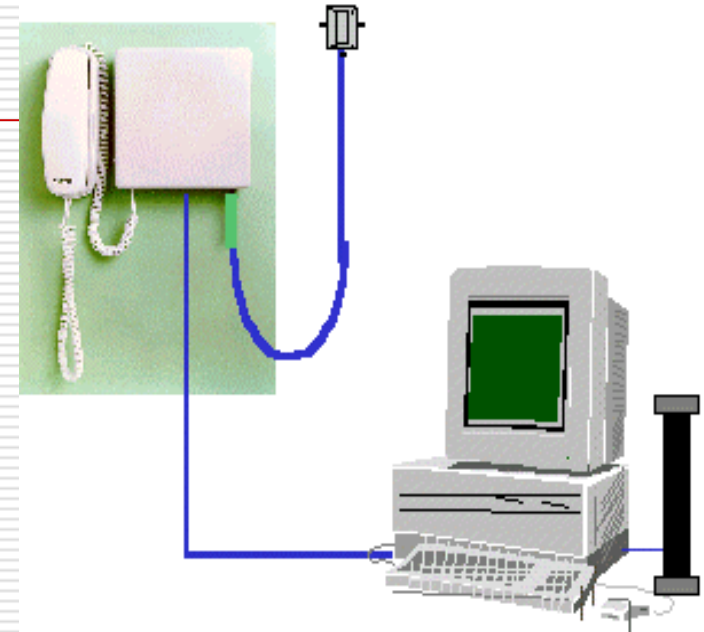
- SMS, MMS, WAP, SYNC and IM
 - handset software
 - WAP2 browser, MMS client, Sync client, IM Client, IOTA client
 - Gateways on infrastructure
 - ❑ SIM Platform, IM Server, OTA provisioning server
- Providing SMS / MMS on Reliance, Hutch, BSNL mobiles

Connecting Rural Areas

Vision



Connect(voiceandInternet)
Rural Areas and Small
TownsalloverIndia



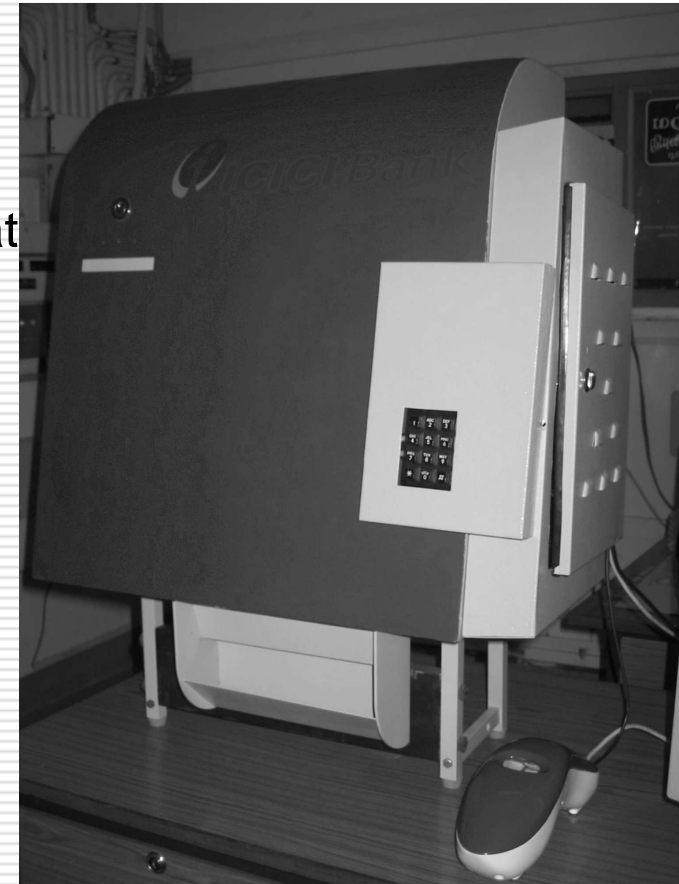
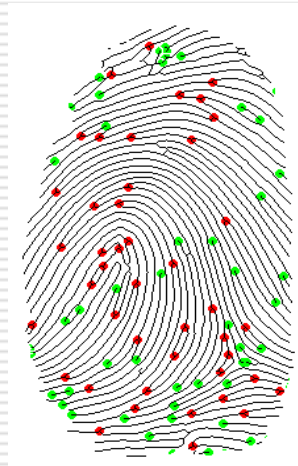
- Rs 50000 per Kiosk providing telephone, Internet with multi-media PC, Camera, printer, 4 hour power back-up for Personal Computer, training, installation, 6 months always on Internet
 - plus Indian language & video conferencing SW

Low bit-rate multi-party Video Conferencing



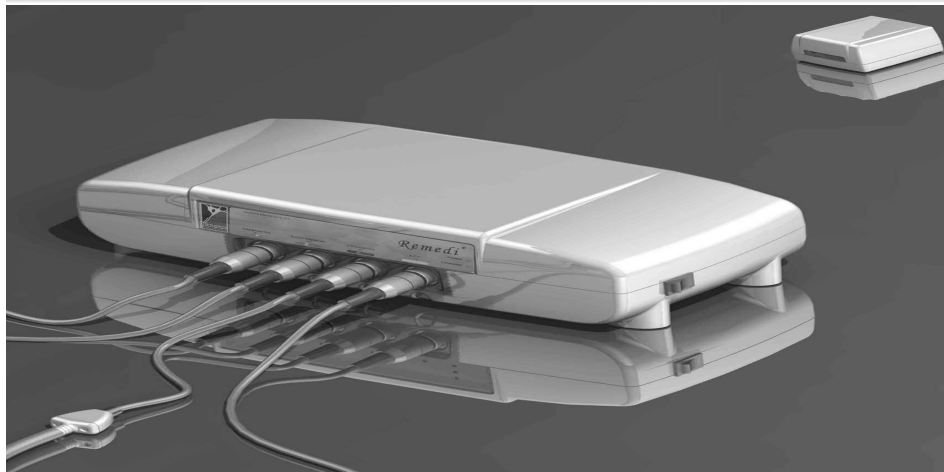
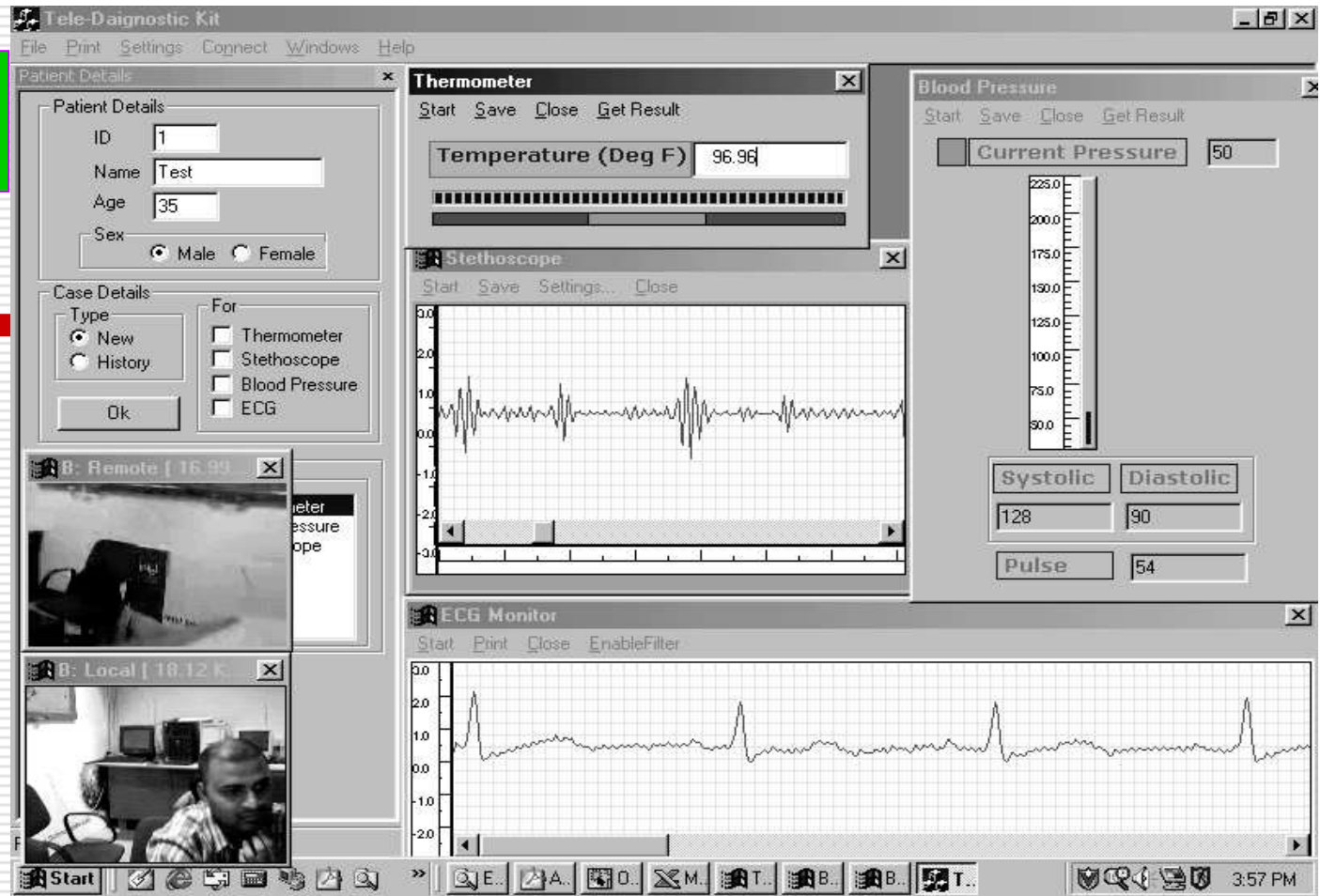
Rural low cost ATMs at kiosks

- ❑ Works along with the PC already existing
- ❑ Breakthrough pricing envisaged at Rs 50000



IITM - NeuroSynaptic

Remote
Monitoring of
patient's
health using
Internet



A kit consisting of BP, Temperature, ECG measurement and Stethoscope and pulse count for Rs 10,000

3. Critical Lessons from TeNeT Experience

- **Knowledge-based** Industries require
 - **faculty** : encompassing advanced knowledge
 - **students** : spirit to conquer the world
 - **R&D personnel** : convert ideas into marketable products

- **Entrepreneurship flourishes**
 - in the **vicinity of high quality** educational institution

3. Critical lessons from TeNeT experience

But besides Knowledge & Technology

- Venture business also require
 - Vision
 - Understanding of Market
 - Organisational building capabilities

- University based Ventures require support from
 - **Venture fund** : fund and provide organisational support
 - Venture funds which understands **disruptive** technologies

3. Critical lessons from TeNeT experience

University faculty and Venture Business

- Faculty: good in **academics** to enter University
 - But to be entrepreneur require additional skills
 - a **vision** for society / country
 - understanding of industry and **market economics**
 - besides mastering conversion of **technology into products**

- Indian Culture sometimes **discourages**
 - University **faculty from being entrepreneurs**
 - even faculty reward system only look at academic work
 - is changing slowly
 - **failures** considered a black-mark in the India

3. Critical lessons from TeNeT experience

Students and Venture Business

- Ventures require **creative** work
 - long hours of struggling on **apparently unsolvable** problems
 - passion and determination

- In India, we sometimes **load** the students with too much of **material**
 - giving little time for independent development

- 1999-01 IT boom have taught some **wrong lessons**
 - students often do not realise the value of hard work and that **success follows multiple failures**

4. Experience around the World – similarities with TeNeT

- Stanford R&D Park, MIT and Harvard in Route 128 are the classic examples of successful **University lead ventures**
- **Common theme**
 - **A strong Vision –**
 - Stanford: to leverage its R&D for commercial use
 - Harvard: To support start-ups
 - **Strong faculty passion –**
 - Stanford: Prof. Tenant
 - Harvard: Prof. Doirot
 - **Leverage** students, alumni, faculty and resources of University

4. Experience around the World – similarities with TeNeT

University created formal incubation programs

- Have done well only rarely
 - do not have flexibility
 - experience is more important initially than earnings
 - faculty or university must be prepared to get nothing but experience from his/her first venture
 - with experience, a faculty will try again
 - Place, office, computers, network is very small part of a venture

- Informal incubation has done better

5. What more can we do ?

- Must drive solutions for Emerging Markets
 - Developing countries have a **large potential market for affordable products**
 - West / incumbent players are paying **little attention** to it

- University lead Knowledge based initiatives
 - have a potential of creating **very successful** ventures catering to this need / opportunity
 - Can promoting Ventures be made **a principle objective** of universities (in addition to training and education)?