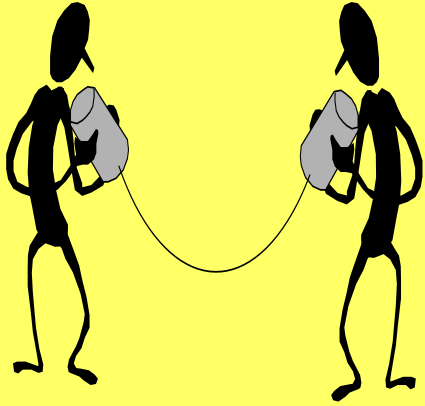


Overview of Changing Telecom & Converged Services Scenario and Indian Context



By

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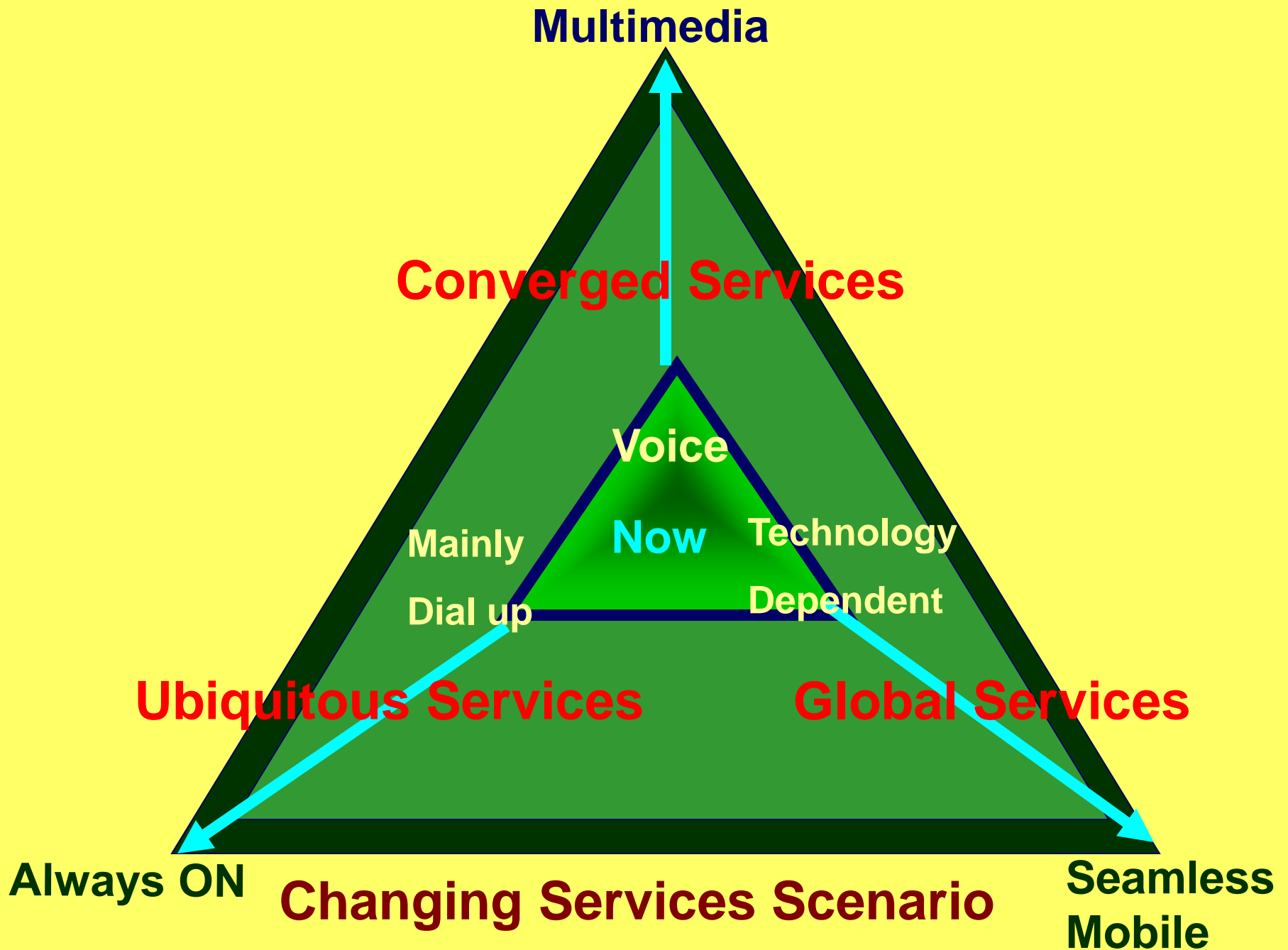
Objectives of the Presentation

To present a summary of the following:

- **Paradigm shift from the Networks driven Telecom to that driven by Customers' requirements**
- **Emerging Telecommunication Services, Technologies & Techniques**
- **Issues being addressed to accelerate the pace of Change**

FAST CHANGING TELECOM PARADIGM

- Paradigm Shift from *Operators & Network Centric Telecommunication* to the one WHICH IS DRIVEN BY SERVICES & CUSTOMERS' REQUIREMENTS
- **Voice**, **Internet** & **Video** on same Subscriber line
- Unified Voice, Data & Broadcast **Networks**
- Single **Subscriber Equipment** capable of making and receiving Voice Data and Video Calls
- Evolution of innovative value added **subscriber services**



Role Players In Changing Telecom Scenario

- **USERS**

- With Service Wish List (Mainly Urban)
- With Social Needs (Mainly Rural)

- **CONTENT & APPLICATION DEVELOPERS**

- **Network Operators & Service Providers**

- **Infrastructure Providers**

- **Governments & Administrations for**

- ***Policy***
- ***Social Role***
- ***Standards***
- ***Regulation***
- ***Spectrum & Resource Provisioning***
- ***Dispute Settlement***



Major classes of Services

- **Fixed** - Based on
 - **COPPER**
 - **OPTICAL FIBRE**
 - **WIRELESS**
- **Mobile** - Presently GSM and CDMA based
- **Narrow band**
 - **Voice**
 - **Internet**
 - **Fax**
- **BROAD BAND**
 - **High speed Internet**
 - **Video**

Types of Interactive Services

THREE MAJOR TYPES



OKAY, YOU TAKE OVER MY CONTENT AND
WE'LL BUILD A GREAT KIDSTUFF PORTAL

- Relationship: *Phone Call, E-Mail, Chat,*
Video Conference
- Information : *Weather, Internet Search*
Yellow pages, Movies, Games
- Transactions: e-Commerce, e-Business



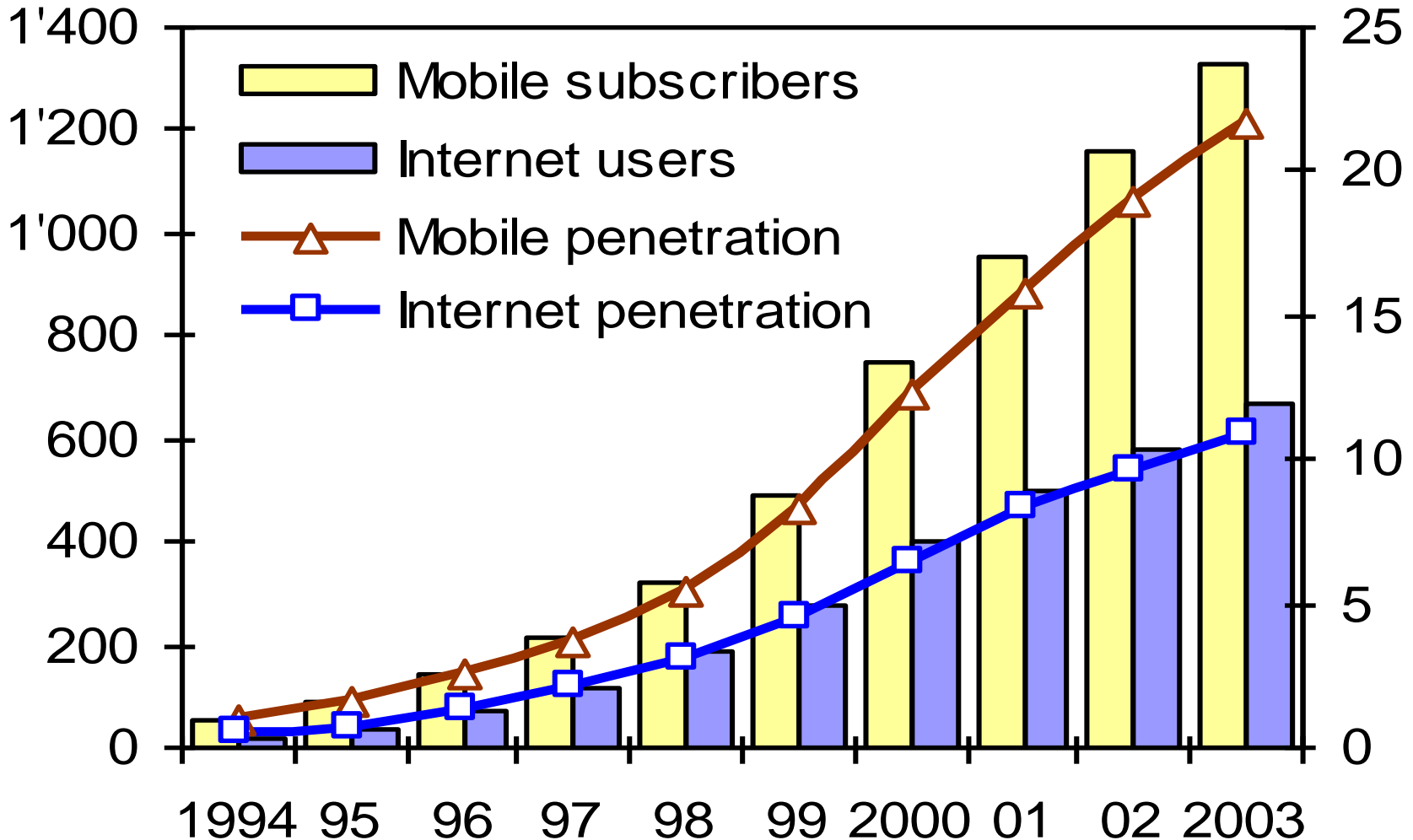
Subscribers Wish List

- To be **virtually present** at ~~interactive site~~ to
 - ❑ **Speak & Hear interactively**
 - ❑ *See* as if present at the site and perhaps **feel**
 - ❑ *Seek & Store* information for future use
- **Affordable cost , Agreed Quality of Service**
- Available *Everywhere, Always*

World-Wide Growth of Mobile and Internet

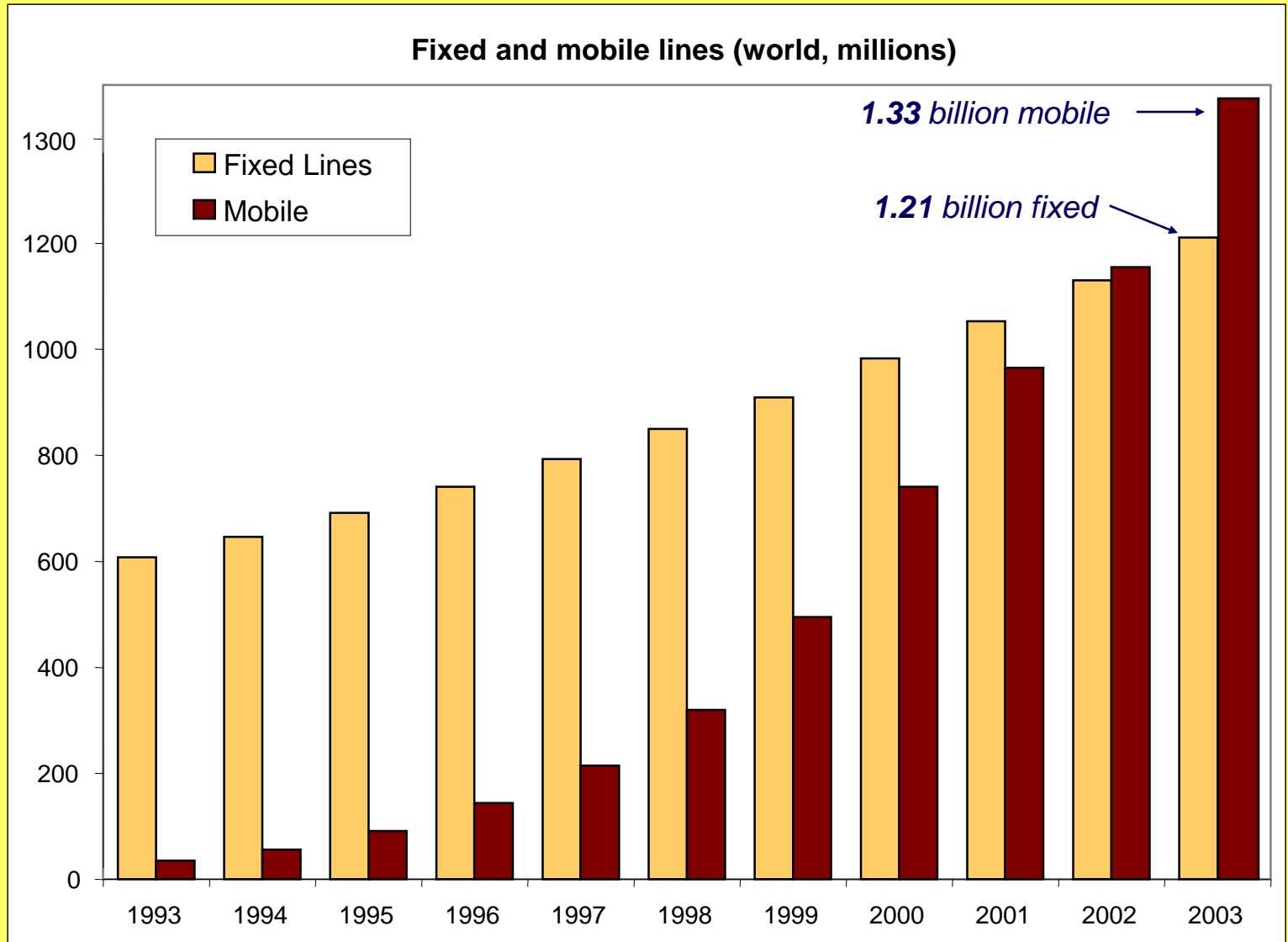
Reference Ms Lara Srivastava ITU

Users (millions) and penetration per 100 pop.



It is more mobile than fixed

Reference Ms Lara Srivastava ITU



Source: ITU

Is it Wireless or Optical Fibre or Both!

- *When the Optical Fibres emerged with infinite Capacity and High Speed of Information Transport, the Engineers said the Wireless was dead*
- Then came again the wireless to allow mobility in the last mile but with bandwidth limitations
- **Some One Said**
 - *Mother Optical Fibre will feed the Reborn Wireless Mobile Access*
 - Efficient Spectrum management as well as Content Compression will let Bandwidth Problems cured
 - SPEED OF TELECOMMUNICATION WILL EQUAL SPEED OF LIGHT

The “personalization” of the mobile

- *Physical proximity: users are getting closer & closer to their mobiles, all times of the day*
 - **Emotional Attachment:** many can't leave home without it. Its theft/loss often causes *panic* and *disruption* to daily life
- **Fashion:** mobile is quickly becoming an important *daily accessory*
- **Identity:** *mobiles are playing an increasingly important role in creating/maintaining identity (through pictures, SMS messages etc...)*

Convergence Scenario for Residences

- Members of the same household are **On-line** Simultaneously
 - Browsing Web
 - *Downloading Information*
 - Watching, Downloading & Recording Video on Demand
 - *Digital Video Broadcast*
 - Digital Audio Broadcast



Requirements of Business Users

Professional Business Services Including

- **MULTI-PARTY CONFERENCING**
- Instantaneous Database Access
- **e-Commerce**
- **Knowledge Sharing**
- *Virtual Presence for Interactive Business*
- **Ubiquitous Virtual Office**



Customer's Willingness to Pay *to be based upon*

- Type of Service
- Quality of Service
- Customer's personal priority

Independent of Distance !!



- **Media for Information Access & Transport**

- **Copper Pairs From Exchange**

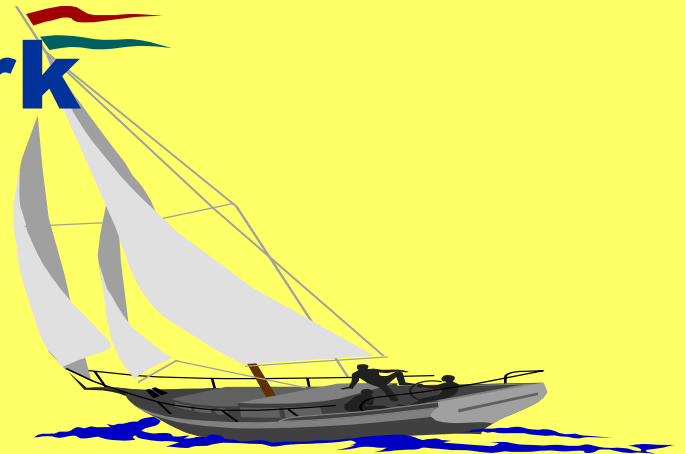
- **Cable TV Network**

- **Optical Fibres**


- **Radio (Wireless)**

- ***Direct To Home via Satellite(DTH)***

- ***Very Small Aperture Satellite
(VSAT)***



Trends Towards

- 
- Futuristic Networks for adaptation to changing *Customer Expectations*
 - Efficient Spectrum Management
 - Mobility independent of technology and geographical boundaries
 - Unified Customer Equipment & mobile handsets for all types of services

Network Sharing Merits & Issues

- Cost reduction through Optimized use of network resources
- Focus of investors on new Services and variety of *Content*
- *More returns on Services*
- ***New Content development in Local Languages***
- **Possible through franchising, mutual business model agreements.**
- Disputes on revenue sharing and Quality of Service issues pin-pointing, blame game.

Multi-operator & Complex Services Environment Requires

- **Clear Service Level Agreements between**

- *Service Providers*
- **Network Providers**
- **CONTENT PROVIDERS**
- *Users*



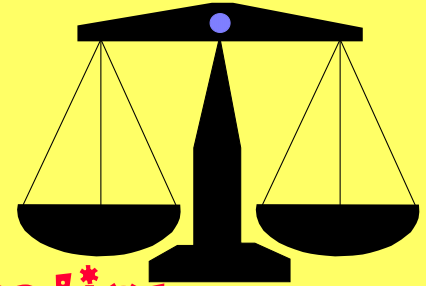
- *Automated tools and relational database to facilitate the Regulators and legal agencies to ensure fair implementation of the agreements*

Development is taking place in this area

Software based Network Management

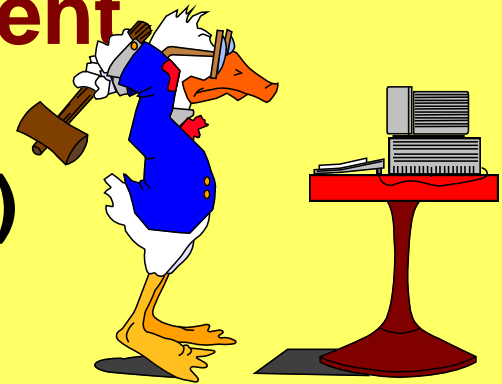
- Optimized usage of Networks and Resources
- **FAULT & PERFORMANCE MANAGEMENT**
- Security Management for information privacy and Network protection
- Financial Management for billing & revenue sharing
- **Quality of Service monitoring**
- Service Level Agreements & execution
- ***Operation Support Systems for efficient operation & maintenance of Network & Services***

Continued Need of Regulation, Standards to address the following Challenges of Multi Operator Environment



- **Technological Challenges & Innovation**
- **Interconnectivity and Interoperability**
- **APPROPRIATE MIGRATION SCENARIOS TO NEXT GENERATIONS**
- **Enhancing Performance and Lowering Costs**
- **INTELLECTUAL PROPERTY RIGHTS, SECURITY & PRIVACY**
- **Legal & Political Aspects, Fair Competition**

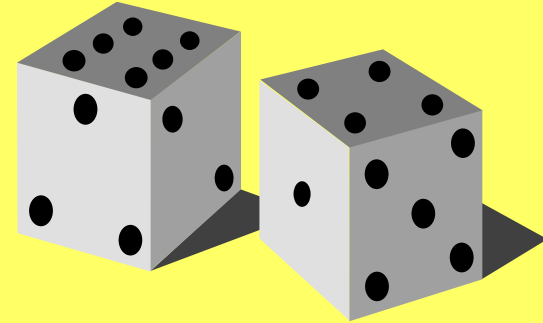
Service Providers could generally overlook the following Factors to some extent



- *Quality of Service* (to make more profit)
 - **Efficient use of Spectrum**
 - Services to Remote and Sparsely Populated Areas
 - Participate in *social programs* like e-Education, e-Health and Community Communication
 - *Tariff Caps as mandated by the Regulator by Providing such Attractive Looking Technical Features which may not justify very high prices*
- However, Administrations, Regulators & Market Forces would Balance it out in Customers favour**

India - Broad Statistics

(Indicative Figures Only)



- Fixed Telephones 45 million
- Mobile Telephones 39 million
- Internet connections (5.0 million) >15 million users

- No. of TVs 78 million
- No. of Cable TV connections 55 million
- Broadband Connections 0.4 million



*ENTERTAINMENT & CABLE TV
NETWORK MAY BECOME MAJOR
BROADBAND DRIVERS IN INDIA*

Challenges to be addressed in the Indian Scenario

- **Unique Rural Scenario**
- **Low current Tele-density both in Urban and Rural Areas inspite of good growth**
- **Need for Spectrum re-farming & re-allocation**
- **Lack of Content in Local Languages**
- **Unstructured Cable TV Network**
- **Confidence on e-Commerce**
- **Lower Number of IPR Entities**
- **Network Security**
- **Bridging Digital Divide**

