

VoIP: A small but crucial step in the evolution of communications

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VoIP and the ICT (r)evolution:

- VoIP an inevitable and desirable part of ICT developments
- VoIP a very small part of ICT
- VoIP mostly irrelevant to users
- likely substantial long-term impact of VoIP

Communications revolution of last two decades:

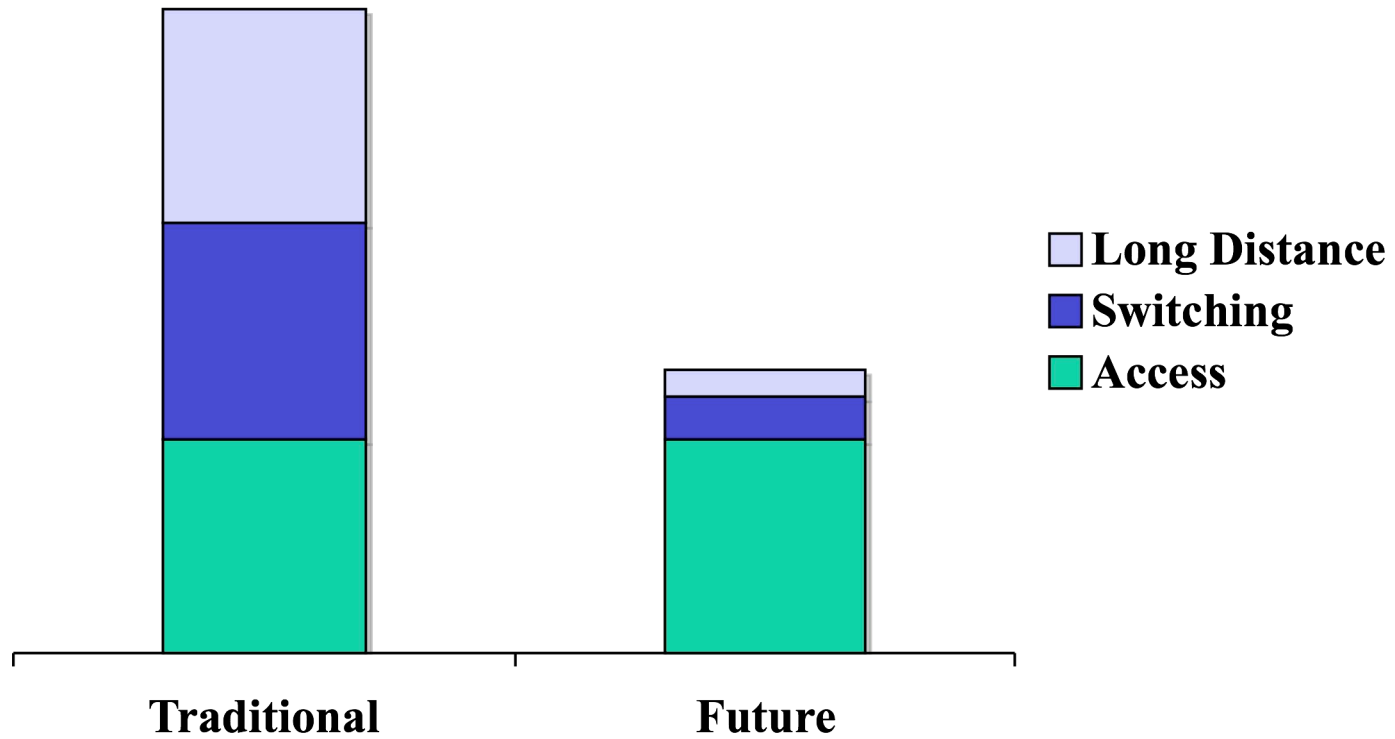
- broadband Internet is all the rage
- narrowband mobile voice telephony has 2x users and many more times the revenues
- over 70% of telecom revenues come from voice
 - good information source: Jan. 2007 ITU workshop
The Future of Voice:
<http://www.itu.int/osg/spu/ni/voice/meeting.phtml>

Revenue per MB:

- SMS: \$1,000.00
- cellular calls: 1.00
- wireline voice: 0.05
- residential Internet downloads: 0.01
- backbone Internet traffic: 0.0001

Volume is not value, but is an indicator of ecosystem health and growth!

Telecom Costs



Main telecom problems:

- voice, the main revenue producer, to become just another service
- “big dumb pipe”: threat or opportunity

VoIP role so far:

- primarily cost driven
 - users: bypass extortionate international, ..., charges
 - service providers: cost reduction
- practically no new services yet, and no significant impact on nature of communications

Telecom restructuring:

- From vertically integrated to horizontal
- Established players threatened, fighting rearguard actions
- Winners are innovative new players, such as Google
- VoIP facilitates industry evolution

History of communications: slow, steady growth with rare bumps

year	revenues as % of GDP	pieces of mail per capita
1800	0.05%	0.7
1900	0.6	94
2000	0.7	750

But phone industry: 3% of GDP in 2000

Internet time is a dangerous myth!

A modern maxim says: “People tend to overestimate what can be done in one year and underestimate what can be done in five or ten years.”

J. C. R. Licklider

“Libraries of the Future,” 1965

Important exceptions: forcing agents (and
browser)

Examples of major change, just not on Internet time:

- VoIP
- DVR (digital video recorders)
- mobile phones

Sociological changes especially slow
(often take a generation)

Special role of voice:

One picture is worth a thousand words

Special role of voice:

One picture is worth a thousand words,
provided one uses another thousand
words to justify the picture.

Harold Stark, 1970

Unexploited opportunities in voice:

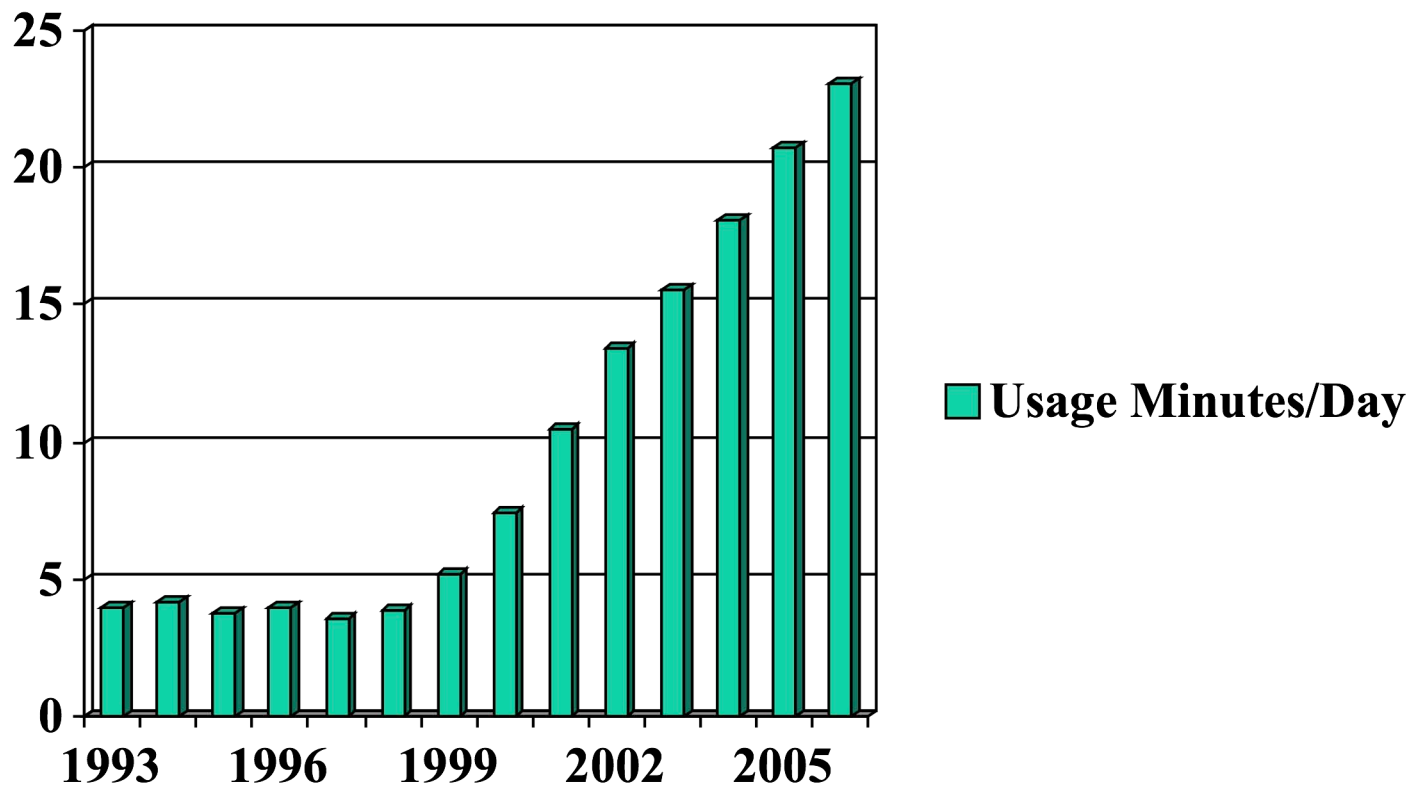
- higher voice quality
- differentiated voice quality
- voice messaging
- toll-free mobile calling
- ...

plus integration with novel services

all facilitated by VoIP

Almost flat rates :

U.S. cell phone usage, minutes per day around June of each year.



Dominant types of communication: business and social, not content, in the past as well as today

Thirty years ago you left the city of Assur. You have never made a deposit since, and we have not recovered one shekel of silver from you, but we have never made you feel bad about this. Our tablets have been going to you with caravan after caravan, but no report from you has ever come here.

circa 2000 B.C.

A fine thing you did! You didn't take me with you to the city! If you don't want to take me with you to Alexandria, I won't write you a letter, I won't talk to you, I won't say Hello to you even. ... A fine thing you did, all right. Big gifts you sent me - chicken feed! They played a trick on me there, the 12th, the day you sailed. Send for me, I beg you. If you don't, I won't eat, I won't drink. There!

circa 200 A.D.

Content vs. connectivity:

At a briefing last week with Takeshi Natsuno, one of the principal architects behind DoCoMo's wildly successful 1999 launch of i-mode, one message became abundantly clear: **content is not king**.

Times Online, October 17, 2007

Only half a dozen years and \$200 billion late: see "**Content is not king**," First Monday, Feb. 2001

Next steps in evolution of Internet:

- fuller integration of broadband into social communication
 - better tools
 - free video
 - exploit locality
- without forgetting voice

all facilitated by VoIP

Blockbusters vs. “long tail”:

- Zipf and Pareto laws
 - among billion items, most valuable thousand account for 1/3 of value
- room for both blockbusters and “long tail”
- challenge: spanning the gap

Will VoIP impact privacy, reliability, cybercrime, government policy, ...?

- **Yes!**
- Yes, but far less than other elements of ICT evolution
 - Privacy compromised far more by mobile phones (even without IP)
 - Privacy compromised far more by web browsing
 - ...
- Benefits of VoIP outweigh costs, mitigating measures will be similar to those for other ICT parts (such as operating system deficiencies)

Conclusions:

- VoIP an important part, but just a part, of ICT evolution
- VoIP will help transform communication into much more flexible medium (whose exact shape is impossible to forecast)
- VoIP irrelevant to users, will be largely hidden
- change to be slow by “Internet time” standards

Further data, discussions, and
speculations in papers and
presentation decks at:

<http://www.dtc.umn.edu/~odlyzko>