Impact of Internet on the telecommunication business model

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The views expressed in this paper are those of the author and do not necessarily reflect the opinions of the ITU or its Membership.
If distance is dead, and bandwidth is infinite ... What do we bill for?
Agenda

- The phenomenal growth of the Internet
- Internet economics
- Pricing the Internet: What makes it different?
  - Retail pricing
  - Pricing of local calls
  - Wholesale pricing
- Vulnerability of telephone companies to competition from the Internet
- Future pricing and billing of IP services
Internet hosts (million) and comparative growth rates, 1999-1998

Distribution of Internet hosts, January 1998

Canada & US 65.3%

Europe, 22.4%

Australia, Japan & New Zealand 6.4%

Other 5.9%

Developing Asia-Pacific 3.7%

LAC* 1.9%

Africa 0.3%

Other 5.9%

Source: ITU “Challenges to the Network: Internet for development, 1999”.

LAC* refers to Latin America and the Caribbean.
Internet eclipsing the PSTN

Note: Based on usage of circuits between the US and the rest of the world. Source: FCC.
Inter-regional Internet backbone

Internet Economics: Five factors that make the Internet different

1. Packet-switched network architecture
   ➞ Connection-less not connection-oriented

2. Pricing independent of distance & duration
   ➞ Average message covers 15 or more “hops”

3. Peering arrangements, not settlements
   ➞ Based on a full-circuit regime, not on half-circuits

4. Traffic flows highly asymmetric
   ➞ Dominant flow is to terminal that initiates a session
      (though this is changing ....)

5. The United States sets the rules!
   ➞ There is no “Internet Telecommunication Union”
Internet, price and service trends: Retail market

- Towards a flat-rate price structure
  - All you can eat for US$19.95

- Towards lower service quality
  - “Best efforts” service delivery at lowest price

- Death of distance
  - Message to other side of earth costs same as a message sent next door

- Cross-promotion of Internet and other services
  - “Free PC” with three year’s ISP subscription
  - “Free Internet” with residential local loop charges

- Tendency towards industry concentration
  - AOL’s subscriber base > next ten ISPs added together
Where does the money go? Typical Internet Service Provider cash-flow

$19.95 per month subscription

$7.50-$10.50 Wholesale PoP Access

$2.00 - $3.00 Customer Care

$3.00 amortised customer marketing

$3.50-$7.50 margin per customer

Source: Adapted from Paul Stapleton, ISP$ Market Report, Boardwatch Magazine.
Asia-Pacific, comparative prices,
In US$, based on 20 hours off-peak use per month

Source: ITU “Challenges to the Network: Internet for development, 1999”.
When is a local call not a local call?

- Internet usage has grown fastest in countries which permit “free” or untimed local calls (e.g., USA, Canada, HK, Australia)

- But, PTOs claim that Internet users and ISPs are “free-riding” the network
  - longer average sessions
  - asymmetric traffic flows

- In countries where local calls are metered, users complain that Internet is too expensive
  - “ Strikes” of Internet users in Germany, France

- Rapid take-off of “Free Internet”
  - Free monthly Internet access in return for loyalty to dial-up local loop service provider
**Internet, price and service trends: Wholesale market**

- **Trend towards industry concentration**
  - Top 3 backbone service providers control > 70% of the market (measured by ISP connections)

- **Economics of industry driven by hubbing**
  - > 90% of Internet traffic still passes through USA

- **Peering arrangements being replaced with capacity-based transit payments**
  - Economies of scale forces smaller ISPs to concentrate traffic or surrender independence

- **Leased line prices are critical to price variations**
  - Full-circuit regime replaces half-circuit telephony regime
Infrastructure capacity and costs, TransAtlantic cables, 1983-2000

Capacity (voice paths), growing by 64% p.a.

Cost per voice path (US$), declining by 41% p.a.

Source: ITU, TeleGeography Inc., FCC.
Note: Voice-path numbers assume a compression ratio of 5:1 to number of circuits.
Internet taking an increasing share of international network capacity. Usage of int’l circuits between US & UK, 1995-97

Source: ITU, adapted from TeleGeography, FCC.
But, Internet backbone market is more concentrated than int’l telephone traffic

Top 3 companies control 73% of market

Top 3 control 28% of market

Rank of company

Share of market
Sizing the market

Domestic - Telephony/fax
US$435 billion worldwide, 1997

International - Telephony/fax
US$65 billion worldwide, 1997

Internet Services
<US$2 billion worldwide, 1997

Source: ITU World Telecommunication Indicators Database, and ITU estimates
Top 8 international carriers, 1996/97

Growth in traffic
8.8% 10.3% 4.6% 18.3% 13.8% 11.2% 7.7% 11.8%

Change in int’l revenue
AT&T -10.6% MCI 0.8% DT 5.0% BT -14.3% FT -39.7% Sprint 1.3% T. Italia 12.5% SwissCom -19.0%

Source: ITU, TeleGeography Inc.
Note: Revenue change is based on dollar figures and may be different if expressed in local currency.
### Assessing the risk to the Telcos
#### Where will they take a hit?

<table>
<thead>
<tr>
<th>Risk Level</th>
<th>Fax traffic</th>
<th>International voice</th>
<th>National and local voice traffic</th>
</tr>
</thead>
<tbody>
<tr>
<td>High risk</td>
<td>Data communications</td>
<td>Mobile data services</td>
<td>Leased circuits</td>
</tr>
<tr>
<td></td>
<td>Public Packet-switched Data Networks</td>
<td>Managed Data Services</td>
<td>Mobile voice services</td>
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<td>Proprietary e-mail</td>
<td>Virtual Private Networks</td>
<td>Public Switched Network</td>
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<td>Electronic news services</td>
<td>Paging services</td>
<td>Maintenance</td>
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<td>Freephone</td>
<td>Local loop</td>
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If distance is dead and bandwidth is infinite, what do we bill for?

- Bill for network connection
  - Increasing integration of monthly telephone subscription and Internet subscription prices
- Bill for privacy/advertising
  - Privacy-protected customer pays premium
  - Customer agreeing to receive advertising pays less
- Bill for quality of service
  - Differentiated by transmission quality, waiting time, bandwidth on demand, value-added secretarial support, mail functions etc.,
- Bill for Billing
  - Customising of billing: by service, by user, by site