

# **The state of telecom: Fundamental drivers of evolution**

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# *Telecom today:*

- ◆ Still suffering from the overinvestment and malinvestment of the bubble years
- ◆ Moving into major restructuring phase

# *Technology:*

- ◆ Many choices
  - ◆ Drive for uniformity (converged network)
  - ◆ Drive for diversity (walled gardens, security, redundancy, customer-owned networks, outsourcing, ...)
- ⇒ Likely outcome a multimodal telecom scene, unified by IP layer (in analogy with transportation sector, unified by container)

# *Long-haul is not where the action is:*

- ▶ 360 networks transatlantic cable

**Construction cost** **\$850 M**

**Sale price** **\$18 M**

**Annual operating cost** **\$10 M**

**Lit capacity** **192 Gb/s**

**Fully lit capacity** **1,920 Gb/s**

**Ave. transatlantic Internet traffic** **200 Gb/s**

**(mid-2005)**

# *Primacy of user needs and user inertia:*

## **Yellow pages example:**

- ◆ Qwest sale of directory division in 2002 for approx. \$7 billion (annual revenues \$1.6 billion, margins 63%)
- ◆ Current (October 2005) market cap of Qwest: approx. \$7 billion

⇒ user inertia often most important factor in business success

# *User needs: frequently misunderstood by telecom*

**Example: connectivity and not content primary  
post-Katrina: what was the main complaint:**

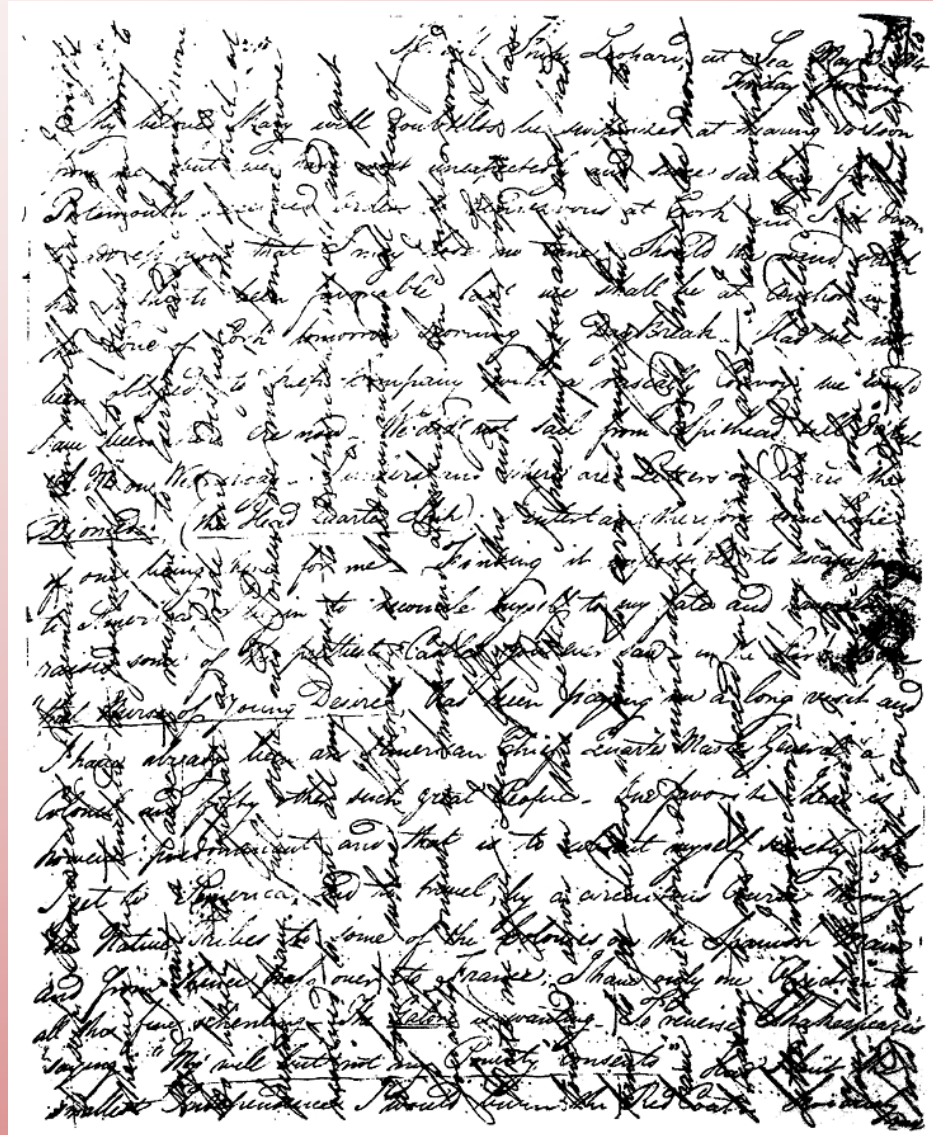
◆ lack of voice telephony?

*or*

◆ lack of TV?

# Connectivity: value of connection probably logarithmic in bandwidth

early 19<sup>th</sup> century  
“crossed-letter”



# *Human communication:*

One picture is worth a thousand words



# *Human communication:*

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

*Harold Stark, 1970*

# *Voice is uniquely important for human communication:*

## **Possible enhancements:**

1. higher quality
  2. segmenting the market through several levels of quality
  3. voice mail (to combine power of voice with the non-intrusive advantage of email)
  4. emergency capacity boosts through pushing all users to lower levels of quality (and higher compression) instead of complicated prioritization schemes
  5. wireless toll-free calls
- ...

but all are being ignored by telecom that is deluded by the content dream

# *Conclusions:*

**Promising future for telecom, but**

- ◆ much turmoil
- ◆ likely to have a heterogeneous collection of technologies unified at IP layer
- ◆ winners impossible to predict
- ◆ success dependent on overcoming false dogmas

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

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