How We Got Here: Lessons From History

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Outline

• From radio to cellular technology
• From cellular technology to cellular service
• From regulation to deregulation
• Where we go from here
The first dropped call was experienced by…

a. Ronald Reagan
b. John Kennedy
c. Winston Churchill
d. Czar of Russia
Mobile radio

- Push to talk in 1920s-30s
  - Car phone
  - No handoff. 75 mile limit.
- Motorola -- world's first hand-held portable two-way radio system, the *Handie-Talkie*.
Early Indications of Wireless Competitive Impact

• 1915 – AT&T decides to not pursue cellular because of wireline monopoly

• Carterphone
  ▪ Customer desire to integrate wireline and wireless

• Above 890 Decision
  ▪ Opens door for MCI to compete with AT&T
From radio to cellular

- Limited airwave space
  - New York City in 1981 (pre-cellular) mobile phone system could handle only 700 customers
- AT&T asks for more spectrum, but FCC declines
Inventing cellular

• AT&T Bell Labs developed cellular technology in 1947
  ▪ Area divided into “cells”
  ▪ Customers could move from one cell to another
  ▪ Greatly increased capacity

• By early 1970s, technology was ready for commercial application
First cellular calls

• First private cell call made by Motorola’s Martin Cooper in 1973
  ▪ DynaTAC or The Brick

• First commercial cell call made by Ameritech’s Bob Barnett from Soldier Field in Chicago to Alexander Graham Bell’s grandson in Germany, 1983

Source: Rico Shen
Getting permission

• AT&T needed a license to use the radio spectrum for cellular
  ▪ Seeks FCC permission in 1950s and 1960s, but FCC continues to decline

• In 1970s, FCC authorizes
  ▪ AT&T test of cellular in Newark and Philadelphia
  ▪ Trials in Chicago (AT&T) and Baltimore (American Radio Telephone Service)
Getting started

• Nordic countries begin using first generation cellular in 1981
• FCC authorizes cellular service for U.S. in 1982, but licensing is slow and awkward
Regulatory Delays

• FCC says “no” to cellular several times
• FCC decides to reconsider in 1970s
• After about 15 years, FCC decides to license cellular
  ▪ Cost to consumer
  ▪ Chooses competition, but with confusion
• Breakup: AT&T gives away cellular
FCC’s First Cellular Licenses

• Duopoly
  ▪ Wireline licenses issued and service begins
  ▪ Non-wireline clumsy and long

• Non-wireline
  ▪ Comparative hearings process
  ▪ Lottery
Comparative hearings

• Trying to determine who is a good provider
• How much paper was required to apply for the first FCC cellular licenses?
  ▪ One company (Graphic Scanning) used two semi trucks to deliver its applications.
    • Graphic Scanning applied for a license in each of the first 30 markets
• FCC gets arbitrary. Then chooses lottery.
Czar Comes To America
Bell Labs Develops Cellular
FCC Says “no”
AT&T Asks for Cellular Spectrum
AT&T Puts Cellular On Amtrak
FCC Approves Testing of Cellular
AT&T Asks for Cellular Licensing Again
FCC Issues First Cellular Licenses
First Mobile Cell call
Public Trials Begin
FCC Makes Licensing Decision
AT&T Breakup
AT&T Asks for Cellular Licensing Again
FCC Issues First Cellular Licenses
AT&T Asks for Cellular Spectrum
AT&T Puts Cellular On Amtrak
FCC Approves Testing of Cellular
FCC Makes Licensing Decision
AT&T Breakup
1900 1950 1970s 1980s
Policy makers choose competition

- FCC decides to use auctions to license spectrum
- Federal deregulation in early 1990s
- FCC auctions PSC spectrum in mid 1990s
- Service grows
Millions of Customers or Households

FCC Issues First Cellular Licenses

MCI Sells To McCaw

Federal Deregulation

McCaw Sells To AT&T

FCC Licenses PCS


Year

Customers

Households

Public Utility Research Center
UNIVERSITY of FLORIDA

“Leadership in Infrastructure Policy”
U.S. Overall and Telecommunications CPIs, 1997-2007

Cellular leads all other telecommunications services in price declines in the U.S. since 1997.

Source: FCC 13th Report
Worldwide Usage and Prices

U.S. prices are near the lowest worldwide and U.S. customer usage is near the highest.

Source: FCC 12th Report
U.S. Mobile Monthly Churn and Average Price, 1999-2002

Churn indicates intense competition.

Source: FCC Ninth Report
U.S. Mobile Subscribers by Operator, 2006 (000s)

- **Verizon**, 65,707
- **AT&T**, 70,052
- **Sprint Nextel**, 45,329
- **T-Mobile**, 28,685
- **Alltel**, 13,400
- **All Other**, 39,827

Source: FCC 13th Report
Mobile Subscribers by Technology Worldwide, 2013 Forecast

Standards Competition

• Stronger incentive to expand networks
• Higher switching costs for customers

Over single technology

GSM/GPRS/EDGE, 56.6%
W-CDMA, 29.1%
CDMA, 11.4%
TDMA, 0.0%
PDC, 0.0%
Analog, 0.0%
Examples of Innovations

• Customized and Simplified Pricing
  ▪ Menus of Options; Flat Rate Pricing; Sprint’s Solution to Overages; Nationwide; International

• Intermodal features
  ▪ Unified GUIs; e.g., Vodafone live!, Microsoft OS, Google wireless search
  ▪ Interoperable features; e.g., IM, SMS

• Personalized mobile services; e.g., Qualcomm’s MediaFlo, ESPN wireless, personal safety applications like uLocate
Basic Lessons

• Regulatory delays in licensing cost customers and the industry

• Competition has been the most important driver of industry development
  ▪ Market and price performance
  ▪ Dynamics of Competition