Global mobile phone subscribers
Five Forces – Industry Competition

- Threat of New Entrants
- Rivalry Among Existing Competitors
- Bargaining Power of Buyers
- Threat of Substitute Products of Services
- Bargaining Power of Suppliers
Current Market

Life Cycle
- Emerging?
- Mature?
- Declining?
- Recent Performance?

Major Players
- Market Share

Industry Changes
- New Players
- Innovation
- Regulation

Profitability
- Margins
- Costs vs. Revenues
<table>
<thead>
<tr>
<th>Telecommunications Industry</th>
<th>Number</th>
<th>Unit</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Worldwide Telecommunications Industry Revenues</td>
<td>3.1 Trils. US$</td>
<td>2010</td>
<td></td>
</tr>
</tbody>
</table>

### Landline

- Households with Wired Subscribership, U.S. | 113.5 Mil. | 2010
- Landline Revenue, U.S. | 286.6 Bils. US$ | 2010

### Wireless

- Annualized Total Wireless Service Revenues, U.S. | 159.9 Bils. US$ | 2010
- Annualized Wireless Data Revenues, U.S. | 50.1 Bils. US$ | 2010
- Number of Wireless Connections, U.S. | 302.9 Mil. | 2010
- Market Penetration, U.S. | 96 % | 2010
- Portion of Mobile Consumers with a Smart Phone, U.S. | 31 % | 2010
- Mobile Advertising Revenue, North America, 2010 | 304.3 Mil. US$ | 2010
- Mobile Advertising Revenue, North America, 2011** | 701.7 Mil. US$ | 2011
- Wi-Fi & Cellular Device Shipments, U.S. | 247 Mil. Units | 2010
- Mobile Cellular Service Subscriptions, Worldwide* | 5.3 Bils. | 2011
- Individual Subscribers, Worldwide** | 4.2 Bils. | 2011
- Mobile Broadband (3G) Subscribers, Worldwide | 940 Mil. | 2011
- SMS Messages Sent, Worldwide | 6.1 Trils. | 2011
- Handset Sales 2010, Worldwide | 1.6 Bils. Units | 2011
- 2010 Mobile Advertising Revenue, Worldwide | 1.6 Bils. US$ | 2010
- Mobile Application Downloads, Worldwide ** | 17.7 Bils. | 2011
- Mobile Application Revenue, Worldwide (Includes Purchases & Ad Revenue)** | 15.1 Bils. US$ | 2011
- 2010 Smart Phone Sales, Worldwide | 296.6 Mil. Units | 2011
- Employment in the Telecommunications Industry, U.S. | 899.7 Thous. | 2010
CURRENT MARKET: Life Cycle

Industry Growth
CURRENT MARKET LIFECYCLE

Industry Growth

Typical Lifecycle

SALES

Number of Subscribers (Million)

Revenue (Bil$)

Time

Year

Subscribers

US Population

Revenue

0 20 40 60 80 100 120

CURRENT MARKET: Life Cycle

Industry Growth

- Subscribers
- US Population
- Revenue
Major Players

- 108.7 Million 32.4% CDMA
- 103.2 Million 30.7% GSM
- 51 Million 15.2% CDMA
- 34 Million 10.1% GSM
- 17.75 Million 5.3% GSM/CDMA
- 9 Million 2.7% CDMA
- 6 Million 1.8% CDMA
- 6 Million 1.8% CDMA
Current Market: Major Players

- 108.7 Million 32.4% CDMA
- 103.2 Million 30.7% GSM
- 51 Million 15.2% CDMA
- 34 Million 10.1% GSM
- 17.75 Million 5.3% GSM/CDMA
- 9 Million 2.7% CDMA
- 6 Million 1.8% CDMA
- 6 Million 1.8% CDMA

**GSM vs. CDMA Cellular Networks**

**GSM** – Global System for Mobile Communications:
- World Standard – top 15 World carriers use GSM
- Serve 80% of the global market

**CDMA** – Code Division Multiple Access:
- Differentiation in its use of Multiple Access, allows different users to share the same physical channel
CURRENT MARKET: Major Players

**Major Players - Carriers**

- 108.7 Million 32.4% CDMA
- 103.2 Million 30.7% GSM
- 51 Million 15.2% CDMA
- 34 Million 10.1% GSM
- 17.75 Million 5.3% GSM/CDMA
- 9 Million 2.7% CDMA
- 6 Million 1.8% CDMA
- 6 Million 1.8% CDMA
### Current Market: Major Players

<table>
<thead>
<tr>
<th>Vendor</th>
<th>2Q11 Units</th>
<th>2Q11 Market Share (%)</th>
<th>2Q10 Units</th>
<th>2Q10 Market Share (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nokia</td>
<td>97,869.3</td>
<td>22.8</td>
<td>111,473.7</td>
<td>30.3</td>
</tr>
<tr>
<td>Samsung</td>
<td>69,827.6</td>
<td>16.3</td>
<td>65,328.2</td>
<td>17.8</td>
</tr>
<tr>
<td>LG</td>
<td>24,420.8</td>
<td>5.7</td>
<td>29,366.7</td>
<td>8.0</td>
</tr>
<tr>
<td>Apple</td>
<td>19,628.8</td>
<td>4.6</td>
<td>8,743.0</td>
<td>2.4</td>
</tr>
<tr>
<td>ZTE</td>
<td>13,070.2</td>
<td>3.0</td>
<td>6,730.6</td>
<td>1.8</td>
</tr>
<tr>
<td>Research In Motion</td>
<td>12,652.3</td>
<td>3.0</td>
<td>11,628.8</td>
<td>3.2</td>
</tr>
<tr>
<td>HTC</td>
<td>11,016.1</td>
<td>2.6</td>
<td>5,908.8</td>
<td>1.6</td>
</tr>
<tr>
<td>Motorola</td>
<td>10,221.4</td>
<td>2.4</td>
<td>9,109.4</td>
<td>2.5</td>
</tr>
<tr>
<td>Huawei Device</td>
<td>9,026.1</td>
<td>2.1</td>
<td>5,276.4</td>
<td>1.4</td>
</tr>
<tr>
<td>Sony Ericsson</td>
<td>7,266.5</td>
<td>1.7</td>
<td>11,008.5</td>
<td>3.0</td>
</tr>
<tr>
<td>Others</td>
<td>153,662.1</td>
<td>35.8</td>
<td>103,412.6</td>
<td>28.1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>428,661.2</strong></td>
<td><strong>100.0</strong></td>
<td><strong>367,986.7</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>
Innovation

Applications
- Mobile App downloads will increase to 25 Bil. in 2015 from 2.6 Bil. in 2009
- 1 in 4 American adults actively use apps
- By 2016 more than 44 billion apps will have been downloaded

Devices
- 270 Mil. data capable devices were in the hands of consumers
- >630 Different handsets
- 35% of Americans own smartphones

Patents
- Over 40,000 wireless-related patents in the last 20 years

New Players
- Wifi/hybrid cellphones - $19/month
CURRENT MARKET: Industry Changes

Research & Development Patent

1987 - FCC adopts NPRM re alternate technologies
1988 - FCC allows digital deployment as overlay to analog network
1990 - FCC initiates "PCS" proceeding, to explore new wireless licenses and services
1993 - FCC adopts broad definition of "PCS" services, to promote flexibility & innovation
1994 - FCC begins auctioning new "Personal Communications Service" licenses
Jan. 2003 - Spectrum cap eliminated
Nov. 2001 - Spectrum cap raised

Telecom Act of 1996
Section 332 passed - 1993
Increasing Data Growth

8x–10x Volume Growth Over Next Five Years

AT&T Expected Total Data Volumes
PB/month

- Rich Media
- Video Teleconferencing
- Connected Devices
- Increasingly Powerful Wireless Devices
- Mobile Computing
- Mobile Business Solutions
- Mobile Video
- Remote Health Monitoring

Faster Speeds + Greater Access to Content = Accelerated Growth

“As the demand increases, and the benefits are more compelling by the day, it’s all the more reason why unleashing more spectrum must be a national priority. That’s what I want to talk about today: four core reasons why spectrum is at the top of my agenda -- American competitiveness, opportunity, the enormous dollar benefits of freeing up spectrum and the enormous costs of delay.”

–FCC Chairman Julius Genachowski
International CTIA WIRELESS 2011 Show
“Virtuous Cycle”

Spectrum is available

Since networks can handle more

So app/content developers are creating new apps/content

Device manufacturers offer new capabilities

Consumers continue to consume & want more

CURRENT MARKET: Industry Changes
**Spectrum Auctions**

Auctions generate billions of dollars in revenues to U.S. - 700 MHz and AWS - 1 auction raised $30B for U.S. Taxpayers

<table>
<thead>
<tr>
<th>Band</th>
<th>Action/Timing</th>
<th>MHz Reallocated/Repurposed</th>
</tr>
</thead>
<tbody>
<tr>
<td>WCS (2.3 GHz Band)</td>
<td>2010 Order</td>
<td>20</td>
</tr>
<tr>
<td>AWS-2/AWS-3</td>
<td>2010 Order</td>
<td>60</td>
</tr>
<tr>
<td>700 MHz D Block</td>
<td>2010 Order</td>
<td>10</td>
</tr>
<tr>
<td>MSS</td>
<td>2010 Order (L-Band and Big LEO)</td>
<td>90</td>
</tr>
<tr>
<td></td>
<td>(L Band: SkyTerra and Inmarsat)</td>
<td>(Big LEO: DBSD and TerreStar)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2011 Order (S-Band)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(S Band: Globalstar and Iridium)</td>
</tr>
<tr>
<td>Broadcast TV</td>
<td>2011 Order</td>
<td>120</td>
</tr>
<tr>
<td></td>
<td>2012/13 Auction</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2015 Clearing</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>300</td>
</tr>
</tbody>
</table>
ATT merger with T-Mobile

- In 2011 – ATT (#2) made a $39 Bil. bid on T-Mobile (#4)
  - Would have extended 4G to 97.3% from 80%
  - Fought off by Justice Department (who filed a federal antitrust lawsuit) and Sprint
  - Would have delayed the spectrum shortage
  - Ended Dec 19th 2011 – After spending $4 Bil.
Five Forces – Industry Competition

- **Threat of New Entrants**
- **Rivalry Among Existing Competitors**
- **Threat of Substitute Products of Services**
- **Bargaining Power of Suppliers**
- **Bargaining Power of Buyers**
Five Forces – Industry Competition

Rivalry Among Existing Competitors

- Bargaining Power of Buyers
  - Rising power due to increased number of telecom products
  - Very little differentiation
  - Switching costs are low for residential customers, but may be high for corporations

- Competitive Rivalry
  - “Cut Throat”
  - New technology is creating substitute services
  - Market is nearly at capacity

- Threat of Substitute Products
  - Cable TV and Satellite compete
  - Internet voice “Internet telephony”

- Threat of New Entrants
  - Access to finance (high fixed costs)
    - Entrants are subject to financial state
  - FCC Still gives telecom licenses
  - “Good” Radio spectrum

- Bargaining Power of Suppliers
  - Many vendors are available (infrastructure, fiber optic cables, software, …)
  - Limit on personnel, talented managers and engineers
Questions?