Agenda

- Introduction
- Research Questions
- Literature Review
- System Design
- Data Analysis
- Conclusions
- Future Directions
Team Responsibilities

Adam
- System design
- Creating and populating database
- Data analysis

Ben
- Initial literature review
- Constructed PPT
- Trend explanation

Preston
- Literature review
- Trend explanation
Focus: Cell Phones

Adam:
• Logic Wireless

Ben:
• Wireless Sales

• Passion
• Accurate Predictions
• Trend Insight
Research Questions

1. Is there a correlation between percentage of sales and patent number?
2. When will we see surges of cell phone patents?
3. Who are the major manufacturers?
4. What types of patent classifications will cell phones encompass?
5. Are any of the companies lagging behind in terms of technology?
There is a direct correlation (ratio) between sales percentages and number of patents.

1979, 1985, and 1993 will see surges in patents.

Top 6 manufacturers will have almost all of the patents.

Patent classifications will primarily be in Telecommunications.

All of the major manufacturers will have an explosion of smartphone patents, except Motorola.
1946: first mobile radiotelephone

1950s: FCC does not allocate frequencies

1960s:
- FCC starts committee
- AT&T develops service
- FCC opens cell docket

1970s:
- FCC allocates 115 Mhz
- AT&T and Bell labs begin testing
- Cheaper parts made

1979: Nippon (NTT) installs first commercial cellular system in Tokyo

1947: cellular concept materializes at Bell Labs

Source(s): 4
1980s:
- Nordic countries implement cell service
- FCC allows cell service
- Pilot systems in Chicago and DC
- Cell systems become overloaded

1992:
- 10 million cellular subscribers
- Simon created, first cellular “smartphone”

1995: 25 million cellular subscribers

2009: 3.5 billion cellular subscribers

Source(s): 1, 2, 3, 4
Top 6 manufacturers

- Nokia (40%)
- Samsung (14%)
- Motorola (14%)
- Sony Ericsson (9%)
- LG (7%)
Baby Boomers adapting

Entertainment devices

Cell Phone 1.0 → Cell Phone 2.0
  • Phone as a device vs. Phone as a platform

“Mid-Tier” phones dwindling
  • Smartphones, Mid-tier, basic phones

Source(s): 5, 6, 7
Research Design

- Literature review
- Establish keywords
- Spider USPTO
- Parse patent results
- Create and populate database
- Analyze data
Keywords

"cell phone"
"cellular phone"
"mobile phone"
"smartphone"
"smart phone"
"handset"
- Install Strawberry Perl
- Enter command console
- Run “perl spider_full.pl keywords.txt”
- Run “perl spider_id.pl NanoID.rpt”

![Screen shot of command console output]
Install Java and Eclipse
Run USPTO_Html_Parser_Ref.java
Collect files
Create the Database

- Install MySQL
- Create database
- Populate and categorize result files
Data Analysis

- Bibliometric Analysis
  - Total Patents per Year
  - Total Patents per Country
  - Total Patents per Company
  - Total Patents per Country per Year

- Classification Analysis
  - Top 10 Patent Classifications

- Citation Analysis
  - Top 7 Most Cited Patents
Total Patents per Year

- First cellular network in Tokyo
- First smartphone introduced
- First US pilot cellular network
- PCS (Personal Communication Service) opened
- Towers are saturated in US

Source(s): 1, 2, 3, 4
Total Patents per Country

Number of Patents

USA, Japan, Finland, Taiwan, Korea, Canada, Denmark, Sweden, Great Britain, Australia, France, Netherlands, Israel, Hong Kong, Singapore, Switzerland, China, Italy
Total Patents per Company

Number of Patents

- Nokia: 2,200
- AT&T: 1,800
- IBM: 1,200
- Intel: 1,000
- Samsung: 900
- Microsoft: 700
- Canon: 500
- Sony: 400
- Lucent: 300
- Siemens: 200
- LG: 100
Total Patents per Country per Yr

Source(s): 4
Top 10 Patent Classifications

- Telecommunications: 38%
- Multiplex Communications: 10%
- Active Solid-State Devices: 8%
- Telephonic Communications: 8%
- Computer Graphics: 6%
- Digital communications: 6%
- Multicomputer data transferring: 5%
- Radio Wave Antennas: 5%
- Semiconductor device: 7%
- Chemistry: electrical current: 7%

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## Top 7 Most Cited Patents

<table>
<thead>
<tr>
<th>Patent ID</th>
<th># Cited</th>
<th>Patent Title</th>
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<tbody>
<tr>
<td>D289896</td>
<td>74</td>
<td><em>Pocket Telephone</em> by <em>Technophone</em></td>
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<tr>
<td>RE34034</td>
<td>57</td>
<td><em>Cellular telephone data communication system and method</em> by <em>Spectrum</em></td>
</tr>
<tr>
<td>4456793</td>
<td>37</td>
<td><em>Cordless telephone system</em> by <em>Bell Telephone</em></td>
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<tr>
<td>D388784</td>
<td>36</td>
<td><em>Portable Telephone</em> by <em>Nokia</em></td>
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<tr>
<td>5101501</td>
<td>32</td>
<td><em>Method and system for providing a soft handoff in communications in a CDMA</em> by <em>Qualcomm</em></td>
</tr>
<tr>
<td>5493692</td>
<td>32</td>
<td><em>Selective delivery of electronic messages in a multiple computer system based on context and environment of a user</em> by <em>Xerox</em></td>
</tr>
<tr>
<td>4266098</td>
<td>32</td>
<td><em>Device to automatically screen incoming telephone calls, determine the identity of the caller and process the call accordingly</em> by <em>Albert Novak</em></td>
</tr>
</tbody>
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Conclusions

1. There is a direct correlation (ratio) between sales percentages and number of patents

2. 1979, 1985, and 1993 will see surges in patents

3. Top 6 manufacturers will have almost all of the patents

4. Patent classifications will primarily be in Telecommunications

5. All of the major manufacturers will have an explosion of smartphone patents, except Motorola

Source(s): 6
Future Directions

- Analyze more patent content
- Connect company names throughout the patent history
- Complete a more in-depth literature review
- Input data into NetDraw
- Correlate number of document published with patents issued


References

