Killer Applications

What is a Killer App?
- Household name
- "The software to DIE for"
- The next best thing since sliced bread
- How did I ever manage to get by without it?
- Affecting human lives
- Commercial success

Non-Software
- Paradigm shift
- Radio
- Television
- 800-numbers
- Laptop computers
- Internet
- Cell phones
- Digital photography

Time-Sharing Businesses
- ADP
  - Payrolls, etc.
  - Revenues (2006) – $7 billion
- Tymshare
  - Networks (public, private)
  - Banks, airlines, gov. agencies, etc.
- BBN Technologies
- NIH – National Institutes of Health
  - 1968 – 32 time-sharing service bureaus

Word Processing
- 1970s

Text Editing
- The idea
  - 1960s
  - Programs to manipulate code
Killer Applications

Word Processing Machines
- 1970s
- Dedicated computerized systems
  - IBM MT/ST
  - Wang 1200 WPS

Office Automation Systems
- Late 1970s – early ‘80s

WordStar
- 1978
- CP/M

WordPerfect
- 1982

Spreadsheets
  - 1968 – Capex Corporation
    - AutoPlan – on General Electric
    - AutoTab – on IBM mainframe

Batch Spreadsheets
Killer Applications

- 1974
  - Works Records System

- 1979
  - VisiCalc

- 1983
  - Lotus 1-2-3

- 1985
  - Excel

Office Software
- Word processor
- Spreadsheet
- Presentation software
- Database
- Graphics suite
- Communication tools

- 1984
  - AppleWorks
**Microsoft Office**
- 1990 – Office 1, Mac OS
- 1992 – Office 3.0, Windows

**OpenOffice.org**
- 2001

**Google Docs & Spreadsheets**
- 2006

**Before WWW**
- FTP
- Usenet (1979)
- BBS (1979)
- ENQUIRE (1980)
- Gopher (1991)

**WorldWideWeb**
- 1990
- Hypertext + Internet = WWW

**Web Growth**
Number of web-sites

- Tim Berners-Lee

### Web Growth Chart
- Number of web-sites

- 1998: 130
- 1999: 623
- 2000: 2,738
- 2001: 10,022
- 2002: 23,500

- 2003: 650,000
**History of Computers Seminar**

**Killer Applications**

### Web Growth

Number of web sites

- 1991: ViolaWWW
- 1993: Mosaic
- 1994: Netscape

### Internet Usage

Internet usage growth 1995 - 2006

- ViolaWWW
- Mosaic
- Netscape

### ViolaWWW

- 1991
-Israeli startup (Orni Petrushka)

### Mosaic

- 1993
- Israeli startup (Orni Petrushka)

### Chromatis

- Israeli startup (Orni Petrushka)
- Optical Networking
- Bought by Lucent - $4.8 Billion (stock)

### Network Hardware

<table>
<thead>
<tr>
<th>Company</th>
<th>Revenues (2006)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cisco</td>
<td>$28.48 Billion</td>
</tr>
<tr>
<td>Marvell</td>
<td>$1.67 Billion</td>
</tr>
<tr>
<td>Qualcomm</td>
<td>$7.53 Billion</td>
</tr>
<tr>
<td>Alcatel-Lucent</td>
<td>€18.3 Billion</td>
</tr>
</tbody>
</table>
**Internet Search**

- Archie – FTP search (1990)
- Gopher (1991)
  - Veronica
  - Jughead
- WAIS

**Early Search Engines**

- 1993
  - Wandex
- 1994
  - WebCrawler
  - Lycos
  - InfoSeek
- 1995
  - AltaVista
  - Excite

- [http://www.archive.org](http://www.archive.org)

**Yahoo!**

- 1994

- Google

- 1998 – launch
- 2001 – gained popularity

**Before Databases**

- Serial storage
  - Punched cards
  - Magnetic tape
- Direct access storage devices

**Data Models**

- 1960s
  - Turing award
    - 1956 – Dijkstra
    - 1973 (4th) – Bachman
    - 1974 (4th) – Knuth
    - 1981 (1st) – Codd
  - Charles W. Bachman
  - Edgar F. Codd
Killer Applications

**1980**
- **dBASE**

**2006**
- Nokia – MySQL Cluster
- **flickr** – millions of photos and users.
- NetQOS – large networks

**2005**
- 85 million dynamic page views/day
- 1.5 billion MySQL queries/day
- Wikipedia
  - 200 million queries/day
  - 1.2 million updates/day
  - Peak loads – 11,000 queries/second

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- Internet Growth Statistics - Global Village Online
- Netcraft: Web Server Survey Archives
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  - The size of the World Wide Web
  - Pandia - on the number of websites in the world
  - Lucent to Close Chromatix
  - Remembering the Office of the Future: Word Processing and Office Automation before the Personal Computer
**Electronic Mail**

- Personal communication
- Newsletters, magazines
- Scientific collaboration
- Financial transactions
- Government, taxes
- Workplace memos

Many can be achieved electronically
- Some new uses: technical support

**Postal Service – A Definition**
- One way discrete message delivery
- Preset or set source and destination
- Many available transfer media
  - Homing pigeons
  - Horses and carriages
  - Mainframe computers
  - Local area networks
  - Satellite links
  - The Internet

**Popular Uses**
- Personal communication
- Newsletters, magazines
- Scientific collaboration
- Financial transactions
- Government, taxes
- Workplace memos

Many can be achieved electronically
- Some new uses: technical support

**PROFs and the Iran-Contra Affair**
- IBM’s Professional Office System
  - VM/CMS-based, 3270-type terminals, IBM’s VNET
- White House scandal
  - Secret correspondence

**Current Day Usage Statistics**
- #1 reported online pursuit in the USA
  - 91% of online users have done it (FEB-MAR07)
  - As opposed to 39% for instant messages (AUG06)
  - As opposed to 22% for chat rooms/discussions (SEP05)

- Worldwide volumes (OCT06)
  - 1.1 billion email users with 1.4 billion active accounts
  - 183 billion emails sent each day in 2006

- At least once a day, often more
  - 53% of surveyed people check every day

**Webmail Usage Statistics**
- Successful combination of universally available remote access (via WWW) and 3rd party storage
- Top three:
  - Yahoo Mail
  - MySpace Mail
  - Hotmail
Killer Applications

Email Marketing

- Various advertisements and offers, including medications, education, computer fraud, electronic advertising services, real estate, computers and the internet, adult content, you name it…

Drawbacks – Viruses

- Not entirely new: think Anthrax
- Wide, easily accessible, victim base

Additional Drawbacks

- Denial of Service
- Impersonation
  - Fake sender address
  - No plausible deniability
- Anonymity

Instant Messaging

- A real-time extension of email
- A less communal form of chatrooms
- Used for productivity in workplaces
  - Integrated with existing office systems

IRC – Internet Relay Chat

- Jarkko “WiZ” Oikarinen, 1988
- Real-time discussions in BBSs
- Numerous “channels”
  - Akin to chatrooms with topics
- 1990: 1 net, 12 users, 38 servers
- Open server debate led to a split
  - Open = nickname collisions, abuse
Killer Applications

IRC – Current Day

- 818 nets, with many users and channels
- Largest ones: ~200K users, ~30 servers

ICQ – I Seek You

- Yossi Vardi’s Mirabilis, 1996
- Assigns each user a UIN
- Combines user online status and real-time messaging

Advanced Features

- Audio
- Video
- Emoticons
- File Transfer
- Conferencing
- Games
- Cellular IM

Current Day Usage Statistics

- Increasingly common
  - 42% of internet users in the USA (54 million)
  - Of these, for 24%, IM use > email use, for 6%, IM = email
  - Younger users IM more frequently, and also multitask
- At work (SEP04)
  - Used by 24% of American IM users (11 million)
  - 40% use IM with coworkers, 33% with friends and family
- At least once a day, often more (SEP04)
  - 36% of surveyed people check every day
  - 63% say they use IM at least several times a week.

Social Networking

- A graph structure
- Nodes are individuals or organizations
- Edges indicate the ties between them
  - Shared interests, kinship, web links, trade, …
Types of Social Networking

- Personal networking
  - School, college, work, military, family, dating, …

- Business networking
  - Colleagues, career options, resume publishing

- Social bookmarking
  - Gathering links, ascertaining popularity

- Special common interest
  - Cars, sports, books, music, travel, games, …

Typical Features

- Photo sharing
- Video sharing
- Web logging (= online journals)
- Talkbacks, comments, polls
- Forums
- Chat

Web Log Statistics

- In the top 10 global web ranks
  - Windows Live, MySpace, Orkut

- 7% have created a web log
  - Used to be 3% (2002), then 5% (2004)

- 27% have read web logs
  - Mostly those relating to current affairs

- 12% have posted response comments

- But, 62% of online Americans have never heard of it!

Web Log Users

- 57% male
- 48% under 30
- 82% online for more than 6 years
- 39% have college or graduate degrees

Business is Business

- MySpace sold for $580 million
  - Became worth $1.5 billion in a year

- Data mining for advertising
- Offering local social services
- Stealing online dating business

Computer and Video Games
Killer Applications

The Gaming Industry

- More money than the movie industry
  - More money than box office sales, to be precise
- A multitude of genres
  - Puzzles, educational
  - Adventure
  - Sports
  - Arcade
  - Simulators
  - Action
  - Shooters
  - Real time strategy
  - Role playing games
  - Card and board games

Classic Platforms

- Arcade machines
  - Video arcade phenomena
- Personal computers
  - XT, AT (ability to save state)

Japanese Arcades

- Multiple stories
- Well lit, colorful
- Social hub

American Arcades

- Ground floor or basement
- Dimly lit atmosphere
- Subcultural scene

Platforms – Gaming Consoles

- Develop together with computers, side by side
- Require less resources, used solely for gaming
- Nintendo Entertainment System, N64, XBOX
- Gameboy, PSP (portable)
- Nintendo WII (novel MMI)
Killer Applications

Multiplayer Games
- Hotseat
- Networked
  - LAN parties
  - Online servers (WON, Blizzard, Yahoo)

Mass Online Multiplayer
- Social aspects
- Online marketing/payment models
  - Game items on eBay
  - Peer ranking systems
  - Second Life

Current Day Usage Statistics
- Worldwide volumes
  - 217 million gamers worldwide
  - Average of 9 visits per month
  - Yahoo! Games is largest (53 million unique users)

- Women
  - Age 40+ spend 9.1 hours per week (41% of online time)
  - Compare with 7.4 hours for teens, 6.2 women age 40
  - Word & puzzle games (49%), casino (22%), arcade (16%)
  - Used to relax during work and after putting kids to bed

Audio Development
- Sound Blaster
- Stereo versus mono
- Synthesized versus recorded
  - WAVetable MIDI, CD music
- 3D surround
- Voice activated

Graphics Development
- 2D raster
  - Sprites
- 2D vector
  - Polygons

Graphics Development 3D
- Pseudo-3D
  - Multilayered
  - Isometric views
- 3D
  - Wireframes
  - Shading/Lighting
- Fractals