The World is Flat

The Ten Forces That Flattened the World

*Two: Flatteners*

Prepared by *F. Sibel Salman*

INDR 481 Information Systems course, Koc University
Flat World

- It is now possible for more people than ever to collaborate and compete in real time
  - in different corners of the world
  - in different kinds of work
  - on a more equal basis
  - using computers, e-mail, workforce software, teleconferencing, fiber-optic networks
- Connects all the knowledge centers in the world into a single global network
The Flatteners

- Flattener #1: Fall of the Berlin Wall, Rise of Windows (PC)
- Flattener #2: Netscape goes public (the Internet)
- Flattener #3: Work Flow Software
- Flattener #4: Uploading
- Flattener #5: Outsourcing
- Flattener #6: Offshoring
- Flattener #7: Supply-Chaining
- Flattener #8: Insourcing
- Flattener #9: In-forming
- Flattener #10: The Steroids: digital, mobile, personal, virtual
Flattener #1

- Fall of the Berlin Wall (11/9/89)
  - End of the Cold War

- Rise of the windows-enabled PC
  - Basic platform that started the global information revolution emerged in late 80s and early 90s
On the 9th of November, 1989, the border separating Western Germany from Eastern Germany was effectively opened.
In August 1961, the *Berlin Mauer* separated East Berlin from West Berlin for over twenty-eight years.

The Fall of the Berlin Wall is a symbol for the end of the Cold War.
Fall of the Berlin Wall (11/9/89)
- The end of the Cold War broke down barriers between people
- It shifted the balance of power toward democratic, free-market-oriented governance
- Fall of the wall eliminated a physical and geopolitical barrier that held back information
- Flow of knowledge freely among people
Fall of the Berlin Wall (11/9/89)

- The world could be seen as a whole: a single market, single ecosystem, single community

- Ripple effect felt all the way to India
  - From 1947 to 1991, infrastructure was government owned; massive regulations, controls, bureaucracy
  - 1991 reforms opened up the economy; higher growth
Flattener #1

- Rise of the Windows-enabled PC eliminated the limits on the amount of information that a single individual could access, author, manipulate and diffuse

- Adoption of common standards
  - In economics, accounting, banking, technology
  - Free movement of best practices
  - Creates a level playing field
  - European Union expanding, euro
Flattener #1

- Rise of the Windows-enabled PC
  - 1977, release of the Apple II home computer by Steve Jobs and Steve Wozniak
  - 1981, first IBM PC in market
  - 1985, first version of Windows operating system
  - 1990, Windows 3.0, breakthrough user-friendly version

- Increase in productivity

- Millions of people became authors of their own digital content that could be shared far and wide
  - Words, music, data, maps, photos, voice, video
1977, release of the Apple II home computer by Steve Jobs and Steve Wozniak
1981, first IBM PC in market

Model: IBM 5150
Released: September 1981
Price: US $1,565 ~ $3,000
CPU: Intel 8088, 4.77MHz
RAM: 16K, 640K max
Display: 80 X 24 text
Storage: dual 160KB 5.25-inch disk drives
Ports: cassette & keyboard only 5 internal expansion slots
OS: PC-DOS v1.0

http://oldcomputers.net/ibm5150.html
Flattener #1

- 1990, Windows 3.0, breakthrough user-friendly version
Flattener #1

- **Information at your fingertips** – empowerment of individuals
- Application programs were developed to enhance productivity
  - Spreadsheets, word processing
- Basic platform that started the global information revolution emerged in late 80s and early 90s
Read more:
http://www.time.com/time/photogallery/0,29307,1630529,00.html#ixzz1Y8ZeTBI5
The emergence of the Internet as a tool of low-cost global connectivity

The emergence of the World Wide Web to post and share digital content

Spread of the commercial web browser to retrieve and display web pages

World Wide Web (WWW): a system for creating, organizing, and linking documents over the Internet

Developed by Tim Berners-Lee at CERN, Switzerland
Tim Berners-Lee

- Tim Berners-Lee is credited for inventing the World Wide Web in 1989 while working at CERN, the European Particle Physics Laboratory in Geneva, Switzerland.

- In 1989, he proposed a global hypertext project, to be known as the World Wide Web.

- Based on the earlier "Enquire" work, it was designed to allow people to work together by combining their knowledge in a web of hypertext documents.
Berners-Lee wrote

- the first World Wide Web server, "httpd"
- the first client, "WorldWideWeb"
- a what-you-see-is-what-you-get hypertext browser/editor which ran in the NeXTStep environment
- most of the communications software and defined URLs, HTTP and HTML
Berners-Lee and the emergence of the WWW

- Berners-Lee posted the first web site ever on Aug 6, 1991 at http://info.cern.ch explaining how the WWW worked

- He designed an addressing scheme that gave each Web page a unique location or URL (Universal Resource Locator)

- He popularized HTML (hypertext markup language), coding system of the web pages

- He came up with a set of rules that permitted the documents to be linked, and called it HTTP (HyperText Transfer Protocol)
Emergence of the World Wide Web

- The program "WorldWideWeb" first made available within CERN in December, and on the Internet at large in the summer of 1991.

- From 1991 till 1996 number of Internet users jumped from 600K to 40 M.

- What popularized the Internet and the Web as tools of connectivity and commerce?
What popularized the Internet and the Web as tools of connectivity and commerce was the creation of easy-to-use commercial web browsers.

The first widely popular commercial browser to surf the web was....?
The first widely popular commercial browser to surf the web was Netscape, created by a tiny start-up company in Mountain View, CA.

Netscape went public on Aug 9, 1995, followed by the release of Windows 95 which was equipped with built-in Internet support for PC applications. This sparked the Internet boom.

Investors saw infinite demand for Internet-based products and services.
These developments led to the dot-com stock bubble and a massive overinvestment in fiber-optic cable. As a result, the world got wired together.

Netscape played another flattening role: it helped make the Internet “interoperable”.

Open protocols: rules that enable digital devices to talk to one another. FTP, HTTP, HTML, SSL, SMTP, POP, TCP/IP. System for transporting data securely.
TCP/IP
Flattener #3

- Work flow software
  - Many software developments, standards, and protocols enable computers and other digital devices to interact over the Internet so that work can be done by people anywhere in the connected world.
  - Adoption of standards
    - HTML, HTTP, TCP/IP, XML, SOAP, AJAX
    - Interoperable and interconnected
    - Focus on main functionality of application software, better quality
Flatteners 1,2,3

- With the first three flatteners a "collaboration platform" is emerging for people to share digital content inexpensively all over the world.
  - Web-enabled platform for multiple forms of collaboration

- In the mid to late 1990s the world changed. The remaining flatteners expand on this opportunity for collaboration, "steadily flattening the world even more."
Uploading

- Upload files and globalize content, and collaborate on that content individually or as part of self-forming communities
- *Bottom-up* model rather than *top-down*

Forms of uploading:
- Community developed software
- Blogging
- Wikipedia
- Podcasting
- Book reviews on Amazon.com
- Rating sellers and buyers on eBay
- Videos on Youtube
Flattener #4

- Community developed software
  - Make the source code available online: “open source”
  - Let anyone improve it
  - Let people download it for their use

1. Intellectual commons community
   - The source can be used as the foundation for a commercial product by acknowledging the original group who produced it

2. Free software community
   - Product built on free code should be free
Flattener #4

- Examples to community developed software
  - Apache web server
  - Linux operating system
  - Firefox web browser
Flattener #4

- **Apache**
  - One of the most successful open source tools (2/3 of web sites in the world use it)
  - It is a *web server* – free shareware program for Web server technology
  - Developed for free by people working online in an open-source chat room => community developed software
  - Developed by means of a source code repository managed by a CVS tool
  - By 1999, the original NCSA code was rewritten with improvements and named Apache
  - IBM incorporated Apache into its own Web server product named Web Sphere (commercial product built on top of Apache code)
Linus operating system

In 1991 Linus Torvalds, a student at the University of Helsinki, posted his operating system online and asked others to improve it for free.

Free software movement – Linux must always be free.

Microsoft argues that

- innovators should be financially rewarded for innovation to continue.
- If everyone gets the same free software, you cannot have competitive edge.
Flattener #4

- Firefox
  - Released in November 2004 by the Mozilla Foundation
  - Free, fast, easy-to-install Web browser
  - Many extensions added new applications to the browser
Flattener #4

☐ Blogging
  ■ Uploading news and commentary

☐ Podcasting
  ■ Audio/video version of blogging

☐ Wikipedia
  ■ People’s encyclopedia
Social Media

- Social media are places, tools, services allowing individuals to express themselves.
- In “Social Media” there is ”Media”, which means that social media are digital places for publication.
- In “Social Media” there is “Social”, which implies sharing (files, tastes, opinions...) but also social interactions (individuals gathering into groups, individual acquiring notoriety and influence).

Facebook: millions of people have a platform to tell their own stories

Source: [http://www.fredcavazza.net/2008/06/09/social-media-landscape/](http://www.fredcavazza.net/2008/06/09/social-media-landscape/)
In "Social Media" there is "Media", which means that social media are digital places for publication.

In "Social Media" there is "Social", which implies sharing (files, tastes, opinions…) but also social interactions (individuals gathering into groups).
The World is Flat

The Ten Forces That Flattened the World

*Two: Flatteners*

Prepared by *F. Sibel Salman*

Indr 481 Information Systems course, Koc University
Outsourcing

Take some function that was done in-house, and have another company perform it and then reintegrate it back.
Flattener #5

- Outsourcing
  - How did the outsourcing movement to India start?
  - What factors contributed to it?
Flattener #5

- Outsourcing

- 25,000 graduates of India’s top engineering schools have settled in the US since 1953 – one fourth of IIT grads ended up in the US

- American companies started to discover they could draw on India’s brain power in India late 80s and early 90s

- Jack Welch at GE forcing his IT people to contract out some of their work to Indian vendors
Flattener #5

- Outsourcing
  - Wired and connected by fiber-optic cables by late 90s
  - Y2K crisis
    - Internal clocks of computers going up to 99 created risk
    - Internal clocks and related systems had to be adjusted – tedious job
    - Upgrading work outsourced to India
  - By 2000, managing e-commerce applications in India
The World is Flat

The Ten Forces That Flattened the World

Two: Flatteners

Prepared by F. Sibel Salman

Indr 481 Information Systems course, Koc University
Offshoring

- A company takes one of its factories and moves the whole factory offshore.
- The same product is produced the same way but with cheaper labor, lower taxes, subsidized energy.
- In December 2001 China joined the World Trade Organization.
- Companies started shifting production to China.
Flattener #7

- Supply-Chaining
  - Collaboration among suppliers, manufacturers, retailers, customers to create value
  - The more supply chains grow, the more they force the adoption of common standards between companies
Supply-Chaining

- Prime example to supply-chain efficiency and implementation of innovative IT solutions
- Wal-Mart, US-based retailer
- A chain of large discount department stores
- Wal-Mart has 8,500 stores in 15 countries, with 55 different names
- In 2010 it was the world's largest public corporation by revenue
- Wal-Mart headquarters in Bentonville, Arkansas
- 1.2-million-square-foot distribution center
- (over 100,000m² -> 15 soccer fields)
Flattener #7

- Supply-Chaining
  - Wal-Mart distribution center
  - Operational 24/7
    - supplier trucks arrive at loading docks and feed boxes to conveyor belts
    - an electric eye reads the bar code on each box
    - boxes ordered by particular Wal-Mart stores are sorted out by an electric arm and are loaded into waiting Wal-Mart trucks
Wal-Mart distribution center
Supply-Chaining at the *Wal-Mart distribution center*

- **STORE - AVAILABILITY**
  - products are placed on the shelves

- **STORE – SALES – INFORMATION FLOW**
  - when a consumer buys a product, the cashier scans it and a signal is sent across the Wal-Mart network to the supplier of the product

- **SUPPLIER**
  - the supplier will make another one
Flattener #7 Supply-Chaining at Wal-Mart
Wal-Mart’s supply chain

- In 1960’s started as a discount store
- Buy goods in bulk directly from a manufacturer to get it cheaper
- Not efficient for manufacturers to ship to the stores spread all over
- Wal-Mart setup a distribution center to which all the manufacturers could ship their merchandise
- Wal-Mart got its own trucks to distribute these goods to the stores
- Next worked with manufacturers to cut their costs
- Constantly improved its Information Systems – know what customers want and inform the vendors quickly
Wal-Mart’s supply chain

- **Scale and efficiency**
  - Truck drives connected by radios and satellites; drop and pick-up
  - Shared inventory information with suppliers
  - Point-of-sale terminals, linked to headquarters
  - *Retail Link* private extranet for suppliers
  - Latest innovation: RFID microchips attached to each pallet and box that comes into Wal-Mart (to replace barcodes) to track them in the supply chain
Prof. Yossi Sheffi at MIT explains

- **Good news:** global supply chains that draw parts and products from every corner of the world have become essential for both retailers and manufacturers

- **Bad news:** making them work is difficult

- **Two basic challenges in developing a global supply chain**
  1. Global optimization, consider total cost, get the most reliable, low cost delivery system
  2. Coordinating supply and demand
Prof. Yossi Sheffi at MIT explains strategies to cope with these challenges.

1. Replace inventory with information

Wal-Mart
- pioneered this strategy - also visibility into where products are

Zara
- believes it is more profitable to incur shortages than overstock, and then respond to shortages rapidly
- Zara’s store managers carry PDA’s and send customer preferences to a central planning office
- From design to store in at most a month
Prof. Yossi Sheffi at MIT explains strategies to cope with these challenges.

2- Postponement

As it becomes harder to forecast demand, companies postpone adding value to their products until the end.

Dell

- Custom makes computers
- It has no inventory of computers
- It has a basic supply of parts that can be used in many configurations
Insourcing

Very few companies can afford to develop and support a complex global supply chain on their own.

This created an opportunity for package delivery firms like UPS: *Third party managed logistics*
Insourcing

UPS

- Engineers come inside your company, analyze its manufacturing, packaging and delivery processes and then design, redesign and manage your global supply chain
- They can even finance operations, collect money from customers – TRUST is key
- Small business can act like big
UPS started out in 1907 in Seattle
Its founder, Jim Casey, borrowed $100 from a friend to start a package delivery business
Casey delivered packages by bicycle and on foot
The company's name changed to UPS in 1919
Picking up and delivering package is not all that UPS does
Insourcing

- Logistics company UPS
  - It has partnered with businesses like Amazon and eBay to provide shipping options to customers
  - **UPS Supply Chain Solutions** oversees some surprising jobs for other companies.
  - Basically, UPS takes care of warehousing, shipping, delivery, logistics, repair and customs brokerage for businesses.
  - It also offers consulting services to businesses to help them refine their warehousing, shipping and logistics practices.
  - “Synchronizing global supply chains for companies”
Insourcing

One such company is Toshiba. If you buy a Toshiba laptop and it breaks, UPS will:
- Send you a return-shipping box that your laptop will fit in
- Repair the laptop
- Ship it back to you in 3 days

UPS operates Toshiba’s repair shop in their hub.

UPS is also in charge for inventory and shipping for several other companies, including Rolls-Royce.

Dispatching drivers and scheduling pickups of supplies for Papa John’s
Insourcing

- More than 60 companies have moved operations closer to the UPS hub since 1997 so that they can produce and ship them directly from the hub without keeping a warehouse.
- UPS engineers redesigned Ford’s North American delivery network with better tracking, time to get the cars to dealer was cut by 10 days.
- UPS has an Operations Research Division which works on supply-chain algorithms for optimization of the supply chain.
Flattener #9

- In-forming
  - Ability to build and deploy your own personal supply chain of information, knowledge and entertainment
  - Self-collaboration
  - Web search
  - Seeking like-minded people and communities
  - Google
    - Cofounders Larry Page and Sergey Brin, 1995
    - processing around 1 billion searches per day – only a third US-based
Flattener #9

- In-forming

- Google

- PageRank technology: Rank a web page by how many other web pages are linked to it
- Analysis of page content to determine which pages are most relevant to the search
- Images, videos, books, maps are searchable
- Targeted advertisement model – show adds relevant to the search
- Charge advertisers for the number of times users clicked on their adds
Digital, Mobile, Personal, and Virtual

- **Digital**: thanks to PC-Windows+Netscape+Work flow, all analog content (photography, communication) are digitized

- **Virtual**: shaping, manipulating and transmitting digitized content can be done at very high speeds, easily

- **Mobile**: thanks to wireless technology all this can be done from anywhere, any time, through a variety of devices

- **Personal**: can be done by you on your own device
Steroids

- The first steroid: Computing power
- The second steroid: Breakthroughs in instant messaging, peer-to-peer networks
- The third steroid: Breakthroughs in making phone calls over the Internet (VoIP)
- The fourth steroid: Videoconferencing
- The fifth steroid: Advances in computer graphics
- The sixth steroid: Wireless technologies and devices
The first steroid: Computing power

- Computational capability
  - MIPS: Millions of instructions per second
  - In 1971 Intel 4004 microprocessor produced 0.06 MIPS
  - Today Intel Pentium Extreme Edition (with two cores) produces over 20,000 MIPS
  - Itanium processor contains 1.7 billion transistors
  - Core processors can share the load so that neither one heats or uses too much energy
The first steroid: Computing power

- Storage capability
  - Growing exponentially
  - Ipods with 60 GB of storage, thousands of songs, pictures, videos

- Input/output capability
  - With advances in fiber optics a single fiber can carry one terabit per second
    - With 48 fibers in a cable, you can transmit all the printed material in the world in minutes
**Flattener #10**

- **The second steroid:** Breakthroughs in instant messaging, peer-to-peer (p2p) networks
  - File sharing (p2p)
    - Share songs, video online
    - Started with Napster (reached 60 million visitors per month in a year)

- **The third steroid:** Breakthroughs in making phone calls over the Internet (VoIP)
  - VoIP: Internet protocol service, turns voice to data packets sent via the Internet
  - Skype: cheap, videoconferencing, handset system
  - Voice will become free, phone companies will charge for add-ons
Flattener #10

- **The fourth steroid:** Videoconferencing
  - HP and DreamWorks designed a videoconferencing suite that is realistic (sold at $250K)
  - Will make outsourcing and offshoring easier and more efficient

- **The fifth steroid:** Advances in computer graphics
  - Third generation user Interfaces, inspired by games
  - Highly visual, interactive interfaces to applications in health care, education, sports, science, business
The sixth steroid: Wireless technologies and devices

- Access the Internet, email, using a cell phone or a handheld device
- Machines talking to machines via RFID chips,
- People can work from anywhere
- DoCoMo in Japan
  - Two-way video-phones
- Communication between people and machines
- With a phone
  - Allow payment - With a smart card you can pay in virtual shops
  - Authentication system – reach medical records
  - Control machines at home
The steroids will increase collaboration and will make it easier and cheaper.

They enhance uploading, outsourcing, supply-chaining, insourcing, informing.