Platforms and Publishing
Week 3 #1
List the technological differences between computers and consoles.

Explain how the computer developed into a major game platform.

Understand the components of the computer as game machine.

Describe how consoles differ from computers for playing games.

Understand the capabilities of different handheld game platforms.
Platforms Today

- Platforms
  - Computer
  - Console
  - Handheld
  - Cell phone
  - Online (Networked)

- Old Platforms
  - Arcade
Game Platforms

- **Platform**
  - Device on which a game is played

- **Platform dependent**
  - Can only be played on appropriate board / setup

- **Platform independent**
  - Can be played anywhere
Game Platforms cont.

- Electronic game platform
  - Hardware game is played upon
    - Computer
    - Console
    - Handheld
    - Cell Phone

- Cross platform
  - Games that run on multiple platforms
Game Platforms cont.

- Console games
  - Must have license from console manufacturer
  - Must buy a development station
  - Console games outsell computer games

- Computer games
  - Anyone can develop and sell
Declining platform

Arcade machines were about one hardware generation ahead of what was possible at home

Today, it has become difficult for arcade machines to stay ahead of the technological curve.

Arcades survive by providing games that cannot be cheaply replicated at home.
PC Platforms

- Windows
- Mac
- Linux
Evolution of Game Platforms

- Early electronic games
  - Minimal graphics
  - Low amount of processing power
  - Simple game controls
Rise of home computers

- Apple II
  - Color graphics
- PC clones
  - Worked like IBM-PCs
  - Windows
    - Easier to communicate with computers
Moore’s Law
- Predicted that number of transistors per chip would double every year
- Doubling every 18 mos. since 1995
Figure 1-2. Floating-Point Operations/Second on the GPU
Applying Moore’s law to intelligence...
- 2001  Insect
- 2010  Mouse
- 2023  1 Human
- 2050  All humans

What does this mean for future game play?
“Hot Rod” Gamers

- “Open hardware” mods applied to realize a *hot rod* PC (for computer game playing)
- Venue for hot rod PCs: QuakeCon
  - QuakeCon2002 LAN party w/>1700 PCs
  - QuakeCon2003 LAN party w/>3200 PCs
Four distribution models

- **Boxed product**
  - Price split amongst retailer, wholesales, distributor, publisher, and developer

- **Shareware**
  - Free at first, then 100% goes to the developer

- **Downloads**
  - Split amongst publisher, developer, and host (e.g. Gamesp’s Direct 2 drive)

- **Web-based games**
  - Subscription or advertising based
Windows

- Represents the majority of the PC market
- Current generation OS: Windows XP
- Next generation OS: Windows Vista
- DirectX – a collection of API’s that theoretically allows designers to program games without worrying about specific hardware details
Hundreds, if not thousands, of possible hardware configurations.

Despite DirectX, there are inevitably hardware conflicts which cause difficulty in programming bug-free games.

No central governing body for determining compatibility
Primary genres are strategy and first-person shooters.

Market includes both casual gamers and hardcore enthusiasts.

Most important predictor of PC game performance is the graphics card.

Primary graphics chip developers: ATI and nVidia.
Mac and Linux

- Generally receive games well after they are released on PC.
- There are very few original games developed for these platforms.
Video Game Consoles

- Sony PlayStation 2
- Sony PlayStation 3
- Microsoft Xbox
- Microsoft XBOX 360
- Nintendo GameCube
- Nintendo Wii

![U.S. Console Sales](chart.png)

(Source: NPD)

First Six Month Totals
Game Platforms cont.

- Console games
  - Must have license from console manufacturer
  - Must buy a development station
  - Console games outsell computer games

- Computer games
  - Anyone can develop and sell
Currently available only as boxed product at retail

Revenue is divided just like in the PC realm, except the console manufacturer receives a licensing fee (usually $5) for every unit sold.
Video Game Consoles

- No upgrading
  - Systems are integrated units
- Less RAM than a computer
  - Must often get information from cartridge or disc
- Video games outsell computer games 7:1
- Video consoles have simpler components
PlayStation 2

- DVD-based system
- Backwards compatible with PlayStation
- Uses solid-state memory cards for permanent storage.
- Network connectivity with purchase of a network adapter.
- Hard drive is also available for purchase.
- Oldest of current generation of consoles.
DVD-based system.
Requires separate purchase to unlock DVD functionality.
Ships with a hard drive. Can also use memory cards for storage.
Ships with built-in networking but requires an XBox Live subscription to function.
Most sophisticated of the current generation.
Uses DVD-format mini-discs. Cannot play DVD movies.

Uses memory cards for storage.

Network adapter is available for separate purchase.

Can interact with GameBoy Advance for additional features in supported games.
November 2005; DVD–based

4–5 times the power of XBox.

Microsoft’s **Xbox 360** is $399, uses a standard DVD optical drive, and only includes a hard drive and wireless game controller in its premium version.

Microsoft recently updated the 360 to provide support for full HD, 1080p video output to match the PS3.

Microsoft has plans to offer HD movie playback both with an optional HD–DVD player in an external box, and over the web through its online Xbox Live video store.

However, the Xbox 360's optional, external HD–DVD player is $200, pushing the 360 up to the same price as the PS3. Further, the $300 core Xbox 360 systems can’t use Microsoft's online video store because they don’t have the required hard drive to save downloaded movies.
PlayStation 3

- 2x as powerful as Xbox; Backwards compatible.
- Sony's PS3 is the most expensive at $500–600
- Includes a standard hard drive, a high definition Blu-ray optical drive, HD video output, Bluetooth wireless controllers, and—in the premium version—WiFi wireless networking.
- Sony is setting up the PS3 as a PC alternative. The premium model has a memory card reader for not only Sony’s own Memory Stick but also—in what must be an incredible first for the company—Compact Flash and SD memory cards, making the PS3 a digital hub for photos; with a USB keyboard and mouse and the included web browser, it can serve as a basic PC.
- The PS3 is also the new HD core of Sony’s modern take on the stereo system, offering 5.1 Dolby Digital Surround and true 1080p high definition video playback from prerecorded Blu-ray movies.
## PlayStation vs. Xbox 360

<table>
<thead>
<tr>
<th>Feature</th>
<th>Sony PlayStation 3</th>
<th>Microsoft Xbox 360</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price</td>
<td>$500</td>
<td>$400</td>
</tr>
<tr>
<td>Release Date</td>
<td>2006</td>
<td>Q4 2005</td>
</tr>
<tr>
<td>Controller</td>
<td>Bluetooth Wireless</td>
<td>2.4 GHz Wireless</td>
</tr>
<tr>
<td>Graphics Speed</td>
<td>550 MHz</td>
<td>500 MHz</td>
</tr>
<tr>
<td>System Memory</td>
<td>256 MB XDR</td>
<td>512 MB UMA (Shared w/GPU)</td>
</tr>
<tr>
<td>Video Memory</td>
<td>256 MB</td>
<td>512 MB UMA (Shared w/CPU)</td>
</tr>
<tr>
<td>Resolution</td>
<td>480i/p, 720p, 1080i/p</td>
<td>480i/p, 720p, 1080i</td>
</tr>
<tr>
<td>Controller Ports</td>
<td>Up to 7 Bluetooth Controllers</td>
<td>Up to 4 Controllers</td>
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<tr>
<td>Media Format</td>
<td>Blu-ray BD-ROM</td>
<td>Dual-Layer DVD-ROM</td>
</tr>
<tr>
<td>Communications</td>
<td>802.11 B/G Wi-Fi, Bluetooth L2 Cache 512KB</td>
<td>802.11 A/B/G Wi-Fi “ready” L2 cache, 256KB per SPE 1MB</td>
</tr>
<tr>
<td>Processor</td>
<td>Cell Processor Custom</td>
<td>IBM PowerPC CPU</td>
</tr>
<tr>
<td>Processor Speed</td>
<td>3.2 GHz</td>
<td>3.2 GHz</td>
</tr>
<tr>
<td>Built-in Features</td>
<td>Backward Compatible</td>
<td>Backward Compatible (limits)</td>
</tr>
</tbody>
</table>
Nintendo Wii

- The **Wii** is the least expensive of the three at $250
- Includes both Bluetooth for wireless controllers and a DVD drive, but will not be able to play DVD movies. It also lacks a hard drive. Instead, the Wii focuses on physically involving games using the wireless **Wii Remote** paired with the accessory **Nunchuk** controller.
- Backwards compatible with all previous Nintendo systems, through downloads of legacy games.
- The Wii Remote uses accelerometers to sense how players swing, point, and tilt the controller, encouraging game titles to incorporate activity.
- The Wii will also wirelessly connect to Nintendo's **DS portable game system**, using its microphone and touchscreen as inputs for Wii games.
- Nintendo has an online store that sells classic games from the Nintendo 64 and other previous game consoles.
# Console Comparisons

<table>
<thead>
<tr>
<th>Feature</th>
<th>Xbox 360 Core</th>
<th>Xbox 360 Premium</th>
<th>Wii</th>
<th>Playstation 3 Basic</th>
<th>Playstation 3 Premium</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU</td>
<td>3.2GHz PPC &quot;Xenon&quot; (3 Core)</td>
<td>729MHz &quot;Broadway&quot;</td>
<td>3.2GHz PPC Cell (7 Active, 1 Redundant)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GPU</td>
<td>500MHz &quot;Kenos&quot;</td>
<td>243MHz &quot;Hollywood&quot;</td>
<td>550MHz RSX</td>
<td></td>
<td></td>
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<tr>
<td>RAM</td>
<td>512MB GDDR3</td>
<td>88MB LT-SRAM</td>
<td>512MB (XDR &amp; GDDR3)</td>
<td></td>
<td></td>
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<tr>
<td>CPU-RAM Bandwidth</td>
<td>22.4GB/s</td>
<td>4GB/s</td>
<td>25.6GB/s (XDR), 22.4GB/s (GDDR3)</td>
<td></td>
<td></td>
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<tr>
<td>DVD/DVD-Video</td>
<td>12x Read</td>
<td>6x Read (DVD-Video Optional)</td>
<td>8x Read</td>
<td></td>
<td></td>
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<tr>
<td>Next-Gen Optical</td>
<td>HD-DVD Optional (Q4)</td>
<td>No</td>
<td>2x Blu-ray Disc</td>
<td></td>
<td></td>
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<tr>
<td>Proprietary Optical</td>
<td>Xbox 360 DL DVD</td>
<td>GameCube Disc, Wii Optical Disc</td>
<td>Playstation 3 BD, Playstation 2 DVD, Playstation CD</td>
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<td></td>
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<tr>
<td>Internal Memory</td>
<td>20GB HDD Optional</td>
<td>20GB HDD</td>
<td>512MB Flash</td>
<td>20GB HDD</td>
<td>60GB HDD</td>
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<tr>
<td>External Memory</td>
<td>Memory Card - 64MB</td>
<td>SD, USB Storage</td>
<td>No</td>
<td>Memory Stick, Compact Flash, &amp; SD/MMC</td>
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<tr>
<td>Wired LAN</td>
<td>1x 100Mb/s</td>
<td>Optional via USB Adapter</td>
<td>1x 1000Mb/s</td>
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<td></td>
</tr>
<tr>
<td>Wireless LAN</td>
<td>Optional</td>
<td>Yes</td>
<td>Optional</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>USB</td>
<td>3x USB2.0</td>
<td>2x USB2.0</td>
<td>4x USB2.0</td>
<td></td>
<td></td>
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<tr>
<td>Wired Controller Ports</td>
<td>4x via USB</td>
<td>4x GameCube</td>
<td>4x via USB mini-D</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wireless Controller Support</td>
<td>4x</td>
<td>4x</td>
<td>4x</td>
<td></td>
<td></td>
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<tr>
<td>Controller Motion Sensing</td>
<td>No</td>
<td>3-Axis Rotation, 3-Axis Position (Full Motion)</td>
<td>3-Axis Rotation, 3-Axis Acceleration</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Controller Rumbling</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td></td>
<td></td>
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<tr>
<td>Video Output</td>
<td>Composite, S-Video, Component, VGA</td>
<td>Composite, S-Video, Component</td>
<td>Composite, S-Video, Component, SCART, VGA</td>
<td>All Basic Outputs + HDMI</td>
<td></td>
</tr>
<tr>
<td>Maximum Video Resolution</td>
<td>1080i</td>
<td>480p</td>
<td>1080p</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Audio Output</td>
<td>Dolby Digital, DTS</td>
<td>Dolby Pro Logic II</td>
<td>Dolby Digital, DTS</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Console Comparisons
Mobile Platforms

- GameBoy
- Nintendo DS
- Sony PSP
- Cellphones/PDAs

GtZMONDO – a dog by any other name
Mobile business models

- Dedicated game systems (GameBoy, PSP, DS) use same model as consoles.
- PDAs and cellphones offer games either as downloads directly to the device or as retail product that can be installed by hooking up the device to a computer.
Handheld games
  ◦ Relatively new to the market

Nintendo Game Boy
  ◦ Simple controls
  ◦ Games available on small cartridges

Nokia N-Gage

Sony’s PlayStation Portable

Cell phones

PDAs
Most popular mobile platform
Current incarnation: GameBoy Advance
Backwards compatible with all previous GameBoy platforms.
Cartridge-based system
Can link with other GameBoy systems for multiplayer
Nintendo DS

- Cartridge-based system
- Uses two screens for added game play alternatives.
- Second screen is a touch screen that opens up new interface opportunities.
- Wireless connectivity for network play.
- Backwards compatible with GameBoy
Sony PSP

- Disc-based system
- Uses Memory sticks for storage.
- Can play movies as well as games.
- Includes wireless networking for game play as well as Internet.
Primarily casual games.

Must have the ability to play for just a few minutes and then stop.

Because cellphone and PDA key layouts are not consistent, interface must be simple and use only one hand.

Games are primarily available as downloads.

Not really designed as a game platform.