

CISC 1600

Introduction to Multi-media Computing

Summer Session II 2012

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Class Hours: MTWTH 11:50 – 1:35PM 5301N

Agenda

- The Business of games
- Game Design
- Ludology
- Game Theory
- "Funativity"
- Abstract Rules
- Concrete Rules
- Narrative
- Genres

Video Games = Big Business

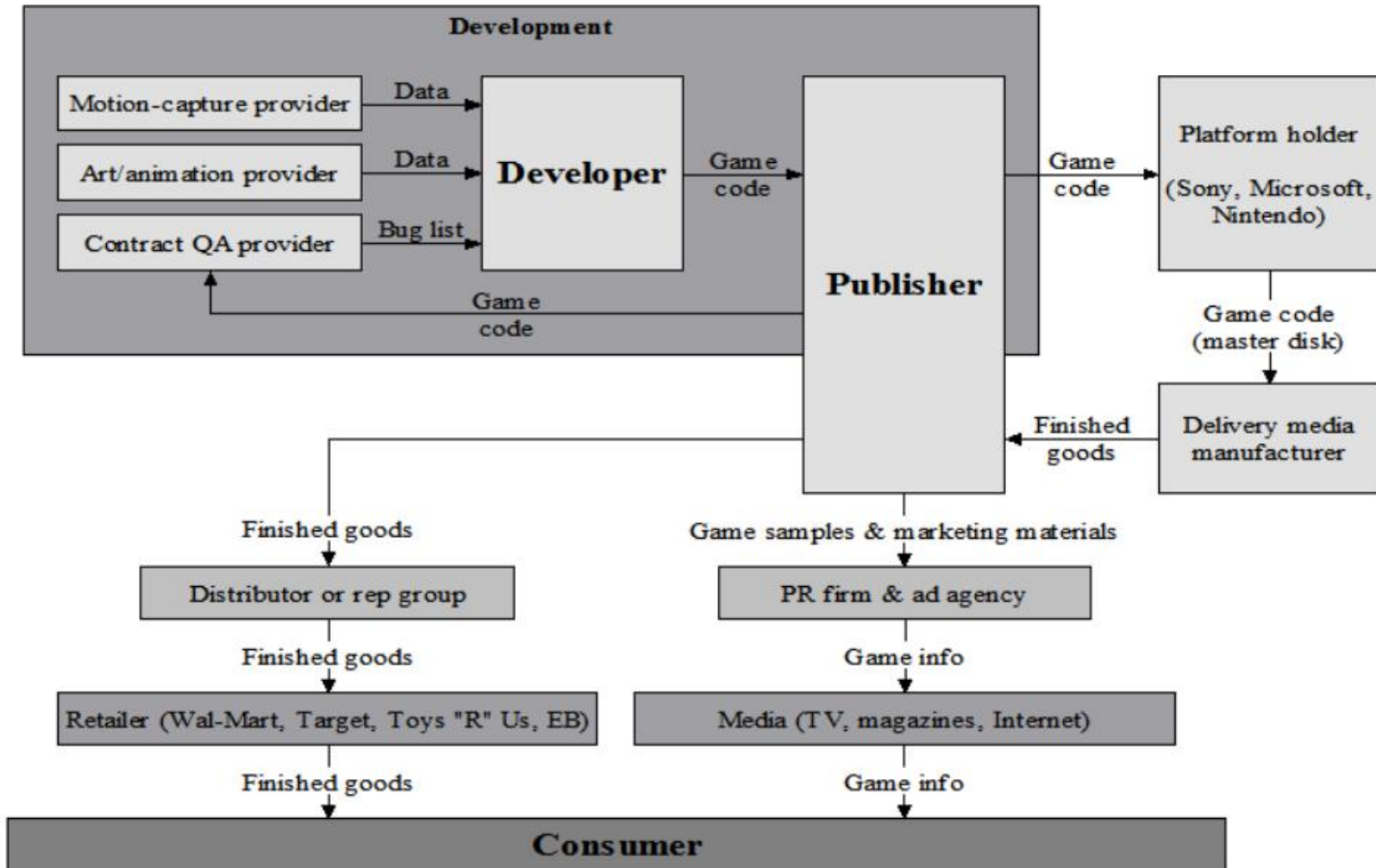
- U.S. video game sales 2010, \$15.4 billion (i).
 - True contribution to economy probably double that (toys, videos, movies, costumes, conventions).
 - Directly employees over 250,000 people.
 - Even those figure under-estimates the impact the game industry has on industry.
- Video games driving force behind:
 - CPU power.
 - Graphics processing power.
 - Rendering and 3D projection algorithms.
 - Interest in computer science/mathematics.

The Business of Games

- Developing a title for the PS3 or Xbox 360
 - Costs \$20 to \$40 million on average
 - GTA IV \$100 million development budget.
 - Marketing costs are added on top of that.

- Large Game Developers/Publisher Employ
 - Graphic Artists, Animators, Writers
 - Vocal Talent, Motion Capture Specialists
 - Programmers, Tool Creators, QA testers,
 - Project Managers, Directors
 - Media Creators, Marketers, Salespersons

Game Development Pipeline



Questions

- With so much money at stake, thousands of papers and books have been written on the subject of game design & development.
- Can we answer the following questions:
 - What defines (how do we classify) a game?
 - What makes a game fun?
 - Can we come up with a methodology for creating successful games?

Ludology

- From the Latin ludus (game) + -logy
- The study of games and other forms of play.
- Ludologists analysis games in terms of the abstract and formal systems that the games describe.
 - In other words, the focus of ludologists are on "the rules of a game."
- Papers and books about ludology are often categorized under the title "game studies". Game studies also encompasses a competing view that called "narratology"
 - The narratological view is that games should be understood as novel forms of storytelling and can thus be studied using theories of narrative.
 - Question: What is the compelling story behind "tetris"?

“Game Studies” is not “Game Theory”

- Don't confuse "game studies" with "game theory". They are not the same thing.
- Game Theory: "A mathematical method of decision-making in which a competitive situation is analyzed to determine the optimal course of action for an interested party (agent)."
 - Game theory is often used in politics, economics and military planning.
 - Note: We also use Game Theory when contemplating "agents" within a game.

Theory of Natural Funativity

- All fun derives from practicing skills that (previously) insured species survival.
 - Skills may relate to earlier context, but appear disguised in a more modern form.
 - Games are thus a safe way to "practice" skills.

Funativity & Humans

- For most of our species' history humans have been tribal hunter/gatherers.
- Many current popular games reflect modern incarnations of these ancient skills:
 - Hunting: Shooters, sports games, hand-eye-coordination
 - Gathering: Pattern games, powerups, resources
 - Tribal Interaction: High scores, Sims, MMO

Funativity & Humans Cont...

- In humans we can identify three overlapping categories into which we can divide aspects of game play.
- People like (or find fun) games that have components that fall into these categories:
 - Spatial Reasoning (Physical)
 - Pattern Recognition (Mental)
 - Social

Spatial Reasoning (Physical)

- Abstract Definition: Reasoning about objects in 3D space and how they might interact (includes your own body, hand-eye coordination).



Pattern Recognition (Mental)

- Abstract Definition: Recognizing patterns in organized sets of data, remembering chains of linked events that are significant.



Social

- Abstract Definition: Practicing interpersonal communication skills, competing/cooperating with others or modeling dynamics of social situations.



Concrete Components

•Along with the abstract concepts of spatial reasoning, pattern recognition and social interaction, research has identified many concrete things that can also improve a players perception of a game:

1. Multiple clear achievable goals.
2. The illusion of choice.
3. Clear punishments and rewards.

Goals

Legend of Zelda Map

Heuristic #1: GOALS

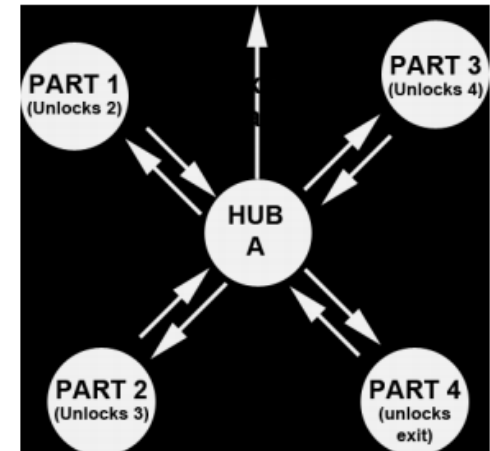
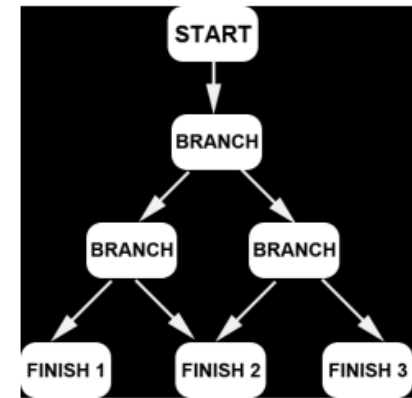
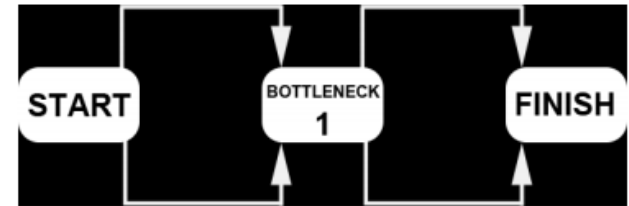
- Multiple, clear and achievable goals.

1. You aren't just trying to save the princess, you are also collecting, buying, trading, completing stages.
2. Player should never be "wondering what to do".
3. One impossible jump, one too-difficult boss fight and the player WILL quit.



Choice

- Choice is an illusion, only be so many paths through a game (no "infinite" content).
- But players MUST feel that their choice matter.
 - If the result of winning a boss battle and losing a boss battle are the same you won't be happy.
- Players want to feel that their game experience is "unique".
- Customizable characters, branching game progressions and multiple endings all help.



Rewards/Punishments

- Isn't the reward winning and the punishment losing? NO!!!
 - Rewards are positive reinforcement signals (auditory/visual).
 - Punishments are negative reinforcement signals (auditory/visual).
- Modern games have "rewards" about every 2 minutes (achievement unlocked!)
- You are more likely to keep playing when killed, if you're a mocked in some way.



Rewards/Punishments

- Some researchers suggest that modern game design is moving beyond "funativity" and moving towards direct conditioning of players aimed at getting them to play all the time (game addiction).

So What Makes a Game Fun?

- Applying "natural theory of funativity":
 - Spatial Reasoning
 - Pattern Recognition
 - Social Interaction

- Applying Concrete Rules:
 - Multiple clear achievable goals.
 - The illusion of choice.
 - Clear punishments and rewards.

- Many great games have all of these components. Are there other rules...
yes.

Narratology

- Questions:
 - What about the story?
 - Shouldn't a game have a good story?
- The narratological view of game studies says that games should be understood as a form of storytelling ("choose your own adventure").
- Treating a game as a narrative (or including narrative as part of a game) can help us make a more compelling game, and may even be thought of as adding a "social" component.

Narrative in Literature

- Rules for narrative in literature have been around since the time of the Greeks (Aristotle's Poetics).
- Questions to ask:
 1. Whose telling the story?
 2. What is the conflict?
 3. Who is the player meant to identify?
 4. What do you want the player to feel?

Narrative in Film

- Modern games have far more in common with film (cinematography) than with regular literature.
- Cinema also has a lexicon of well established rules regarding the creation of compelling narrative:
 1. Don't break the narrative chain.
 2. Use the camera to frame action. *
 3. Use the camera to immerse the viewer. *

**What's unique about games is that you always have perfect camera, light, etc.*

Narrative in Games

- Ultimate goal (as with literature, and cinema) is to get the player or viewer to "suspend disbelief" and have a "real" emotional response to events that are entirely fictitious.
- Including a compelling narrative in a game can "make it incredible"

Mechanics, Dynamics & Aesthetics

- ❑ MDA is a game development paradigm designed to help developers make the most out of a game idea, and proceed efficiently through the complex process of bringing a game to market.
- ❑ MDA is one of many development paradigms that are rigidly used by large game development companies.

Mechanics

- Before a single line of code is written the mechanics that will be used by the game should be well thought out and documented.

- This includes:

- The programming language
- The programming libraries, engines, tools
- The hardware required/available
- The logical programming components
- The storage/retrieval/initialization methods

Dynamics

- Before a single line of code is written the dynamics that will be used by the game should be well thought out and documented.
- This includes:
 - The domain of the game.
 - The players in the game.
 - The rules of the game.
 - The objects in the game.

Aesthetics

- Before a single line of code is written the aesthetics that will be used by the game should be well thought out and documented.
- The "art bible" which should contain every detail of the "look" of the game will come out of this development area.
- This includes:
 - Color Palette
 - Physical looks for all players
 - Lighting plots, schemes, etc.

Genres

- MDA also gives us a way to classify (and group) games into Genres:
- Mechanical Genres:
 - iPhone game, C++ game, Quake Engine
- Dynamic Genres
 - Shooter, Strategy, RPG, MMORPG
- Aesthetic Genres:
 - Fantasy, Sci-Fi, Horror Survival