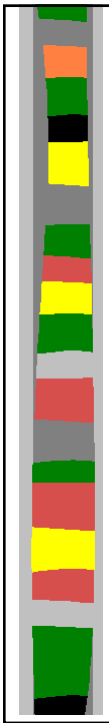
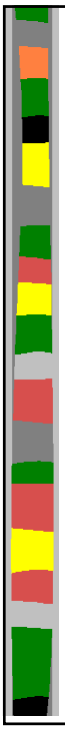


The Game Development Process

Introduction



Outline

- Game Business Overview
  - Stats
  - Shape
- Game Companies
  - Structure
  - Timeline

Random Statistics

- 60% of all Americans play video games
  - In 2000, 35% of Americans rated playing computer and video games as ***the most fun entertainment activity*** for the third consecutive year
- Computer/video game industry on par with box office sales of the movie industry
  - $6.35B/year for U.S. Sales in 2001
- Development
  - Costs $3M to $10M to develop average game
  - Takes 12-24 months
- 70+ million Playstations worldwide
  - 30 million PS2's, 4 million Xbox's, 4 million GameCubes
- 400,000 pay $12.50/month to play Everquest

Hit-Driven, Entertainment Business

- Entertainment, not packaged goods
  - Consumers say, "I have to ***have*** the next *WarCraft* game from Blizzard!"
  - No one says, "I have to ***have*** that next razor blade from Gillette!"
  - Games generate
    - emotional responses - fulfill fantasies
    - escape from reality - stimulate the senses
- Causes of success are *intangible*
- "Quality is king"
- Consumers are smarter than often thought
- Hits are made by:
  - those who are: creative, instinctive, and who know what a great gaming experience feels like
  - not by marketing executives

Business Models

- Software developers and publishers
  - Money from game sales
  - Internet games
    - Initial game
    - Monthly fee
- Console developers
  - Proprietary media delivery
  - Lose money on consoles (the faster they sell, the faster they go out of business)
  - Charge fee for each game sold
- Tool developers
  - Create "engines" and "middleware" and sell to game developers
- Contract services:
  - Motion capture, art, cut-scenes, audio, …

Laird and Jamin, EECS 494, Umich, Fall 2003

Sales

- 2003 U.S. sales of console games totaled $5.8 B
  - Computer games $1.2 billion, consoles $4.6 billion
- Only entertainment industry to grow in 2003
  - Movie and music industries reported losses
    - According to Exhibitor Relations and Nielsen SoundScan
- Console game players:
  - Action (30%), sports (20%), racing (15%), RPG (10%), fighting (5%), family entertainment (5%), and shooters (5%)
- Computer gamer players:
  - Strategy (30%), children's entertainment (15%), shooters (15%), family entertainment titles (10%), RPG (10%), sports (5%), racing (5%), adventure (5%), and simulation (5%)

The Entertainment Software Association

Online Growth

- Grew from 38 million (1999) to 68 million (2003)
- Not just for PC gamers anymore
- 24% of revenues will come from online by 2010 (Forrester Research)
- Video gamers
  - 78% have access to the Internet
  - 44% play games online
  - Spend 12.8 hours online per week
  - Spend 6.5 playing games online

Outline

- Game Business Overview
- Game Companies
- Game Development
  - Timeline
  - The Role of Documentation

Shape of Industry (1 of 2)

- Hardware:
  - Sony, Nintendo, Intel, Microsoft
- Software:
  - Publishers
    - Electronic Arts, Activision, Sony, Microsoft, Infogrames, UbiSoft, Mindscape, Interplay,…
  - Developers
    - Electronic Arts, Sony, Microsoft (Bungie), Blizzard, Lucas Arts, id, Namco, Square, Valve, Raven, Relic, Red Storm, High Voltage, Outrage, 3DO, …

Shape of Industry (2 of 2)

- Similar to Film Industry
  - About 1 in 10 titles breaks even or makes money
  - Sequels and franchises are popular
    - EA Sports, Sims, Star Trek, …
  - Few self-published titles
  - Fewer small developers as development costs go up
- Internet
  - Increasingly sales
  - Updates
  - Multiplayer versions of games
  - Massively multiplayer games

Game Studios – Vertical Structure

- Developers
- Publishers
- Distributors
- Retailers

- Much like a mini-Hollywood

Developers

- *Design and implement games*
  - Including: programming, art, sound effects, and music
  - Historically, small groups
  - Analogous to book authors
- Typically work for royalties & funded by advances
  - Do not have the capital, distribution channels, or marketing resources to publish their games
  - Can be unstable

Publishers

- *Fund development of games*
  - Including: manufacturing, marketing/PR, distribution, and customer support
- Publishers assume most of the risk, but they also take most of the profits
- Relationship to developers
  - Star Developers can often bully Publishers, because publishers are desperate for content
  - Most Developers are at the mercy of the almighty Publisher
- Originally grew out of developers
- Massive consolidation in recent years
- Most also develop games in-house

Moving Projects Forward

- Most Publishers have a "Greenlight Process"
  - Use to determine which projects go forward
- Developers submit to committee at five, independent stages:
  - Concept
  - Assessment
  - Prototype
  - First Playable
  - Alpha
- At each stage, committee reviews:
  - Decides whether or not to continue funding
  - Evaluates market potential
  - Adjusts unit forecasts accordingly

Distributors and Retailers

- Distributors
  - *Get software from publisher to retailer*
  - Originally modeled on book distribution
  - Becoming less important as the retail market changes
- Retailers
  - *Sell software*
  - Started with mail-order and computer specialty stores
  - Shift in 80's to game specialty stores, especially chains (Today 25%)
  - Shift in 90's to mass market retailers (Today 70%)
    - Target, Best Buy, WalMart
  - Internet sales big but still not huge (Today 5%)

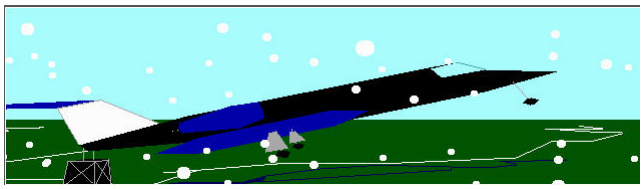
Development Team Size

- As late as the mid-80's teams as small as one person.
- Today, teams today ranging from 10-60 people.
- Programming now a proportionally smaller part of any project
- Artistic content creation proportionally larger
- See Gamasutra, (www.gamasutra.com)
  - Search "post mortem"
  - Game data at bottom includes team size and composition

Development Team 1988

- Sublogic's *JET* (early flight sim)
  - Sublogic later made scenery files for MS flight sim
- 3 Programmers
- 1 Part-Time Artist
- 1 Tester

Total: 5



Development Team 1995

- Interplay's *Descent*
  - Used 3d Polygon engine, not 2d sprites
- 6 Programmers
- 1 Artist
- 2 Level Designers
- 1 Sound Designer
- Off-site Musicians

Total: 11

Development Team 2002

- THQ's *AlterEcho*
- 1 Executive Producer
- 1 Producer
- 4 Programmers
- 2 Game Designers
- 1 Writer
- 3 Level Designers

Total: 19+

- 3 Character Modelers and Animators
- 1 2d and Texture Artist
- 1 Audio Designer
- 1 Cinematic Animator
- 1 QA Lead and Testers

Development Teams for Online Games

- Star Wars online (2003?)
- Development team: 44 people
  - 50% Artists
  - 25% Designers
  - 25% Programmers
- 3 Producers
- "Live" Team (starting at Beta, 6 months before done)
  - 8 Developers
  - 50-60 Customer support (for 200K users)
  - 1000 Volunteer staff (for 200K users)

A (Larger) Developer Company Today

- Designing and creating computer games is serious business
  - Large budgets ($1000000+)
  - Large number of people involved
  - Large risk
- Wisdom
  - Use modern software development techniques
  - Keep creativity were it belongs
    - In the design
    - Not during the programming

Based on notes from Mark Overmars

What's Involved?

- People involved
  - lead designer
  - project leader
  - software planner
  - architectural lead
  - programmers artists
  - level designers
  - testers
- Time involved
  - 12-24 months

(Will walk through what phase
Each plays a roll, next)

Based on notes from Mark Overmars

Game Development Timeline (1 of 4)

- Inspiration
  - getting the global idea of the game
  - duration: 1 month (for a professional game)
  - people: lead designer
  - result: treatment document, decision to continue
- Conceptualization
  - preparing the "complete" design of the game
  - duration: 3 months
  - people: lead designer
  - result: complete design document

Based on notes from Mark Overmars

Game Development Timeline (2 of 4)

- Blueprint
  - separate the project into different tiers
  - duration: 2 months
  - people: lead designer, software planner
  - result: several mini-specification
- Architecture
  - creating a technical design that specifies tools and technology used
  - duration: 2 months
  - people: project leader, software planner, lead architect
  - result: full technical specification

Based on notes from Mark Overmars

Game Development Timeline (3 of 4)

- Tool building
  - create a number of (preferably reusable) tools, like 3D graphics engine, level builder, or unit builder
  - duration: 4 months
  - people: project leader and 4 (tool) programmers
  - result: set of functionally tools (maybe not yet feature complete)
- Assembly
  - create the game based on the design document using the tools; update design document and tools as required (consulting the lead designer)
  - duration: 12 months
  - people: project leader, 4 programmers, 4 artists
  - result: the complete game software and toolset

Based on notes from Mark Overmars

Game Development Timeline (4 of 4)

- Level design
  - create the levels for the game
  - duration: 4 months
  - people: project leader, 3 level designers
  - result: finished game with all levels, in-game tutorials, manuals
- Review
  - testing the code, the gameplay, and the levels
  - duration: 3 months (partially overlapping level design)
  - people: 4 testers
  - result: the gold master

Based on notes from Mark Overmars

Role of Prototypes

- Prototypes
  - Build prototypes as proof of concept
  - In particular to test game play
  - Throw them away afterwards
- Projects 1-5 … prototype!
  - Pitch to publisher

Based on notes from Mark Overmars

Is This the Way for Everyone?

- Some companies still work in old-fashioned ways
  - No good division of tasks
  - No good schedule/deadlines
  - No good design
  - Feature creep
  - No good software development techniques
  - No reusable components
  - Not object oriented (or even assembly)
  - No working hours, dress codes, etc.
  - Bad salaries
- Things need to change
  - It is getting too expensive
  - Games are getting too complex
  - Many projects fail
  - Many companies go bankrupt
  - Divide tasks and responsibilities
  - See the timeline above

Based on notes from Mark Overmars