

VIDEOGAME DESIGN & DEVELOPMENT
PUBLIC COURSE MATERIALS AND NOTES

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Introduction

Key Questions

- 1) What is game design?
- 2) What does this course offer?
- 3) What does this course expect?

Key topics

- 1) Course positioning: (Estonian) gaming industry
- 2) Course design & literature
- 3) Course outcomes
- 4) Post-course future

Theoreticians / Literature

- Fundamentals of Game Design, 2nd Edition, Ernest Adams
- The Art of Game Design: A book of lenses, Jesse Schell
- A Theory of Fun for Game Design by Raph Koster
- Challenges for Game Designers, Brenda Brathwaite & Ian Schreiber
- Richard Rouse III's book Game Design: Theory & Practice,
- Game Design: From Blue Sky to Green Light, Deborah Todd
- Replay: The History of Video Games, by Tristan Donovan
- The Computer Game Design Course, Jim Thompson (2007)

Links:

<http://courses.cs.ut.ee/gamedev>

<http://gamedev.ut.ee/klubist>

Game Elements Overview

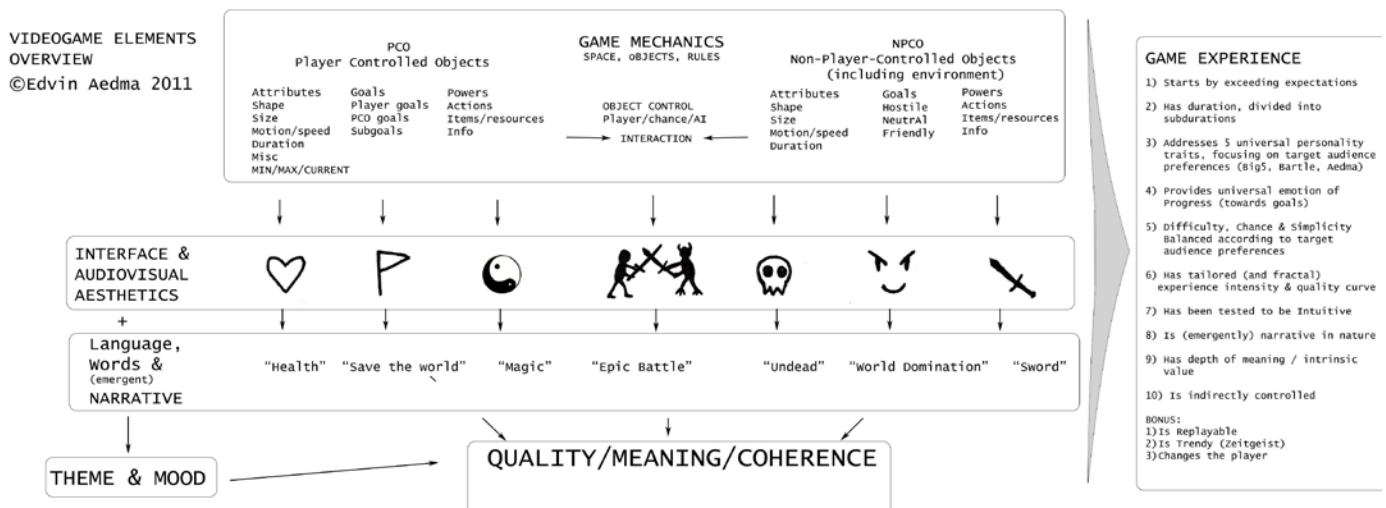
Key Questions

- 1) What elements are games made of and how do they all fit together ?
- 2) Which are necessary and which optional elements?
- 3) What are the most important components of each element?

Key topics

- 1) Space & dimensions
- 2) Rules & time
- 3) Objects (environment, Player, NPCs)
- 4) Object attributes and attribute states

Main Schematic:



Additional links:

<http://gamedesigntools.blogspot.com/p/game-design-theory.html>

GAME MECHANICS

Overview of player choices and interaction types between



INTERACTION TYPES & CHOICES

- 1) get info/guess/analyze/learn/see
- 2) make choices/aim/direct/
- 3) move/expand
- 4) use/control
- 5) destroy/damage/kill
- 6) get/acquire/steal/rob/find/trade
- 7) create/build/combine/make
- 8) manage/balance/exchange/trade/
- 9) improve/upgrade/boost
- 10) test/try/experiment/estimate
etc

Game Mechanics Home Assignment

Minimal Analysis of game elements/components through explained examples

Goals:

- 1) Structure & archive your game experience
- 2) Integrate understanding of game elements into your mental models
- 3) Exercise analytic thinking

Task:

1) Negative and Positive Examples

Please provide at least one positive and one negative game example for all the listed game elements/components. Do this by providing game name + youtube link (or screenshot (with link to source) if the youtube video is not available)). Use only games released after 1990. Try to find the examples that you consider most positive or most negative for the element/component in question.

3) Minimal Explanation

Under the game examples, write 1-2 sentences which explain shortly why you consider this element to be **well/poorly designed** (why do you consider it “good” or “bad”).

For example, when explaining a positive example, you may praise realistic psychology of NPC dialogue responses under the “characters” element in a game. Or when explaining a negative example, point out the unuseful diplomacy function under the “diplomacy” element in a game. Try to be as exact and concise as possible.

Game elements to be provided with examples & explanations:

- 1) Difficulty
- 2) Graphics
- 3) Music
- 4) Sound
- 5) Story
- 6) Characters
- 7) Level design
- 8) GUI
- 9) Diplomacy

Philosophy & Theory

Key Questions

What are the following phenomenon in psychological and evolutionary sense?

- 1) Playing
- 2) games
- 3) toys
- 4) sport
- 5) art
- 6) competition
- 7) puzzles & riddles

Key topics

- 1) Surplus theory
- 2) Meaning of life (hint: wisdom & peace/joy)
- 3) Game design as a way to analyze at life
- 4) Playing as modeling reality
- 5) Playing as mastering an activity
- 6) Playing as social competition
- 7) Playing as social bonding

Theoreticians

- 1) Immanuel Kant
- 2) Herbert Spencer
- 3) Johan Huizinga
- 4) Ludwig Wittgenstein
- 5) Roger Caillois
- 6) Chris Crawford
- 7) Stefan Beyst

Links

<http://en.wikipedia.org/wiki/Game>

<http://d-sites.net/english/mimesisplay.htm>

Videogames History

Key Questions

- 1) How did videogames become what they are today?
- 2) How understanding history can be used to predict future?
- 3) How different game genres emerged?
- 4) How did the following factors influence the evolution of videogames?

Keywords

- 1) technology
- 2) other entertainment media
- 3) economy
- 4) politics

Main subdivisions of video game history

1940-60: First experiments on electronic games and mainframe computers

1970-80: golden era of arcades & first consoles

1980-90: personal computers and rapid advancement of technology, windows1

1990-2000: coming of 3D graphics, windows 3, cd's

2005-2005: internetization and casual games

2010: social-network and indie games

Literature

Replay: The History of Video Games, by Tristan Donovan

The Ultimate History of Video Games by Steven L. Kent

Links

List of best selling videogames

http://en.wikipedia.org/wiki/List_of_best-selling_PC_video_games

Wikipedia link:

http://en.wikipedia.org/wiki/History_of_video_games

Open Directory Project documenting videogames history:

http://www.dmoz.org/Games/Video_Games/History/

Home Assignment

Write a 1-3 page essay on future of videogames. Organize it into 3 parts: 2015, 2020, 2030.

Working with Game Ideas

Key Questions for game ideas

Why game ideas are valuable but cost nothing and how to:

- 1) Create game ideas (including brainstorming)
- 2) Understand ideas
- 3) Develop game ideas
- 4) Categorize ideas to genres
- 5) Evaluate ideas

Authors and approaches to creativity

- 1) Mihaly Csikszentmihalyi "[flow](#)"
- 2) School of Thought / Edward de Bono "[six thinking hats](#)"
- 3) Arthur Koestler "[bisociation](#)"

Links to subject matter

Wikipedia link to creativity

<http://en.wikipedia.org/wiki/Creativity>

Wikipedia link to videogame genres

http://en.wikipedia.org/wiki/Video_game_genres

Creativity game for generating ideas

<http://creativitygames.net/random-word-generator/randomwords/4>

Working with Game Ideas:

Various ways for categorizing games that help you to categorize yours:

Players:

Single-player / Multi-player (hotseat/ team-based /MMO / etc)

Connectedness:

Online / not online (downloadable)

Dimensions:

2D / 2,5D / 3D

View:

1st person / 3rd person / Top-down / Isometric / Sidescrolling / Customizeable

Scale:

Strategic / Tactical / First-Person

Level of time & effort required:

Casual / hardcore

Time progression type

Real time / turn-based

Content Time (fused with Theme / Topic / Realism):

Fantasy / Ancient / Medieval / Early Modern-19/20th century / WW2 / Modern / (realistic) Future / Science-Fiction

Style (fused with Topic):

Realistic / Stylized / Retro / Cartoony / etc...

Misc / Theme / Topic:

Racing / War / Location-based / Stealth / Survival / Trade / Horror / Digital Boardgame / Space / Zombies / Interactive movie / Sport / City management / Dragons / Art / Fruits / Ninjas / Sex / etc - anything can become a theme/topic/game focus by itself if the game focuses on it.

Progress type:

Linear / multipath / open-ended

Purpose:

Entertainment (and profit for creators) / education / art (often fused with philosophy) / advertising a product/service/philosophical/political/religious message

Controller type:

Keyboard / mouse / controller / joystick / Touch-scene

Platform & operation system:

Windows / Mac / Browser-based / Console / Mobile / Tablets

Working with Game Ideas:

Examples of GENRES (classic/mainstream categorizations)

Action (focus on mastering controls)

Action subgenres by main type of interaction:

Shooter / hack-and slash / beat-em-up

Strategy (focus on thinking and planning)

Adventure (focus on story, exploration & puzzles)

RPG (focus on story, character (skill) development and item hoarding, fused with Adventure)

Puzzle (focused on solving spacial-logical puzzles)

Simulation (focused on realistically replicating a real life action, such as golf, fishing or city planning)

Casual (focused on providing quick gameplay with short sessions)

Card (often focused on deck/hand management & card collection)

Sport (focused on playing classical sports)

Music & Rhythm (focused on music as important part of gameplay / mechanics)

(Tower) Defence (focused on building defence networks)

MISC (category for lumping together all the games that are difficult to categorize)

Gamified applications / Serious games / Educational games / Advergimes etc (gameplay is only a means for some other goal, such as learning)

Starting the Pitch & Game Design Document

Key Questions

- 1) Why pitch documents are necessary
- 2) Why game design documents/logs are necessary
- 3) How to make a design document
- 4) How to categorize your game
- 5) How to use categorization for understanding your target audience
- 6) How to work with your game title

Keywords

- 1) Synopsis (idea, topic, theme, atmosphere)
- 2) Game mechanics & gameplay
- 3) User Interface, Game Controls
- 4) Visual Art
- 5) Sound and Music
- 6) Story, world & characters
- 7) Level/environment design
- 8) Subdocuments (e.g. lists of ingame stuff)

Authors

- 1) Jesse Schell
- 2) Ernest Adams
- 3) Chris Crawford

Links to subject matter

Wikipedia link to videogame genres

http://en.wikipedia.org/wiki/Video_game_genres

Bank of game design documentation materials

<http://gamedesigntools.blogspot.com/2010/10/game-design-documentation.html>

Home Assignment

Write a 2-6 page pitch document for your best game idea. Provide illustrations or find someone who can do them for you.

GAME DESIGN DOCUMENT

(Playtest Games & Marketing format)

Summary

Game title X, Company Y,
chief editor/concept author N,
Design version number N, date N
(Genre/Categorization) ABC
Target age/sex AB
Alternative titles: XYZ
Target Platform(s): X

Table of contents (hyperlinked for easy access)

Introductory illustrations (cover / gameplay / concept art)

Note: If possible, try to illustrate anything that's important or complex

SYNOPSIS / description of main concept of the game including story and gameplay (about one paragraph).

MARKETING summary (illustrated and schematized if possible)

- 1) Target audience & target market description
(size/age/sex/location/note on game prices/market overview, successful similar games etc)
- 2) Target Platform(s)
- 3) All other marketing considerations

Note: In the Gamed Design Document, provide only a summary of the most important marketing considerations. Detailed marketing info should be provided in the Marketing Strategy document.

GAMEPLAY: Player Controlled Object choices & actions

Describe what choices & actions the player can or has to make.

For example

“1: Dodging opponents: Character is moved by keyboard WASD controls and must avoid opponents or their shots, choosing where to move...”

“2: Shooting: Character shoots (Enter key), must choose who to fire at...”

MECHANICS

(ideally also schematic illustrations for main interactions)

Elements: Space, Environment, PCO, NPCO, Goals & Powers (Actions, Items/resources/rewards, Info), Choices

Element Interactions: eg moving, shooting, collecting, upgrades

Game content Editors

GAME DESIGN DOCUMENT

EXPANDED ENTRIES:

Environment

PCE (pictures, goals, powers, choices)

Hostile/opponent NPCO (overview of the category, list of NPCs, complete sample)

Neutral NPCO (overview of the category, list of NPCs, complete sample)

Helpful NPCE (overview of the category, list of NPCs, complete sample)

AESTHETICS

Description of theme, mood, look and feel (+ inspirational art/moodboard)

Graphics (concept art & screenshots, style examples)

Ideally, list of all initial graphics and animations in the game

Music & sound (and dialogue)

Examples/prototypes attached or should be easily accessible online.

Ideally, list of all initial music & sounds in the game

Game theme

(topics, player emotions, player motivations, game message)

STORY

Story genre (science fiction adventure)

Story synopsis (try 1-3 sentences).

Story design document, dialogue design document (attached)

LEVEL DESIGN

Complete Example level

List of levels

GAME WALKTHROUGH

Example of how one person plays the game from the beginning to end

Controls

Menu systems

UI / Camera / View

Examples of additional documentation:

Programming overview / architecture

Marketing Strategy

Project Budget & Schedule

Game development teams & development process

Key Questions

- 1) What are the main roles in game development?
- 2) What are necessary and optional roles?
- 3) How to create a development team?
- 4) How to organise team communication?
- 5) How to share game ownership?

Team Keywords

- 1) Clients & Partners
- 2) Management
- 3) Game designers
- 4) Artists
- 5) Programmers
- 6) Testers
- 7) Marketers

Process Keywords:

- 1) Idea
- 2) design
- 3) Team formation & proposal/pitching
- 4) Development (art & programming)
- 5) Prototyping, testing, balancing
- 6) Marketing & sales
- 7) Community management

Links to subject matter

Worcester Polytechnic Institute game development course:

<http://web.cs.wpi.edu/~id111x/c05/>

Wikipedia link

http://en.wikipedia.org/wiki/Game_development#Roles

Home Assignment

Organize an informal meeting with your game team. Break the ice. Get to know each other. Find an agreement on the game idea central focus, developer roles, and initial shares of the game. Write a basic project management plan & responsibilities by weeks. Write a memo on the meeting (1-2 pages) describing its results.

Artists: concept art, moodboard, references

Others: architecture & references

Game development teams & development process:
Main roles in game development

Clients & Partners

Publisher
Investor

Management (Strategic / Tactical)

Producer
Development team manager/leader

Game designers:

Lead designer
Content consultants
Story writer
Dialogue writer
Level designer
Character/unit designer

Artists

Lead artist
2D artist
3D artist
Animator
Music artist
Sound artist

Programmers

System Analyst
Architect
Back-end
Front-end

Testers

Marketers

Lead marketing specialist
Community Manager
Marketing Team (More is More)

List of skills important for game designers

(originally by Jesse Schell)

- Anthropology / Culture / Semiotics / Media
- Architecture
- Brainstorming
- Business / Economics
- Cinematography
- Communication
- Creativity
- Creative Writing
- Engineering / Programming
- History
- Management
- Mathematics
- Music
- Psychology
- Public Speaking
- Sound Design
- Technical Writing
- Visual Arts

How to ideally evaluate potential team members?

1) Motivation for the project

2) Personal compatibility, meaning:

- Mutual Respect
- Honesty
- Egolessness

3) Technical skills

4) Conscientiousness

(skills for organizing time & tasks, see the big 5 personality traits

http://en.wikipedia.org/wiki/Big_Five_personality_traits)

Game Development Project Management / Scrum

Key questions

- 1) How to manage a game development project?
- 2) What is scrum?
- 3) What are the main roles, artifacts, meetings and risks in scrum?

ABC Sprint Course Schedule:

Table 1: Course Outline

Phase	Activity	Deliverables	Week	Lecture Topics
Design	Start		1	Organizational Matters
	Idea Creation		2	Genres, Innovation and Ideas
	Grouping	Game Design Document, Product Backlog,	3	Production Process
	Conception	Alpha Sprint Backlog	4	Production Tools
	Planning		5	Project Engineering
ABC-Sprints	Alpha Sprint	Basic Functionality, Proof of Concept, Beta Sprint Backlog	6	Structure of Games
			7	Gameplay and Balancing
	Beta Sprint	Feature-complete Game, Final Assets, Completion Sprint Backlog	8	Interface Design
			9	M1 ALPHA VERSION
			10	Christmas Gaming Session
			11	Interactive Storytelling
			12	Character Development
			13	M2 BETA VERSION
Completion Sprint	Bug-free, Balanced, Polished, and Finalized Game	13	Code Review and Refactoring	
		14	Games Business	
		15	M3 RELEASE	

(by Jonas Schild et al 2010, University of Duisburg-Essen)

Note: Our course will have ABCM Sprint Format

M- marketing and release

Links to subject matter

Wiki:

[http://en.wikipedia.org/wiki/Scrum_\(development\)](http://en.wikipedia.org/wiki/Scrum_(development))

ABC Sprint Course Schedule

<http://dl.acm.org/citation.cfm?id=1822373>

Good videoexplanation of scrum:

<http://www.youtube.com/watch?v=Q5k7a9YEoUI>

Prototypes, software & game engines

Key Questions

Why throw-away prototypes are valuable
What are game engines
Why it is important to start playtesting early
How to design prototypes

Keywords

Construct Game Engine
Allegro software toolset
Moving, controllable objects versus other objects
Finding & testing key interactivity (mechanics)
Placeholder graphics & creativity
Placeholder sound

Game Engine Names

See file “008b Game Engines and similar tools EA”

Links

See further discussion at:

<http://forums.indiegamer.com/showthread.php?17429-Best-game-programming-language-for-a-beginner>

and also at:

<http://lemmasoft.renai.us/forums/viewtopic.php?f=4&t=10276&start=0>

For greatest overview, see Wikipedia:

http://en.wikipedia.org/wiki/List_of_game_engines

Home Assignment

- 1) Keep working on prototype so it becomes testable
- 2) Decide if you will be using a game engine or not
- 3) Playtest the game mechanics to see if is fun or has fun potential for everybody
- 4) Find external testers and have them playtest your prototype
- 5) Create a log of bugs and other problems encountered
- 6) Generate 5 programming-related questions that will help you
- 7) Artists: compete & submit tasks set last week

Prototyping 101

Toomas Laasik

What is prototyping anyway. Why should I do it?

- * main purpose: test if your gameplay "works". In exotic cases controls/art/music may also need testing
- * fail fast, it's ok. Discover your design flaws early
- * use the enthusiasm you have in the beginning
- * one week, no more. In one day stretch you should already have a toy
- * toy vs prototype. Toy is a prototype of a prototype
- G time != quality. The more you work, the less value is added
- G game engine vs game itself. It's a common flaw to work mostly on engine not a game itself
- * constrain yourself, at first provide only the absolute minimum gameplay/graphics/sound
- G vertical vs horizontal prototyping

Prototyping ...

- * is not about programming
- * is not about documenting features
- * is not about completing your game/project
- * nobody cares how you made it or the marvellous engineering behind it

Introducing one free tool for rapid game prototyping: Construct Classic

- * Construct Classic is a free, DirectX 9 game creator for Windows, designed for 2D games. Minimum scripting needed.
- * walkthrough (live show)
- * examples (live show)
- * suggestion: take the closest example to your project and learn from it
- * tutorials and examples: http://scirra.com/forum/examples-tutorials-list_topic41594.html

Organizing work inside a team:

- G development cycle: plan -> develop (alone) -> test result
- * agree how to manage assets (code, art, sound). Even sending files by email is better than chaos
- * paper prototyping / visual documentation. Lay all you want to push into a prototype on one A4 paper, be creative
- * assign responsibilities, derive concrete tasks
- * START developing

Next time:

- * Each team should be ready to present their prototype on big screen
- In a bare minimum, it must have at least the "fun" element (or lack of it, that is

also totally ok, but means your game mechanics don't work and they need to be changed).

If you think it is impossible, then you either want to spend too much time on developing your own engine or have not stripped your idea to bare minimum.

**Some free assets/resources for using in your prototype
(and later in the game too):**

<http://www.gamedev.net/topic/544073-free-2d3d-art-assets-09/> (2d graphics)

<http://gamedev.net> (learning resources)

Link to a good related article:

http://www.gamasutra.com/view/feature/2438/how_to_prototype_a_game_in_under_7_days.php?page=1

OVERVIEW OF VARIOUS GAME ENGINES and other similar tools

[Adventure Game Studio](#)

Allows you to create your own point-and-click adventure games similar to the early 90's Sierra and LucasArts

[Custom](#)

Custom built projects made directly with a programming language, open-source or obscure maker.

[Game Maker](#)

A general game making suite designed to allow its users to easily develop computer games without needing to program.

[IG Maker](#)

The latest software from Enterbrain. It features a unique interface and the ability to create several distinct game genres.

[Ika](#)

An open-source and Python-powered game engine with hardware acceleration for blazing performance.

[Multimedia Fusion 2](#)

Clickteam products are powerful and complete development studios that require no programming knowledge to use.

[Renpy](#)

Python-based visual novel creator

[RPG Maker 2000](#)

A maker dedicated to producing traditional top-down SNES-era-like RPGs with a Dragon Quest-like default battle system.

[RPG Maker 2003](#)

A minor update to RPG Maker 2000 with a new sideview battle system, class system and native MP3 support.

[RPG Maker 20XX](#)

A custom-built replacement run-time engine for RM2k/3 games

[RPG Maker VX](#)

A tile-based point and click engine tailored towards creating traditional RPGs integrated with Ruby scripting.

[RPG Maker XP](#)

A tile-based point and click engine tailored towards creating traditional RPGs integrated with Ruby Scripting

[RPG Toolkit](#)

The RPG Toolkit is an open-source tool for creating 2D role-playing games and more

[Sphere](#)

An open source RPG development engine based in the JavaScript language.

OVERVIEW OF VARIOUS GAME ENGINES and other similar tools (continues)

Construct

Construct 2 is a brand-new, general purpose HTML5 game and app maker. It uses an event based system for defining functionality in a visual, human-readable way. Construct 2 is the only tool which allows you to do real, productive work in a non-programming system. It does not patronise you with colorful blocks or over-complicated gadgetry. It's great for beginners, and powerful enough to let experts work even quicker than by coding.

Pygame

Pygame is a cross-platform set of Python modules designed for writing video games. It includes computer graphics and sound libraries designed to be used with the Python programming language. It is built over the Simple DirectMedia Layer (SDL) library, with the intention of allowing real-time computer game development without the low-level mechanics of the C programming language and its derivatives. This is based on the assumption that the most expensive functions inside games (mainly the graphics part) can be completely abstracted from the game logic in itself, making it possible to use a high-level programming language like Python to structure the game.

Games Factory 2 by Clickteam (site: gambuilder.info) (free demo)

Provides everything you need to manufacture Arcade games, Platform games, Adventures, Screen Savers, and much, much, more. You simply click on an object, drag it to the play field, and click on the action it should perform. We supply all the heroes, monsters, powerups, and other objects you need, plus the sound and music for your games. Of course, you can easily add your own, custom items if you choose.

FPS Creator

FPS Creator X10 is the world's first DirectX 10 game creator for Windows Vista/Windows 7! for the first time ever you can control the powerful features on your graphics card. Visually stunning effects including parallax relief mapping, bloom, reflection, refraction, volume soft shadows and soft particle shader effects are all under your control.

Torque Game Builder

Torque 2D is the world's most powerful and easy-to-use 2D game engine. Built atop the common Torque core architecture, it offers many of the features of our cutting-edge 3D game engine, but customized for 2D gameplay. With development paths that allow publishing to Windows, Mac, Xbox 360*, Wii*, iPhone*, your game will reach the widest possible audience. And with its intuitive and powerful editor, anyone can jump into game creation with little to no prior knowledge. *Requires a separate license

OVERVIEW OF VARIOUS GAME ENGINES and other similar tools (continues)

BlitzBASIC

Blitz BASIC refers to the programming language dialect that was interpreted by the first Blitz compilers, devised by New Zealand-based developer Mark Sibly. Being derived from BASIC, Blitz syntax was designed to be easy to pick-up for beginners first learning to program. The languages are game-programming orientated but are often found general-purpose enough to be used for most types of application. The Blitz language evolved as new products were released, with recent incarnations offering support for more advanced programming techniques such as object-orientation and multi-threading. This led to the languages losing their BASIC moniker in later years.

BlitzMax

The first **BlitzMax** compiler was released in December 2004 for Mac OS X. This made it the first Blitz dialect that could be compiled on *nix platforms. Compilers for Microsoft Windows and Linux were subsequently released in May 2005. BlitzMax brought the largest change of language structure to the modern range of Blitz products by extending the type system to include object-oriented concepts and modifying the graphics API to better suit OpenGL. BlitzMax was also the first of the Blitz languages to represent strings internally using UCS2, allowing native-support for strings literals composed of non-ASCII characters.

BlitzMax's platform-agnostic command-set allows developers to compile and run source code on multiple platforms. However the official compiler and build chain will only generate binaries for the platform that it is executing on. Unofficially, users have been able to get Linux and Mac OS X to cross-compile to the Windows platform.

DarkBASIC

A commercial game creation programming language released by The Game Creators. The language is a structured form of BASIC and is similar to AMOS on the Amiga. The purpose of the language is game creation using Microsoft's DirectX from a BASIC programming language. It is faster and easier to use than comparable languages, but also less powerful. It is marketed on its ability to take a total novice and have them making games with its tutorials.

The Playground SDK API

Please provide commentary or overview

Allegro

Allegro is a free and open source software library for video game development.^{[1][2][3]}

The functionality of the library includes support for basic 2D graphics, image manipulation, text output, audio output, midi music, input and timers, as well as additional routines for fixed-point and floating-point matrix arithmetic, unicode strings, file system access, file manipulation, data files, and (limited, software-only) 3D graphics.

OVERVIEW OF VARIOUS GAME ENGINES and other similar tools (continues)

Wintermute

Wintermute Engine Development Kit is a set of tools for creating and running graphical "point&click" adventure games, both traditional 2D ones and modern 2.5D games (3D characters on 2D backgrounds). The kit includes the runtime interpreter (Wintermute Engine, or WME) and GUI editors for managing and creating the game content (WME tools) as well as the documentation, demonstrational data and prefabricated templates.

<http://dead-code.org/home/>

Eclipse Origins

DirectDraw engine with proper memory management. DirectMusic system for midi playback. Winsock byte-array packet system. Dynamic sprite sheets. Player vs Environment combat. Player vs Player combat. Full level-up system with statistics and vitals stored in a persistent environment. Full set of content editors, including items, animations, spells, maps, npcs and shops. Drag and drop visual inventory. Drag and drop visual bank. Visual shop system with the ability to both buy and sell items. Complete spell system with both damaging and healing spells, DoT, HoT, AoE, teleporting, stunning, cool-down and casting times. Intuitive interface design which can easily be swapped out by simply editing the external image files. Hotbar which allows users to drag items and spells into a set of hotkeys. Dynamic maps which can be any size up to 255 x 255. Tons of tile attributes including npc spawns, doors, locks, resources, teleports and banks. Directional blocking allowing for partial movement restrictions on tiles. *And lots more!*

<http://www.touchofdeathforums.com/eclipse/downloads.php>

LINKS

See further discussion at:

<http://forums.indiegamer.com/showthread.php?17429-Best-game-programming-language-for-a-beginner>

and also at:

<http://lemmasoft.renai.us/forums/viewtopic.php?f=4&t=10276&start=0>

For greatest overview, see wikipedia:

http://en.wikipedia.org/wiki/List_of_game_engines

Game Mechanics

Key Questions

- 1) What makes an interactive program into a game?
- 2) What are the various ways of describing game mechanics?
- 3) What components are the mechanics made of and how do they all fit together ?
- 4) Which are necessary and which optional components?
- 5) What overlaps in imaginary world design, game mechanics and narratology?
- 6) How game mechanics create an experience?

Keywords

- 1) Space
- 2) Rules
- 3) Objects (environment, Player, NPCs)
- 4) Object attributes and attribute states
- 5) Player controlled Objects
- 6) PCO goals
- 7) PCO powers for achieving goals
- 8) Powers 1: abilities,
- 9) Powers 2: resources & items
- 10) Powers 3: information

Authors

- Jesse Schell
- Ernest Adams
- Chris Crawford
- Ralph Koster

Links to subject matter

Wikipedia link to

http://en.wikipedia.org/wiki/Game_mechanics

Gamification.org wiki link:

http://gamification.org/wiki/Game_Mechanics

Home Assignment

- 1) Document all game mechanics in your GDD
- 2) Evaluate the fun factor of all possible PCO actions (use grades 1-5)
- 3) Generate a list of PCO resources/items
- 4) Artists: complete & submit tasks set last week

Game Mechanics NOTES

challenge "physical" or mental? > kinetic (visual-semantic) or strategic thinking
list all gameplay & challenges ingame (Rem to do this in your GDD)

abstract / automate parts that aren't fun (or are too trivial, eg micromanagement)

have hierarchy of challenges, also easy ones for rest
(start and finish should be "always" visible) (exclusion for mystery games)
player must be informed of challenges, obstacles
tangibly reward success & victories
+consider time as opponent

important skills players can use in games:
mastering controls, strategic thinking, making quick choices

table showing use of skill requirement / time stress

hand/eye coordination, accuracy, precision
intuitive understanding of physics
reaction time, timing, rhythm
controls combinations
logics / mathematic problems (numeric relationships)
formal logic puzzles (don't make puzzles that need trial/error for solution)
pattern recognition
understanding / evaluating probabilities
memory
spatial navigation (mazes, illogical spaces/teleporters etc)
perception challenges (finding objects, secrets, etc)

strategic challenges (+time pressure, chance, new information > tactics)
situational analysis (often involves evening/balancing stuff out)

environmental challenges
doors, traps, level design etc

conflict with NPO

Game Mechanics NOTES (continues)

traditional applications:

STEALTH

defence

speed

survival

attacking

economy

research

quantity progress/resource allocation (research, exp, skills, spells etc)

lateral thinking (improvising, using tools for other purposes)

saving good in strategy, action, bad in multiple narratives/stories

remember the player is not your opponent

pseudo random numbers for testing min, max, middle (better to develop)

monte carlo sim (test with random sets)

game chance: luckier than in real life? use curves, eg gaussian.

Playtesting & Balancing

Key Questions

- 1) Why playtesting & balancing go together?
- 2) Why it is important to start playtesting early with a disposable prototype?
- 3) What you need to take into account when you start playtesting?
- 4) What, how and why you are testing/balancing in your game?
- 5) How to use external testers?
- 6) What is Quality Assurance testing?

Keywords

- 1) Time consumption & subdivision durations
- 2) Difficulty
- 3) Choices
- 4) Information
- 5) Numerical Variables
- 6) Names
- 7) Characters
- 8) Bugs
- 9) Video recording of testers playing (notice gameplay video on screen, tester face & body language)

Links to subject matter

Wikipedia links

<http://en.wikipedia.org/wiki/Playtest>

http://en.wikipedia.org/wiki/Software_testing

http://en.wikipedia.org/wiki/Quality_assurance

Gamecareer guide featured article

http://www.gamecareerguide.com/features/503/pro_game_dev_tips_play_.php

Home Assignment

1. Create QA testing questionnaire
2. Find external testers and have them playtest your prototype
3. Playtest & Balance
4. Artists: provide sketches for each game screen

Playtesting & Balancing NOTES

store data and code separately (so that content team can modify data without coders)
avoid dominant strats

role of chance should not make skill irrelevant

early losers get chances to catch up (no kingmaker)

game perceived as fair
(dangers are warned, hinted, reasonable reaction time, difficulty)

stalemate (for unequal players) only rarely

difficulty does not increase too much/suddenly

find rockpaper scissors

give each other several attributes (cost etc) and variants
also nonobvious, hidden or vague attributes

Rock paper scissor vs dom strats
quality dimensions (elements, colours,etc) not just strengths

chance (in frequent challenges with small risks/rewards not big ones)
indicate odds
decide how much to risk

asymmetry starcraft

avoid learning by dying/losing
avoid stalemate
avoid player having to guess (instead, allow them make informed choices)
avoid stagnation (where player does not know how to proceed/win (such as hidden exit door etc))

Playtesting & Balancing NOTES (continues):
Friendly user / alpha tester input

+ Content enrichment task

we love to make things better
(or change them more to our preferences)
but we are jealous when others change our stuff
in fact sometimes we are even afraid they might give us good ideas

but actually, everything is fine as long as their input does
not restrict you (by demanding unreasonable shares, for example).
Enging Credits are your friends.
Why?

Each group describes their pco:
powers (actions, items/resources, information)
npco (opponents, helpers)

Each person picks one game and writes down keywords:
what is the greatest element they would:
a) add
b) remove
c) change
d) what they perceive as

the greatest asset in the devproject
the greatest risk of the devproject

NOTES about puzzle mechs

1: match 3 (recoqnizing alignment (by recogn lines), time managem)

2: combine/organize elements to form a sequence/combination:
challenges: limitations to movement/organizing activity
(put colours into order, jigsaws)

2: learn control use pattern (click 1,2,3; pattern use need doubles with a delay
with each customer)
underlying: what to do in which order

3: learn to time the use of a few controls (push this button whe, and this button when)
(if done with geom/abstract shapes or physical parts of an item,
then shmup becomes real time puzzle)

Game Aesthetics

Key Questions

- 1) What are the aesthetic options you can choose from?
- 2) How to make informed choices when choosing between graphic styles.
- 3) How aesthetics create emotions and ultimately your game experience focus/core?
- 4) How to find and work with artists?
- 5) What to keep in mind when designing UI layout and aesthetics?

Keywords

1. Concept art
2. Placeholder art
3. Moodboard
4. storyboard
5. Fusion of aesthetics & topics
6. Style selection
7. Colours, brightness, lighting, semantic associations
8. Animation
9. Artist selection
10. External art (covers, advertisements, webpage elements)

Overview of some game graphic styles

- 1) Realistic / Stylized
- 2) Iconic / symbolic
- 3) Cartoony
- 4) Retro
- 5) Painting-like
- 6) Photographic

Links

http://en.wikipedia.org/wiki/Video_game_graphics

<http://en.wikipedia.org/wiki/Color>

Home Assignment

Follow your game project schedule

Game Psychology 10

10 very important aspects of designed game (user) experience

by Edvin Aedma and Playtest Games & Marketing business research

- 1) Starts by exceeding player expectations (“with a free gift, with a bang”)
- 2) Has measured duration, divided into subdurations
 - a) Play session duration
 - b) Level/area/stage duration
 - c) Activity duration
 - d) Game duration
- 3) Addresses universal personality traits, focusing on target audience preferences (Big5, Bartle, Aedma*) * Playtest Games & Marketing business research
 - a) Explore / discover / learn / surprise
 - b) Achieve / master / finish
 - c) Help / social modelling or socializing
 - d) Enjoy / positive emotions
 - e) Fight / flight / confront / kill
- 4) Provides universal metaemotion of Progress (towards goals) which:
 - a) is visible (player understands her position on the progress track)
 - b) is gradual (divided into subgoals)
 - c) can be achieved by different means
- 5) Balanced according to target audience preferences in
 - a) experience difficulty / ease
 - b) experience predictability / chance
 - b) experience simplicity / richness or depth of detail

Note: difficulty balance provides brain with cognitive feedback to achieve **flow** (Chiksentmihaily), which is one of the most noticeable intrinsic value of gameplay.
- 6) Has tailored (and fractal) experience intensity & quality curve with
 - a) strong beginning
 - b) decrease and increase of intensity & content variation in the middle
 - c) strong ending
- 7) Has been tested to be Intuitive & fun

Game Psychology 10 (continues)

8) Is (emergently) narrative in nature

9) Has depth of meaning / intrinsic value by reflecting:

- a) Beauty
- b) Art
- c) Humour
- d) Love
- e) Sex
- f) Philosophy

10) Is indirectly controlled, by means such as

- a) Constraints & limited choices (2 doors)
- b) Goals (you must find the secret key)
- c) Avatar & interface (player want what their avatar wants)
- d) Visual design (lines guide eye movement and avatar movement)
- e) Music (restaurant fast music = fast eating, slow music = slow eating)

BONUS:

- 1) Is Replayable
- 2) Is Trendy
- 3) Changes the player (to become a better person)

Game Sound & Music

Key Questions

- 1) How music and sound creates emotions and atmosphere?
- 2) What to represent?
- 3) How sound/music provides indirect control?
- 4) What is dynamic sound/music?
- 5) Can sound be used as interface?

Keywords

1. Emotions
2. Rhythm
3. Examples & reference material
4. Comparison to films
5. Lengths
6. Dynamic Music
7. Ambient sound
8. Free music & Sound databases
9. Music or sound

Links to subject matter

Wikipedia link to

http://en.wikipedia.org/wiki/Game_music

<http://en.wikipedia.org/wiki/Music>

http://en.wikipedia.org/wiki/Ambient_music

Collection of free downloadable videogame music

<http://www.gamealbums.com/index.htm>

<http://downloads.khinsider.com/>

<http://www.makeuseof.com/tag/5-sites-download-free-video-game-music/>

Home Assignment

Follow your game project schedule

Game Story/ Narrative

Key Questions

- 1) Why all games have narrative elements?
- 2) Why stories are useful when designing experiences?
- 3) What are the principles of storytelling/narratives?
- 4) What to keep in mind when creating characters and environments.
- 5) How to design virtual/imaginary worlds?

Key topics

- 1) Creative writing
- 2) Archetypes
- 3) Classical Story Structure
- 4) Dramatic events
- 5) Topics & themes
- 6) Meaningful information
- 7) Literary techniques & devices

Authors

- 4) Vladimir Propp
- 5) Mikhail Bakhtin
- 6) Anton Chekhov

Links to subject matter

Wikipedia links

<http://en.wikipedia.org/wiki/Narrative>

http://en.wikipedia.org/wiki/Literary_technique

Gamasutra article on story

http://www.gamasutra.com/view/feature/3498/the_watery_pachinko_machine_of_.php?page=2

Home Assignment

- 1) Follow your game project schedule
- 2) Creative writing assignment

Game Story/ Narrative (continues)

Note: Meaningful info with intrinsic value

- 1) Beauty
- 2) Art
- 3) Humour
- 4) Love
- 5) Sex
- 6) Philosophy

List of classical stock characters from [Theophrastus](#)

- The Insincere Man (Eironeia)
- The Flatterer (Kolakeia)
- The Garrulous Man (Adoleschia)
- The Boor (Agroikia)
- The Complacent Man (Areskeia)
- The Man without Moral Feeling (Aponoia)
- The Talkative Man (Lalia)
- The Fabricator (Logopoiia)
- The Shamelessly Greedy Man (Anaischuntia)
- The Pennypincher (Mikrologia)

- The Offensive Man (Bdeluria)
- The Hapless Man (Akairia)
- The Officious Man (Periergia)
- The Absent-Minded Man (Anaesthesia)
- The Unsociable Man (Authadeia)
- The Superstitious Man (Deisidaimonia)
- The Faultfinder (Mempsimoiria)
- The Suspicious Man (Apistia)
- The Repulsive Man (Duschereia)
- The Unpleasant Man (Aedia)

- The Man of Petty Ambition (Mikrophilotimia)
- The Stingy Man (Aneleutheria)

- The Show-Off (Alazoneia)
- The Arrogant Man (Huperephania)
- The Coward (Deilia)
- The Oligarchical Man (Oligarchia)
- The Late Learner (Opsimathia)
- The Slanderer (Kakologia)
- The Lover of Bad Company (Philoponeria)
- The Basely Covetous Man (Aischrokerdeia)

Game Story/ Narrative :
The End

Keywords

- 1) The end (class assignment)
- 2) ending (the strongpoint)
- 3) branching stories
- 4) dialogues (PCO attributes / powers)
- 5) player choices affecting the narrative (immediate, cumulative, future)
- 6) consequences (be relatively clear about them)
- 7) multiple endings (must reflect choices)
- 8) game world (class assignment)
- 9) cliffhangers

other topics

1) reference art (next week)

2) scrum of scrums (today)

3) 27th october:

alpha sprint end (ideally: playable game with placeholder content), sprint retrospective,
beta sprint planning

Home assignments

- 1) project schedule
- 2) In the end of alpha sprint: story/game structure divided into episodes, synopsis for each episode

Level Design

Key Questions

- 1) Why to have levels?
- 2) How to and where from start designing a level?
- 3) What are the common mistakes in level design?
- 4) How level design provides indirect control?

Key topics

- 1) Indirect control
- 2) Strongpoints
- 3) Symmetry
- 4) Risk & reward balance
- 5) Action & resting balance
- 6) Fairness
- 7) Level objectives and titles

Authors

- 1) Cliff Bleszinski
- 2) Jesse Schell
- 3) Ernest Adams

Links to subject matter

Wikipedia links

http://en.wikipedia.org/wiki/Level_design

Site dedicated to level design

<http://www.worldofleveldesign.com/>

Article on level design

<http://www.cliffyb.com/art-sci-ld.html>

Home Assignment

- 1) Follow your game project schedule
- 2) Work on level design (create levels)

Level Design (continues)

What you need to ask yourself to make a good level?

- 1) Why do I have this level in the game (intro, start, middle, ending?)
- 2) What are the general importance, size and duration of the level?
- 3) What (new) am I introducing in this level?
 - Npcos?
 - Powers? (actions, resources, information)
 - If new information, then story advancement?
 - If powers, then upgrades, rewards etc?
- 4) What are the main emotions/mood here and why?
- 5) What are the main (expected & promoted) player paths in this level
(= what is the best experience you are offering)?
- 6) How (if present) the story progresses in this level?
- 7) What comes before and after the level?

Level Design NOTES

methods: fractal user experience design (beginnings, middles and ends in everything)

method: specified question becomes an answer

game design says: this will be a dangerous looking area

level designer: how we make it dangerous looking?

shared knowledge generated by level designers:

make early level tutorial levels

vary pacing of the level (especially important in action games!)

replenish resources (do not make the player stingy)

don't make unlogical, unreachable spaces

don't put interactive stuff in places that player can't/won't/don't want/have no reason to reach

the current short term (next) goal should be obvious

be clear about risk & rewards (provide risk evaluation game) and consequences of decisions (story exception)

reward players for skill, imagination, intelligence, dedication

reward in large way, punish in small way

visual foreground is more important than background

the purpose of a good NPCO is to put up a good fight and then lose

implement multiple difficulty settings if possible (you can't motivate them enjoy hard play by forcing hard play on them)

strategy tip: reward planning (by using the level/map to your advantage)

RPG: offer opportunities for character growth and player self expression

construction & management: offer initial variety of start conditions and goals

puzzle: give player time to think

ATMOSPHERE

lightness/darkness levels

color of lights

dominating colors in the scene

weather and atmospheric effect

special visual effects (see hollywood)

ambient audio

music (rhythm=pace, timbre(by what/who sound is produced)+key(pitch class)= mood)

special audio effects

notes for game level design (for many levels)

good to make each level experience duration a bit longer than last

environment progression & change

tutorial levels=make them optional,disable strong punishments, enable moving back&forward,

From Pseudo Interactive company experience:

- general layout
- major challenges
- pacing & save/checkpoints
- victory conditions
- resources
- start & end points
- NPCO locations
- elevations & dimensional expansions
- secret areas
- special events
- destruction (of environment)
- story points

Marketing Games

Key Questions

- 5) What is marketing (hint: not selling or advertising)
- 6) What are the options of making money with your game?
- 7) How to understand your target groups
- 8) How to makes something attractive
- 9) What is virality
- 10) When & how to ask money

Key topics

- 8) B2B vs B2C
- 9) Selling emotions & experiences
- 10) Persuasion & motivations
- 11) Prices
- 12) Donations
- 13) Freemium strategy
- 14) Guerilla & social media marketing

Authors

- 1) Robert Cialdini
- 2) Talis Bachmann
- 3) Ernest Adams

Links to subject matter

Wikipedia links

<http://en.wikipedia.org/wiki/Marketing>

http://en.wikipedia.org/wiki/Herd_behavior

http://en.wikipedia.org/wiki/Viral_marketing

Article on level design

<http://www.cliffyb.com/art-sci-ld.html>

Home Assignment

- 1) Follow your game project schedule
- 2) Create a marketing strategy

Marketing (continues)

Cialdini & Persuasion

Principle 1: Reciprocity

People feel obligated to give back to others who have given to them.

Principle 2: Liking

We prefer to say “yes” to those we know and like.

Principle 3: Social proof

People decide what’s appropriate for them to do in a situation by examining and following what others are doing.

Principle 4: Authority

People rely on those with superior knowledge or perspective for guidance on how to respond AND what decision to make.

Principle 5: Consistency

Once we make a choice/take a stand, we will encounter personal and interpersonal pressure to behave consistently with that commitment.

Principle 6: Scarcity

Opportunities appear more valuable when they are less available.

Robert Gifford

- Urgency (scarcity)
- It has to have as much certainty as can be mustered with integrity (will vs can)
- There can’t be just one message: there must be messages targeted to different groups.
- Messages should be framed in positive terms. People are less willing to change their behaviour if you tell them they have to make sacrifices. If you tell them they can be in the vanguard, be a hero, be the one that helps — that works.
- You have to give people the sense that their vote counts and that their effort won’t be in vain. (interactivity/feedback/dialogue)

Marketing (continues)

Choices and emotions

Lower price = more emotional decisions

Emotionality connected with pain/problems = address problems when selling.

Some notes on game homepage

Show assets (but don't give them)

External assets

Concept art

Covers

Fan art, comments, likes (social proof)

Behind the scenes material

Comparison to other stuff

Reviews & critical acclaim

Metagames (contests: scoreboards, achievements, secrets, donations)

Story?

theme>topic>story>character>personality is the brand, gameplay is the product

Internal assets

Gameplay video

Story

Feature list (units, gameplay hours, upgrades, opponents, skills, spells)

Character

Map

Units

Encyclopaedia

Easter eggs

NOTES on Marketing (continues)

target audience statistics
the more precise, the better

best target audience is an organized community
with established and well working communication
channels.

market penetration and
community penetration

Miller's prism of clinical knowledge:

uses
can use
can explain & show
knows elements or details
heard of / knows about

It is easier to offer products to existing target audiences
(which are people, communities and preference packages in the end)
than try create a new target audience (community)/market
(possible with innovation, which is inherently risky)

good question to ask:
why you would buy this game?
what would it take you to buy this game?> audience considers buying.

TIPS

from cognitive Therapy:
i know about the problem/goal
i can change the problem/achieve goal
i want to change the problem/achieve goal
i will change the problem/achieve goal
i will be doing it wihtin this amount of time
i am doing it.
i am finishing it before that time.
i have done it (reflection strengthens change).

Presentation & Post-Course strategies

Final Game Project Presentation structure:

- 1) Show youtube video of actual gameplay
- 2) Show concept art & other visual resources
- 3) Talk about your development process (problems & solutions)
- 4) Introduce your development team
- 5) Talk about your goals
- 6) Show the audience your website

Post-launch:

- 1) Write a post-mortem analysis of your development process
- 2) Network (with other course members) for professional cooperation
- 3) Create a strategy for developing a portfolio / CV
- 4) Keep developing, playtesting, balancing
- 5) Initiate your launch marketing campaign
- 6) Find investors
- 7) Through cumulating factors of the results of aforementioned operations...become a better person/make the world a better place.

Thank you

Thank you for reading/being a part of this and I hope it helps you. Feel free to network or send your meaningful comments/questions on the subject matter through e-mail or social media.

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