Computer Games 2011
Game Design

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Game Design Documents

- A design document is
  - a bible from which the producer preaches the goal,
  - through which the designers champion their ideas, and
  - from which the artists and programmers get their instructions and express their expertise.

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Why creating a design document?

The purpose of documentation is to communicate the vision in sufficient detail to implement it.

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Roles in Design Documents

- Handbook for the producer
  - Details on what the producer wants
  - Producer makes sure everyone reads it
- Lead game designer is principle author
  - Presents the consensus of the team
- Senior programmer or technical director
  - Writes technical specification

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Team Work

- Essence of discussion
  - Design document underlines the outcome of team decisions & discussions
- Basis for discussion
  - Provide a common ground for discussion
- Living documents
  - Iteratively adopted to the state of design
  - Fleshing out ideas & eliminating vagueness

Benefits of Documentation

- Elimination of hype
  - Define substantial elements
  - Scale back “far-reaching dreams”
- Clarity and certainty
  - Definitions & guidelines as a common ground
- Drafting schedules and test plans
  - Project plan based on the design document

Game Concept Document

- Expresses the core idea of the game
- One- to two-page document
- Brief and simple
- Target audience
  - People responsible for next step (game proposal)

Game Concept Structure

- Introduction
- [Background]
- Description
- Key features
- Genre & Platform(s)
- [Concept art]

Game Concept: Introduction

- Most important words in the document
  - selling your idea to the reader
  - getting the reader excited
- Start with describing the game in one sentence …

"Man or Machine is a first-person shooter for the PC that uses the proven Quake II engine to thrust players into the role of an android space marine caught up in the epic saga of the interstellar techno-wars of the thirty-seventh century."

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Game Concept: Background

- Optional part to expand on
  - other products and projects
  - licenses and IP
- Necessary for game with strong influence of previous titles
  - existing code, tools, engines, ..
  - describe success stories

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Game Concept: Description

- Describe game to the players (readers)
- Exciting narrative of players experience
  - Try to use second-person perspective - “you”
- Encompass key elements
  - but not on mouse click level
- Content and entertainment value of the game should get obvious and convincing

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Game Concept: Description

You scan your tactical radar and pick up two more bogies coming up the rear

You click on your tactical radar button and the window pops up revealing two bogies coming up the rear.

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Game Concept: Key Features

- List of features that …
  - set your game apart from others
  - provide goals for the next step
  - has the right size (balance tasks to features)
  - do not include the obvious (e.g. compelling visuals)
- Consider features that
  - end up on the game box
  - sell the game

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Game Concept: Key Features

- Advanced Artificial Intelligence (AI): *Man or Machine* will recreate and advance the challenging and realistic AI that made *Half-Life* game of the year
- Community built levels & sharing: *Man or Machine* will provide an easy-to-use and intuitive level editor and a level sharing framework to become the LBP of the FPS genre.

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Game Concept

- Genre
  - Summarize the genre(s) in a few words
- Platforms
  - List and argue preferred platforms
  - Note e.g. Internet multiplayer
- Concept art (optional)
  - a picture is worth a thousand words …

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Game Concept: Common Mistakes

- The concept is totally off base or inapplicable to the company's plans
- The document asks for the moon
- The document lacks content
- The game isn't fun
- The document employs poor language and grammar

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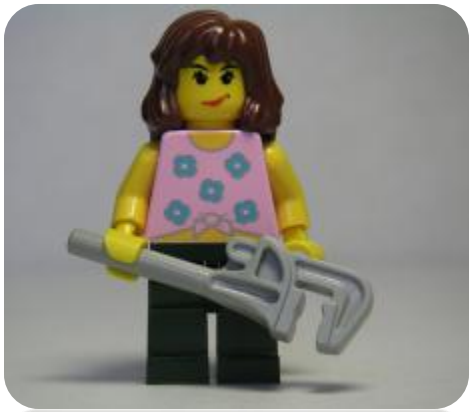
Game Proposal



- Formal project proposal
- To request and secure funding
- Takes time to write
  - decision based on game concept

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Game Proposal Structure

- Revised game concept (preceding)
- Market analysis
- Technical analysis
- Legal analysis (if applicable)
- Cost and revenue projections
- Art

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Game Proposal: Revised Game Concept

- Adaptation of concept to
  - technical, marketing, and finance feedback
  - scale down the idea
  - modify, remove, add features
- Revised concept is
  - communication tool for receiver of proposal
  - basis for proposal

src. http://www.gamasutra.com/view/feature/3384/the_anatomy_of_a_design_document_.php

Game Proposal: Market Analysis

- Present (valid) information on the market
  - e.g. http://www.gamestats.com
  - e.g. games.markt
- Focus on
  - target market numbers (relative or absolute)
  - top performers in the genre
  - feature comparison to competitors

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Game Proposal: Technical Analysis

- Proves the games chance of succeeding
- Discusses in non technical terms
  - Major development tasks
    - work packages, tool chain, integration, …
  - Experimental features
    - unique and untried ideas
  - Technical risks
    - Untried tools & techniques
    - “Can’t say I didn’t warn you!”

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Game Proposal: Technical Analysis

- Discusses in non technical terms (ctd.)
  - Alternatives (if any)
    - Discuss trade-offs in quality, time, money and features
  - Estimated resources
    - employees, contractors, software, hardware, etc.
  - Estimated schedule
    - development schedule, testing plan
    - alpha, beta, gold, master

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Game Proposal: Cost and Revenue Projections

- List all costs
- Suggest retail price
  - Based on existing games
- Revenue projection
  - pessimistic, expected and optimistic values

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Game Proposal: Cost Example

Employee	Cost Per Month	Work Months	Total
2D Artists	$4,000	35	$140,000
Lead Artist	7,000	14	98,000
Level Designers	3,000	35	105,000
			Total: 343,000

Hardware/Software	Price	Qty.	Total
Graphics Workstations (PIII 500MHz/256MB/9GB/Voodoo2)	$4,200	3	$12,600
3D Studio Max Extended Site License (5-user pack)	3,000	1	3,000
			Total: 15,600

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Game Proposal

- Legal issues
  - copyrights, trademarks, licensing agreements, …
- Art
  - created by skilled artists
  - include GUI mockup
- Presentation
  - fancy for business people

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Game Proposal: Common Mistakes

- Magic numbers (not proven)
- Boring text (cannot be sold)
- Failure to anticipate common sense issues
- Not prepared for devils advocate
- No flexibility (regarding changes)

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Functional Specification

- Details the actual game design
- Separates
  - functional definitions from
  - technical specifications
- Cp. to *software requirements*
- Visualizes the game for the user
  - written from user perspective

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Functional Specification

- Game Mechanics
- User Interface
- Art and Video
- Sound and Music
- Story
- Level Requirements

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Functional Specification: Game Mechanics (I)

- Core game play
  - essence of the game
- Game flow
  - player activities
  - progression of challenge and entertainment
  - no UI based description (shoot & move vs. click)
- Characters or units
  - actors in the game (PC or NPC)
  - characteristics , relationships & attributes of actors

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Functional Specification: Game Mechanics (II)

- Game play elements
  - elements a player interacts with
  - buildings, elevators, cars, switches, etc.
- Game physics and character attributes
  - movements, collision, etc.
  - interconnection with character attributes and progress

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Functional Specification: Game Mechanics (III)

- Artificial intelligence
  - behavior of AI in the game
  - movement, reaction, decision
- Multiplayer
  - methods (co-op, hot seat, internet, …)
  - difference to single player

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Functional Specification: Game Mechanics (IV)

- Reward system & progress
  - abilities and game elements
  - high score, leader boards
  - motivation for the player
  - horizontal reward systems
  - Balance: allow progress with balanced game play experience

Functional Specification: User Interface

- Functional requirements
  - what is needed
- Mockups
  - simple drawing
- GUI Objects
  - pointers, sliders, fonts, HUD, etc.
- Flow- and click-chart

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Functional Specification: Art & Video

- Overall goals
  - motifs, characteristics, style, mood, colors etc.
  - consensus with the lead artists, art director & producer
- Video
  - list and detail videos in the game
  - general purpose, length, general content
  - number of actors, blue-screened etc.

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Functional Specification: Art & Video

- 2d art & animation
  - GUI
    - screens, windows, pointers etc.
  - marketing & packaging
    - web page, box, demo splash screens, ads etc.
  - terrain
    - tiles, textures, backgrounds
  - game play elements
    - sprites, models, interactive elements
  - special effects
    - footprints, explosions, sparks etc.

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Functional Specification: Art & Video

- 3d art & animation
  - basically the same as 2d
  - split into models, texture, animation, lighting & special effects
- Cinematics
  - scripted game play as cut scenes
  - purpose, content, length

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Functional Specification: Sound & Music

- Overall Goals
  - aesthetic and technical goals, mood
  - name examples for inspiration
- Sound FX
  - for everything including GUI, terrain, etc.
- Music
  - level, GUI, events, situations, cinematics

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Functional Specification: Story

- Describe the story of the game
  - characters, background etc.
- Outline
  - why the story motivates the user to take part
  - relationship progress of story vs. progress of game
- Indicate game text & dialogue requirements

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Functional Specification: Level Requirements

- Linear campaign vs. branching decisions
- Asset revelation schedule
  - when is an ability acquired?
  - reward system
- Level design seeds
  - indication or pointers, no full specification

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Functional Specification: Common Mistakes

- Insufficient details
- Patronizing material
- Ambiguity and contradiction
- Too big
- Getting too personal with the design
- Wandering vision (feature creep)

src. http://www.gamasutra.com/view/feature/3384/the_anatomy_of_a_design_document_.php

Technical Specification

- Provides a blueprint for the game
- Defines how functions are implemented
- Written by lead programmer or tech. director
  - from a systems perspective
- Cp. software design document
  - MVC, UML, interface definitions, etc.

src. http://www.gamasutra.com/view/feature/3411/the_anatomy_of_a_design_document_.php

Technical Specification: Game Mechanics

- Control loop
- Game object data
- Game physics and parameters
- Artificial intelligence
- Networking

src. http://www.gamasutra.com/view/feature/3384/the_anatomy_of_a_design_document_.php

Technical Specification: User Interface

- Game shell
  - all windows other than the main game play
- Main play screens

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Technical Specification: Art & Video

- Storage, processing, transmission
  - codec, resolutions, etc.
- Graphics engine
  - methods, effects, view ports etc.
- Artist instructions
  - interface to visual and audio design

src. http://www.gamasutra.com/view/feature/3384/the_anatomy_of_a_design_document_.php

Technical Specification: Sound & Music

- Loading & playing
  - memory specifications, runtime demands etc.
- Technical sound details
  - 3D sound, mixing, channels, sample rates, formats, codecs etc.
- Sound engineering instructions
  - interface to the sound artists

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Development Schedule

- Conceptual phase
  - document: game concept
  - document: game proposal
- Design phase
  - document: functional specification
  - document: technical specification
  - documents: tool specifications (if applicable)

src. http://www.gamasutra.com/view/feature/3384/the_anatomy_of_a_design_document_.php

Development Schedule

- Production phase
  - production schedule
  - technology and art demo
  - first playable level
  - documents: level blueprints, scripts
  - alpha - functionally complete
- Testing phase
  - beta - first potential code release
  - gold master - code release

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Sample Design Document: Abstract

Catch the Clown

Catch the Clown is a little action game. In this game a clown moves around in a playing field. The goal of the player is to catch the clown by clicking with the mouse on him. If the player progresses through the game the clown starts moving faster and it becomes more difficult to catch him. For each catch the score is raised and the goal is to get the highest possible score. Expected playing time is just a few minutes.

source: http://www.yoyogames.com/make/tutorials

Sample Design Document: Game Objects

Game objects

There will be just two game objects: the clown and the wall. The wall object has a square like image. The wall surrounding the playing area is made out of these objects. The wall object does nothing. It just sits there to stop the clown from moving out of the area. The clown object has the image of a clown face. It moves with a fixed speed. Whenever it hits a wall object it bounces. When the player clicks on the clown with the mouse the score is raised with 10 points. The clown jumps to a random place and the speed is increased with a small amount.

source: http://www.yoyogames.com/make/tutorials

Sample Design Document: The Rest

Sounds

We will use two sounds in this game. A bounce sound that is used when the clown hits a wall, and a click sound that is used when the player manages to click with the mouse on the clown.

Controls

The only control the player has is the mouse. Clicking with the left mouse button on the clown will catch it.

Game flow

At the start of the game the score is set to 0. The room with the moving clown is shown. The game immediately begins. When the player presses the <Esc> key the game ends.

Levels

There is just one level. The difficulty of the game increases because the speed of the clown increases after each successful catch.

Game Postmortems

- Written after finishing the project
  - Done by senior developer or manager
- Summarizes dev process to
  - Avoid pitfalls in later projects
  - Apply practices that worked well in later projects

Check for instance gamasutra.com

Game postmortems: Structure

- **Project Overview**
  - *Describe the game (idea, setting, story, features)*
  - *Describe team and circumstances*
- **What went right**
  - *Describe „best practices“*
  - *Describe and argue „good“ decisions*
  - *Motivation for this part: Think of benefits for future projects*

Game postmortems: Structure

- **What went wrong**
  - *Describe pitfalls and difficulties*
  - *Describe mistakes experienced, technical as well as from management perspective*
- **Conclusion & Closing**
  - *Final note from the authors, personal experience*
  - *Project brief: dev tools, resources, …*

Exercise

- Create a game concept
  - groups of four
  - draw requirements card
  - design a game meeting the requirements
- Mandatory requirement for all:
  - game play should not exceed 10 minutes

Requirements

```
# randomized output of different game requirements
type <- c("puzzle", "jump & run", "adventure", "maze", "shooter")
mode <- c("single player", "cooperative multiplayer", "competitive multiplayer")
platform <- c("for mobile phones", "for pc")
for (i in 1:10) {
    cat(mode[sample(1:length(mode),1)], type[sample(1:length(type),1)])
    cat(" game", platform[sample(1:length(platform),1)], "\n")
}
```

```
cooperative multiplayer jump & run game for pc
cooperative multiplayer maze game for mobile phones
single player puzzle game for mobile phones
competitive multiplayer adventure game for pc
competitive multiplayer maze game for mobile phones
single player adventure game for mobile phones
single player shooter game for pc
competitive multiplayer adventure game for pc
competitive multiplayer maze game for pc
single player puzzle game for mobile phones
```

Thanks …

… for your patience