

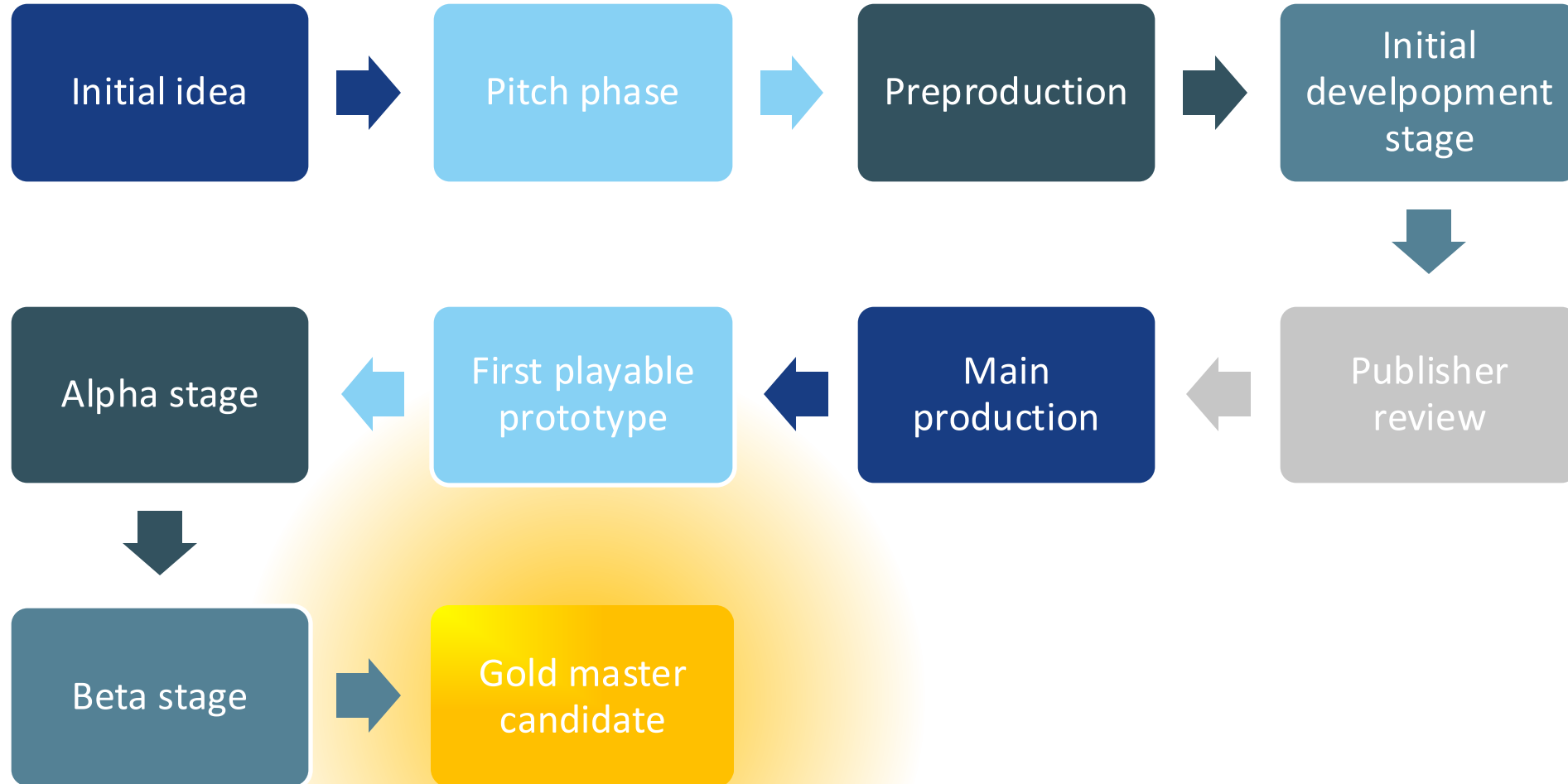
COMPUTER GAME TECHNOLOGIES PROCESS AND ROLES

Lukas Esterle | Aarhus University

LEARNING OUTCOMES

- Understand the different steps in game development process
- Identify the roles involved in a games development process
- Discuss the responsibilities and challenges of roles and processes
- Compose and differentiate main documents to present a game
- Understand and choose ways of progression in games

GAME PRODUCTION PROCESS



WHO MAKES GAMES?

Games are a **team effort**

Teams: different people with different abilities

- similar to a production team for a movie
- a bunch of creative people working together

Earlier teams were really small

- Pong - Allan Alcorn
- Prince of Persia - Jordan Mechner (also for animation and music)

Nowadays teams are multidisciplinary

- Specialization is key, but one can wear many hats

TEAM



AARHUS
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DEPARTMENT OF ENGINEERING

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CHARACTER SHEET - PRODUCER

A producer is overseeing the entire game development

Producers have to do many tasks

- hiring and building teams
- contributing to the game's design and implementation
- managing the work schedule and synchronizing work
- handling the game's budget
- maintaining outside parties (publishers, third party developers)
- public relations

Typically also a team effort

- assistant and associate producers help out with day to day tasks



CHARACTER SHEET - DESIGNER

Creating and tuning ideas and rules that make up the game

Have to understand games

- ie. what makes good games and what makes bad ones

Are also specialized ...

- *level designers* build the game worlds
- *system designers* develop how game elements relate to each other
- *scripters* write code that allow things to happen in the game
- *combat designers* balance player's experience in combat situations
- *creative directors* maintain the vision of the game while supervising



CHARACTER SHEET - PROGRAMMER

Writing program code for games for ...

- drawing graphics, control and camera systems, physics, AI, and much more

Split into tasks, like ..

- programming / integrating a tool chain
- writing / extending the game engine
- developing inverse kinematics, sound, or effect systems

Nowadays very specialized

- Many are “hired guns” for special tasks



CHARACTER SHEET - ARTIST

Making contributions to the audio/visuals of a game

Many are specialized, like ...

- *concept artists & storyboard artists* developing the art
- *3D modelers & environment artists* using tools like Maya and ZBrush
- *texture artists* paint surfaces on 3D models
- *visual effect and lighting artists* add the eye candy
- *animators & riggers* bring characters and environment to life and make cut scenes
- *technical artists* interconnect and communicate on a technical level
- *art directors* supervise the work on visual art



CHARACTER SHEET - TESTER

Playing and testing the same game over and over again

Persistence, patience and communication skills are needed

Multiple ways to test a system:

- Playtesting - checking for a game being fun / solvable / understandable
- Usability testing - checking if the human computer interface works
- QA testing - finding and reporting software bugs
- Test management - Organizing tests and evaluating results



CHARACTER SHEET - COMPOSER

Composers create music for games

Tasks include composition, setting, mixing and mastering

Game music nowadays interactive

- composers have to reflect the game state in a seamless fashion
- leads to non-linear music systems



CHARACTER SHEET - SOUND DESIGNER

Covers every sound beside music including

- environmental sounds, effect sounds, etc.

Responsible for mixing, blending, prioritizing sound

Using the characteristics of the underlying sound engine

- 3D sounds, multiple channels, live effects, etc.



CHARACTER SHEET - WRITER

Typically come in late in the game development process

Making a story from the idea the design team came up with

Writing dialogues for in-game and cut-scene dialogues



EXAMPLE TIMELINE



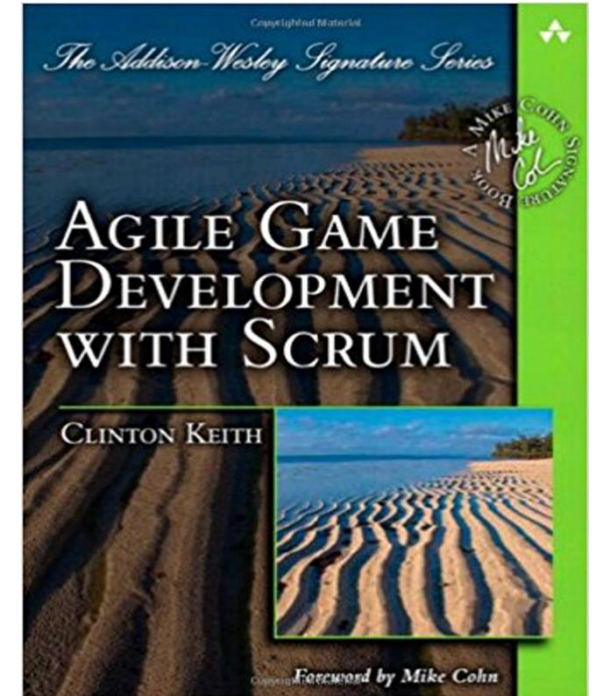
LESSONS FROM SOFTWARE ENGINEERING

SCRUM as a method

- rapid and focused implementation of functionality
- team is self-responsible in close contact with end users
- product owner communicates to customer
- scrum master directs process & communicates to organization

Cross functional teams

- include team members from different fields
- team members learn from and support each other



THE GAME DESIGN DOCUMENT

Defines everything in your game

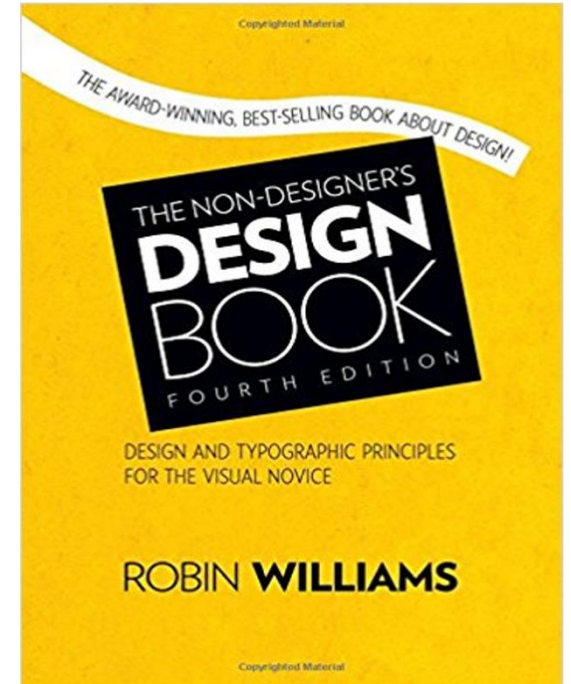
- Sometimes called *game bible*

Size depends on complexity of a game

- like 30 pages for a mobile puzzler, 300 for a AAA title

Has to be readable

- no bad grammar or typos
- simple and readable layout (typefaces, organization)
- maybe read a design book first ...



TOWARDS A GAME DESIGN DOCUMENT

Step 1: the one-sheet

Step 2: the ten-pager

Step 3: the gameplay progression

Step 4: the beat chart

Step 5: the game design document

STEP 1: THE ONE-SHEET

Simple overview on the game

For many people to read

- including publishers, teammates, marketing people, ...

Should be interesting, informative and short



STEP 1: THE ONE-SHEET

- Game title
- Intended game systems
- Target age of players
 - **ESRB / PEGI rating**
- Summary of the game's story, focusing on gameplay
- Distinct modes of gameplay
- **Unique selling points**
- **Competitive products**

ESRB RATINGS

General category

- EC, E, and alike, see below

Content descriptors

- Alcohol reference, animated blood, blood, ...
- see http://www.esrb.org/ratings/ratings_guide.aspx



PEGI RATINGS

General categories

- see below



Content Descriptors

- only eight descriptors
- see <https://pegi.info/what-do-the-labels-mean>



UNIQUE SELLING POINTS

Bullet points found at the back of the box

A game should communicate around five USPs

- not including obvious ones like amazing graphics, compelling story, etc.

USPs should get readers excited, like ...

- “Multiple gameplay modes including 256-player battle royale”
- “You are in command and your decision influence the game world on a level never experienced before”
- ...

COMPETITIVE PRODUCTS

Implicitly give context and target group of your game

Pick popular and successful games

- especially publishers are interested in games that sell well

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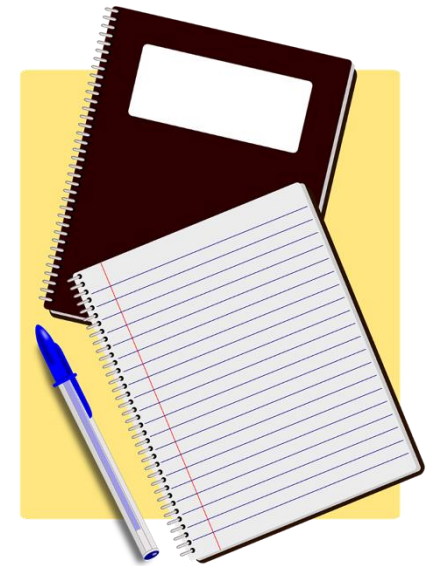
Step 3: the gameplay progression

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STEP 2: THE TEN-PAGER

- Abstract game design document
- Lays out the spine of the game without going into details
- Most importantly it's interesting to read
- Plenty of visuals, but relevant ones



A DOCUMENT FOR DIFFERENT AUDIENCES

Production team	Marketing / Executives
Provide clear diagrams of gameplay	Show exciting conceptual images
Use short, punchy sentences	Organise text in bullet point form
Use terms and language of the team to get your intention across clearly	Use vivid, descriptive examples
Compare gameplay to appropriate games, even vintage titles	Use successful, modern games as comparative titles

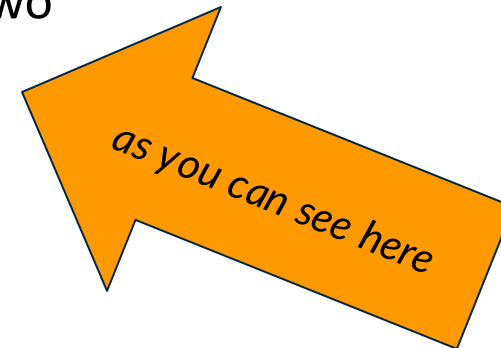
THE RULE OF THREE



... is a little help for organizing text.

Three is a great number to communicate things, ideas, examples and concepts

- The first bullet gives the reader an idea what's going on
- The second contrasts the first one
- The third one complements or contrasts the other two
- Anything beyond three gets immediately boring



TEN-PAGER: PAGE 1 - TITLE

The *title page* should include

Game title

Intended systems

Target age of players

Intended ESRB / PEGI Rating


Projected ship date

Maybe add a drafted Logo

Super Magic World

Very Fast Cars

Dude with Sword

Guys named like rees

TEN-PAGER: PAGE 2 - OUTLINE

The *game outline* should include ...

Game story summary

- Just a few paragraphs build on top of the one-sheet
- Tells beginning, middle and ending of the story

Game flow

- Describe the players' experience from their viewpoint

TEN-PAGER: PAGE 3 - CHARACTER

The character description introduces the main character/s:

Highlight a few relevant specifics

- age, sex, and other ground material related to the game
- concept art on the character

What is the character's backstory

- Cp. *Kratos* from *God of War*

How does this relate to the gameplay?

How is the character controlled by the player?



TEN-PAGER: PAGE 4 - GAMEPLAY

The *gameplay* description

Details on the gameplay and sequence of play

- multiple story characters? game divided in levels / rounds / quests?

Unique selling points need to be emphasized

Outline eventual minigames

TEN-PAGER: PAGE 5 – GAME WORLD

Images and descriptions of the *game world*

- Describe game world as found by the player
- Including a map or flowchart of the world
- What will the player find there?
- How does the game world tie into your story?
- What is the mood / music of this game world?



TEN-PAGER: PAGE 6 - GESTALT

The *game experience* page outlines the “gestalt” of the game

What is the overall, end-to-end experience?

- What do player first see when they start the game?
- What emotions / moods are to be invoked by your game?
- How are music and sound use to convey the game’s feel?

Include minigames, cutscenes and unique gameplay

- like bowling in *Plants vs. Zombies* or
- the *Call of Duty: Modern Warfare 2* level “No Russian”

TEN-PAGER: PAGE 7 – GAMEPLAY

Gameplay mechanics (mechanics in contrast to hazards)

Mechanics is an action-reaction item

- moving platforms, opening doors, rope swings, etc.

Hazards are mechanics that can harm or kill the player

List and description of the mechanics of the game

- power-ups, collectibles, skill trees, economy system, ...

TEN-PAGER: PAGE 8 - ENEMIES

Enemies of the player (Als that react to the player)

Which enemies to find in the game world?

What makes them unique?

How do players overcome them?

Describe types and character of enemies

- cp. Stella the Witch vs. evil Wilbur in Bubble Witch Saga
- cp. the Wild Hunt in Witcher 3

TEN-PAGER: PAGE 9 - BONUS

Description of *multiplayer & bonus material*

Is multiplayer available? If yes, how?

- p2p, server infrastructure, interaction modes, ...

Additional encouragement for the players

- vertical achievements and unlockables
- incentives for playing the game again, replayability

TEN-PAGER: PAGE 10 - MONEY

Description of monetization

Overall business model

- free-to-play, full price title, subscription, ad-based, ...

What are players getting for their money?

- costumes, hats, stickers, ...
- weapons, in game objects, ...
- time, automation of tasks, ...

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STEP 3: GAMEPLAY PROGRESSION

Determine how the gameplay unfolds for players. Suggestions:

Starting from ground zero with no skills, gears or abilities

Skills are presented, but need to be unlocked over time

- gating mechanism can be money, experience, ...

Skills are there, but players doesn't know how to use them

- cliché of the amnesia character

Players start with incredible power, only to lose it fast

- cp. Prototype

STEP 3: GAMEPLAY PROGRESSION (CTD.)

Gameplay progression should be rewarding

Players should be satisfied and willing to invest some effort for rewards

Cp. the loot approach of *Diablo* or *Borderlands*

- players like to progress fast ...

E.g. EC: <https://www.youtube.com/watch?v=ROEdggVLKSk>

PROGRESSION FEATURES

Journey features and *reward* features

Journey features are features improving the journey through the game

- New areas
- New enemies
- New skills
- New information

Reward features are actual rewards

- Gold / Money
- Equipment (weapons, armor, potions, ammo,...)

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STEP 4: THE BEAT CHART

Every beat chart requires:

- Level/environment name
- File name (level/environment designation)
- Time of day (in context of the game)
- Story elements for level / Goal
- Progression: gameplay focus of the level
- Estimated play time of level
- Color scheme of level/ environment
- Enemies/bosses introduced and used
- Mechanics introduced and used
- Hazards introduced and used
- Power-ups found in level/ environment
- New abilities, weapons, or gear introduced/unlocked
- Treasure amount and type the players can find
- Bonus material found in level/environment
- Music track(s) to be used in this level/environment



Level: World 1-1	Level: World 1-2
Name: Grave Danger (Boneyard)	Name: Dead Heat (Boneyard)
TOD: Night	TOD: Night
Story: Maximo enters the graveyard, fighting his way through undead creatures that bar his way.	Story: Achilles's drill has cracked open the earth, causing lava pits to open up throughout the graveyard.
Progression: Player taught basic movement, combat and defensive moves. Player learns how to collect and map abilities.	Progression: Player masters hazardous jumps and more intense combat.
Est. play time: 15 min	Est. play time: 15 min
Color map: Green (trees), brown (trees/rock), purples (tombstones)	Color map: Red (lava), brown (trees/rock), purples (tombstones)
Enemies: Skeleton (basic), sword skeleton (red), skeleton (axe), ghost, zombie (basic), wooden coffin, chest mimic	Enemies: Skeleton (basic), skeleton (axe), sword skeleton (red), sword skeleton (blue), skeleton (guardian), zombie (basic), raven, ghost
Mechanics: Holy ground, breakable tombstone, breakable torch, breakable crypt lid, breakable rocks, Achilles key statue, key lock, opening gate (door), opening gate (cave), prize wheel, treasure chest, locked chest, hidden chest, end plinth	Mechanics: Holy ground, breakable tombstone, breakable torch, breakable crypt lid, key statue, key lock, opening gate (door), enemy coffin, floating platform, prize wheel, treasure chest, locked chest, hidden chest, end plinth
Hazards: Unholy ground, Achilles statue, fall-away ground, skull tower, breakaway bridge, deep water, lava pit	Hazards: Unholy ground, swinging gate, skull tower, flame jet, lava pit
Power-ups: Koin, koin bag, diamond, death koin, spirit, life up, flametongue, shield recharge, sword recharge, half health, full health, iron key, gold key, armor up	Power-ups: Koin, koin bag, diamond, death koin, spirit, life up, flametongue, shield recharge, sword recharge, half health, full health, gold key, armor up
Abilities: Second strike, mighty blow, magic bolt, doomstrike, foot cheese	Abilities: Second strike, mighty blow, magic bolt, doomstrike, throw shield
Economy: 200 koins, 2 death koins	Economy: 200 koins, 1 death koin
Bonus materials: N/A	Bonus materials: N/A
Music track: Graveyard 1	Music track: Graveyard 2

Beat Chart Example from S. Rogers (2014) Level Up!

WITH THE BEAT CHART YOU CAN ...

Identify patterns in the gameplay progression

Find holes and fill them

Move elements around to fix deficiencies in the design

ANALYZING THE BEAT CHART

Clumping - too much at one place

- spread gameplay elements out

Samey-ness - too many identical combinations

- mix things up to keep the game fresh

Alternate time of day, music tracks, and color scheme

- to avoid the look and feel of repetition

Problems in the game economy

- Can players buy items/skills they need? Is there too much money?

ANALYZING THE BEAT CHART

Introduction of mechanics and enemies

- mechanics should be introduced at the time / before they are needed

When will the player have “everything”

- 75% of the game is a good time point, to have time to try out the cool stuff

A rule of thumbs ...

- “Introduce two or three new mechanics, rewards and enemies per level.”

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STEP 5 - GAME DESIGN DOCUMENT

Fleshes out the missing details

- using the previous documents as spine

Is a living document

- will change over the course of development

Provides a basis for the technical design document

- written by the technical director / senior programmer

Is a communication tool

- .. especially as a common ground for understanding

WHY PITCHING A GAME TO ANYONE?

A game needs to be published to be a success (most of the time)

- alternative: self-publishing

Publishers take much of the risk

- fund, market and distribute games



CONSTRAINTS FOR PITCHING A GAME

Publishers get hundreds of new proposal every month

- more than 95% get rejected

Project acquisition and dev people are always swamped

- time is valuable and short in supply

Game production and distribution is a high risk business

- cp. Guitar Hero - game successful, boxes were too big

Most publishers have already been burned by developers

- missing deadlines, not delivering, overestimating themselves, ...

Publishers like to work with people they trust

PREPARATION FOR THE PITCH

Start out with the great idea, then lay it out on the table:

1. Clear, realistic, honest and well-thought-out milestones
2. Sufficient projected staff
3. Sufficient projected budget to complete each phase
4. Sufficient time and human resources dedicated to testing and fine tuning the game

EMPHASIZE THE TEAM

People behind the project are equally important:

- Argue a strong team track record
- Argue team experience in the genre

THE 45 SECONDS ELEVATOR PITCH

A typical Hollywood concept

Get a person you meet in the elevator interested

- to make them say “I really want to know more?”

Put your whole game in a short pitch

- publishers are searching for the “killer-app” or the next blockbuster game
- make sure you communicate the key features why it’s your project

THE 45 SECONDS ELEVATOR PITCH

Brief high-level description

- To set the context, e.g. by related games

Offer a reason why your game is especially cool

- point out what is the USP, what your game does the first time

Mention who is on your team

- and what they have worked on before

What's the current status

- Is there playable level or even an alpha version

SAMPLE EVELVATOR PITCH



<https://www.youtube.com/watch?v=i6O98o2FRHw&t=1s>

ANIMATION IS KEY

If something moves, it's better to sell

Videos are easier to make compared to shiny prototypes

ASSASSIN'S CREED III TARGET GAMEPLAY



<https://www.youtube.com/watch?v=3-FMAZh1m3Y>

CYBERPUNK 2077



<https://www.youtube.com/watch?v=P99qJGrPNLs>