Game Production and Project Preparation

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CS 377: Game Development Studio
Winter Quarter 2022
Northwestern University
Overview

1. How to get started on designing your game
2. How to prepare for your project proposal
Let’s recap our model so far

Mechanics
- Game elements, rules, code
- Player’s inputs and outputs

Gameplay
- How the game unfolds over time
- Activity / behavior/ patterns of play

Experience
- The feels / the fun
How do we start designing a new game?
Product design

Design is a **high-dimensional search problem**
- We need to find a good solution to a set of constraints
- Not just in games!

Practicing designers pursue **exploration of the space of possible designs** using **prototypes** and **experience** as guides

Two broad families of approaches:
- Top down design
- Bottom up design
Product design

Start with desired experience, player archetypes, market analysis, etc. Figure out how to make a good experience for them.
Product design

Start with gameplay and the experience it generates, let it “find” an audience
Product design

In this class, you will
- Start with a **broad top-down vision**, and then
- Work mainly **bottom up to prototype it**

**Top down** and **bottom up** design often happens *at the same time*
- Decision about mechanics → affects gameplay → affects experience
- Decision about player experience → affects gameplay → affects mechanics
Some specific “getting started” tips

1. Start with genre
2. Ask who / what / why
3. Riff on inspiring games

These tips are specific to a one-quarter class!
If you had more time, I would suggest a longer design process :)
Start with genre

Genre helps answer many questions
- Game board? Player view?
- Movement?
- Actions?
- Units / resources / stats?
- Progression?
Some specific “getting started” tips

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Who / what / why

1. Who is the player in the game world? → the fiction
2. What do they do in the game world? → the nouns and verbs
3. Why do they do this? What is their job? → challenge for the player

(photos courtesy mobygames.com, Wikipedia)
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Identify inspiration

What inspires you, in particular? Which games?

→ Can you riff on them / extend them in some cool ways?
Evolving mechanics

Most new games start out inspired by what we already know and that’s okay :)

- Chess is a masterpiece that evolved over centuries

So start from a known game and evolve it

- But in a smart way :)
ATARI PONG (1972)
BREAKOUT (1976)
SPACE INVADERS (1978)
GALAGA (1981)
Or, more recently...
Or, more recently...

<table>
<thead>
<tr>
<th>Turn</th>
<th>My guess</th>
<th>Bulls</th>
<th>Cows</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>7564</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2.</td>
<td>2393</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>3.</td>
<td>0210</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>4.</td>
<td>9080</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>5.</td>
<td>1980</td>
<td>4</td>
<td>0</td>
</tr>
</tbody>
</table>

BULLS AND COWS (1900s?)

JOTTO (1955)

LINGO (1987)

WORDLE (2021)

HANGMAN (1890s?)

MASTERMIND (1972)

(photos courtesy mobygames.com, Wikipedia)
1. Start with an existing game

2. Identify mechanics abstractly

3. Modify mechanics in interesting ways

4. Apply to a concrete setting
Modeling gameplay

Games are made of mechanics

We can change existing mechanics...
We can bring in new ones...
We can rearrange them in unexpected ways...

(The following examples courtesy of Raph Koster)
Changing mechanics

1. Simplest change: **add a stat**, and some **rules** that use this stat

   ◦ *Action cooldown* → *requires planning and defense*
   ◦ *Number of moves* → *efficiency and planning ahead*
   ◦ *Different attack / defense ratings* → *possibly divergent strategies*

1b. Remove a stat! More difficult :)

Changing mechanics

2. Add new goals

Take a platformer
  ◦ Add “best time wins” goal. You get speedruns.

Take a side-scrolling shooter
  ◦ Add “rescuing” goal. You get the classic Defender.

It gets interesting when the goals are contradictory...
## Changing mechanics

### 3. Change / extend verbs

<table>
<thead>
<tr>
<th>Game</th>
<th>Actions</th>
<th>Movement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rock paper scissors</td>
<td>3 attacks</td>
<td>None</td>
</tr>
<tr>
<td>Karate Champ</td>
<td>13 attacks, 4 defense</td>
<td>Left/right</td>
</tr>
<tr>
<td>Karateka</td>
<td>6 attacks, 2 stances, bow</td>
<td>Left/right + scrolling</td>
</tr>
<tr>
<td>Battle Arena Toshinden</td>
<td>&gt; 50 attacks, 2 stances</td>
<td>Left/right (2 independent)</td>
</tr>
<tr>
<td>Bushido Blade</td>
<td>8 weapons, many moves</td>
<td>Left/right + depth</td>
</tr>
</tbody>
</table>
Changing mechanics

4. Change input mappings

- Switch from analog (continuous) input to binary one → Asteroid-style thrust
- Switch from instant input to timed input → “Charge up” actions
- Switch from simple input to complex motions → Wii motion sensors
- Split simple input to several inputs → QWOP
Changing mechanics

5. Mash together games with similar systems
   - Mario meets Joust
   - Breakout meets Space Invaders
   - Twister meets Tic Tac Toe

Do you pick mechanics from one and add to the other?
(And how will it change the game?)
Start with an existing game

2. Identify mechanics abstractly

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INTERLUDE
Starting on your project

This week:
◦ Split up into groups (3 people each)
◦ Come up with project ideas
◦ Write up a project proposal

Next week:
◦ Present your project idea to the class
◦ Finalize project plan
◦ Get started!
Project proposals

Make a plan of where you’re going, before you take your first steps
Your constraints

"What can you commit to?"
"Time, scope, or cost: pick two."

Time
- When you have to be done

Cost
- Usually function of team size + external services

Scope
- Which features / how many / what quality level
Your constraints

“Time, scope, or cost: pick two.”

Time
- Shipping date is fixed

Cost
- Team size is capped

Scope
- This is the flexible part!
Project proposals

Make a plan of where you’re going, before you take your first steps

Get your classmates excited about your work

Let me know what you’re going to make
Communicating your design
Design document

How do we communicate this design to others?
- We could write it all down...
- ...but design will evolve over time

GDD (game design doc), or more often a Design Wiki
- “Necessary evil” with large teams where everyone works on a tiny part of the whole
- Used for pitching to publishers etc.
Typical “corporate” greenlight process

- **“One-pager” Pitch**
  - One or two people
  - Very high-level gameplay description
  - Short analysis of intended audience

- **Design Pitch**
  - Tiny team
  - Describes the parts and scope of the game
  - Detailed market feasibility analysis

- **Preproduction**
  - Small/medium team
  - Detailed design of art style and gameplay systems
  - De-risk design (by prototyping design ideas)
  - De-risk tech (by building / testing engine parts)

- **Production**
  - Staffed up as needed
  - Build everything (art, design, tech)
  - Tune, polish, finalize

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GDD is complete overkill for small teams

Many indies start with “prototype first” and let design evolve naturally
- But that causes problems too: easy to lose direction and get lost

The Tadhg Kelly model
- GDD ----------------------------------------------------- Prototype First
- Do prototyping once you’ve created a very brief design pitch
- There are some specific questions he likes to see addressed
7 questions to start your design

Based on Tadgh Kelly’s “Raw Game” approach

(GDC Next 2014 talk)
Q1: Is the game’s fiction urgent?

Not just the game story, but the game’s aesthetics – the player’s experience of playing:

**Tetris**: OMG THESE BLOX JUST WONT STOP FALLING

**Minecraft**: the world is dangerous, and you need to make shelter and everything else

**The Sims**: struggle to remain happy, be successful at work, and have friends

Note: these fictions can be realized with all sorts of mechanics!
Q2: What is the player’s job?

Not the avatar, or the story character – the player! Keep it short. One word. Maybe a short phrase.

Tetris: I’m a sorter

Minecraft: I’m an explorer and a builder

The Sims: I’m a working adult
Q2: What is the player’s job?

Very helpful in defining boundaries
- If I’m a sorter, I’m probably not a soldier
- If I’m an explorer, I’m probably not a manager

Gives player clear context of what’s expected of them

What if you have more than one “role”?
- Probably several games in one
- Proceed with caution! There be dragons

(“The Movies”, Lionhead 2005)
Q3. What are the actions?

By verbs we mean individual units of in-game action.
- **not** physical actions like swipe, touch, or click

**Fighting games:** punch, kick, block, jump

**Tycoon games:** build, collect rent, buy, sell

**Minecraft likes:** go, dig, collect, craft, attack
Q4: Do actions support each other?

If actions are completely independent, they’ll get boring quickly. It’s better to make them support or chain together.

**Soul Calibur**: combos like jump + kick
- Gives it extra strength, but takes longer

**Diablo**: loot and economy
- Planning how to convert items and resources

**FPS**: weapons and upgrades
- Choice of weapon and add-on becomes strategic
Q5. What are your objects?

Give me some examples of nouns:

**FPS**: Guns, bullets, health
  - Different guns have different speed and damage; you need to find bullets to shoot, etc.

**Tennis**: Ball, aim, court position

**StarCraft**: base, soldiers, time, board visibility

What are yours?
  - Don’t have to have all of them, but have a variety
Q6. What’s the defining rule?

Is there one rule that makes the game unique, and without it, it wouldn’t be the same?

**Chess**: putting the king in check

**FarmVille**: making the player wait

**Roguelikes**: risk of sudden death

(“Rule” is deliberately vague in this context)
Q6. What’s the defining rule?

You can make the game more interesting by adding player actions that support or frustrate the defining rule.

Example: Mario Cart

- The defining rule is driving quickly and accurately
- The game is full of elements that mess with it (offense + powerups)

If you evolve your game from an existing game...

- See if you can identify some defining rule (or rules)
- See if it’s interesting to add game elements that mess with it
Q7. What are you testing?

In the sense that the game is always “testing” or “challenging” the player at something

**Quake**: fast reflexes, accuracy

**Tetris**: sorting shapes quickly

**StarCraft**: managing a zoo of units

What is the challenge your player will be facing?
The 7 Questions Wrap-Up

The goal is not to get them right immediately

The goal is to explicate you design assumptions – it’s to make the designer think and plan

You will use these 7 questions in your project proposal, instead of a design document!
Schedule

- Jan 3
- Jan 10
- Jan 17
- Jan 24
- Jan 31
- Feb 7
- Feb 14
- Feb 21
- Feb 28
- Mar 7
Project presentations, work starts

Playtesting starts

Core loop identifiable

User experience focus

Polish and adding more content

DEMO DAY
MON MAR 7

Jan 24
Jan 31
Feb 7
Feb 14
Feb 21
Feb 28

More talks etc.
Remainder of this week

Until end of this week:

Organize into teams of ~3
  ◦ Please use Discord to discuss ideas and recruit team members

Settle on the project idea
  ◦ Something that fits into one quarter :)
  ◦ Optimize for the first ~5 minutes of gameplay

This week
  ◦ Myself + PMs will be available on email / Discord for your project questions
  ◦ Also, PM office hours start this week
    See Canvas!
Homework due EOD Sunday

1. One-pager pitch doc for your classmates
   - Your team name
   - Your team members
   - What’s your game idea
   - What’s cool about it
   - Submit on Canvas
   - I will share everyone’s pitch docs with the whole class

2. Project details doc for me
   - Your team name
   - Your game idea
   - Design details:
     - Identify your inspiration (other games etc)
     - Answer each of the “7 Questions” for your game
     - Draw me some screenshots using pen and paper
   - Also submit on Canvas
Next week

On Monday Jan 24:

Each team will present their project in class
- One person per team does the presentation
- Quick pitch – 3 minutes max
Qs?