CS/INFO 4154: Analytics-driven Game Design

Lecture 3: Brainstorming and Prototyping
Last time…

Game Mechanics

Actions

Interactions
Thursday: Paper Prototyping
Tuesday: More Paper Prototyping
Key Lesson of this Class #1

nobody reads and nobody listens
people can only keep track of a few things
Key Lesson of this Class #3

make lots of pots
Making pots

1 hour: no fame
10 hours: no fame
100 hours: lots of fame
Design Tradeoffs

Image source: www.finecraftimports.com
## What are the tradeoffs?

<table>
<thead>
<tr>
<th>Fewer designs</th>
<th>More designs</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Spend more time per design</td>
<td>• Explore more</td>
</tr>
<tr>
<td>• Avoid duplication of effort</td>
<td>• First idea maybe not the best</td>
</tr>
<tr>
<td>• Reach consensus faster</td>
<td>• Play off each other’s ideas</td>
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</tbody>
</table>

What are the tradeoffs?
Design Tradeoffs

Source: David Bayles, Ted Orland (2001)
Art & Fear: Observations on the Perils (and Rewards) of Artmaking
Design Tradeoffs

Source: David Bayles, Ted Orland (2001)
Art & Fear: Observations on the Perils (and Rewards) of Artmaking
Two key questions

• How many ideas?
• How many iterations?
Two key questions

- How many ideas?
- How many iterations?
How can we evaluate design?
Some design has a purpose
Some design has a purpose
Scenario 1

Design

Design
Scenario 1: Share One

Meeting Room

Final Design
Final Design
Scenario 2

Design 1

Best Design

Design 3

Design 1

Best Design

Design 3
Scenario 2: Share Best Design

Meeting Room

Final Design

Final Design
Scenario 3
Scenario 3

Design 1

Design 2

Design 3
Scenario 3: Share Multiple Designs

Meeting Room

Design 1
Final Design
Design 3

Design 1
Final Design
Design 3

Design 1
Final Design
Design 3

Design 1
Final Design
Design 3

[Images of individuals]
Release

Wear the ribbon and remember. FACE AIDS
Share One

Share Best

Share Multiple
Effect of sharing multiple designs

+25%  +50%  +75%  +100%  +125%
Clicks per million impressions

- Share One
- Share Best
- Share Multiple
1 tip of good design:

Improve your design by 25% by simply using this one weird tip.
Two key questions

- How many ideas?
- How many iterations?
Two key questions

- How many ideas?
- How many iterations?
Egg drop
Iterative group

Non-iterative group
<table>
<thead>
<tr>
<th>Effect of iteration</th>
</tr>
</thead>
<tbody>
<tr>
<td>worse</td>
</tr>
</tbody>
</table>
Effect of iteration

+25%  +50%  +75%  +100%  +125%
Maximum height

- Iterative: 6
- Non-iterative: 3
Functional fixedness

The Candle Problem (Karl Duncker)
Functional fixedness

The Candle Problem (Karl Duncker)
What does this mean for you?

- Take the time to think
- Come up with *multiple ideas*
- Your ideas are valuable even if they are not used
Brainstorming Technique

- Focus
- **Limit the amount of time** (30 minutes max)
- Appoint a scribe who will write down ideas
- Positive phase
  - Only write down new ideas! *Don’t criticize any suggestion.*
- Negative phase
  - Discuss each idea and reject as a group
- Repeat if necessary
  - But take a break!
  - If done correctly, you will be exhausted.
Paper prototype!
Purpose of Paper Prototyping

- Evaluate *central* design questions
  - Not necessarily the whole design
- Decide if it will work
- Identify key problems quickly
Paper prototyping is sometimes easy
Less clear in other cases...
What about...
Sid Meier

a series of interesting decisions

(GDC 2012)
Should be able to simulate *decisions*
What are the decisions?
What are the decisions?
Modeling Gameplay

- Key is *discretization*
- Identify game variables and break them into decision-significant pieces
  - Space
  - Time
  - Money
  - Health
Discretizing Space
Discretizing Space
Discretizing Space
Discretizing Space
Discretizing Time

Turns!
Adding turns
Possible Starcraft Turn

1. **Fire Planning Phase**
   - Choose units to attack

2. **Firing Phase**
   - Units fire one-by-one
   - Subtract hitpoints

3. **Move Phase**
   - Units move

4. **Upkeep Phase**
   - Units recharge / heal

5. **Build Phase**
   - Units build, finish, etc.

6. **Mining Phase**
   - We need more minerals
Simulating Reaction Time
Discretizing Resources

Jetpack expends oxygen (=health)
Discretizing Resources
Questions to explore

- Does the game “work”?
- Is it fun?
- Can someone learn how to play?
- Is the interface usable?
- Can the design scale to include multiple levels?
Paper Prototype
Must have three levels

Easy | Medium | Hard
Bias

- Testers don’t want to hurt your feelings
- But you need their real opinions
Research on Bias
Number of participants

- Preferred interviewer's video: 103
- Preferred other video: 41
- Thought videos looked the same: 56
Interviewer’s video

Competitor video
Without claiming ownership

<table>
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<tr>
<th></th>
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<tbody>
<tr>
<td>Preferred low-quality video</td>
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<tr>
<td>Preferred high-quality video</td>
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<tr>
<td>Thought videos looked the same</td>
<td>4</td>
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<td>38</td>
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<td>10</td>
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<td>2</td>
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Overcoming bias

- Be specific

Did you like the first level?

Were you able to complete the first level?
It’s all in the body language
Game: Video Game Charades
Group Activity

- Come up with a team mascot
- Come up with four game ideas and post them into Piazza
- Name the post “X Brainstorming” where X is your group name
- Specify:
  - Hook (why is this fun?)
  - Goals
  - Actions/Interactions
  - Decisions
  - Growth in complexity