The Game Development Process: Gameplay

Gameplay Example (1 of 2)
- Adventure game: Knight and Priest
  - During combat:
    - Knight in front with sword
    - Priest in back casts spells (all spells cost the same)
    - E-bolts (do damage equal to sword)
    - Band-aids (heal equal to sword)
  - Fight a single opponent with sword
  - Which spell should Priest cast?
    - Against 1 big opponent with 6 arms?
      - E-bolts
    - Against 30 small opponents with weak attacks?
      - Band-aids
  - How can we fix this?

Based on Chapter 3: Game Architecture and Design, by Rollings and Morris

Group Exercise
- Break into project groups
- Adventure game: Knight and Priest
- Add gameplay elements that make combat more interesting than in previous choice
- Discuss
- What are the categories?

Gameplay Example (2 of 2)
- Now, suppose...
  - Band-aids still affect single target but e-bolts have an area affect
  - E-bolts do less damage, but armor doesn't make a difference
- Now, which spell should Priest cast?
  - Answer isn't as easy. Interesting choices. Good gameplay.

“A game is a series of interesting choices.”
-Sid Meier (Pirates, Civilization...)

Avoid Trivial Choices
- Cavalry → Archers → Lancers
  - Transitive, not so interesting
- Better (see right)
  - Cavalry fast, get to archers quickly with lances
  - Lancers’ spears hurt cavalry bad
  - Lancers slow, so archers wail on them from afar
- What game does this look like?
  - rock-paper-scissors
  - Intransitive, more interesting

Toolbox of Interesting Choices
- Strategic versus Tactical
- Supporting Investments
- Compensating Factors
  - Impermanence
- Shadow Costs
- Synergies
Strategic versus Tactical (1 of 2)

- Strategic choices affect course of game over medium or long term
  - Tactical choices apply right now
  - Ex: build archers or swordsmen (strategic)
  - Ex: send archers or swordsmen to defend against invading force (tactical)
- Strategic choices have effect on tactical choices later
  - Ex: if don’t build archers, can’t use tactically later

Based on Chapter 3, Game Architecture and Design, by Rollings and Morris

Strategic versus Tactical (2 of 2)

- Ex: *StarCraft*
  - Strategic choice: 1) upgrade range of marines, 2) upgrade damage, or 3) research faster fire
  - Which to choose?
    - If armored foes, Protoss Zealot, more damage
    - If fast foes, Zerglings, maybe faster fire
  - Other factors: number of marines, terrain, on offense or defense

Supporting Investments

- Often game has primary goal (ex: beat enemy) but also secondary goals (ex: build farms for resources)
- Some expenditures directly impact primary goal (ex: hire soldier), while others indirect (ex: build farm) called supporting investments
- Supporting primary goals are "one-removed"
  - Ex: improve weapons, build extra barracks
- Supporting secondary goals are "two-removed"
  - Ex: build smithy can then improve weapons
  - Ex: research construction lets you build smithy and build barracks (two and three removed)
  - Interesting since element of strategy
- Payoff will depend upon what opponents do

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Compensating Factors

- Consider strategy game, all units are impeded by terrain
  - Ships can’t go on land, tanks can’t cross water, camel riders only in desert
- Flying unit that can go anywhere → How to balance?
  - Make slow
  - Make weak, easily destroyed
  - Make low surveillance range (but could be unrealistic)
  - Make expensive
    - Common but uninteresting since doesn’t change tactical use!
- Guideline is to ask what is best and worst about choices:
  1) This move does most damage, but slowest
  2) This move is fastest, but makes defenseless
  3) This move best defense, but little damage
- Most should be best in some way
- What if ok in every way? → Versatile (next)

Versatility

- With versatility, a 4th choice:
  1) This is neither best nor worst, but most versatile
    - Ex: beam can mine asteroids and shoot enemies
    - Versatility makes it good choice
- Versatility, neither best nor worst
  - Good for beginners
  - Flexible, so often more powerful
    - (against unpredictable or expert opponent)
  - Speed makes units versatile
    - Common
  - Don’t make fast units best at something else
- Versatile unit cheapest and most powerful → not an interesting choice

Impermanence (1 of 2)

- Some things are permanent
  - Ex: you get a potion that raises max HP
- Others are not
  - Ex: I got the "one ring" but you can grab it off me
- Really, impermanence is another kind of compensating factor
  - I.e., impermanence can compensate for something being really good
    - a common and valuable technique
- Can be used for interesting choices
  - Ex: choice of "medium armor for rest of level" or "invulnerable for 30 seconds?"
  - Advantage (or disadvantages) can be impermanent in number of ways.
    - How?
Impermanence (2 of 2)

- **Examples** (mostly from Magic the Gathering – Battlegrounds)
  - Can be destroyed (enchantments, ex: gratuitous violence makes units tough, but can be destroyed)
  - Can be stolen or converted (ex: threaten steals or converts enemy for short time)
  - Can be applied to something you don’t always have (ex: goblin king gives bonus to goblins, but must have goblins)
  - Certain number of uses (ex: three grenades, but grenade spamming)
  - Last for some time (wears off, ex: Mario invulnerable star)

Based on Chapter 3, Game Architecture and Design, by Rollings and Morris

Shadow Costs (1 of 2)

- In a game, you are continually presented with cost/benefit trade-offs
- But not always directly
  - Ex: soldiers for gold, but need armor first for weapons and barracks for soldiers
  - Called shadow costs for supporting investments
  - And shadow costs can vary, adding subtlety

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Shadow Costs (2 of 2)

- Ex: Age of Mythology has wood and food. Food is inexhaustible, wood is finite
  - Direct cost for Charioteer: 60 wood, 40 food and 40 seconds
  - Shadow costs vary over game
    - Early on, food and wood expensive, spawn doesn’t matter (since make few)
    - Mid-game, much food and wood, spawn makes it harder to pump out new units
    - End-game, no wood, spawn is priceless
  - Vary environment and vary shadow costs
    - Ex: more/fewer trees to vary cost of wood
  - Use variability to add subtlety to game
    - Challenge for level designer
    - Expert players will appreciate

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Synergies (1 of 2)

Synergies are interaction between different elements of player’s strategies (note, terms may be different than Ch 2.1)

- **Positive Feedback**
  - Economies of Scale – the more of one type, the better (ex: wizards draw strength from each other)
  - Economies of Scope – the more of a set, the better, or advantage of combined arms (ex: trident and net, infantry and tanks)

- **Negative Feedback**
  - Diseconomies of Scale – first is most useful, others have less benefit (ex: diminishing returns from more peasants entering a mine since get in each other’s way)
  - Diseconomies of Scope – (ex: mixed troops go only as fast as slowest)

Synergies (2 of 2)

- Ideally, all go together at once, but can emphasize
  - Ex: Chess is a game of positive feedback
  - Small advantage early on, exploited to crushing advantage

- Game of negative feedback needs other ways to keep interesting
  - Ex: trench combat makes a "catch-up" factor, or as get far from base, supply grows long, game lasts a long time
  - Ex: Super NES NBA Jam – catch up setting as an equalizer

- Be aware of both negative and positive feedback

Group Exercise

- Break into groups
- Consider a new game
  - Race across Japan (Sopporo to Nagasaki) (not by air)
  - First team to cross finish line wins!
- Choose 1-2 tools from your toolbox below
  - Strategic versus Tactical
  - Supporting Investments
  - Compensating Factors
  - Impermanence
  - Shadow Costs
  - Synergies
- First choose tool, then consider gameplay to make interesting
- Discuss!