Game mechanics

The art of game design
So far…

• **Lenses:** Experience, Surprise, Fun Curiosity, Values Problem

• **Tetrad:** story, aesthetic, mechanics, technology

• **Flow-focus:** skill vs. challenge

• **Psychographics:** Sensation Fantasy Narrative Challenge Fellowship Discovery Expression Submission

• **Misc:** Anticipation, Another’s Misfortune, Humor, Possibility, Accomplishment, Purification, Thrill
people are not motivated to pursue higher level needs until the lower needs are satisfied.
Game mechanics

• the core
• interactions and relationships
• 6 main categories
Mechanic 1: Functional Space

• Game takes place in a **space**
  – various places that can exist in a game
  – a mathematical construct.
• strip visuals - look at the abstract construction
game spaces

1. discrete or continuous
2. number of dimensions
3. bounded areas may or may not be connected

• tic-tac-toe – discrete 2D board
• circle represents a zero-dimensional place,
• each line shows which places are connected
Monopoly board

• A one-dimensional space — a single line of 40 discrete points, which connects to itself in a loop.
game of soccer

- Playfield boundaries: 2D continuous space (balls can freely move)
Computer-based fantasy role-playing: spaces within spaces

• “outdoor space”: continuous and 2D
• little icons representing towns, or caves, or castles - players can enter as completely separate spaces
“Twenty Questions” - 0D space

- Every game has some kind of information or “state”, and this has to exist somewhere.
The functional space

- the space in which your game takes place
  - Is the space of this game discrete or continuous?
  - How many dimensions does it have?
  - What are the boundaries of the space?
  - Are there sub-spaces? How are they connected?
Organizing your Game Space
Linear. player can only move along a line

- Monopoly
- Super Mario Brothers
- Crash Bandicoot
- Guitar Hero
Grid. easy for computers to understand.

• Chess
• Quake
Web. marking several points on a map and connecting them with paths.

- Metal gear solid
- GTA
Points in Space. RPG.

- Final Fantasy
Divided Space. simulate a real map

- Zelda: Ocarina of Time
- Spore
Mechanic 2: Objects, Attributes, States

- **Objects**(noun): characters, props, tokens, scoreboards
- **Attributes**(adj): information about an object.
- **State**: attribute has a current **state**

- [car – speed - current car speed]
State-transition diagrams

- state: everything that can happen to an object
- transition: what makes it happen.
“movement” attribute state-machine of the ghosts in *Pac Man.*
Pacman ghosts
States scope

- States (A,B,C,D,E)
- knowers

A: public: game board

C: private to 2: cards he was dealt

B: shared between 2 and 3:, look at a face-down card,

D: game knows, but not the players: RPG “game master,
Mechanic 3: Actions(verbs)

• operative actions – base actions player takes
• resultant actions - meaningful in the larger picture of the game
  – strategic moves.
  – not part of the rules
• meaningful resultant actions/operation-oriented actions = emergent gameplay
emergent gameplay

• Add more verbs – integrated
• Verbs that can act on many objects – freedom
• Goals achieved more than one way - interesting
• Many subjects
• Side effects that change constraints - unexpected
“action gap”

- actions and all their effects must be visually simulated on the fly – limited
- too many actions are tiresome (text best adv.)

*games seem similar because they use the same set of actions*
Donkey Kong: running and jumping
HarvestMoon: farming
Katamari Damacy: rolling a sticky ball
Mechanic 4: Rules

Foundational rules
Implicit theoretical basis of game

Operational rules
Average of rules in minds of all players

Behavioral rules
Implicit rules of behaviour

Written rules
Explicit formulation

Laws
Explicit behavioural rules: proprieties, sanctions, corrections

Official rules
Authorisation

Equipment
“Hardware” (physical embodiment of game)

Play
Application of rules to equipment

Advisory rules
“Rules” of strategy and tactics

Feedback
Modes

• very different rules during different parts of play
The Enforcer - game constraints

• players don’t have to memorize all the rules about what is and is not possible
  – just try things in the game, and see what works and what doesn’t work
  – a “rule” becomes a physical constraint of the game world.
Most Important Rule = The Object of the Game

- goal of chess is quite simple: “Capture your opponent’s king.”

- Good game goals
  1. **Concrete.** Players understand clearly what they are supposed to achieve.
  2. **Achievable.** Players think that they have a chance of achieving the goal.
  3. **Rewarding.**
Mechanic 5: Skills

• **Physical Skills** = manipulating a game controller

• **Mental Skills** = memory, observation, puzzle solving.

• **Social Skills** = reading an opponent, fooling an opponent, coordinating with teammates.
Mechanic 6: Chance

• Probability
• Combinatory
• Booleans
• Normal Distribution (Gauss)
• Randomness
Mechanics Balance – asymmetric games
personalization
explore gamespace
Are these cars equally balanced?

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Mechanics Balance

• Asymmetrical Games
  – simulate a real-world situation
  – ways to explore the gamespace
  – personalization
  – level the playing field
Mokujin is banned: stun move is unfair
Meaningful Choices

• If Choices > Desires, player is overwhelmed.
• If Choices < Desires, player is frustrated.
• If Choices == Desires, player feels freedom and fulfillment.

• dominant strategy: choices are offered but one of them is clearly better than the rest
balanced asymmetric risk

- *play it safe, and go for a small reward*
- *take a big risk and try for a big reward*
Rewards vs. Punishment
Rewards vs. Punishment

• **Praise** - game tells you did good
• **Points** - a measure of the player’s success
  – gateway to another reward
• **Prolonged Play** - risk resources to gain points
  – Lives, time limit
• **A Gateway** – desire to explore
• **Spectacle.**
• **Expression.**
• **Powers, resources**
Diabolo: Gather food

- gather food, OR your character suffers from diminished powers because of hunger
  - perform a fairly boring activity, or suffer a penalty.

- player never gets hungry, but if they do eat food, they get a temporary boost
Simplicity vs. Complexity: GO ruleset
Simplicity vs. Complexity

• **Emergent complexity**  - simple and complex at the same time

• *balanced surprises*: design a simple game that becomes a stream of balanced surprises
**Detail vs. Imagination**

- Only detail what you can do well:
  - If what you present is of lower quality than in your players imagination, don’t do it
  - Voice vs. synth voice vs. subtitles: silent-hill

- Give details that inspire imagination
- Familiar worlds do not need much detail.
- Use the opera binocular effect
Balancing Methodologies

• Doubling and halving.
  – You never know what is enough unless you know what is more than enough.

• Document your model.
  – write down the relationships between the things you are balancing.
What’s next?

• Next: Interaction Interfaces, Controllers, Methaphores
• World design, urban scenes, procedural models