Games and Simulation

2020-2021
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Rui Nóbrega

Game Design

- Conceptualization: the Idea
- **Storytelling: the Narrative**
- **Game Mechanics: the Experience**
- Level Design: Creating the World
- Interface: Establishing the Connection
- Documentation: Clarifying and Communicating
- Testing: Playtesting

Storytelling

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Stories

- Donkey Kong (1981) was the first to use a visual story line.
  - In digital game stories can be non-linear.
  - This can generate a combinatory explosion.
  - Multiple endings can disappoint.
  - Not enough verbs
    Videogame Verbs: run, shoot, jump, climb, throw, cast, punch, fly
    Movie Verbs: talk, ask, negotiate, convince, argue, shout, plead, complain
  - Time travel makes tragedy obsolete

[The Elder Scrolls III: Morrowind,2002]

Stories

- Stories can be told in several ways:
  - **Text mode**: Colossal Cave
  - **Graphic Adventure games**: Monkey Island
  - **Introductory cut scenes**: Starcraft
  - **Quick-Time events**: short control between cut scenes: Dragon's Lair (1983)
  - **Scripted Game Scenes**: player loses control temporarily and goes to an animated sequence: Half Life, Resident Evil

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WELCOME TO ADVENTURE!!  WOULD YOU LIKE INSTRUCTIONS?

yes

SOMEWHERE NEARBY IS COLOSSAL CAVE, WHERE OTHERS HAVE FOUND FORTUNES IN
TREASURE AND GOLD, THOUGH IT IS RUMORED THAT SOME WHO ENTER ARE NEVER
SEEN AGAIN.  MAGIC IS SAID TO WORK IN THE CAVE.  I WILL BE YOUR EYES
AND HANDS.  DIRECT ME WITH COMMANDS OF 1 OR 2 WORDS.  I SHOULD WARN
YOU THAT I LOOK AT ONLY THE FIRST FIVE LETTERS OF EACH WORD, SO YOU'LL
HAVE TO ENTER "NORTHEAST" AS "NE" TO DISTINGUISH IT FROM "NORTH".
(SHOULD YOU GET STUCK, TYPE "HELP" FOR SOME GENERAL HINTS.  FOR INFOR-
MATION ON HOW TO END YOUR ADVENTURE, ETC., TYPE "INFO".)
                                                - - -
THIS PROGRAM WAS ORIGINALLY DEVELOPED BY WILLIE CROWTHER.  MOST OF THE
FEATURES OF THE CURRENT PROGRAM WERE ADDED BY DON WOODS (DON @ SU-AI).
CONTACT DON IF YOU HAVE ANY QUESTIONS, COMMENTS, ETC.

YOU ARE STANDING AT THE END OF A ROAD BEFORE A SMALL BRICK BUILDING.
AROUND YOU IS A FOREST.  A SMALL STREAM FLOWS OUT OF THE BUILDING AND
DOWN A GULLY.

east

YOU ARE INSIDE A BUILDING, A WELL HOUSE FOR A LARGE SPRING.

THERE ARE SOME KEYS ON THE GROUND HERE.

THERE IS A SHINY BRASS LAMP NEARBY.

THERE IS FOOD HERE.
```

[Colossal Cave Adventure, 1977]

Story Machine

- When players have different choices about how to achieve goals, new and different stories can arise. How can I add more of these choices?
- Different conflicts lead to different stories. How can I allow more types of conflict to arise from my game?
- When players can personalize the characters and setting, they will care more about story outcomes, and similar stories can start to feel very different. How can I let players personalize the story?
- Good stories have good interest curves. Do my rules lead to stories with good interest curves?
- A story is only good if you can tell it. Who can your players tell the story to that will actually care?

Story Tips (I)

[The Legend of Zelda Series,1986]

1. Define **Goals**, **Obstacles** and **Conflicts.**
2. Provide **Simplicity**: the game world is simpler than the real world.
   and **Trancendence**: the player is more powerful than the real world.
3. Consider the **Hero's Journey**...

Vogler’s Synopsis of the Hero’s Journey (I)

1. **The Ordinary World —** Establishing scenes that show our hero is a regular person leading an ordinary life.

2. **The Call to Adventure** — The hero is presented with a challenge that disrupts their ordinary life.

3. **Refusal of the Call** — The hero makes excuses about why he can’t go on the adventure.

4. **Meeting with the Mentor** — Some wise figure gives advice, training, or aid.

5. **Crossing the Threshold** — The hero leaves the ordinary world (often under pressure) and enters the adventure world.

6. **Tests, Allies, Enemies** — The hero faces minor challenges, makes allies, confronts enemies, and learns the workings of the adventure world.

Vogler’s Synopsis of the Hero’s Journey (II)

7. **Approaching the Cave** — The hero encounters setbacks and needs to try something new.

8. **The Ordeal —** The hero faces a peak life or death crisis.

9. **The Reward —** The hero survives, overcomes their fear, and gets the reward.

10. **The Road Back** — The hero returns to the ordinary world, but the problems still aren’t all solved.

11. **Resurrection** — The hero faces a still greater crisis, and has to use everything he has learned.

12. **Returning with the Elixir** — The journey is now well and truly complete, and the hero’s success has improved the lives of everyone in the ordinary world.

back to Story Tips… (II)

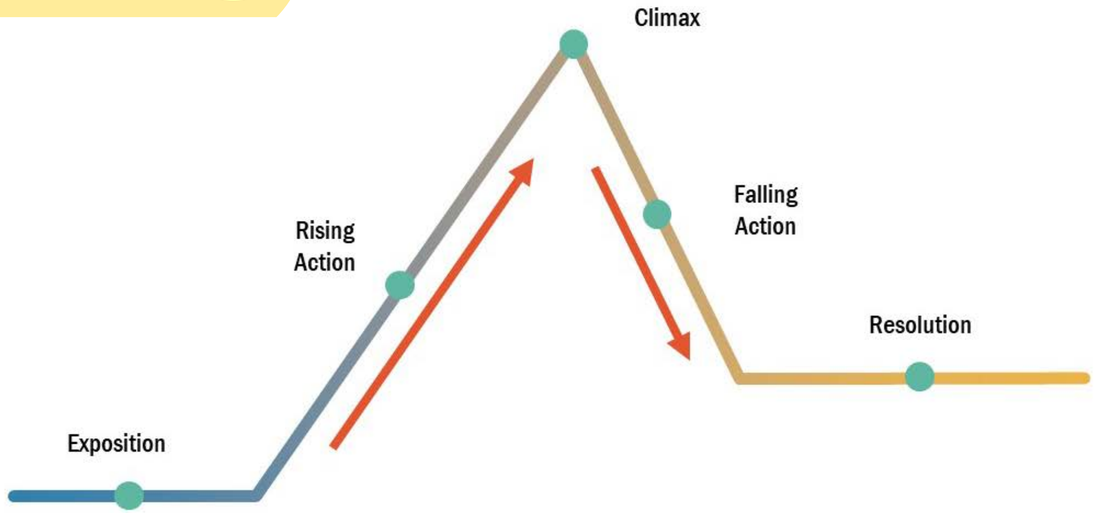
4. Put Your Story to Work! Test it in prototypes with any of the elements of the game tetrad.
5. Keep your story world consistent.
6. Make your story world accessible: if necessary, simplify the story to reach a larger audience.
7. Use clichés judiciously: balance familiarity vs repetitiveness.
8. Sometimes a map brings a story to life!

The Story

- Does my game really need a story? Why?
- Why will players be interested in this story?
- How does the story support the other parts of the tetrad (aesthetics, technology, gameplay)? Can it do a better job?
- What is the weirdest thing in my history?
- What is the relationship between my main character and the goal?
- What are the obstacles between the character and the goal?

Storytelling

- **Who** is the game about?
- **What** is the goal?
- **When** does the story takes place?
- **Where** does the story takes place?



[The Narrative Arc]

- **Why** is this going on in the story and why does the player care?
- **How** is the player going to accomplish the goals and interact with the story and the characters

[Vive La Dirt League]

Game Mechanics

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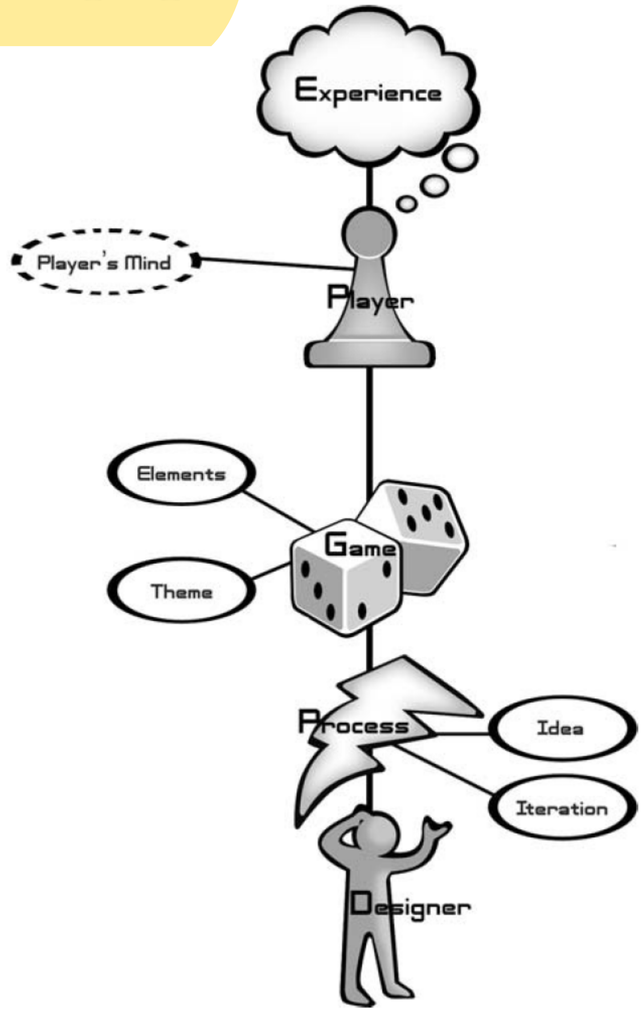
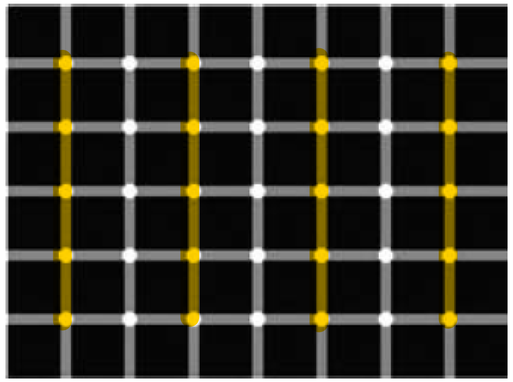
Game Mechanics

- Set of rules in a game that are intended to regulate and drive the gamming experience.
  - Gameplay: Choices, challenges or consequences that players face while playing a game.
  - Victory conditions: some games just get incredibly harder…
  - Loss conditions: How a player loses.

Modeling the Experience

- The creation of the mechanics starts by modeling the experience of the player.
- A game does not need to emulate reality completely: A game is a simplified model of reality.
- Games are created to capture the player's focus



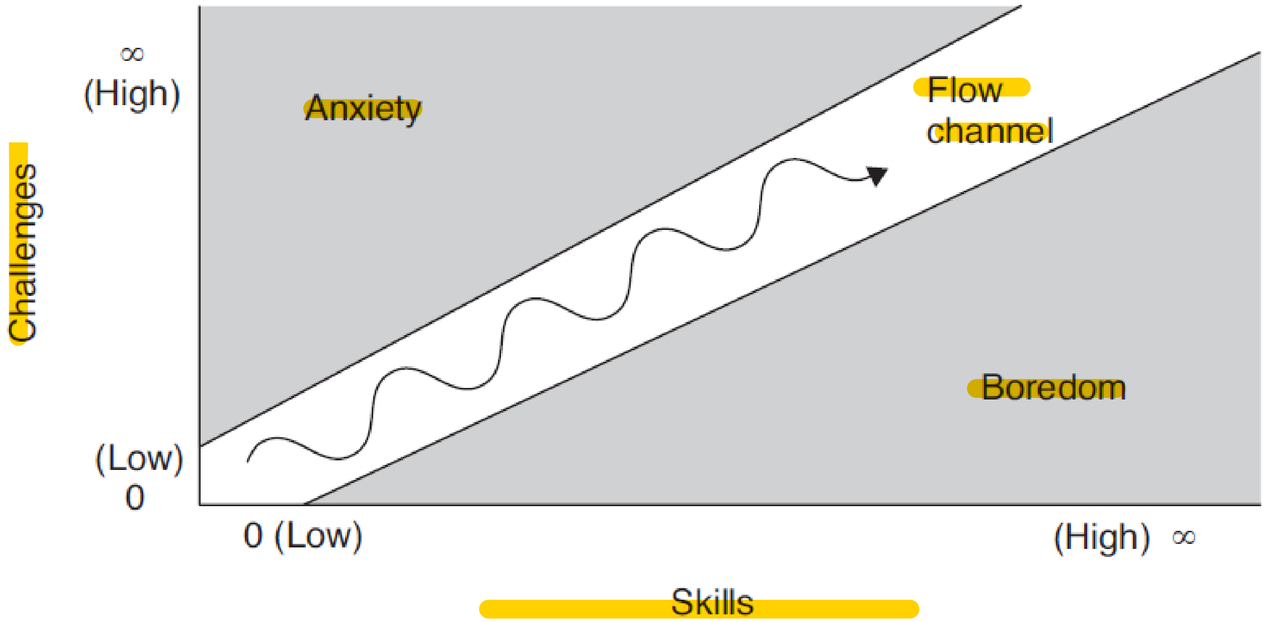


Focus

- Games should create a **State of Flow** using:
  - Clear goals
  - No Distractions
  - Direct Feedback
  - Continuous challenge

State of Flow

- **State of Flow** - State of sustained focus, pleasure and enjoyment.
- Proposed by psychologist *Mihalyi Csikszentmihalyi*.
- Defined as "a feeling of complete and energized focus in an activity, with a high level of enjoyment and fulfillment."



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The Flow

- Does my game have clear goals, How can I fix that?
- Are goals of the player the same as I intended?
- Are there parts of the game that are distractions and not central to the actions
- Does my game supply a steady stream of easy/hard challenges?
- Are the player's skills improving with game play? does this matter?

Game Mechanics (I)

Game mechanics involves a series of challenges:

- Explicit challenges: intentional, immediate, and often intense.
  - Player must react immediately with an action such as jump or turn.

- Implicit challenges: emergent feature of the game, not specifically added to the game.
  - Determine how to divide and manage resources, deploy units in strategy games, etc.

“Game mechanics are the core of what a game truly is. They are the interactions and relationships that remain when all of the aesthetics, technology, and story are stripped away.”

Game Mechanics (II)

Game mechanics and information:

- Perfect Information – Logical challenge (E.g., chess)
- Imperfect Information – Inference (appeal to curiosity). (E.g., card games, mastermind)

Game mechanics and knowledge:

- Intrinsic – Knowledge is gained from within the game world (player's memory)
- Extrinsic – Relies on general knowledge from reality. (Ex: Who wants to be a millionaire)

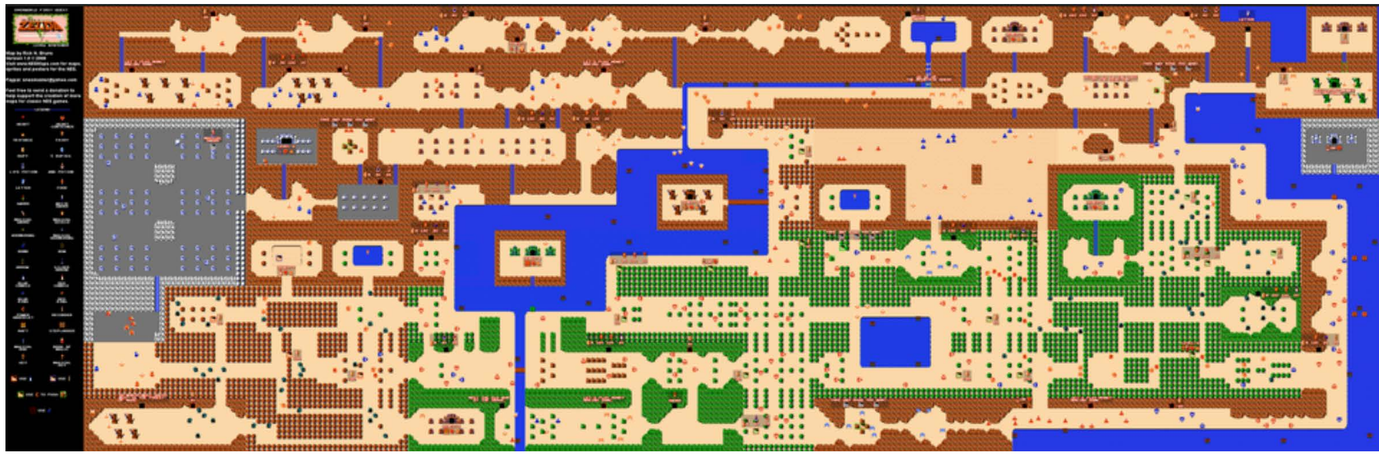
Jesse Schell Taxonomy

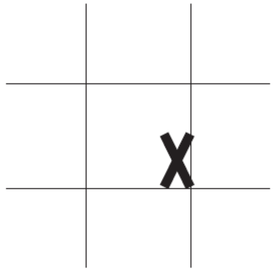
Game Mechanics:

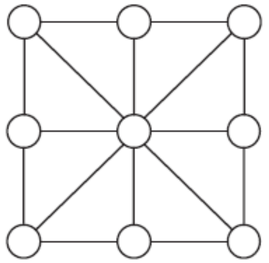
- Mechanic 1: Space
- Mechanic 2: Objects, Attributes, and States
- Mechanic 3: Actions
- Mechanic 4: Rules
- Mechanic 5: Skill
- Mechanic 6: Chance

Mechanic 1:Space

- The space is the “**magic circle**” of gameplay.
- It defines the various places that can exist in the game.
  - Discrete or Continuous
  - n Dimensions
  - m Bounded Areas (connected or not)



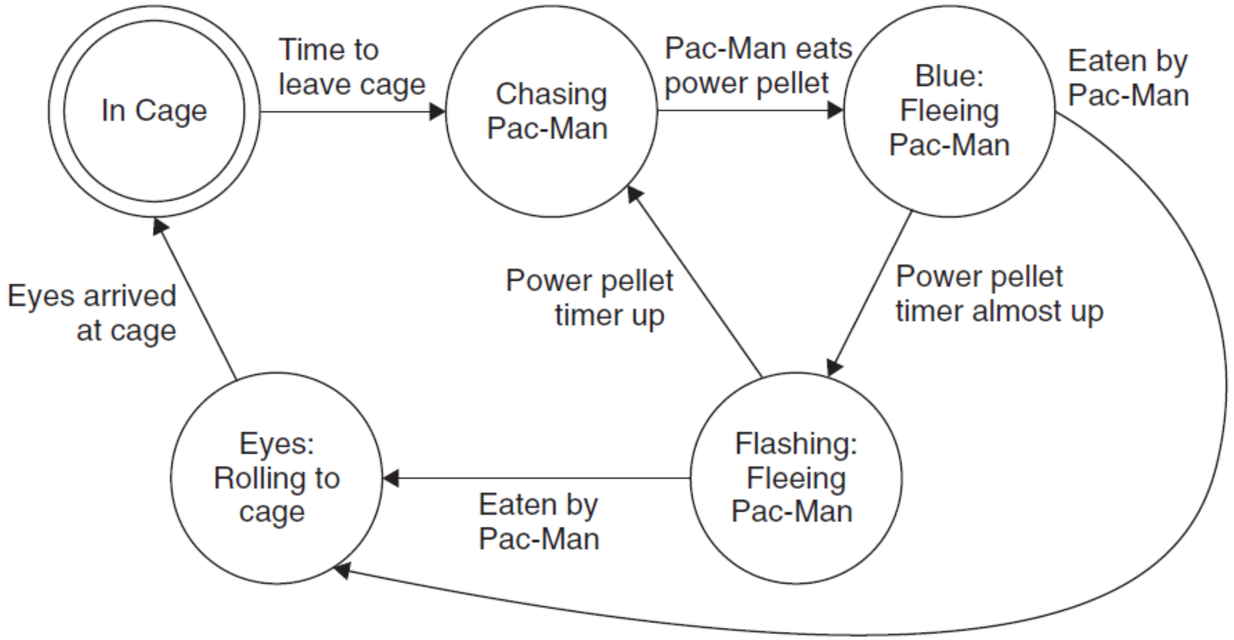




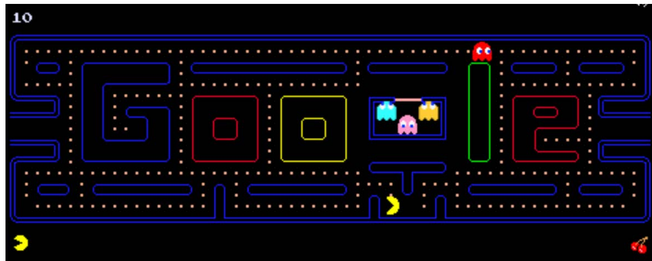
[TicTacToe,unknown year]

Mechanic 2:Objects, Attributes, and States

- The game needs **Objects**, Characters, props, tokens, scoreboards, etc.
- **Objects** have **Atributes:** name, length, size, speed, force, id, tag, etc.
- **Atributes** have **States**: in a race game the speed changes state when we accelerate
- Objects are *nouns*



[PacMan state machine]

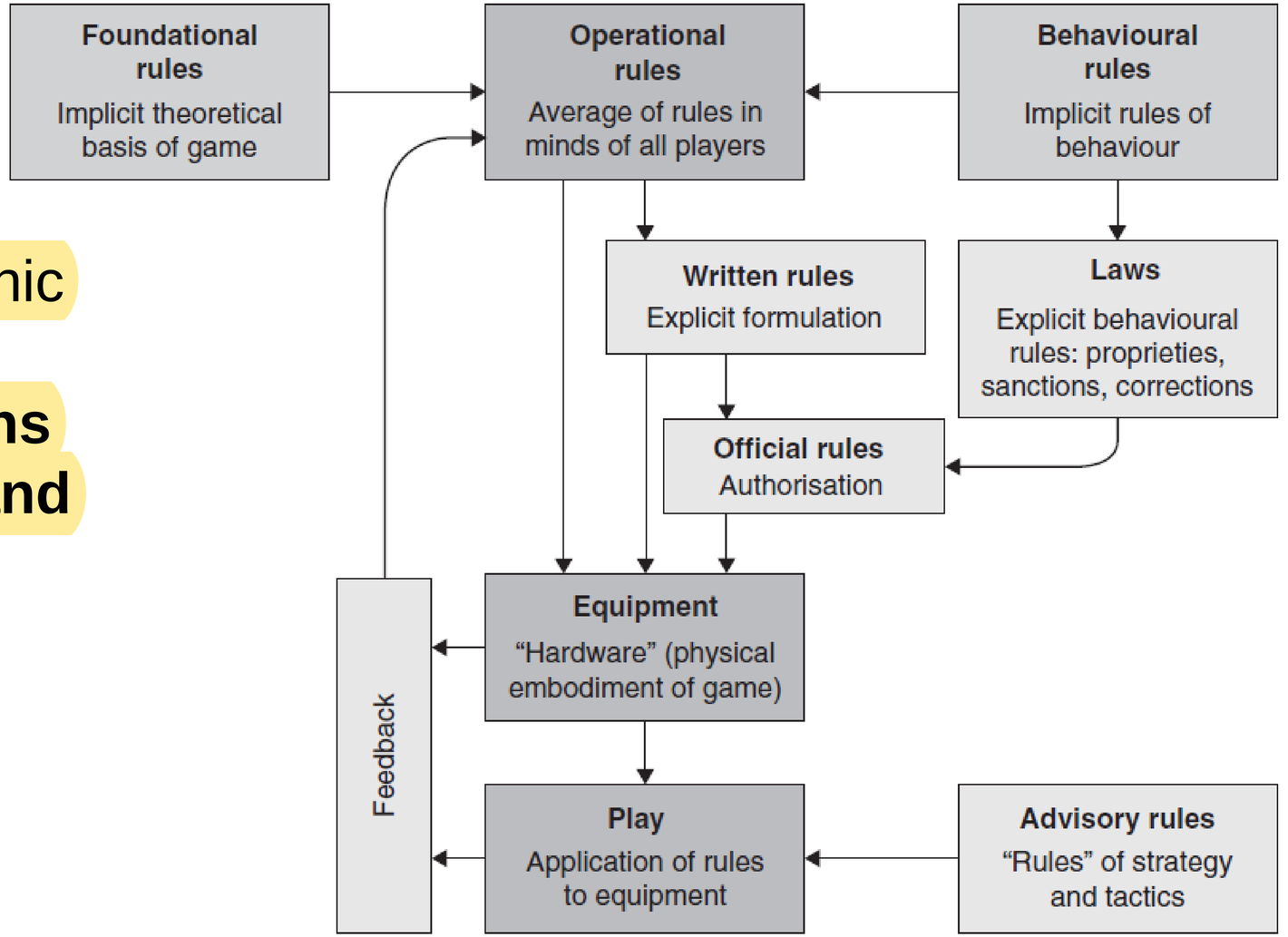


Mechanic 3: Actions

- Actions are *verbs* that can act on objects
- **Operative Actions**: basic actions the player can take
  - “Move a checker forward”
- **Resultant Actions**: complex actions that combine several Operative Actions
  - “Protect a checker from being captured by moving another checker behind it”

Mechanic 4: Rules

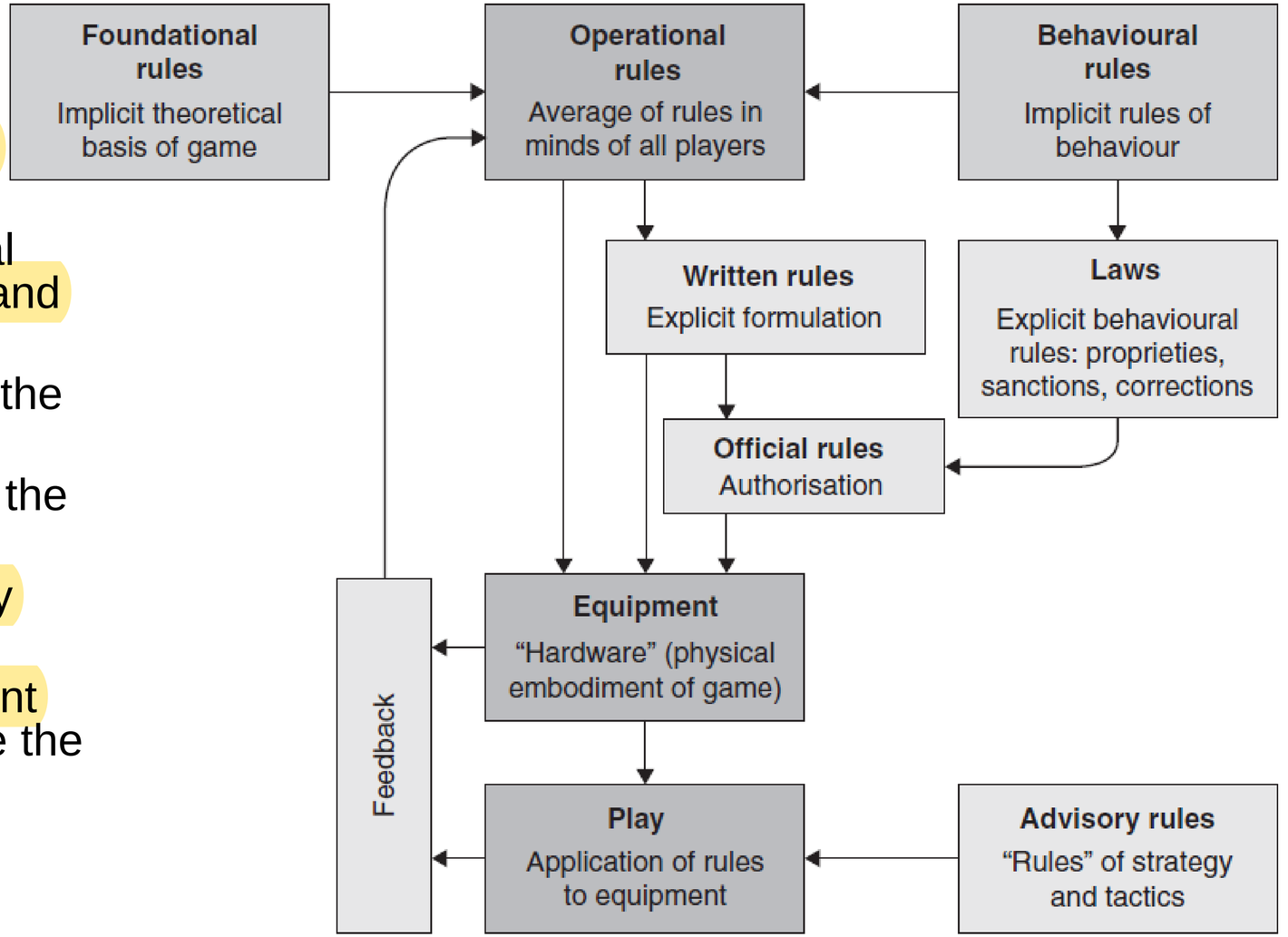
- The most fundamental mechanic
- **Define space, objects, actions consequences, constrains and goals**
- Parlett's Rule Analysis:



Mechanic 4: Rules

Parlett's Rule Analysis:

- **operational rules**: what the players do to play the game.
- **foundational rules**: are a mathematical representation of game state and how and when it changes.
- **behavioural rules**: the implicit rules of the game.
- **written rules**: the documented rules of the game.
- **laws**: also called tournament rules, they formalise what is fair play.
- **official rules**: the laws of the tournament merge with the written rules to generate the official rules.
- **advisory rules**: strategy to improve performance in the game.



Mechanic 5: Skill

- The game may require certain skills from the player
  - Physical Skills
  - Mental Skills
  - Social Skills

[Guitar Hero,2005]

Mechanic 6: Chance

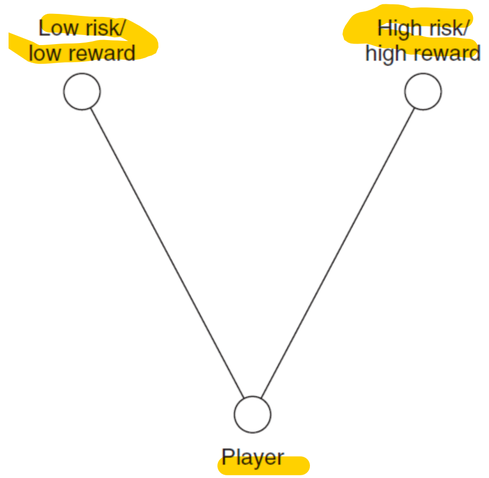
- Chance is an essential part of a fun game because chance means uncertainty, and uncertainty means surprises
- Depends on the study of Probabilities!

Game Balance (I)

- Game Mechanics should be balanced using several criteria
- **Static Balance** : initial rules
- **Dynamic Balance** : balance can evolve over time

Game Balance (II)

1. Fairness
   - Symmetrical Games: all players have the same resources
   - Asymmetrical Games: might be desirable to simulate real world, personalization, to level the playing field (handicap)…
2. Challenge vs Success
3. Meaningful Choices:
   Choice should be balanced in number and reward



Game Balance (III)

4. Skill vs Chance
5. Head (thinking) vs Hand (interacting)
6. Competition vs Cooperation
7. Short vs Long Game
8. Rewards Economy (Points, Praise, Prolonged Play…)
9. Punishment (some is good, to much…)

Game Balance (IV)

10. Freedom vs Controlled Experience
11. Simple vs Complex
12. Detail vs Imagination (Reality vs Player’s mind)

Game Mechanics

- **Game Mechanics** include rules of play, gameplay elements and victory and loss conditions.
- The **state of flow** should be induced while experiencing the game mechanics.
- Game Mechanics involve **challenges**, **information** access and possible prior **knowledge.**
- **Balance** should be provided either statically (starting conditions) or dynamically (as the game progresses).