

50.033

Foundations of
Game Design
and Development

FORMAL ELEMENTS

Basics of game design

GAME?



- A game is a **system** in which players engage in an artificial **conflict**, defined by **rules**, that results in a quantifiable **outcome**.
- System: a set of parts that interrelate to form a complex whole
- Conflict, rules: formal elements of a game
- Outcome: goals

GAME DESIGN?

- Design is the process by which a designer creates a **(game) context** to be encountered by a **participant**, from which **meaning** emerges.
- Context: elements of game
- Participant: player
- Meaning: value encountered by player

SUCCESSFUL GAME DESIGN

- The goal of successful game design is **meaningful play**
- There are two ways to define meaningful play:
 - **Descriptive**
 - **Evaluative**

MEANINGFUL PLAY

- **Descriptive:** the process by which a player takes action within the designed system of a game and the system responds to the action
 - Means that any action played in game produces outcome
 - E.g: press 'W', character moves forward
 - Happens in every functional game
 - Basically, a description of the way games operate : the relationship between action and system outcome

MEANINGFUL PLAY



- **Evaluative:** the relationships between **actions** and **outcomes** in a game are both **discernable** (immediately perceivable) and **integrated** (affects the game in the later point) into the larger **context** of the game.
 - Doesn't happen in all games
 - More about the emotional and psychological experience of inhabiting a well-designed system of play
 - E.g. : press 'W', character animates while moving forward, + footsteps sound (perceivable)
 - E.g. : chess moves may not always have immediate effect but rather is deeply integrated. You'd have to strategise

MEANINGFUL PLAY

- The descriptive definition refers to the way game actions result in system outcomes, hence creating (literal) meaning / purpose
- All games are meaningful in its descriptive definition
- The evaluative sense of meaningful play helps us to critically evaluate the relationships between actions and outcomes, and decide whether they are purposeful enough within the designed system of the game
- This helps us understand why some games provide more meaningful play than others.
- Less successful game designs result in experiences that somehow fall short

FORMAL ELEMENTS

- Before we begin designing a game, we need to know the essence, also known as *formal elements* of game
- A strong understanding of their potential interrelationships is the foundation of game design.
- Formal elements: those elements that **form** the **structure** of a game
- Without them, games cease to be game

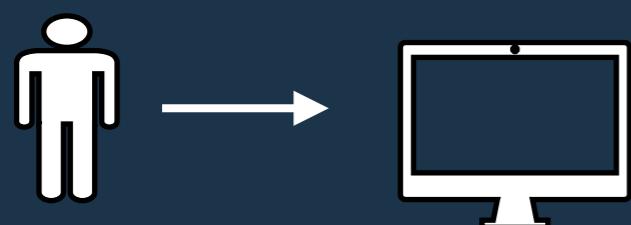
FORMAL ELEMENTS

- Players
- Objective
- Procedures
- Rules
- Resources
- Conflict
- Boundaries
- Outcome

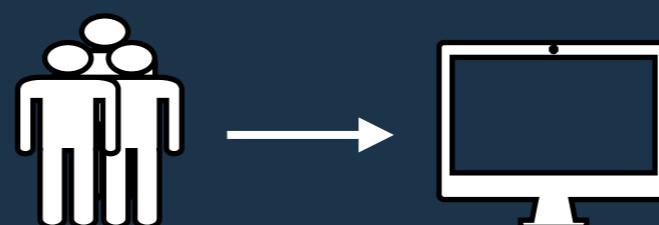
PLAYERS

- **Voluntary**, active participants in gaming activity
- A game contains an *invitation to play*: recognizable rituals or offerings for playing
- A good game: they partake in it, they consume it and they are invested in it
- Players can interact with the system or each other
- In role playing game, players can take up many roles

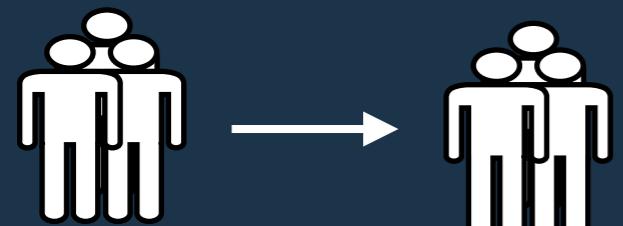
PLAYER INTERACTIONS



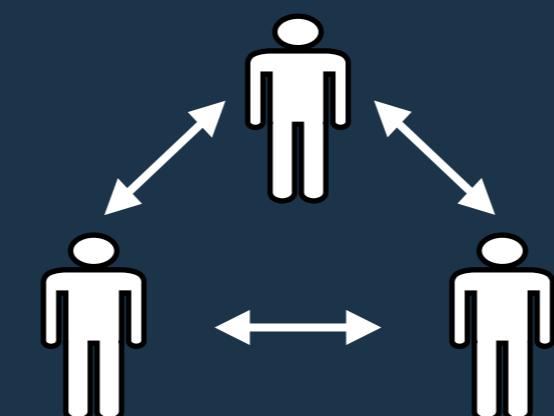
Single Player



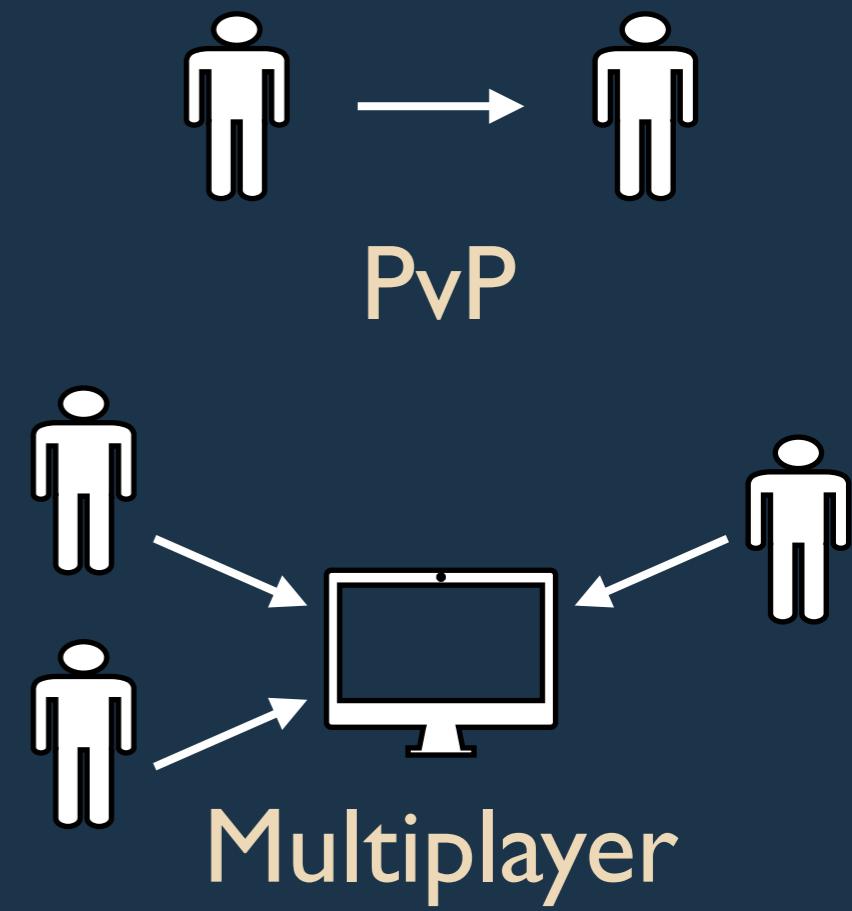
Co-Op



MOBA

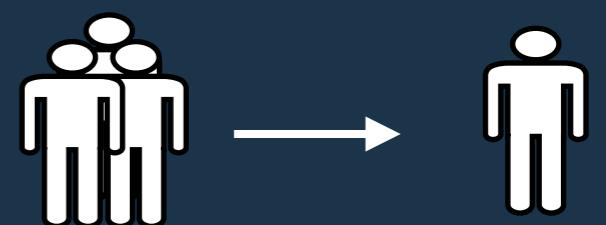


Battle Royale



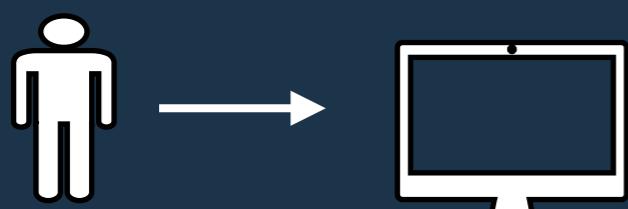
Multiplayer

(no interaction)



Ganking

PLAYER INTERACTIONS



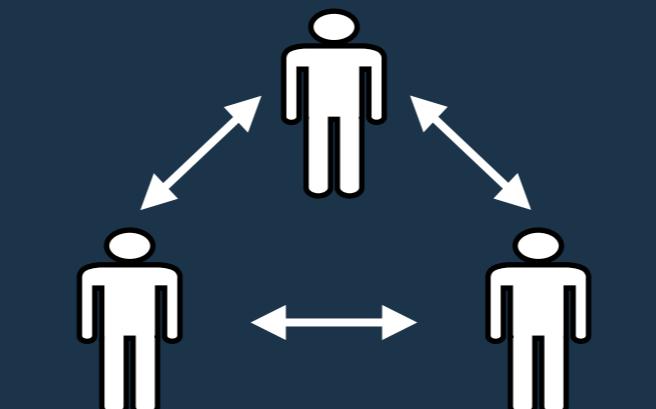
player vs game



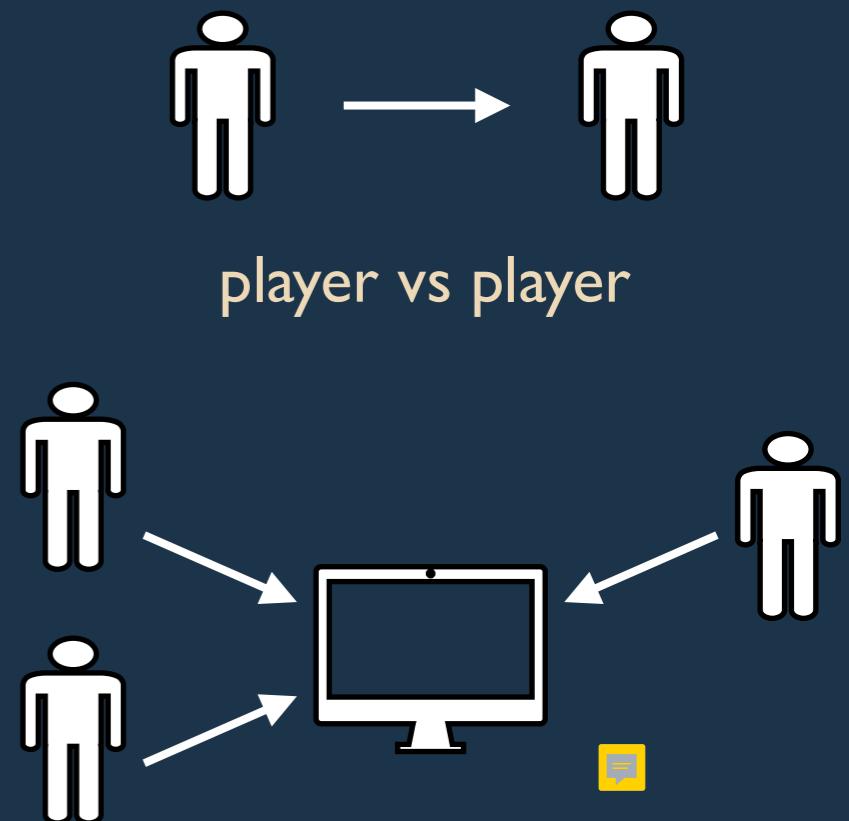
Co-Op gameplay



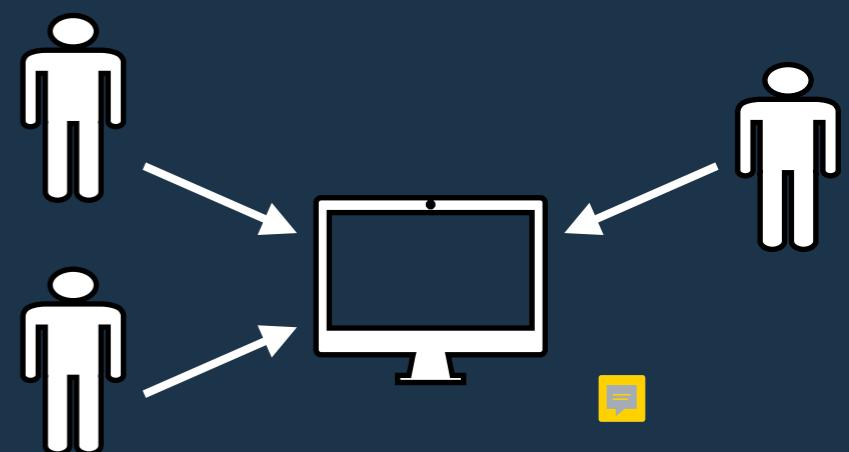
team competition



multilateral competition



player vs player

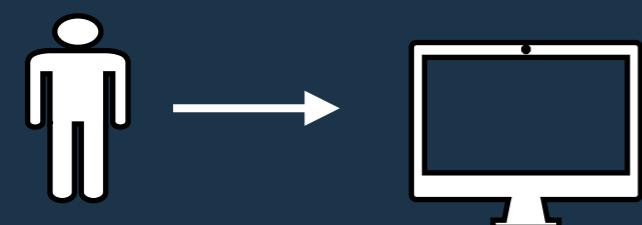


Multiplayer individual vs game

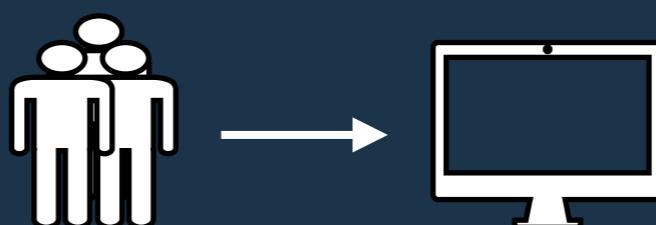


unilateral competition

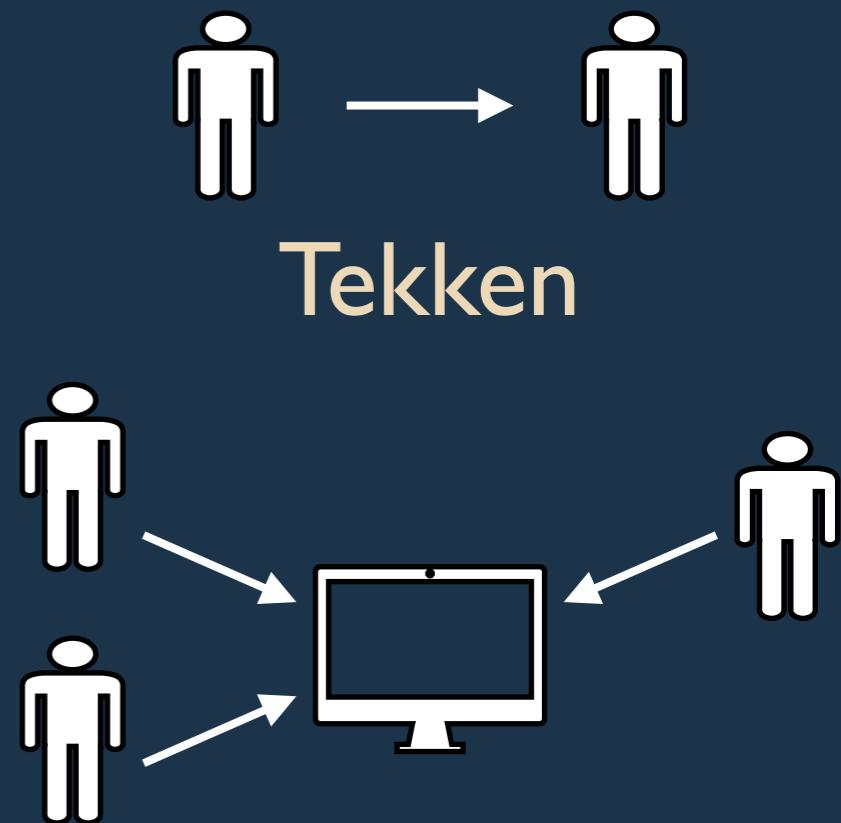
PLAYER INTERACTIONS



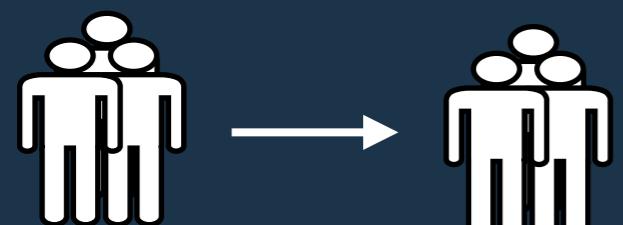
Assassin's Creed



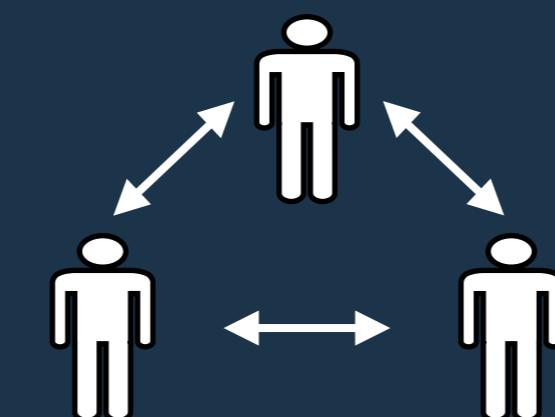
L4D



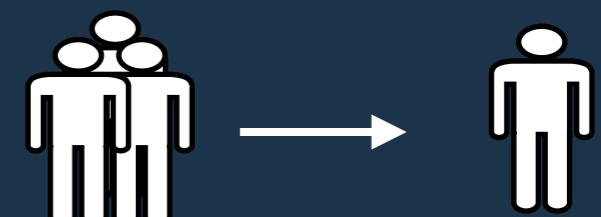
Tekken



DotA



Fortnite Battle Royale



Dodgeball

OBJECTIVES

- Serves as **motivation** for players to engage in a gameplay
- Also known as game goals
- The best game goals:
 - **Seem attainable** but are still perceived as **challenging**
 - Motivate players to complete objectives
 - Eventually, making them very *involved* in the game

OBJECTIVES



- Kill/Destroy
- Collect
- Chase
- Race
- Alignment
- Rescue / escape
- Forbidden Act
- Construction
- Exploration
- Solution
- Outwit

OBJECTIVES

- Kill/Destroy: DotA, LoL
- Collect: Pokemon Go
- Chase: Tag
- Race: MarioKart
- Alignment: Candy Crush
- Rescue / escape: L4D
- Forbidden Act: Jenga, Don't break the ice
- Construction: The Sims
- Exploration: Diablo, Zelda
- Solution: Overcooked, any games with puzzle qualities
- Outwit: Survivor (tv series)

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COMPLEX OBJECTIVES



COMPLEX OBJECTIVES



PROCEDURES

- Who does what? when and how?
- **Actions** or **methods** of play **allowed** by a game's rules
 - Specific instructions of what actions to take during play
 - Can also be a specific set of controls
 - Dictates what are possible / impossible
 - Important to keep in mind the *limitations of the environment* in which the game will be played (digital? non digital? equipments?)

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PROCEDURES

- Four types of procedures:
- **Starting** : how to begin the game?



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PROCEDURES

- **Progression:** ongoing procedures running during gameplay



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PROCEDURES

- **Special:** conditional to other elements or game state



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PROCEDURES

- **Resolving:** brings game to an end



RULES



- The **authority** of the game world, only applies in the game world, and they **form** the exact objects and **concepts** of the game
 - Basically, if A happens, then B
- Rule set **specifies** everything a player can and cannot do
- If players don't follow the rules, they are *leaving* the game.

RULES

- Three main purposes:
 - **Defining** objects and conditions, e.g: cost of items, ingredients to craft items, min. level to unlock a quest
 - **Restricting** player actions, e.g: in international chess, pawns cannot move backwards
 - **Determining effects** on players, e.g: casting skill A costs 50 mana

RULES

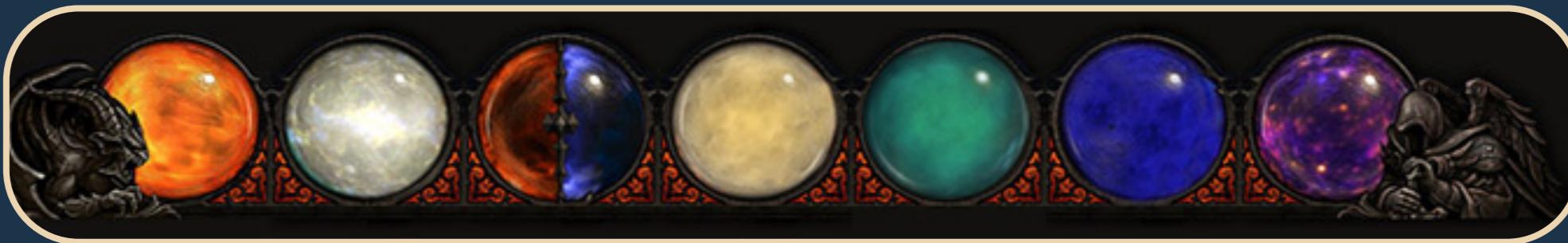
- Designer's job: **describe** the actions for **all** possible situations in the rule set
 - Manual / tutorials / game guides
 - Hide it in the game, reveal during right time
 - Warn players /stop games when rules are violated by them

RULES

- Rules in games can be
 - **inspired** by real-world rules (e.g: gravity),
 - **defy** real-world rules (e.g: fantasy games),
 - totally **unique** to the game-world (e.g: eat mushroom, ++ power in Mario, DotA heroes roles and skills)
- More on rules in the next lecture: how to define rules to create meaningful games

RESOURCES

- Game objects that have a **value** for players in reaching their individual objectives
- Value of resources can be determined by their *scarcity* and *utility*
- Game designer *controls* the availability of resources, but it's important to *balance* the game, and scatter resources in *asymmetric* way (e.g: legendary resources exist in Boss lairs)
- Example: HP, mana, gold, time, items in inventory (equipments, potion), time, skills (actions)



RESOURCES

- Main design:
 - Player to **manage** their resources (e.g: keep loots for future crafting materials)
 - Player to **obtain** new resources (e.g: kill monsters to get new loots in)
 - The game should guide players on how to **discover**, **obtain**, and **use** resources appropriately

CONFLICT

- Any situation, procedure, or rules in the game that **prevent** players from achieving their goal
- *Objectives* in game usually leads to conflicts
- The ‘job’ of the players is to resolve these conflicts
- Conflicts force the players to **employ skills** (strategize, improve reflex, etc)
 - creates a sense of *competition* or play
 - *enjoyable*, gives ultimate sense of achievement when objectives are met

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CONFLICT



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CONFLICT

- Three types of conflict:
 - **Obstacles**: physical form (e.g: blockage in roads, monsters) or mental form (e.g: puzzles in adventure games)
 - **Opponents**: competition with other players
 - **Dilemmas**: strategic decision, where the consequences have to be weighted before proceeding (e.g: go to areas with more resources and obstacles, or less sources and obstacles)

BOUNDARIES

- **Separate** the game from everything that is not the game
- Can be physical (e.g: football field) or conceptual (e.g: social agreement to play)
- Most games (especially digital games) are **closed systems**: purposefully keep the in-game elements from interacting with outside forces

OUTCOME

- Clear, measurable quantities at the end of the game to *offer carthasis* (satisfy the players)
 - E.g: points/stars when completing levels, win +1 /lose -1 statement for zero sum game)
- Typically uneven (in PvP only 1 player can win, or in single player / co-op: defeat boss)
- The outcome of a game has to be **uncertain and unpredictable** to foster player interest (don't know how much points will be scored, or who will win)

OUTCOME

- **Not all** games have simple/measurable outcome/winner:
 - Simulation games like The Sims has no outcome
 - MMORPG games do not end (level up, improve player stats, and roam indefinitely)
- It is **not easy** to create a resolution that satisfies this investment of players
- Players can be disappointed if the resolution offered by the outcome is not comparable to their investment

SUMMARY

- Definition of game and game design
- Defining successful game design
- Defining meaningful play
- Formal elements of a game