

50.033

Foundations of
Game Design
and Development

INTRODUCTION



SUTD
GAME LAB

- <http://gamelab.sutd.edu.sg>
- What do we do?
 - Gamification for serious purposes: education, healthcare, marketing, entertainment
 - Contact Game Designer Yoga (yogabrata_datu@sutd.edu.sg) for more information if you'd like to drop by

BRIEF HISTORY OF VIDEO GAMES



The Strong's online collections

1972

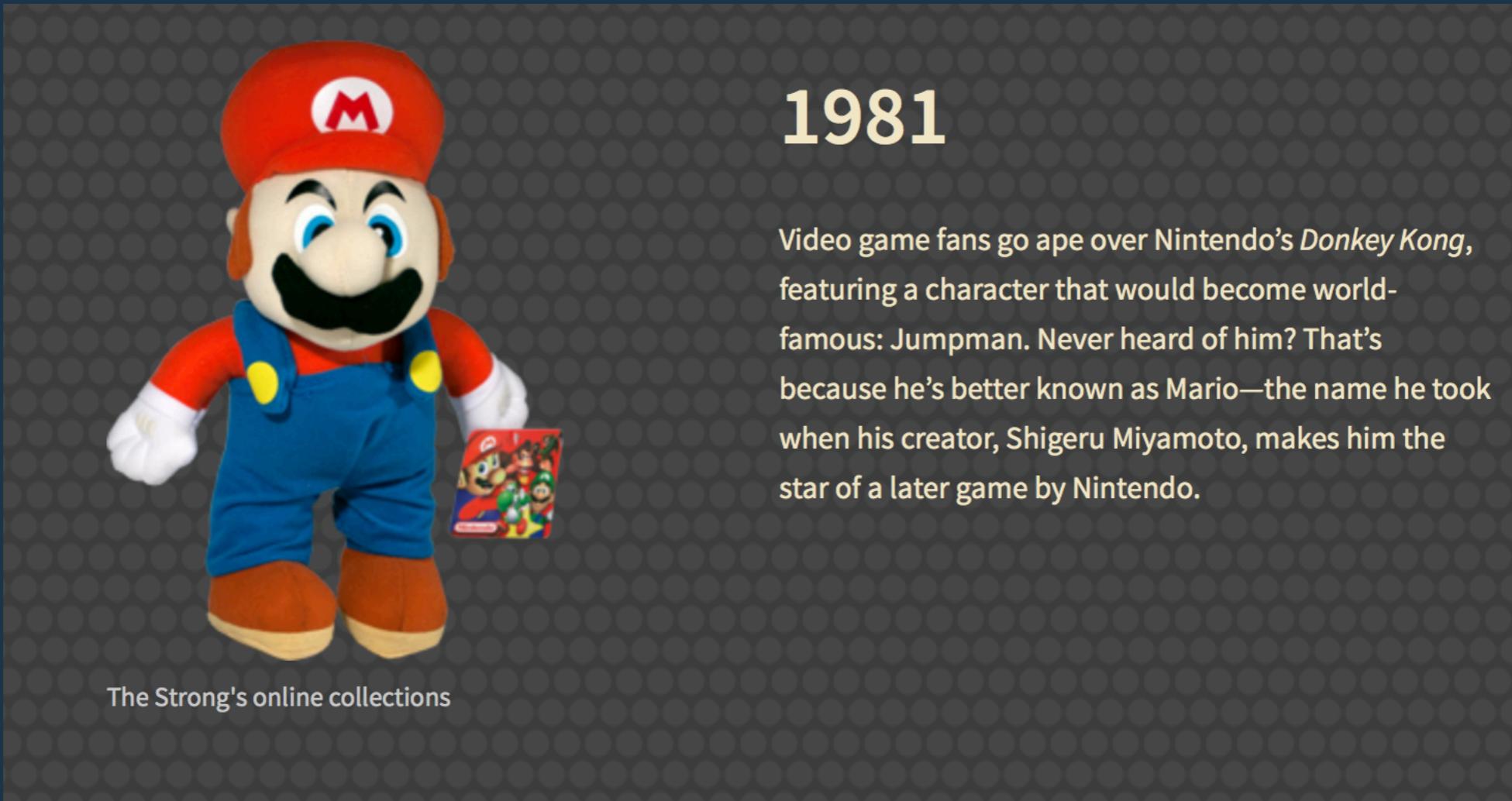
Nolan Bushnell and Al Alcorn of Atari develop an arcade table tennis game. When they test it in Andy Capps Tavern in Sunnyvale, California, it stops working. Why? Because people played it so much it jammed with quarters. *Pong*, an arcade legend, is born.

materials taken from: <http://www.museumofplay.org/about/icheg/video-game-history/timeline>

BRIEF HISTORY OF VIDEO GAMES



BRIEF HISTORY OF VIDEO GAMES



The Strong's online collections

1981

Video game fans go ape over Nintendo's *Donkey Kong*, featuring a character that would become world-famous: Jumpman. Never heard of him? That's because he's better known as Mario—the name he took when his creator, Shigeru Miyamoto, makes him the star of a later game by Nintendo.

BRIEF HISTORY OF VIDEO GAMES



The Strong's online collections

1984

Russian mathematician Alexey Pajitnov creates *Tetris*, a simple but addictive puzzle game. The game leaks out from behind the Iron Curtain, and four years later, Nintendo bundles it with every new Game Boy.

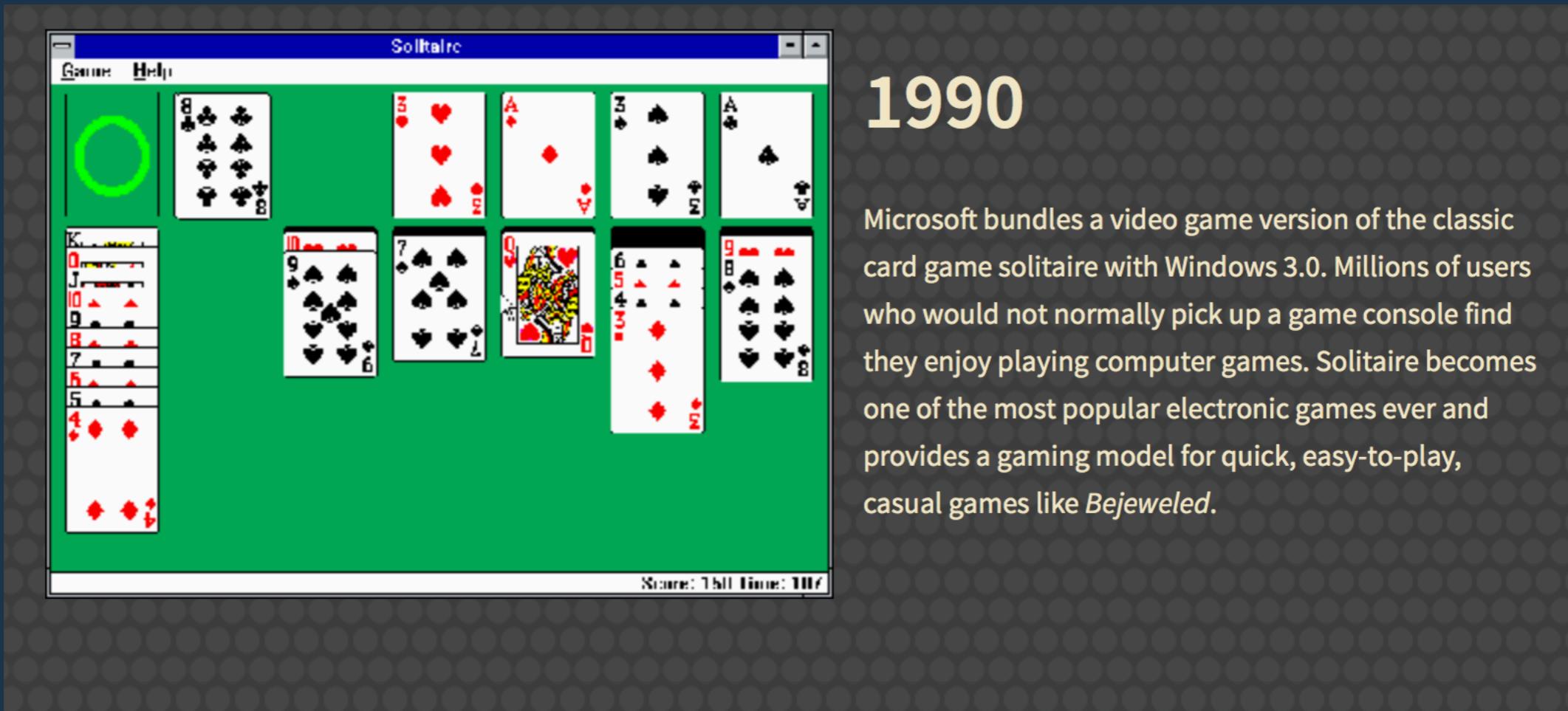
BRIEF HISTORY OF VIDEO GAMES



1989

Nintendo's Game Boy popularizes handheld gaming. Game Boy is not the first handheld system with interchangeable cartridges—Milton Bradley introduced Microvision 10 years earlier—but it charms users with its good game play, ease of use, and long battery life.

BRIEF HISTORY OF VIDEO GAMES



1990

Microsoft bundles a video game version of the classic card game solitaire with Windows 3.0. Millions of users who would not normally pick up a game console find they enjoy playing computer games. Solitaire becomes one of the most popular electronic games ever and provides a gaming model for quick, easy-to-play, casual games like *Bejeweled*.

BRIEF HISTORY OF VIDEO GAMES



The Strong's online collections

1991

Sega needs an iconic hero for its Genesis (known as Mega Drive in Japan) system and finds it in Sonic the Hedgehog. Gamers, especially in the United States, snap up Sega systems and love the little blue guy's blazing speed and edgy attitude.

BRIEF HISTORY OF VIDEO GAMES



The Strong's online collections

1995

Sony releases PlayStation in the United States, selling for \$100 less than Sega Saturn. The lower price point, along with the arrival of Nintendo 64 in 1996, weakens Sega's home console business. When Sony PlayStation 2 debuts in 2000, it becomes the dominant home console and Sega exits the home console business.

BRIEF HISTORY OF VIDEO GAMES



The Strong's online collections

2000

Will Wright's *The Sims* models real life. It is not the first simulation game—*Utopia* on Intellivision (1982), Peter Molyneux's *Populous* (1989), Sid Meier's *Civilization* (1991), and Wright's own *SimCity* (1989) preceded it—but it becomes the best-selling computer game ever and the most popular game with female players.

BRIEF HISTORY OF VIDEO GAMES

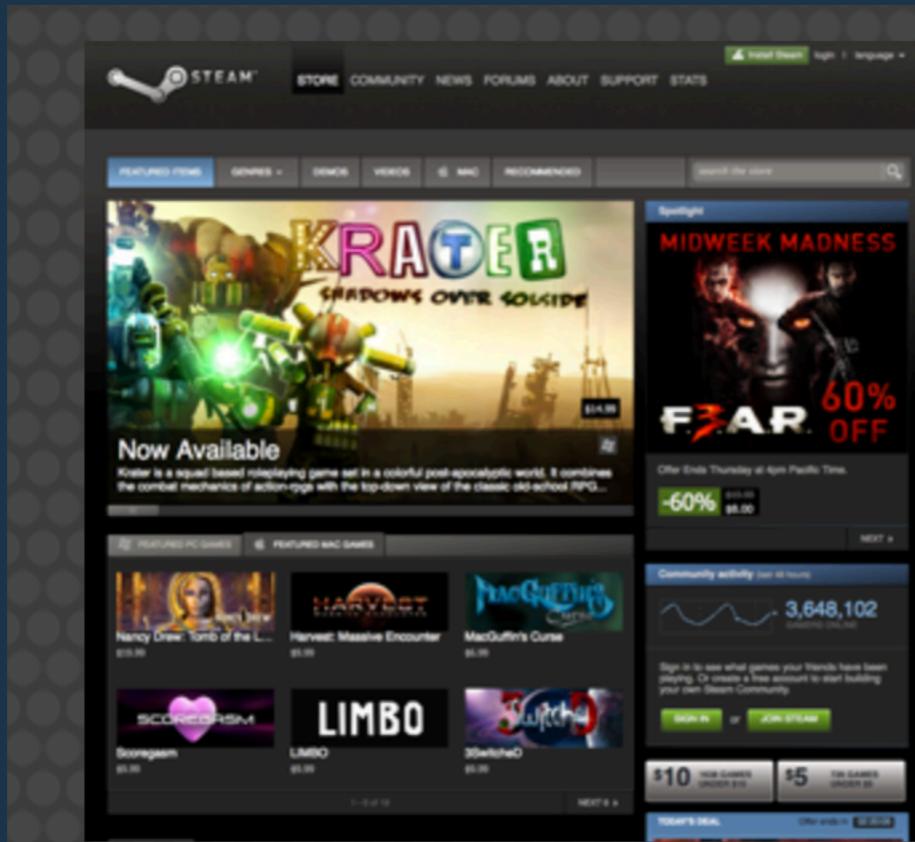


The Strong's online collections

2001

Microsoft enters the video game market with Xbox and hit games like *Halo: Combat Evolved*. Four years later, Xbox 360 gains millions of fans with its advanced graphics and seamless online play.

BRIEF HISTORY OF VIDEO GAMES



2003

Valve energizes PC gaming with its release of Steam. The digital distribution platform allows players to download, play, and update games.

BRIEF HISTORY OF VIDEO GAMES



2004

Nintendo maintains its dominance of the handheld market with the Nintendo DS, an easy-to-use, portable gaming system packed with two processors, two screens, multiplayer capabilities, and a stylus for the touchscreen. Great games like *Super Mario Kart DS* helped too.

The Strong's online collections



2005

Microsoft's Xbox 360 brings high-definition realism to the game market, as well as even better multiplayer competitions on Xbox Live and popular titles such as *Alan Wake*.

The Strong's online collections

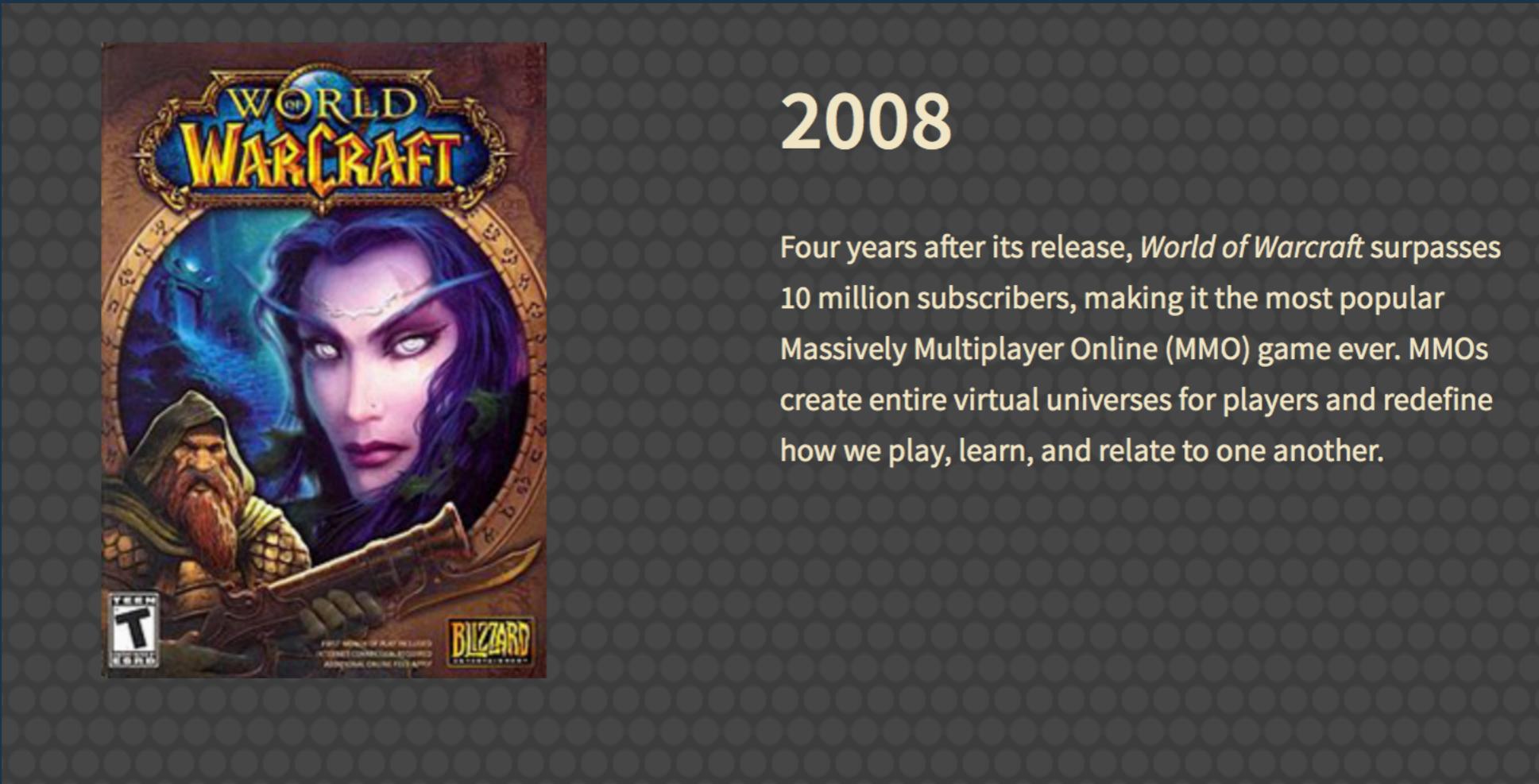


The Strong's online collections

2006

Nintendo Wii gets gamers off the couch and moving with innovative, motion-sensitive remotes. Not only does Nintendo make gaming more active, it also appeals to millions of people who never before liked video games.

BRIEF HISTORY OF VIDEO GAMES



2008

Four years after its release, *World of Warcraft* surpasses 10 million subscribers, making it the most popular Massively Multiplayer Online (MMO) game ever. MMOs create entire virtual universes for players and redefine how we play, learn, and relate to one another.

BRIEF HISTORY OF VIDEO GAMES



Social games like *Farmville* and mobile games like *Angry Birds* shake up the games industry. Millions of people who never would have considered themselves gamers now while away hours playing games on new platforms like Facebook and the iPhone.

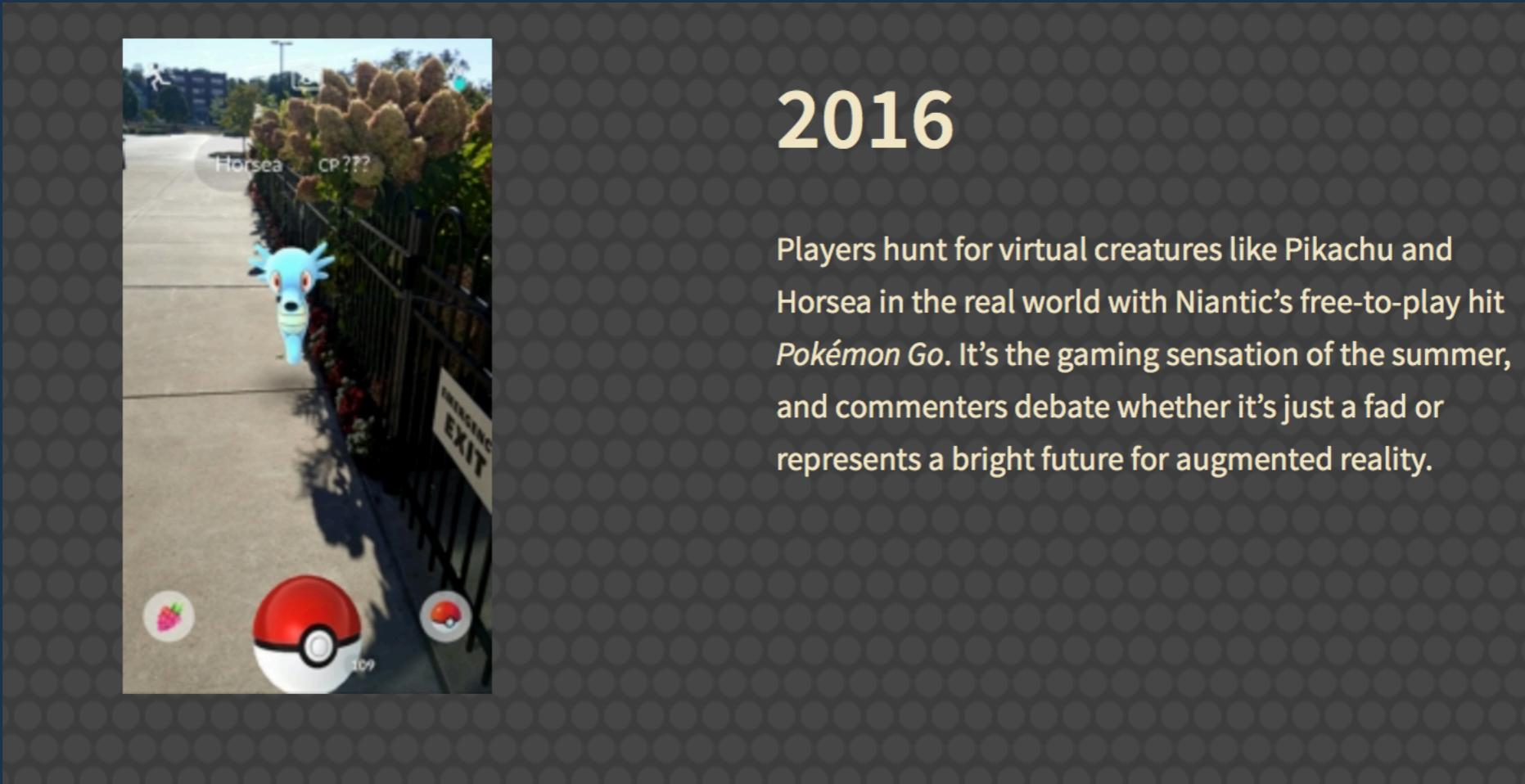
BRIEF HISTORY OF VIDEO GAMES



2014

“Free-to-play” becomes a dominant business model as blockbusters such as *CrossFire*, *Clash of Clans*, *World of Tanks*, and even *Kim Kardashian: Hollywood* achieve sales in the hundreds of millions of dollars through microtransaction payments for in-game items and premium content.

BRIEF HISTORY OF VIDEO GAMES



BRIEF HISTORY OF VIDEO GAMES



2017

Nintendo's Switch introduces the first hybrid mobile/home video game console into a game market dominated by smartphones and tablets. The innovative system allows players to take hit games like *Legend of Zelda: Breath of the Wild* and *Super Mario Odyssey* with them wherever they go.

materials taken from: <http://www.museumofplay.org/about/icheg/video-game-history/timeline>

BRIEF HISTORY OF VIDEO GAMES

<https://youtu.be/rpUmON4Hsd8>

BATTLEFIELD V

(2018) GAMES THAT SUPPORT NVIDIA RTX RAY TRACING

BRIEF HISTORY OF VIDEO GAMES

<https://youtu.be/7Yn09UHWYFY>

METRO EXODUS

(2018) GAMES THAT SUPPORT NVIDIA RTX RAY TRACING

BRIEF HISTORY OF VIDEO GAMES

https://youtu.be/0B96x_OEPOM

SHADOW OF THE TOMB RAIDER

(2018) GAMES THAT SUPPORT NVIDIA RTX RAY TRACING

BRIEF HISTORY OF VIDEO GAMES



<https://www.youtube.com/watch?v=57d59puP3fE>

PLAY STATION 5

<https://www.youtube.com/watch?v=Oa2drgVThbs>

UNREAL ENGINE 5 REAL-TIME DEMO ON PS5 DEMO

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100 RULES OF GAME MECHANICS

Current video gaming trends &
popular rules of video game mechanics

MAJOR PLAYERS

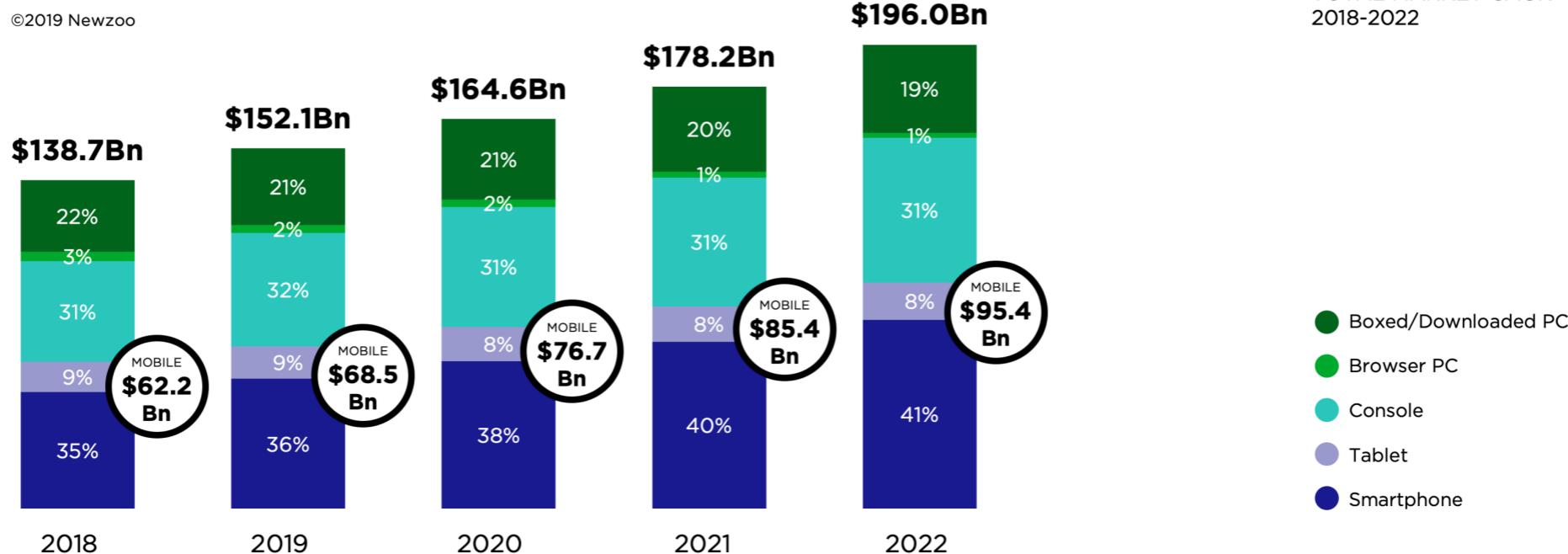
- Gaming industry: > 150 billion USD
- Who?
 - Sony Interactive Entertainment, Microsoft Studios, Nintendo, Activision Blizzard, Tencent, Electronic Arts, King, Ubisoft, etc



2018-2022 GLOBAL GAMES MARKET

FORECAST PER SEGMENT TOWARD 2022

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+9.0%

TOTAL MARKET CAGR
2018-2022

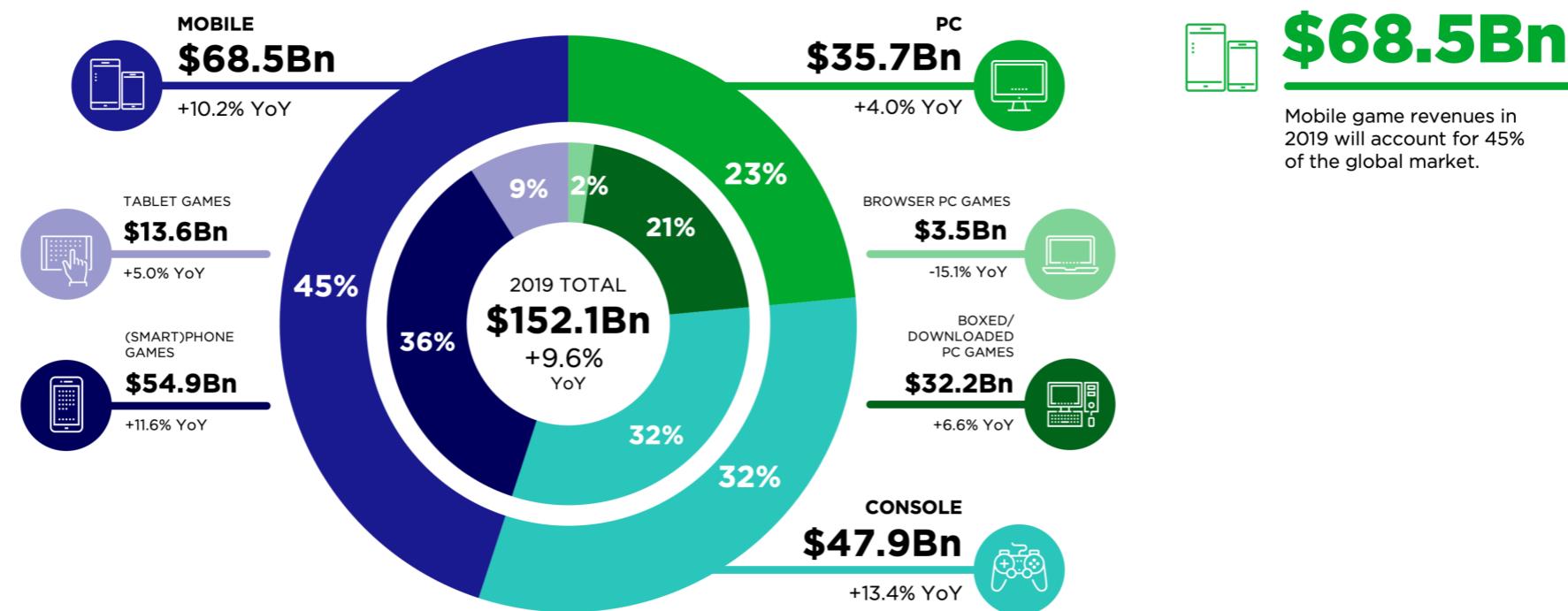
- Boxed/Downloaded PC
- Browser PC
- Console
- Tablet
- Smartphone

Source: ©Newzoo | 2019 Global Games Market Report
newzoo.com/globalgamesreport



2019 GLOBAL GAMES MARKET

PER DEVICE & SEGMENT WITH YEAR-ON-YEAR GROWTH RATES



Source: ©Newzoo | 2019 Global Games Market Report
newzoo.com/globalgamesreport

2018 TOP GAMES



- a.k.a: PUBG
- Publisher: PUBG Corp
- Genre: multiplayer, battle royale game
- loot items for survival, get into safe zones in time
- More realistic looking than Fortnite
- third highest-grossing game of all time on Steam (> 712 M USD, 2017)

2018 TOP GAMES

- Single / Co-op, sandbox (open world)
- Genre: survival, developed by Epic Games
- Explore, scavenge items, exploration, craft weapons, build fortified structures, and fight waves of encroaching monsters (fantasy elements, colorful)
- \$126 M USD (Feb 2018) Fortnite BR surpasses PUBG in monthly revenue



- Battle royale version:
 - Last man standing (online multiplayer),
 - up to 100 players in a map, shrinking safe zone
 - Free, make sales from character skins and emotes

2018 TOP GAMES



- choose hero (carry, support, tank, nuker, pusher, jungler, disabler)
- creep, level up, buy items, kill opponent heroes, destroy throne
- also high learning curve
- Genre: multiplayer online battle arena (MOBA) by Valve Corp
- free, similar to LoL but no runes etc
- 5 v 5 gameplay

2018 TOP GAMES

- Genre: MOBA
- Publisher: Riot Games/Tencent
- free, but can buy stuff to ++ stats
- 5 v 5, choose champion (support, marksman, midlane, tanks, jungler, fighter/off-tank)
- creep, level up, buy items, kill enemy champions
- destroy nexus
- high learning curve
- biggest game in the world by revenue (2.1B in 2017)



2019 TOP GAMES

- ‘The Fortnite Effect’
- Fortnite Battle-Royale on mobile
- Free-to-play, anytime anywhere



2019 TOP GAMES



- a free-to-play battle royale game
- Developed by Respawn Entertainment and published by EA
- Mechanics from Titanfall

2019 GAMING TRENDS

- ‘The Fortnite Effect’ : **Fortnite is completely free**, but it sells in-game packs that makes your character looks “Cooler”. However they don’t sell things that upgrade skills
- APAC players are increasing, China being the one stand-out consumer
- Mobile games account for 50% of the industry. Phones are now able to support sophisticated games
- AR: the ability to superimpose CGI onto screens
- Indie games can gain sudden popularity fast due to platforms: Apple Arcade, Android and iOS stores, using social media to promote, etc

WEB BROWSER GAMES

- Web browser games also have recently gained popularity
- There's casual games: to *relax, but also fast-paced ones*
- [krunker.io](#) — a free browser based multiplayer first-person shooter video game
- <http://slither.io> — another free browser multiplayer game
 - Player controls a “worm”,
 - Consumes multicolored pellets, and grow

2020 GAMING TRENDS?

- AR/VR?
- Web Browser?
- Your homework, please head to edimension to find the handout
- Important to do your research before making any games!

WHY SO POPULAR?

- 100 rules of game mechanics
- Based on :The 400 Projects, GDC 2006
- Worked at Lucasfilm games since 1980
- Aimed to generalize 400 universal rules for most games
- They managed to produce 100 rules in 5 years
- Stopped the project after becoming the chief game designer at Google
- The rules: http://www.finitearts.com/Storage/400_Project_Master_Rule_List_032306.zip

100 RULES OF GAME MECHANICS

● What is it for?

- Learn from past experience, no need to plan from scratch
 - Avoid previously explored problem, save time in making better decision
 - Conceptualize problems
 - Ultimately, make a fun and engaging game
-
- The rules: http://www.finitearts.com/Storage/400_Project_Master_Rule_List_032306.zip

RULE #47 : GAME PLAY COMES FIRST

- SUPER important
 - In order to be fun, games have to be **playable**
- Definition:
 - To emphasize game play than other elements, like story, special effects, or fidelity to license.
 - Game has to work properly. Bugs aren't fun.

RULE #31 :

USE COMMON SENSE WHEN APPLYING RULES

- Goes without saying
- Definition:
 - The Uber-trump.
 - Any rule, carried to **extremes**, can become **non-functional**.
 - It's impossible to consider every possible situation when drafting rules and identifying trumps, so don't follow any rule blindly.

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RULE #31 : USE COMMON SENSE WHEN APPLYING RULES



Castlevania II's Magic Tornado

Who is Deborah Cliff, and why are we headbutting her? She's not a person, but a place -- an anonymous (as in, no sign pointing to it whatsoever) dead end on the other side of the game.



So you hit your head on the cliff and walk through the big hole to the final dungeon, right? Nope. There's no headbutt button in this game. What you need to do is kneel down on the top platform and stay that way until a tornado scoops you up and whisk you away to the final area.

RULE #1 : FIGHT PLAYER FATIGUE

- VERY important 
- Definition:
 - Games are a **challenge** and playing takes **effort** — actively work to keep the player involved, and
 - make sure the **appeal of your game always exceeds its difficulty.**
 - Nobody wants to play a game that's too hard or too easy (for the appropriate age group, of course)

RULE #50 & #51 : AS SIMPLE AS POSSIBLE

- Definition:

- "Everything should be as simple as possible, but no simpler"
- Simple gameplay, simple interface, **intuitive**
- When trying to reach a wide audience, the simpler the interface the better.

- Addictive games are almost, always simple



RULE #50 & #51 : AS SIMPLE AS POSSIBLE



RULE #50 & #51 : AS SIMPLE AS POSSIBLE

- Example: Overcooked (2018 Nintendo Switch game)



RULE #6 : PROVIDE CLEAR SHORT-TERM GOALS

- Definition:



- Always make it **clear** to the player what their short-term objectives are. This can be done **explicitly** by telling them directly, or **implicitly** by leading them towards those goals through environmental cues. This **avoids the frustration** of uncertainty and **gives players confidence** that they are making forward progress

- Example:

- Quests board and maps

RULE #61 :

PLAYERS SHOULD SEE THEIR GOAL BEFORE THEY ACHIEVE IT

- Definition:

- The "No Backward Puzzles" rule. The **satisfaction** of achieving a goal is magnified when the goal has been **clear** (and/or literally visible) for some time. Solving a puzzle or surmounting an obstacle without even knowing you were doing it, or without knowing why, robs the player of satisfaction.

- Example:

- Quests board and maps

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RULE #6 & #61



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RULE #6 & #61



RULE #59 : MAKE THE PLAYER FEEL SMART

- Definition:

- **Provide** avenues for the player to feel **clever**, and conversely avoid situations that will make the player feel stupid.



RULE #59 : MAKE THE PLAYER FEEL SMART

- Example: Assassin's creed eagle strike



RULE #69 : PROVIDE A REACTION TO EVERY PLAYER ACTION

- Definition:

- Ideally, every action a player can take should have some sort of **feedback**, visual, audible, or both.



RULE #46 :

RAISE THE EMOTIONAL STAKES TO MAXIMIZE PLAYER INVOLVEMENT



● Definition:

- A meta-rule with many more specific examples, this should be the **underlying rule** behind many design decisions about story, characters, and theme, as well as choices of gameplay
- Make players have a **particular emotional interest** in the **outcome**
- Especially apparent in games that allow you to do things that aren't allowed in real life

RULE #46 :

RAISE THE EMOTIONAL STAKES TO MAXIMIZE PLAYER INVOLVEMENT



RULE #62 : MAKE CHALLENGES REQUIRE SKILL

- Definition:

- A game should be **difficult enough** (for the directed age group) to avoid player fatigue
- Unless you're making gambling games
- But of course, not *impossibly* hard

- Examples:

- Well, almost all games require skill / challenging enough
- Otherwise you won't even hear about it

RULE #55 :

MAKE THE GAME APPEAR FAIR TO THE PLAYER

● Definition:



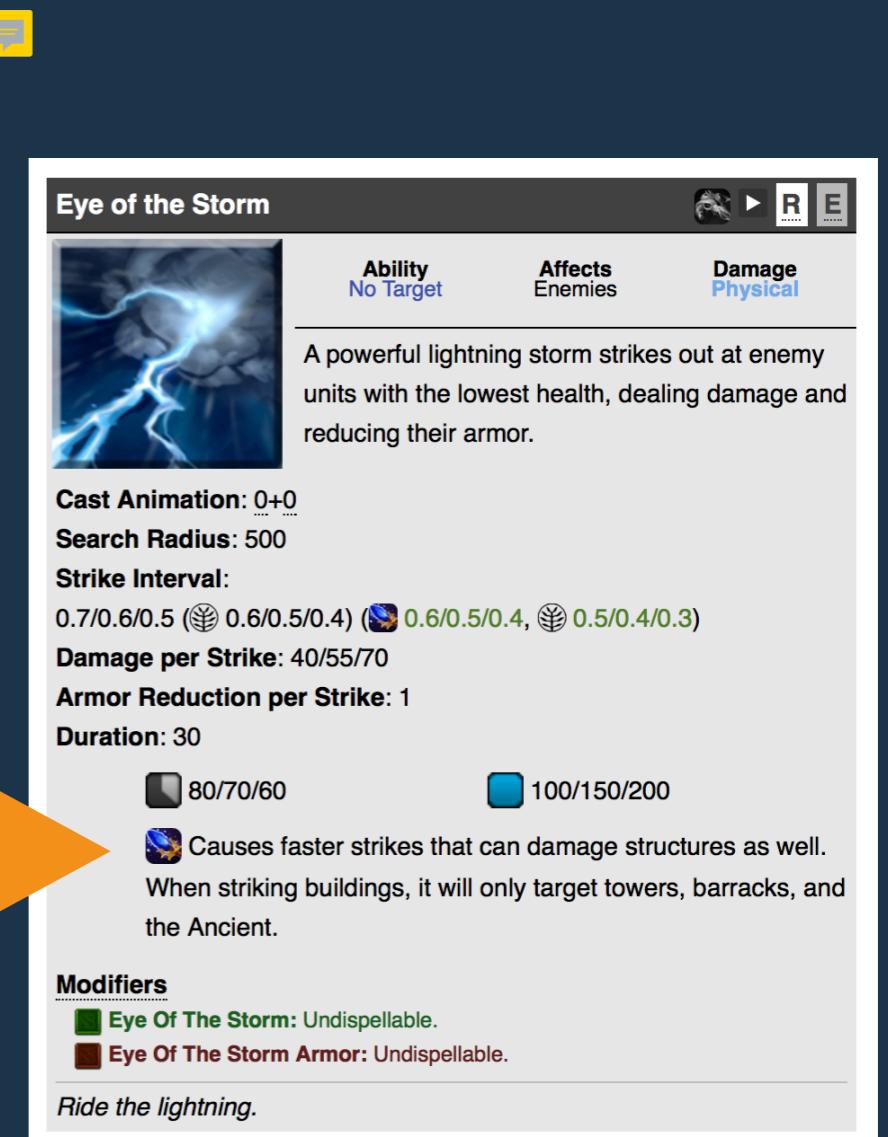
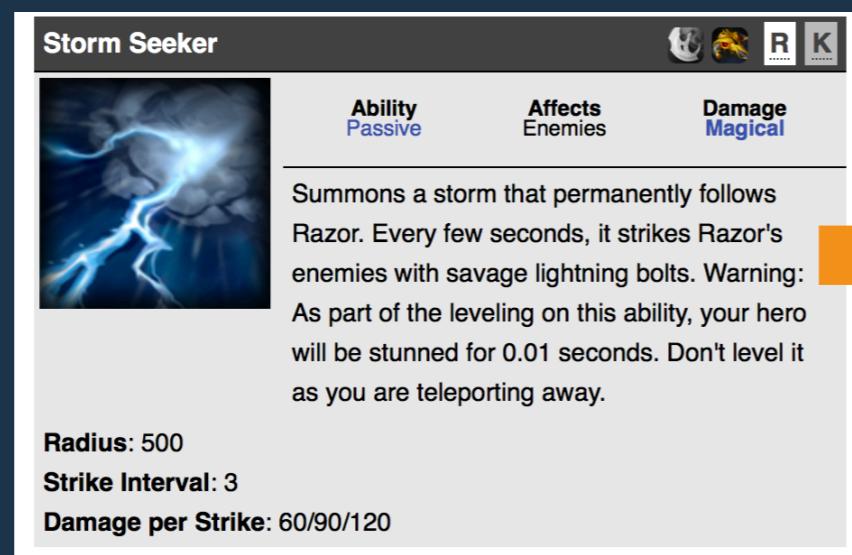
- Computer-controlled opponents **should not appear** to be **taking advantage** of information that would not be available to a human in the same position.
- In multiplayer games, opponents should not have advantages based on their hardware or bandwidth.
- Basically, don't OP (overpowered)
- Indicate monster level difficulties

RULE #55 :

MAKE THE GAME APPEAR FAIR TO THE PLAYER

- Example:

- Closure of Diablo III Auction House
- DotA hero patches to avoid OP, eg: LR's ulti



RULE #16 : DISTRIBUTE GAME ASSETS ASYMMETRICALLY

- Definition:

- When there are objects or experiences the player can encounter in a game, place them **asymmetrically**, both **spatially in the sense of clumping some together and spreading others thinly**, and temporally in the sense of having some be **common**, some **uncommon**, and some **rare** over time. Of course, particularly useful or powerful items are good candidates to be the rarest.

- Example:

- Hunger games
- Explicitly state: cheap, good, great, legendary items

RULE #16 : DISTRIBUTE GAME ASSETS ASYMMETRICALLY



RULE #11 : EMPHASIZE EXPLORATION AND DISCOVERY



- Definition:

- Players like to **figure out** the territory of your game — it's a basic human impulse to investigate the unknown — so let 'em do it.

- Example:

- Basic mechanism for **RPG** games: explore the world
- Maps are often incomplete in the beginning

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RULE #11 : EMPHASIZE EXPLORATION AND DISCOVERY



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RULE #11 : EMPHASIZE EXPLORATION AND DISCOVERY



RULE #22 : ADD A SMALL AMOUNT OF RANDOMNESS TO AI CALCULATIONS

- Definition:

- A little randomness can make a **dumb AI look very smart**. If an enemy responds exactly the same every time, they'll feel robotic and predictable. But just 5% variation can shock a player out of complacency and make an opponent seem alive. Sometimes the easiest way is to add plus or minus a few percent to a basic calculation of distance or direction. This is particularly effective for animal behavior.

RULE #5 MAKE SUBGAMES

- Definition:

- Players want to **participate** in the course they take through your game -- so give them plenty of **opportunities** to voluntarily take up **ancillary** challenges
- Basically make side quests in addition to the main goal

- Example:

- Any RPG side quests / side mission / events
- Diablo III: Jar of Souls (Act I)



RULE #52 MAKE YOUR GAME FAMILIAR, YET DIFFERENT

- This can potentially make your life easier for the final project
- Definition:
 - Another "Make it Fun" specific rule. All successful games have a **mix** of some **familiar** elements and **some fresh or unique variations**. Often the big hits use familiar gameplay but vary the story/theme, or vice versa - doing both at once tends to lose audience share.
- Example:
 - Call of Duty vs Battlefield, DotA vs LoL, Fortnite vs UnnamedPlayers' Battleground, Overcooked vs Cooking Mama, Candy Crush vs Bejewelled, Dead Island vs Left 4 Dead

SUMMARY

- **Basic & meta:** must-have rules (game must work properly, challenging but appealing enough, distribute game assets asymmetrically)
- **Feedback:** clear hints and indications on the game progress (simple UI, clear goals / objectives, clear action feedback)
- **Psychological:** to keep things interesting and balanced (make the player feel smart, fair game, clear goals / objectives to promote the level of satisfaction, add randomness to AI, hide maps to emphasize discovery) 
- **Extra:** add subgames other rules that are not crucial to main gameplay but can be a positive addition of fun 
- There are other categories too: serious games, brainstorming, games for girls, casual games, games for non-gamers, production, level design, development, story, etc. Read more *if you have the time.*

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Foundations of
Game Design
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VIDEO GAME GENRES

GENRE & MECHANICS

- Recall the 8 core-mechanics:
 1. reflex,
 2. timing,
 3. precision/accuracy,
 4. measurement,
 5. tactical choice,
 6. strategy,
 7. management,
 8. puzzle
- A *combination* of these mechanics create a game **genre**

VIDEO GAME GENRES

- Adventure Games
- Action Games
- Role-Playing Games
- Strategy Games
- Simulations Games
- Online Games
- Sport Games
- Fighting Games
- Casual Games
- God Games
- Educational Games
- Puzzle Games

ADVENTURE GAMES



- Story-based games, rely on puzzle-solving to move the action along
- Not in real-time
- Easy navigation: *point-and-click*, focus more on navigation
- Expected to have a large, complex world to explore, interesting characters and a good story.



ACTION GAMES

- Real-time games, must react quickly to what's happening on the screen.
- Ideal for those looking for adrenaline rush of fast-paced action
- Calls for snap judgments and quick reflexes.



ROLE-PLAYING GAMES

- 
- Directs a group of heroes on a series of quests.
 - Gradually increasing the abilities and strengths of these heroes, and money
 - Micro manage their characters: weapons, armor on specific body parts
 - Huge world with a gradually unfolding story.

STRATEGY GAMES

- Manage a limited set of resources to achieve a predetermined goal
- Involves deciding which kinds of units to create and when to put them into action.



- Popular nowadays: real-time strategy (RTS) games set the computer AI in motion against the player, regardless on whether he's ready or not. Also, doesn't progress incrementally in turns

- To emulate the real-world operating conditions of complicated machinery, such as jet fighters, helicopters, tanks, and so on.
- Simulation accuracy is crucial
- Players are expected to spend hours learning the intricacies of the machine, a thick manual to help them with the finer points



SIMULATION GAMES

SPORTS GAMES



FIFA
ORTS

18

FIFA
OFFICIAL
LICENSED
PRODUCT

- Let players vicariously participate in their favorite sport, either as a player or a coach
- Accurately reproduce the rules and strategies of the sport.
- One gameplay session can cover an individual match, a short series, or an entire season.

FIGHTING GAMES

- Two-person games, each player controls a figure on the screen
- Use a **combination of moves** to attack his opponent and defend against his opponent's attacks.
- Generally viewed from a side perspective, each game lasting a few minutes only
- basic set of attacks and counters can be learned right away, as well as more complicated combinations that can be mastered over time.



CASUAL GAMES

- Players can drop into and out of these games quickly.
- Players already familiar with the rules of the real-world game and expect to find those rules emulated here.
- Have an extremely simple user interface, with little or no learning curve.



11

GOD GAMES



- Have no real goal, no winning condition
- Encourage the player to fool around with the game just to see what happens
- Designers try to create games in which the player can do no wrong

EDUCATIONAL GAMES

- Games that teach while they entertain.
- Aimed at a much younger audience than most commercial products
- Has to be age-appropriate



PUZZLE GAMES



- Puzzle games exist purely for the intellectual challenge of problem solving
- The puzzles are an end in themselves and aren't integrated into a story, as is common in adventure games.



ONLINE GAMES

- May include any of the preceding genres, but played over the internet
- Entire communities grow around the most successful of these games
- Game developers constantly create features that encourage those communities to flourish



DECIDING GAME GENRES

- More and more games are *hybrids*, combining elements from different categories
- If your game is hybrid, be familiar with the conventions of each genre so that you end up with the **best of both**, instead of the worst
- When creating a game, *choose a genre that you enjoy playing yourself*, so that you've already internalised the genre's conventions and be familiar with it

SUMMARY

- Video game genres
- Details about each genre
- Dominant mechanics on each genre
- Choosing game genre

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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 perceptible) 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

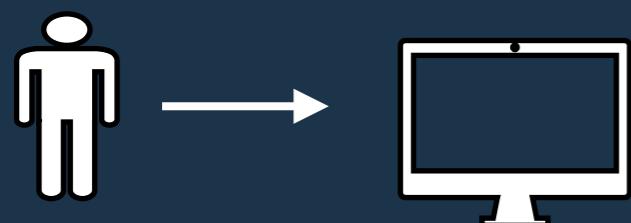
FORMAL ELEMENTS

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

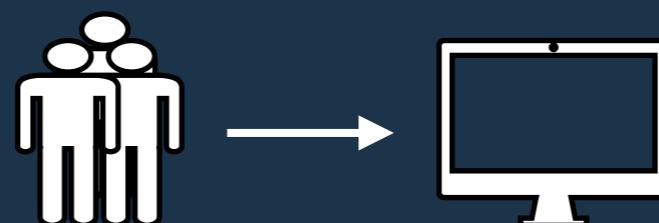
PLAYERS

- **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

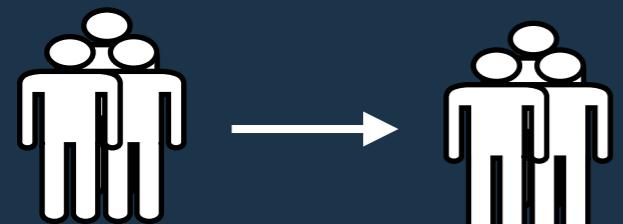
PLAYER INTERACTIONS



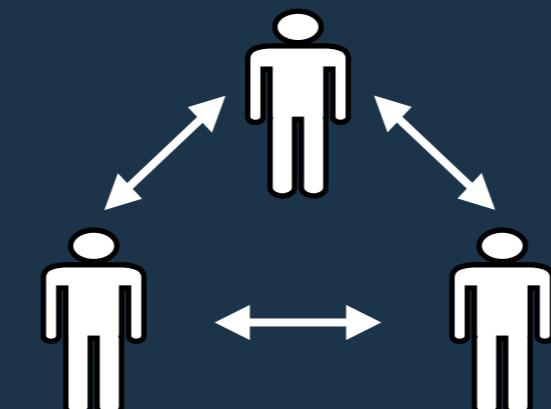
Single Player



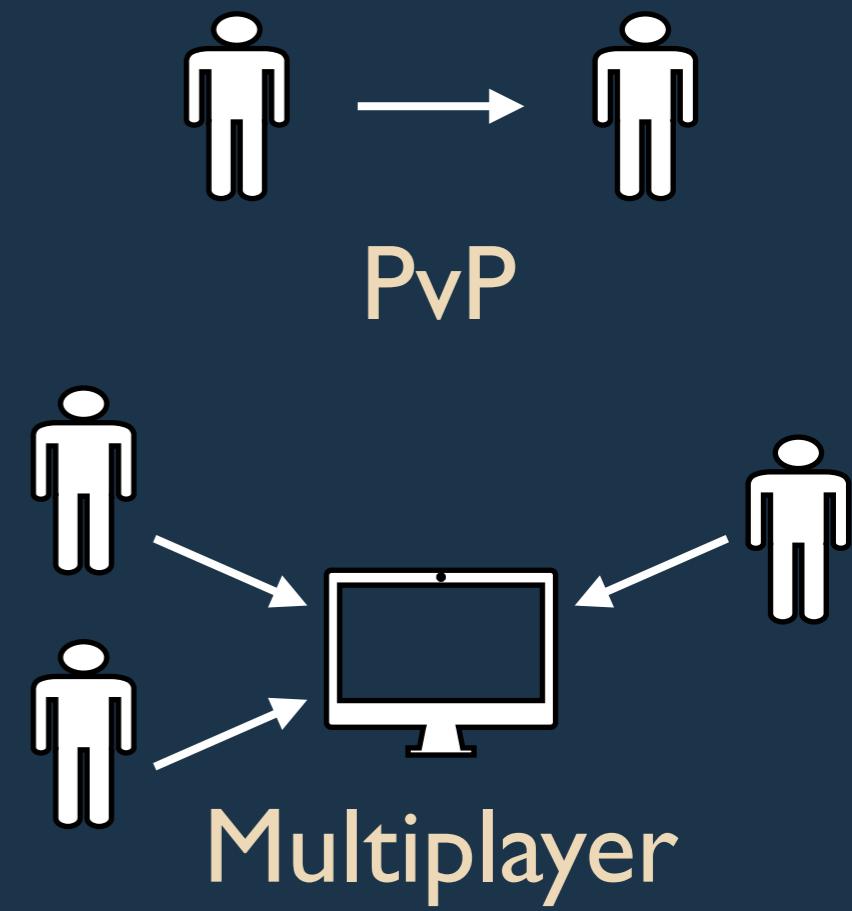
Co-Op



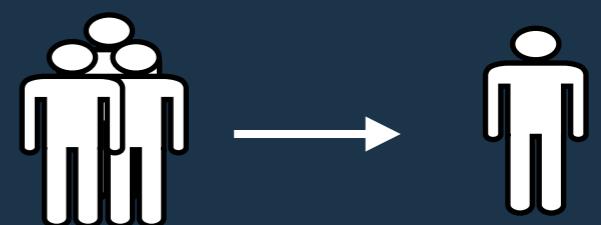
MOBA



Battle Royale

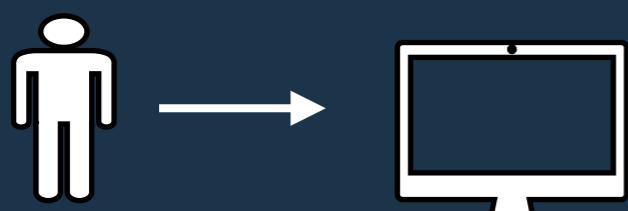


Multiplayer
(no interaction)



Ganking

PLAYER INTERACTIONS



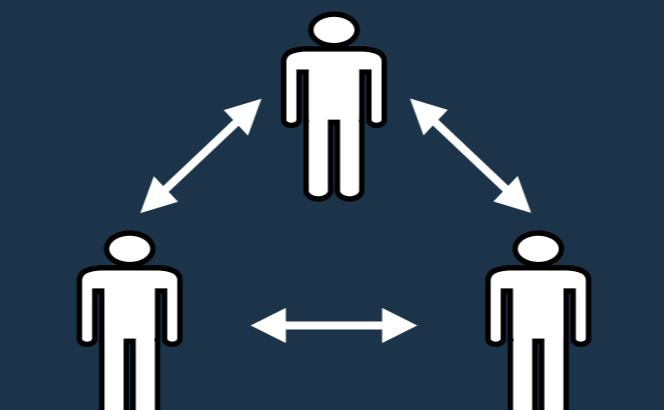
player vs game



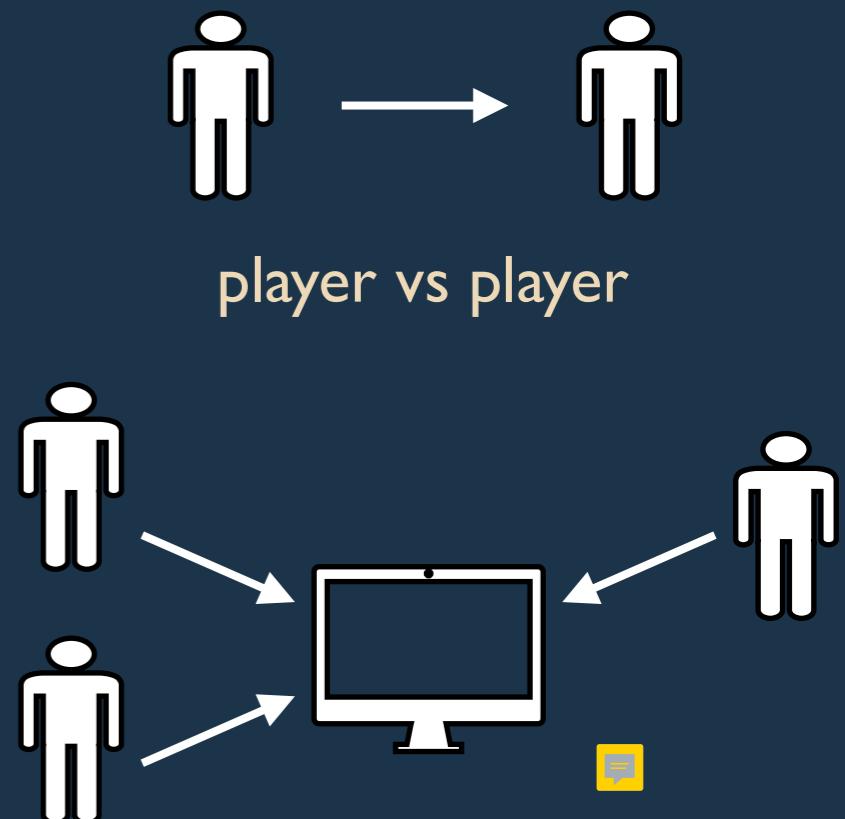
Co-Op gameplay



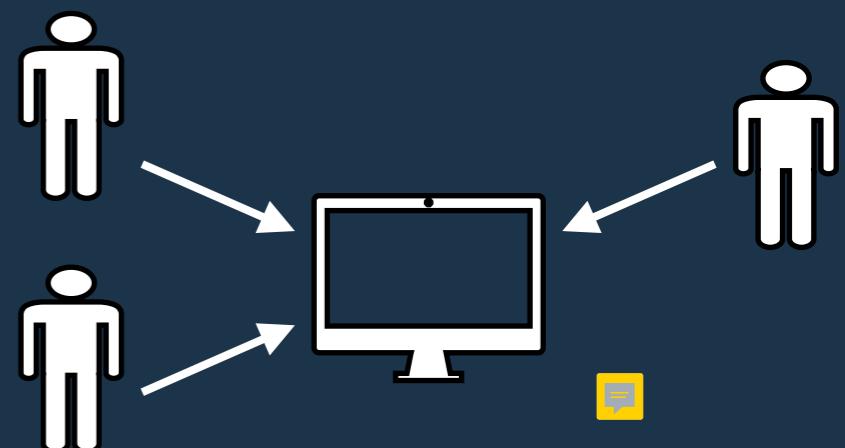
team competition



multilateral competition



player vs player

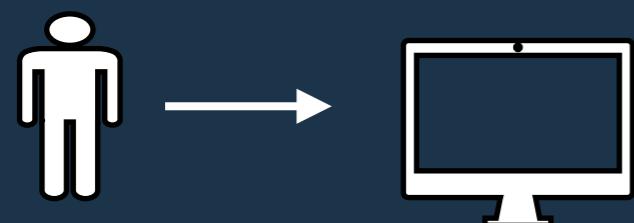


Multiplayer individual vs game

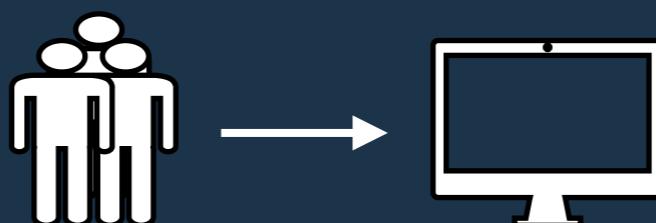


unilateral competition

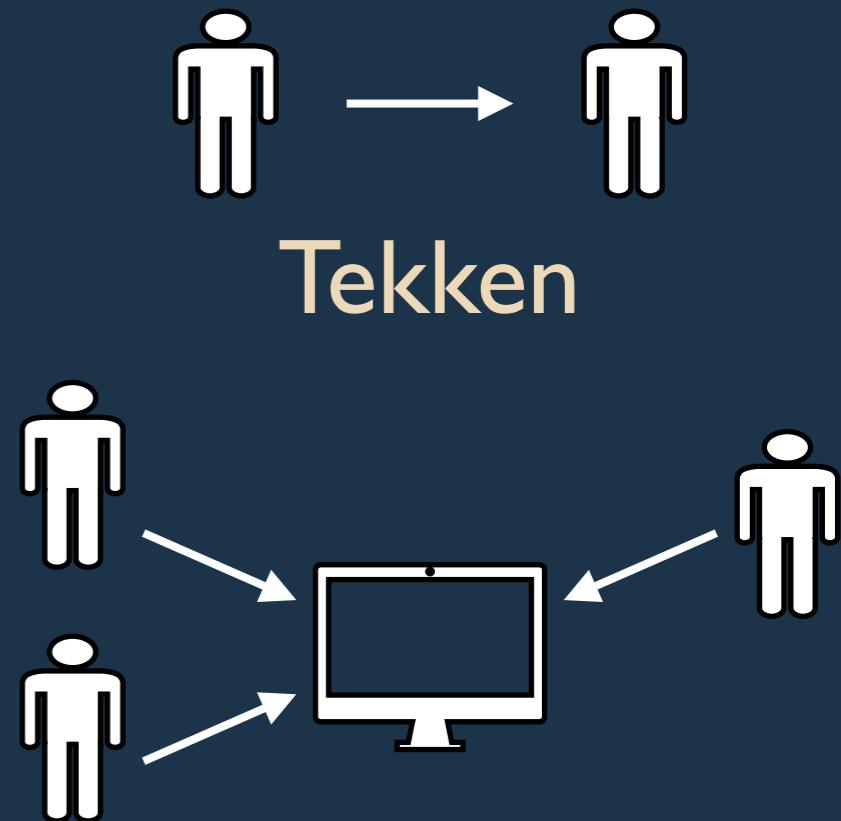
PLAYER INTERACTIONS



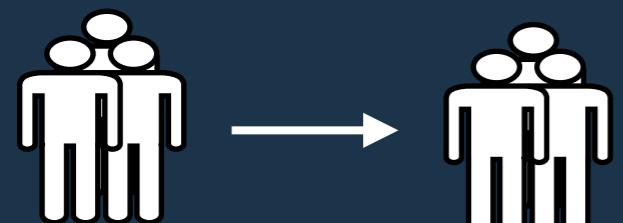
Assassin's Creed



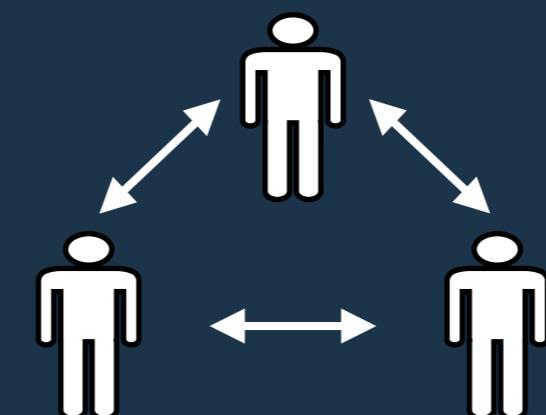
L4D



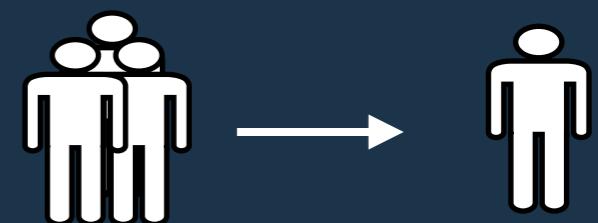
Tekken



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

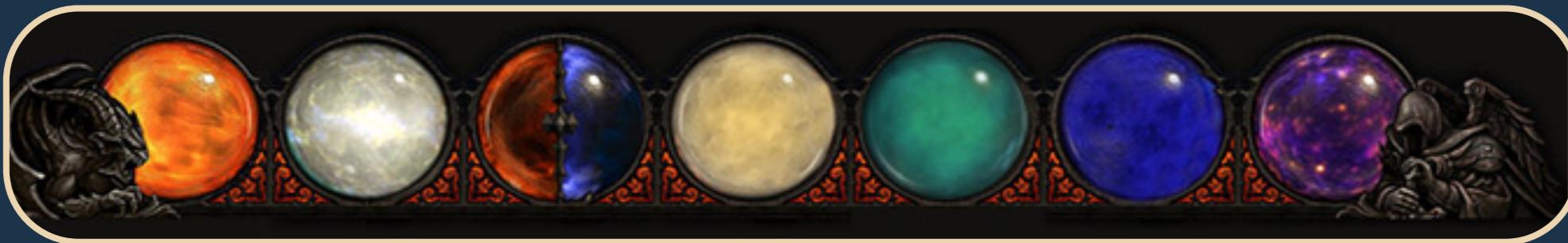
- Designer's job: **describe** the actions for **all** possible situations in the rule set
 - Manual / tutorials / game guides
 - Hide it in the game, reveal during right time
 - Warn players /stop games when rules are violated by them

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



31

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

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Foundations of
Game Design
and Development

GAME MECHANICS

8 core game mechanics

WHAT WE HAVE LEARNED SO FAR

- **Introduction:** history, current trends, 100 rules of game mechanics
 - Informal ‘must-have’ rules according to popular beliefs, as an introduction to the course
 - Goal: to learn how to design a game
- The ‘**what**’: formal elements, rules, *game mechanics*(today), game genres (tomorrow)
 - Basic stuff about *what makes up a game*
 - Characteristics of game rules
 - Types of games

DEFINITION

- Game mechanics is the **action of play (procedure)** of the game
- It is the **product of game rules and procedures** combined
- It describes:
 1. The goal of the game
 2. How players can and cannot achieve it
 3. What happens when they try
- Other *linear* forms of entertainment: movies, books, shows do not require mechanics

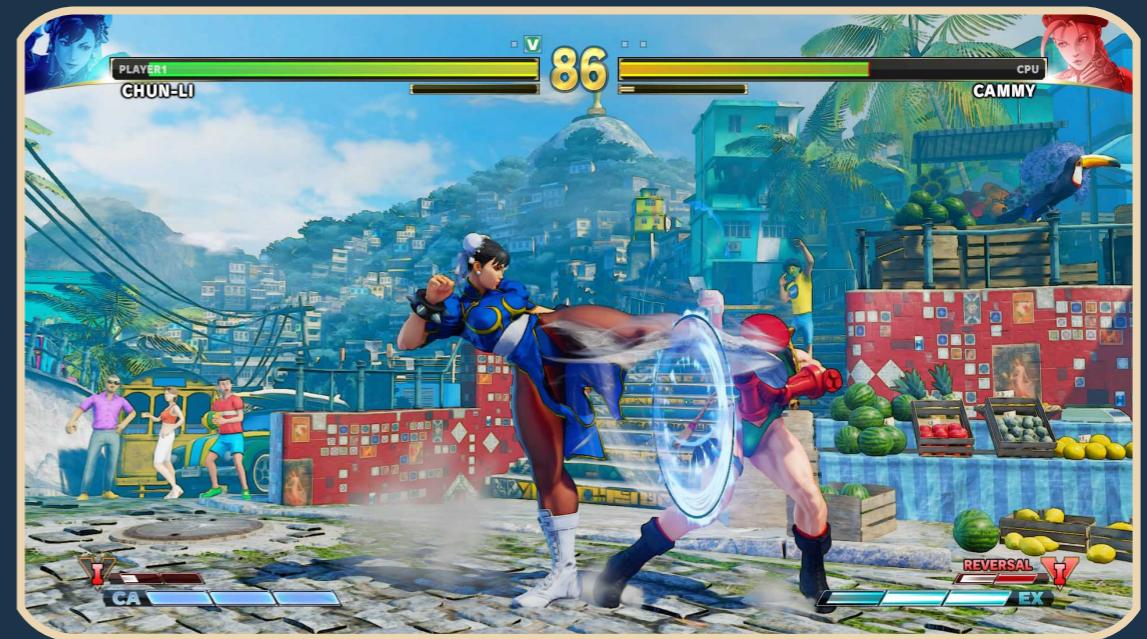
DEFINITION

- After you chose a set of mechanics for your gameplay you have to:
 - **Choose technology** that supports them
 - **Add aesthetics** to emphasize them to the players
 - **Create a story** that allows the game mechanics to make sense to the players

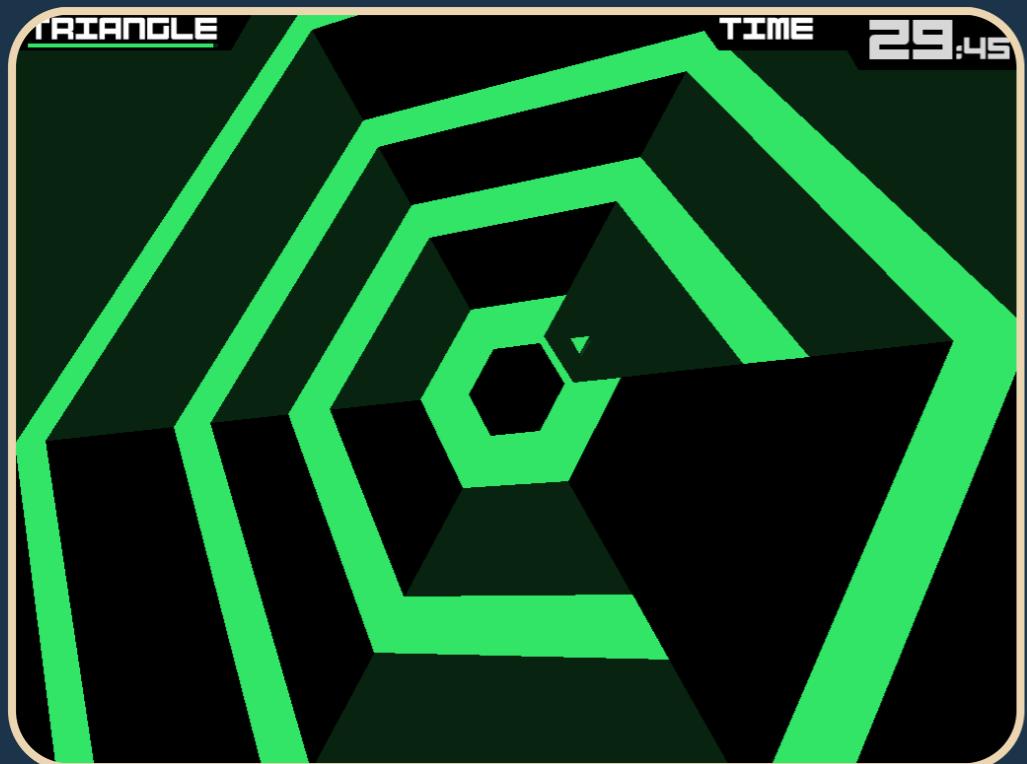
CORE GAME MECHANICS

● Reflex

- Tests how fast you react after certain cues
- Timing of the cues are unpredictable
- E.g: street fighter, tekken



CORE GAME MECHANICS



● Timing

- Got to do with rhythm keeping
- Timing of the cues are predictable
- E.g: Super Hexagon, Rock Band

CORE GAME MECHANICS

- **Precision & accuracy**

- Has to be exact and well-aimed
- E.g: FPS games (especially snipers), dart games, archery, also combos in most games



CORE GAME MECHANICS



● Measurement

- Mental calculations about basic **kinematics**, such as to predict jump distance, swing distance, rotational force, and inertia.
- Usually apparent when navigation through the game environment is a big part of the gameplay
- E.g: Mario Bros, Assassin's creed (sometimes made easy)



CORE GAME MECHANICS



● **Tactical choice**

- Deciding actions that need to be **immediately** taken during dilemmatic or difficult situations, in order to reap as much *instant* benefit as possible
- Weighs **short-term** pros and cons
- E.g: most action/war/stealth games
(Tom Clancy's Splinter Cell, Metal Gear Solid, Battlefield, Call of Duty, L4D)

CORE GAME MECHANICS

● Strategy

- Planning a few steps ahead to maximise future benefit
- Weighs long term pros and cons



- E.g: Tower Defense, Minecraft

CORE GAME MECHANICS



● Management

- Controlling resources or people is key to achieve the goal during gameplay (administrative acts)
- Games with management mechanics play with parameters
- E.g: Football game, Restaurant Empire, Hotel Giant, Roller Coaster Tycoon

CORE GAME MECHANICS

● Puzzles

- Pure thinking game
- Games that can be resolved mentally
- E.g: Tetris, Portal,
Cut the Rope

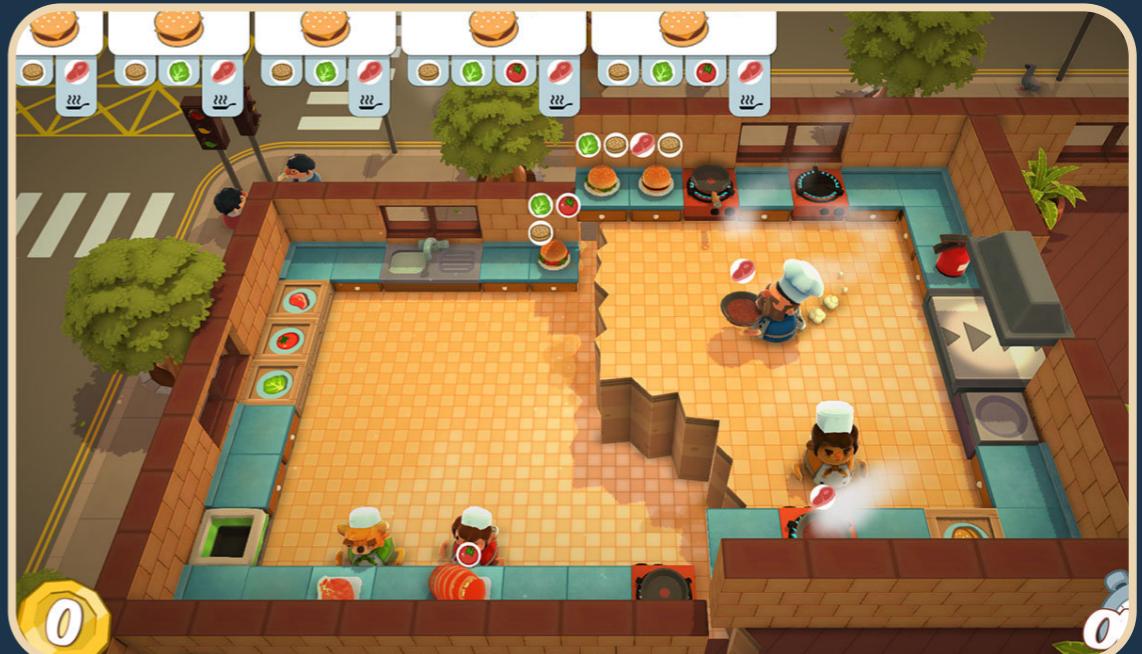
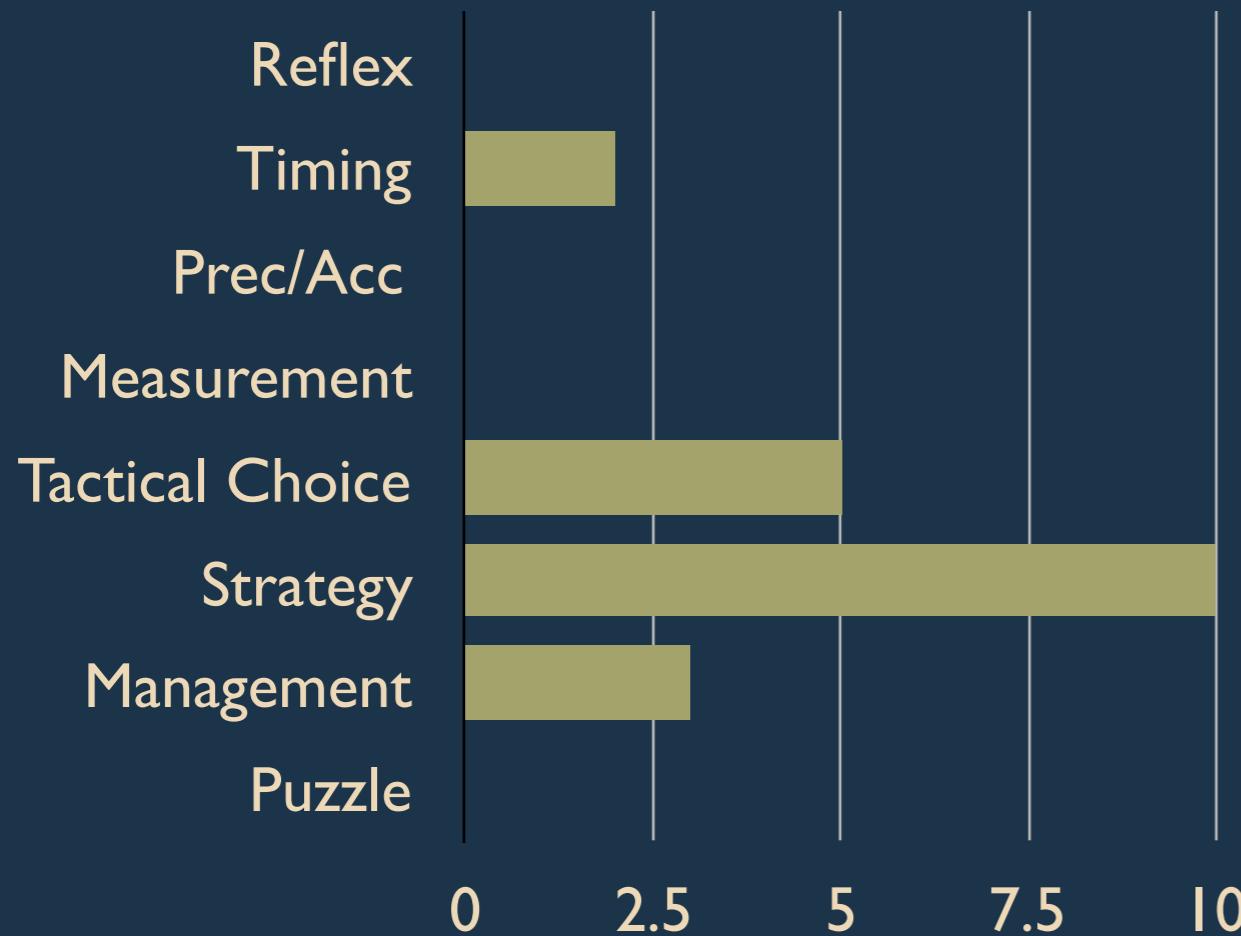


CORE GAME MECHANICS

- Reflex
- Timing
- Precision & Accuracy
- Measurement
- Tactical Choice
- Strategy
- Management
- Puzzle

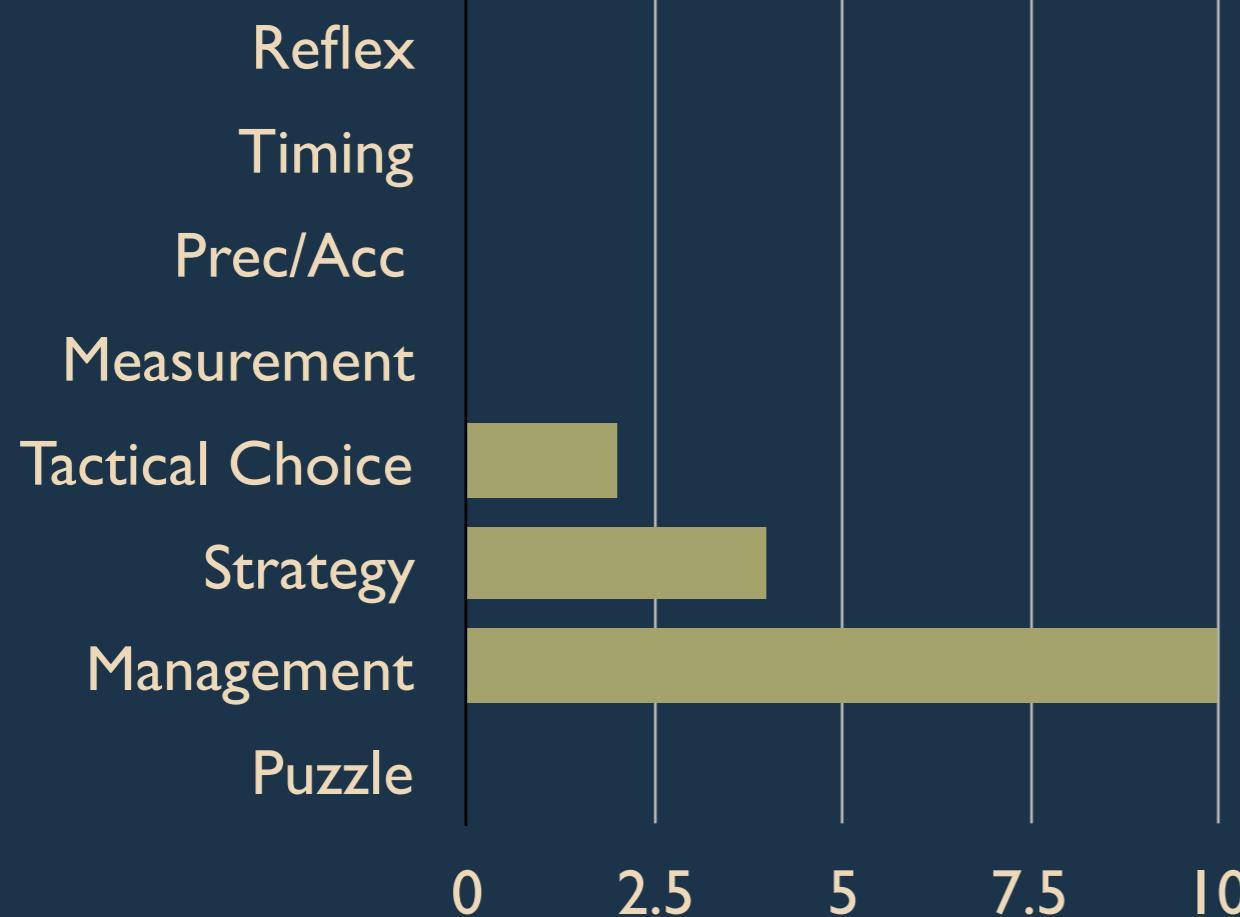
EXAMPLES

- Overcooked



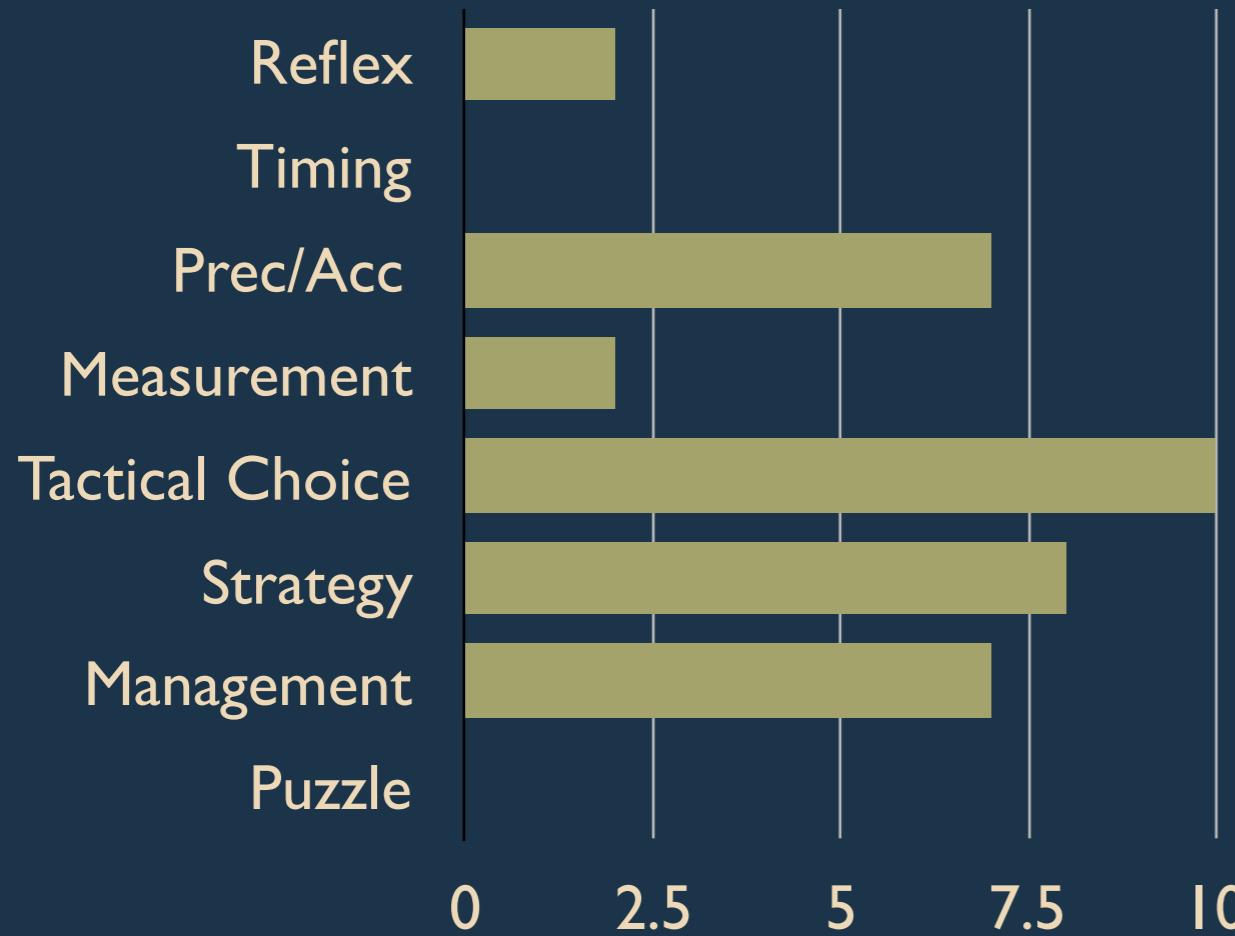
EXAMPLES

- Harvest Moon



EXAMPLES

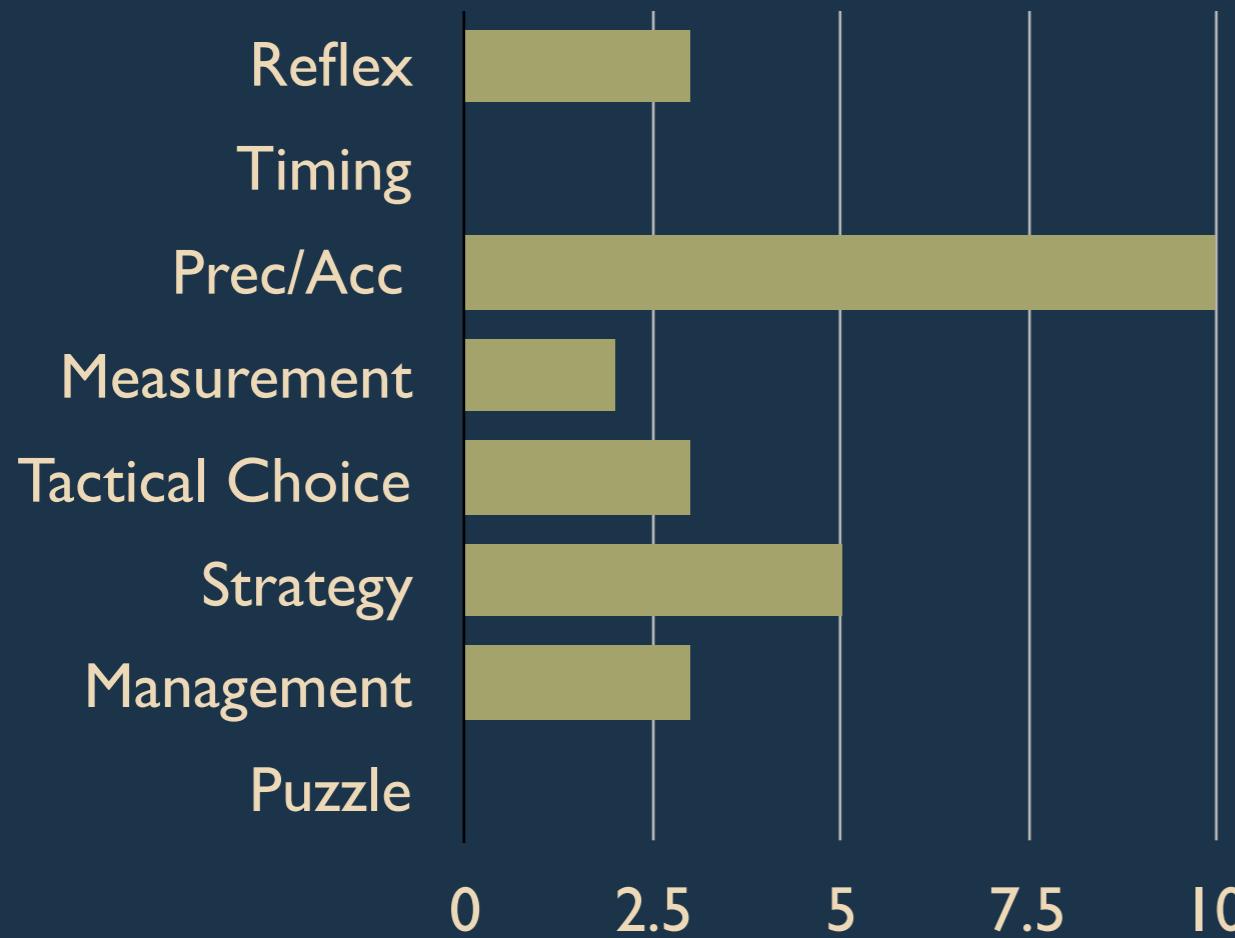
- DotA



EXAMPLES

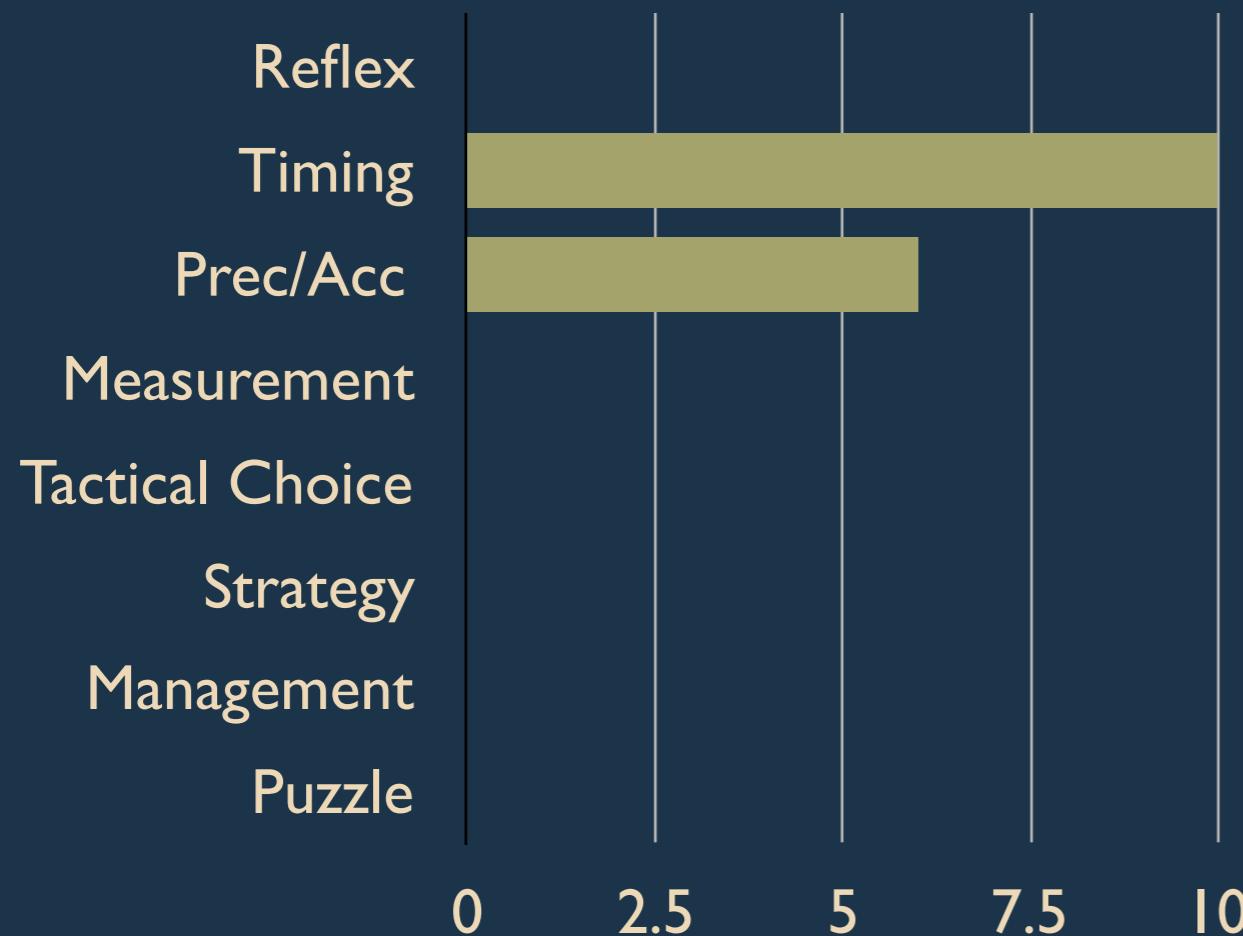


- Counter Strike



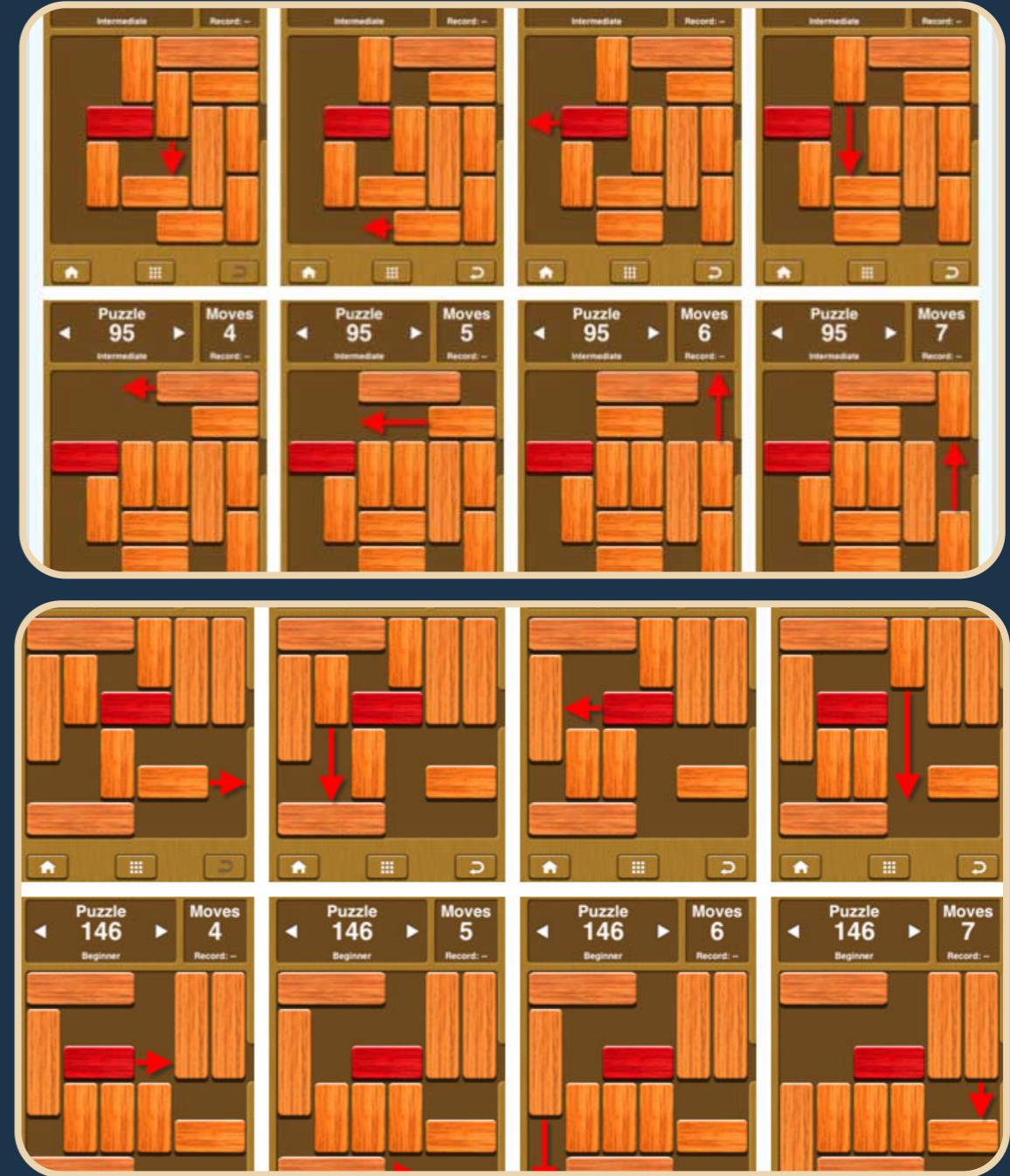
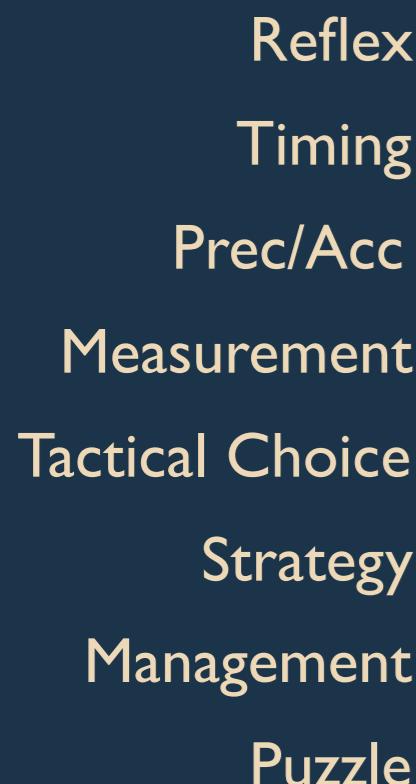
EXAMPLES

- Just Dance



EXAMPLES

- Unblock Me

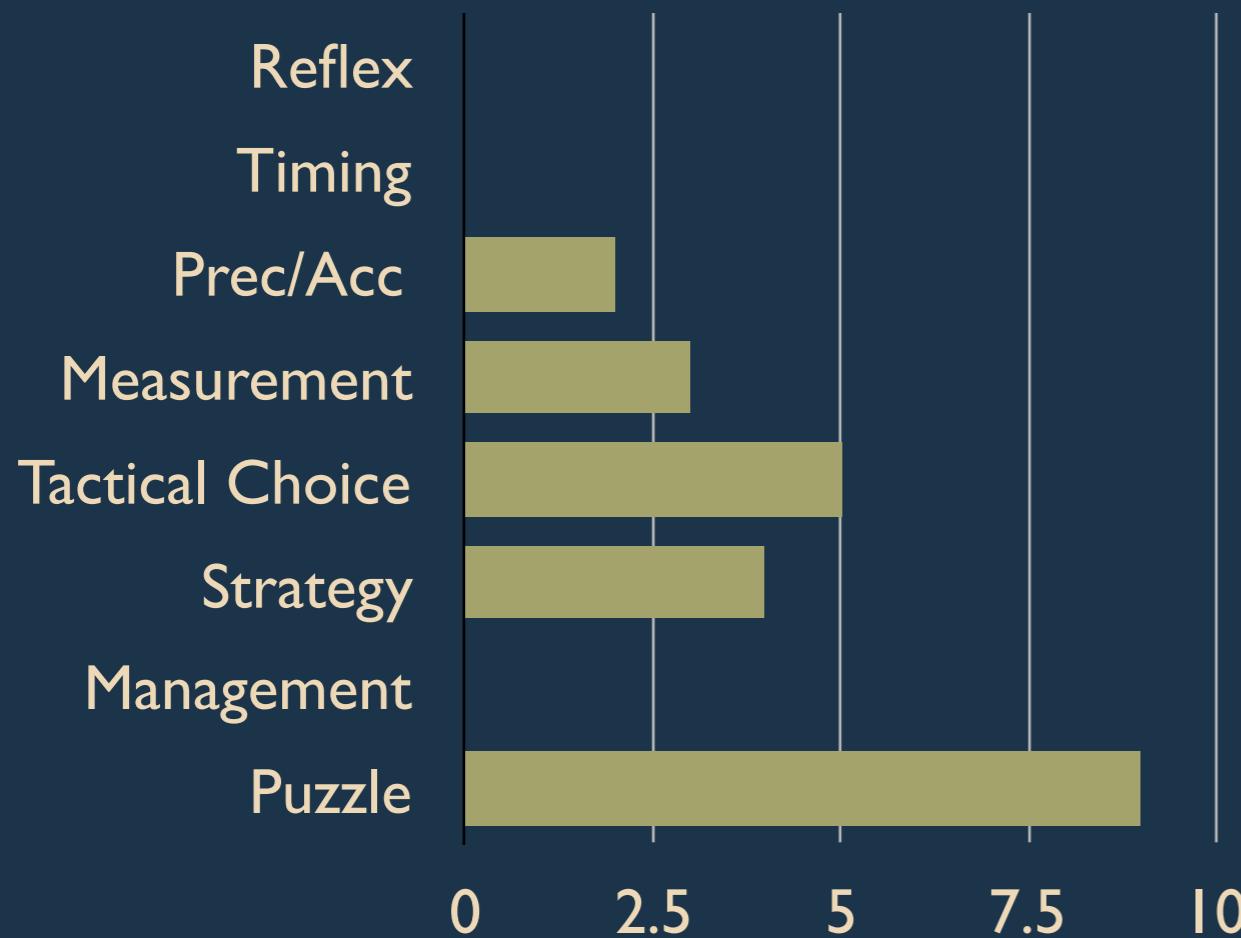


Unblock Me

EXAMPLES



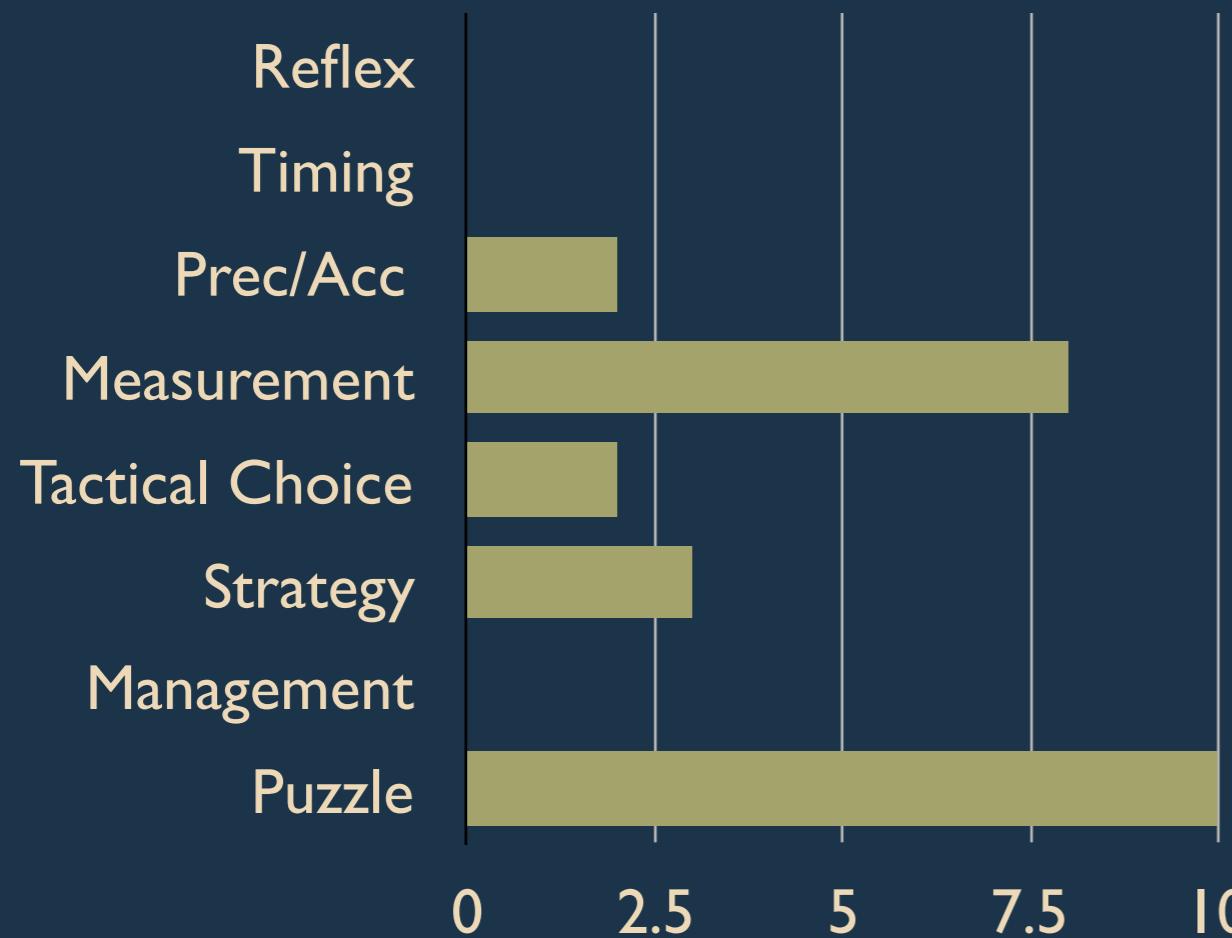
- Prince of Persia



EXAMPLES



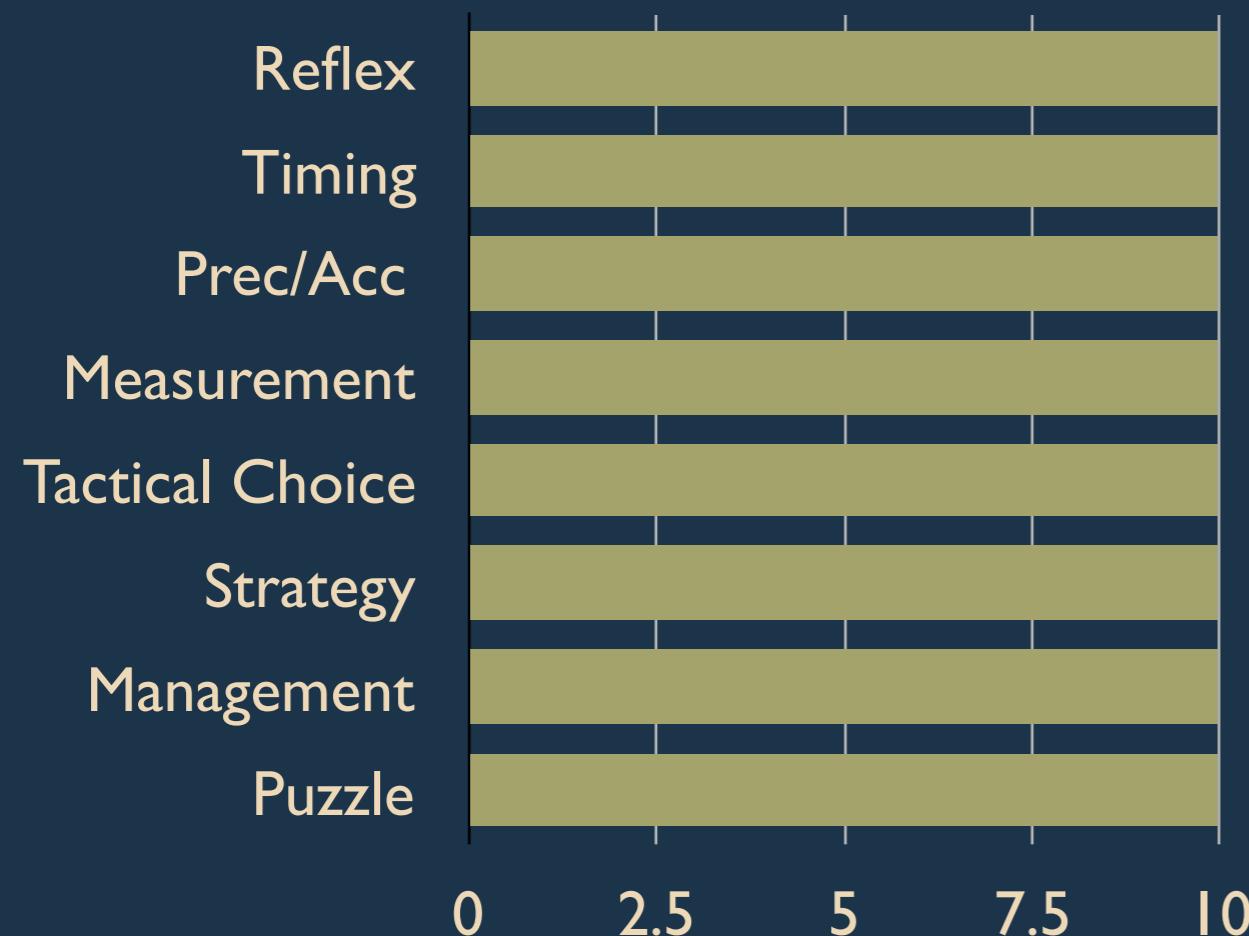
- Portal



DESIGN PRINCIPLE

- The more core mechanics your game has, the more difficult it is to play
- Most games have **one** dominant core mechanics
- *Tips: Focus on one core mechanics when you start designing a game. Afterwards, gather examples from games with similar core mechanics. Think about which aspects can be improved or modified, or use them as sources for inspiration*

DESIGN PRINCIPLE



- It is **impossible** to enjoy and complete a game like this
- Recall: rule#1 fight player fatigue

SUMMARY

- Definition of game mechanics
- Core game mechanics
- Examples
- Design principle of game mechanics

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Foundations of
Game Design
and Development

OCTALYSIS

The complete gamification
framework

WHAT WE HAVE LEARNED SO FAR

- **Introduction:** history, current trends, 100 rules of game mechanics
 - Informal ‘must-have’ rules according to popular beliefs, as an introduction to the course
 - Goal: to learn how to design a game
- The ‘**what**’: formal elements, rules, core game mechanics, and game genres:
 - Basic stuff about *what makes up a game*, *what types of games*, and *what types of players* are out there

WHAT WE ARE GOING TO LEARN

- The ‘**why**’: *Octalysis (today)*
 - Explains *why some games are successful*
 - and *why some people are attracted and / or addicted to certain games*

WHAT IS OCTALYSIS?

- Created by Yu-kai Chou
 - Gamification pioneer
 - Spoken as a speaker/lecturer at organizations such as Google, Tesla, Stanford University, LEGO, TEDx, and Boston Consulting Group
- Octalysis is a *gamification framework* - also known as human-focused or **behavioral design**

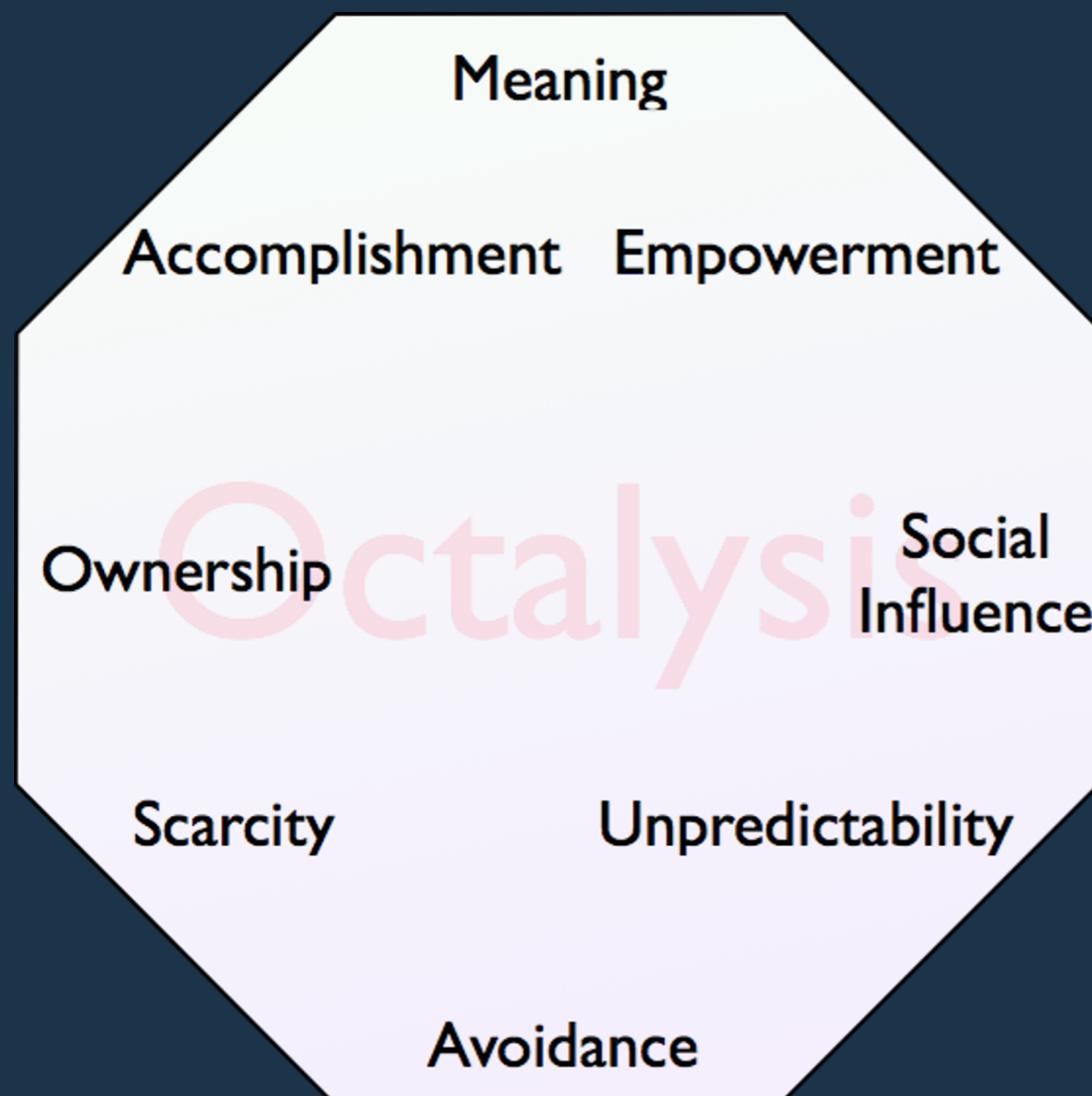
GAMIFICATION FRAMEWORK

- Gamification is the **craft of deriving** all the *fun* and *engaging* elements found in games and **applying** them to real-world or productive activities
- Framework: an **essential supporting structure**
- It is a **human-focused design**, as opposed to *function-focused design*
 - A design process that optimizes for human motivation in a system, as opposed to pure efficiency.

PURPOSE

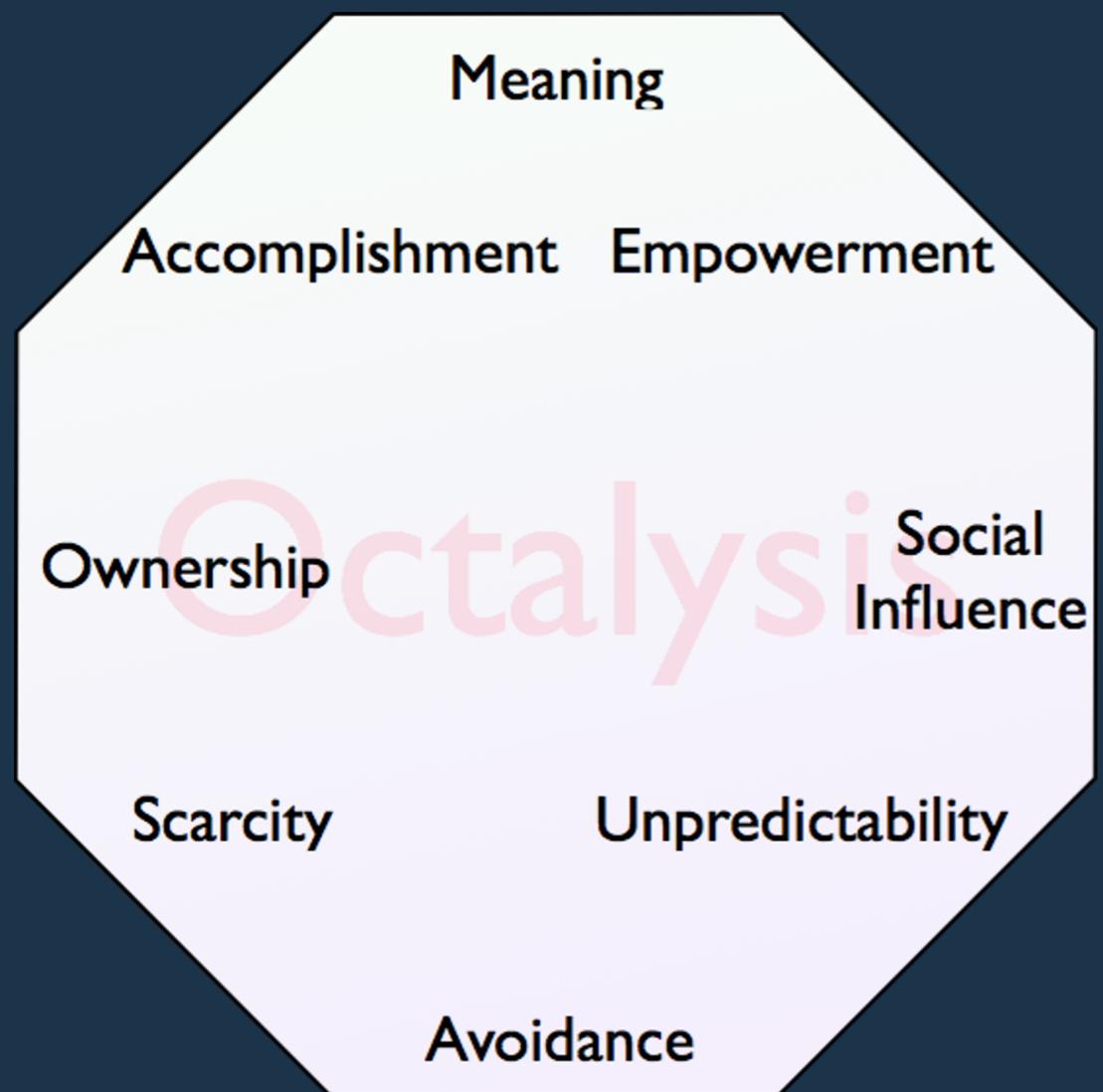
- To **analyze and build strategies** around the various systems that make a game **fun**
- Almost every game is fun because it **appeals** to certain *Core Drives* within us that **motivate us towards certain activities**
- Different types of game techniques push us forward differently: inspiring way / obsessive way / manipulative way / empowering way
- The author drilled down to find what differentiates one type of motivation to another
- Hence resulting in the gamification framework called the Octalysis

THE OCTALYSIS



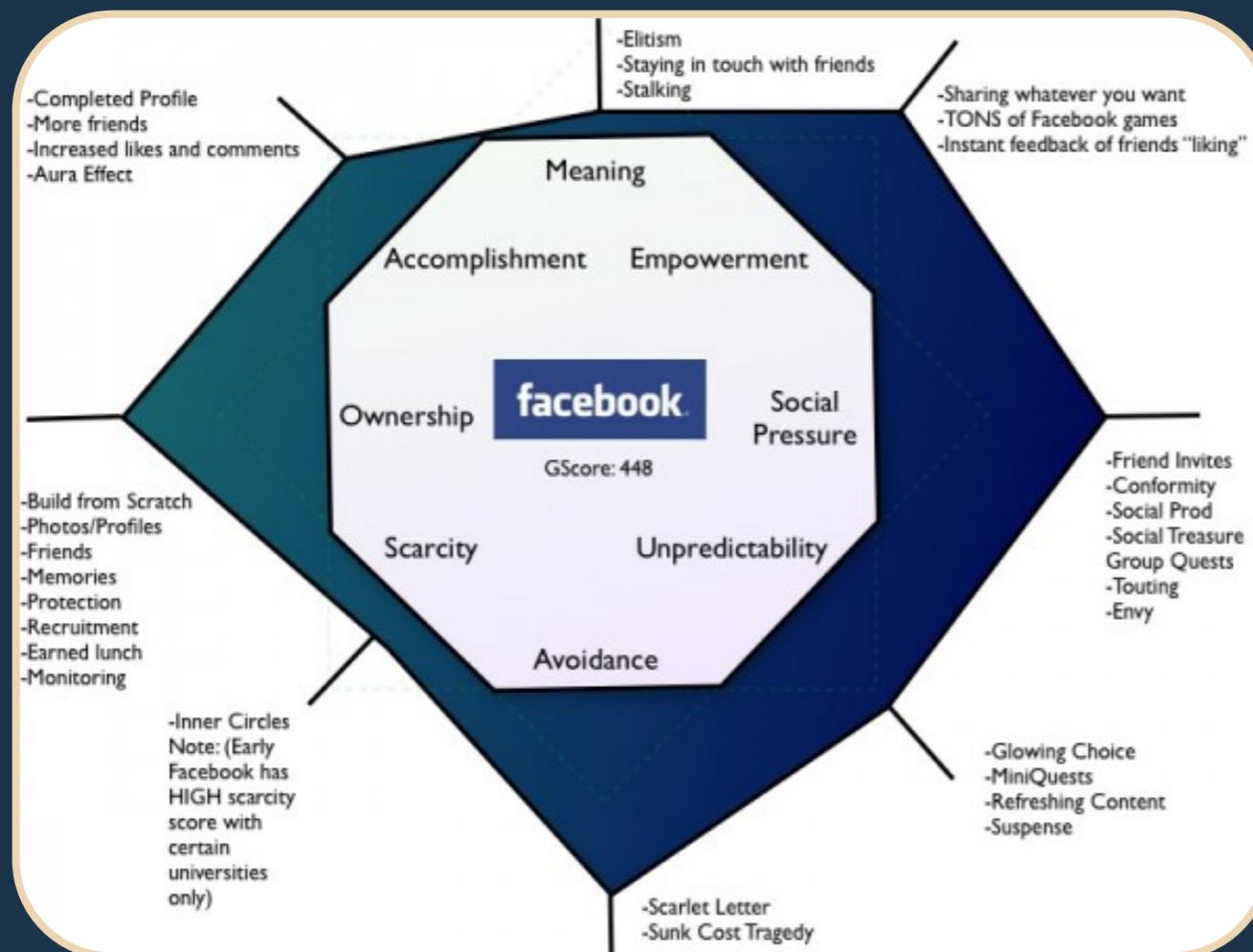
- Each side represents a Core-drive
- Recall: core-drive is what motivates us towards certain activities

THE OCTALYSIS



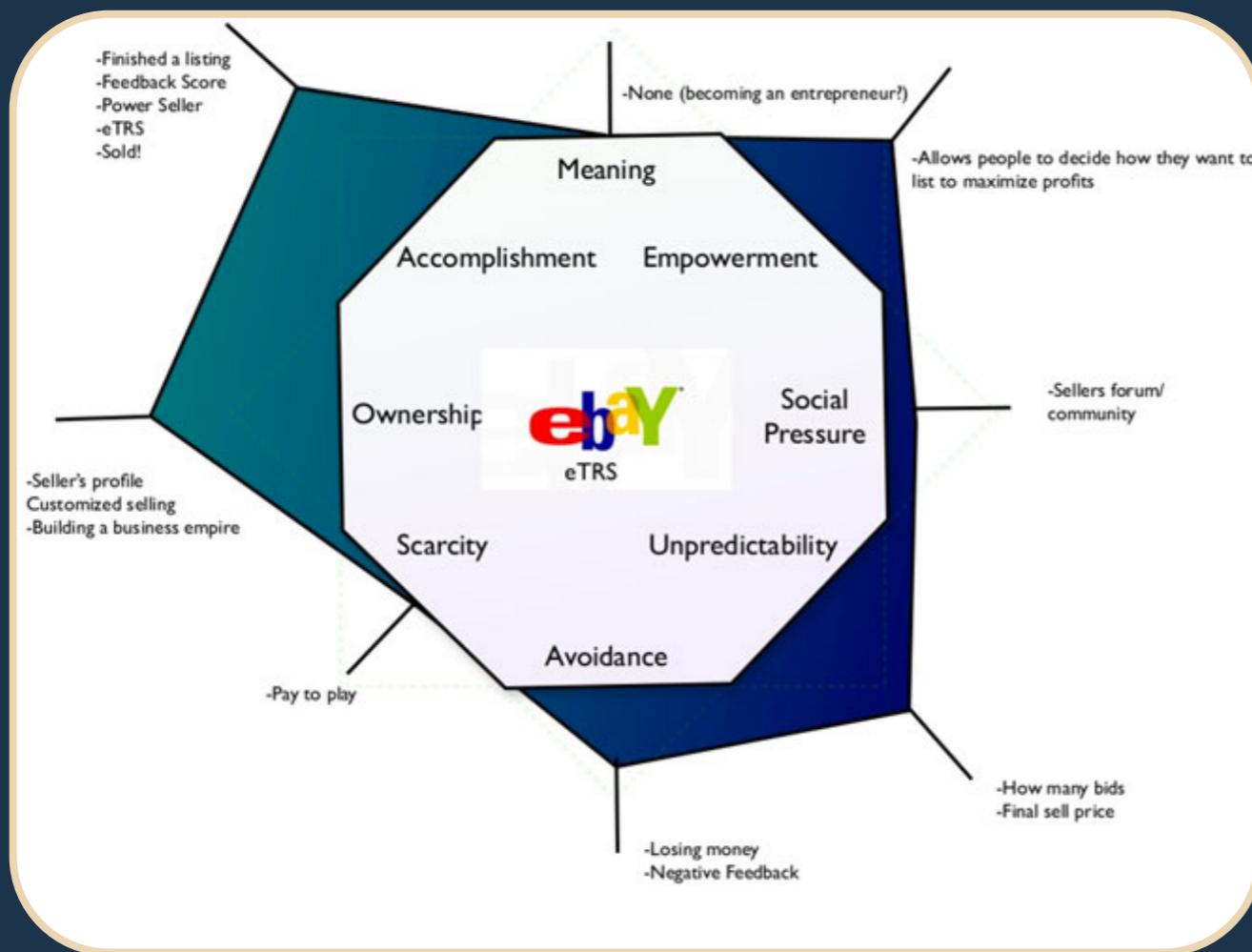
- Recall: "A **game** is a system in which players engage in an artificial conflict, defined by rules, that results in a quantifiable outcome." (Rules of Play, Salen & Zimmerman)
- We can stretch the definition see more things as a 'game', e.g: social media, life
- So, octalysis doesn't just apply to conventional video games or serious games

THE OCTALYSIS



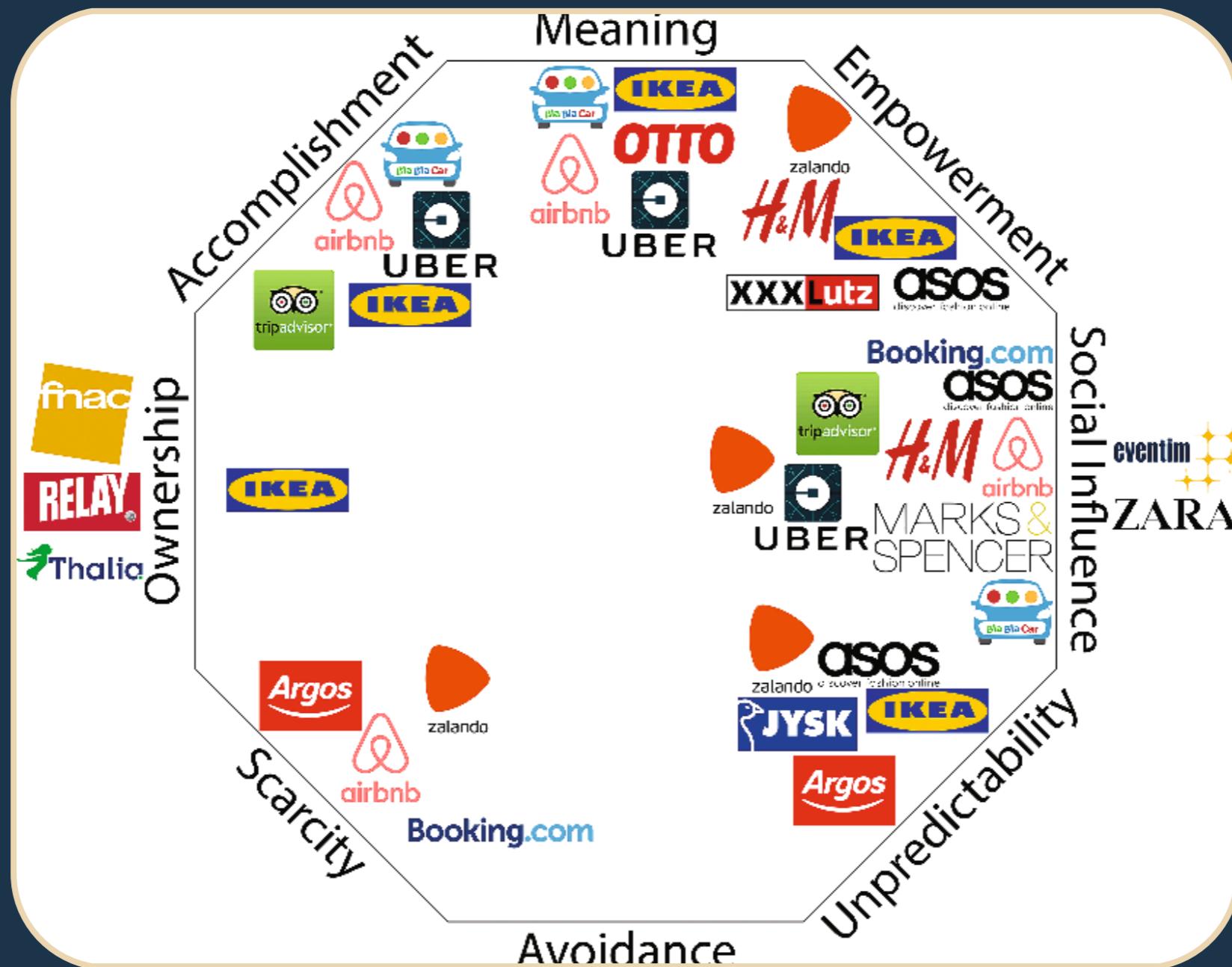
- Applied on Facebook
- Why do people use Facebook actively?
- Some are even *addicted*
- Biggest core-drives : Social pressure, empowerment, avoidance, and ownership

THE OCTALYSIS



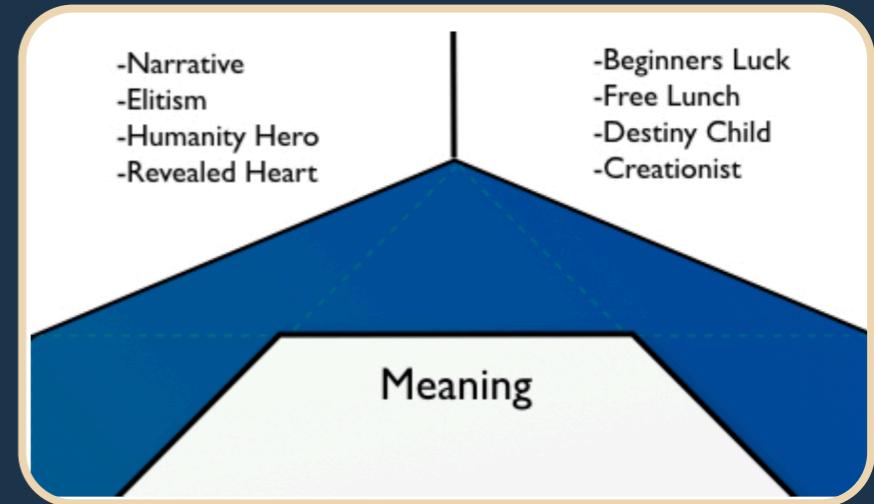
- Applied on Ebay
- Why do people use Ebay actively? (beside of course the functional / practical reason of buying stuff)
- Biggest core-drives : Ownership, accomplishment, and unpredictability

THE OCTALYSIS IN E-COMMERCE



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EPIC MEANING & CALLING



- *How this core drive works:*
 - When players believe that they are doing something greater than themselves or that they were “chosen” to do something (recall rule#46 raise the emotional stakes to maximize player involvement)
 - When players believe they have ‘Beginner’s Luck’

EPIC MEANING & CALLING

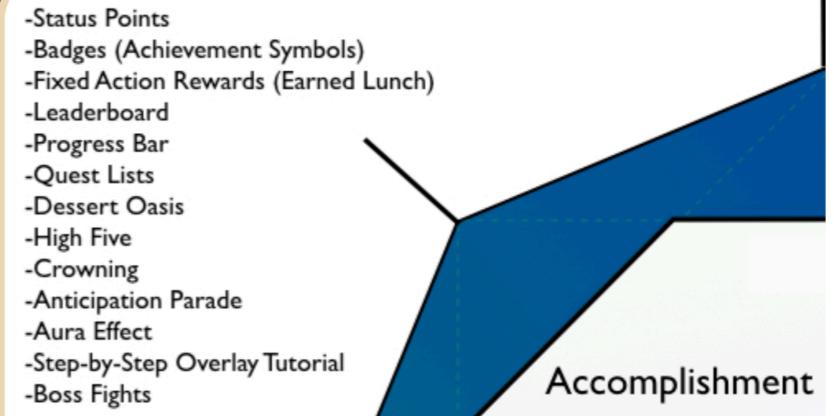


- Example of activities driven by this core drive:
 - Feeling emotionally affected by a game storyline
 - Devote a lot of his time to maintaining a forum or helping to create things for the entire community (Wikipedia / open source projects)



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DEVELOPMENT & ACCOMPLISHMENT



- How *this core drive works*:
- When players feel **internal drive** of making progress, developing skills, and eventually overcoming challenges

DEVELOPMENT & ACCOMPLISHMENT



- Example of activities driven by this core drive:
 - Keep doing challenges and collect badges or trophies to remind them of their achievements

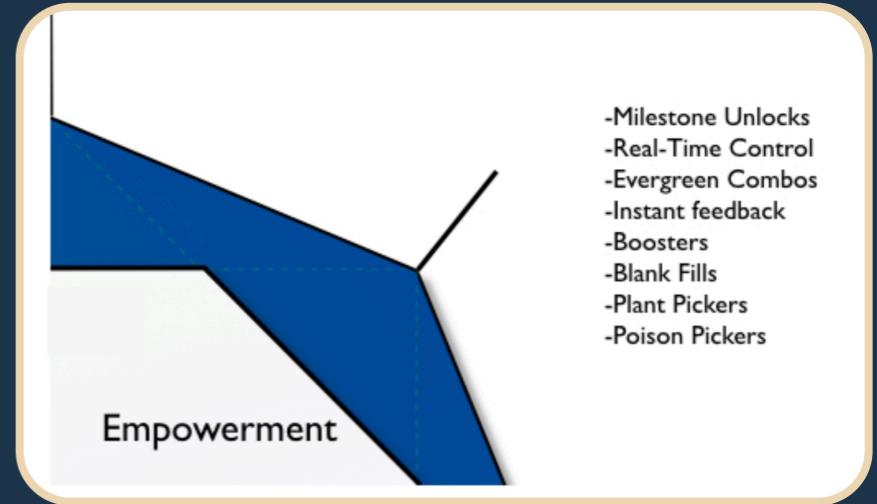
DEVELOPMENT & ACCOMPLISHMENT



- The word “*challenge*” here is very important, as a badge or trophy without a challenge is not meaningful at all (recall rule#62 make challenges require skill, rule#61 player should see their goal before they achieve it)

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EMPOWERMENT OF CREATIVITY & FEEDBACK



- *How this core drive works:*
 - When players long to receive (positive) feedbacks after they figure things out or display their creativity, so that they may feel smart (recall rule#59 make the player feels smart)

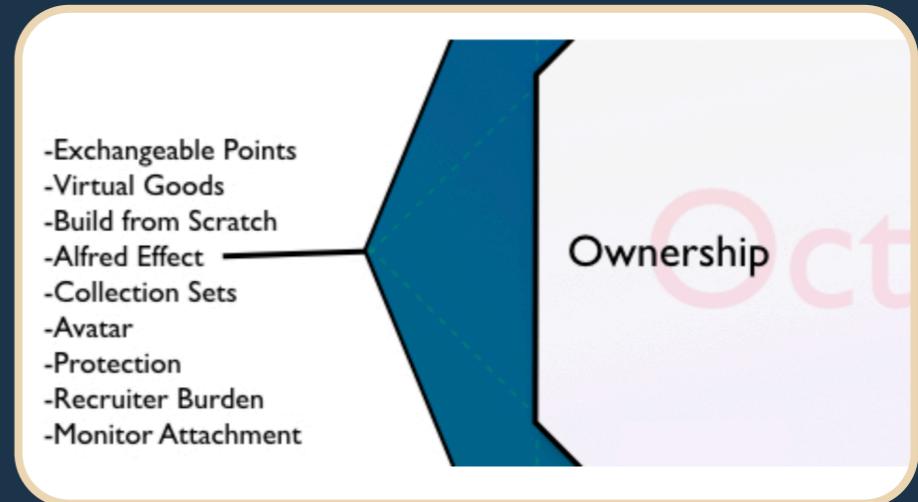
EMPOWERMENT OF CREATIVITY & FEEDBACK



- *Example of activities driven by this core drive:*
 - Activities where they can express their creativity, and also able to see the results of their creativity, receive feedback, and respond in turn (painting, playing legos, posting on Facebook)

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OWNERSHIP & POSSESSION



- *How this core drive works:*
- When players are motivated because they feel like they own something, and innately wants to make what they owns better and **own even more**

OWNERSHIP & POSSESSION



- *Example of activities driven by this core drive:*
 - Players who accumulate ‘wealth’:
 - collect virtual goods
 - currencies,
 - heavily customise their profile or avatar



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SOCIAL INFLUENCE & RELATEDNESS



- *How this core drive works:*
 - When players long for social elements, such as mentorship, acceptance, social responses, companionship, as well as competition and envy

SOCIAL INFLUENCE & RELATEDNESS



- Example of activities driven by this core drive:
 - People who constantly attempt to blend in, be as good (or even better) as other people,

SOCIAL INFLUENCE & RELATEDNESS

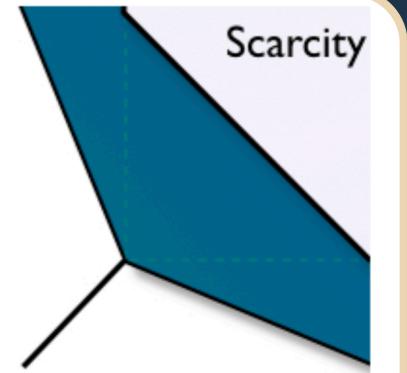
- Look for **nostalgic** elements (people/places/activities) which they can relate to easily (recall **rule#5** make your game familiar yet different)



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SCARCITY & IMPATIENCE

- Appointment Dynamics
- Magnetic Caps
- Dangling
- Prize Pacing
- Options Pacing
- Last Mile Drive
- Count Down Timer
- Torture Breaks
- Moats
- The Big Burn



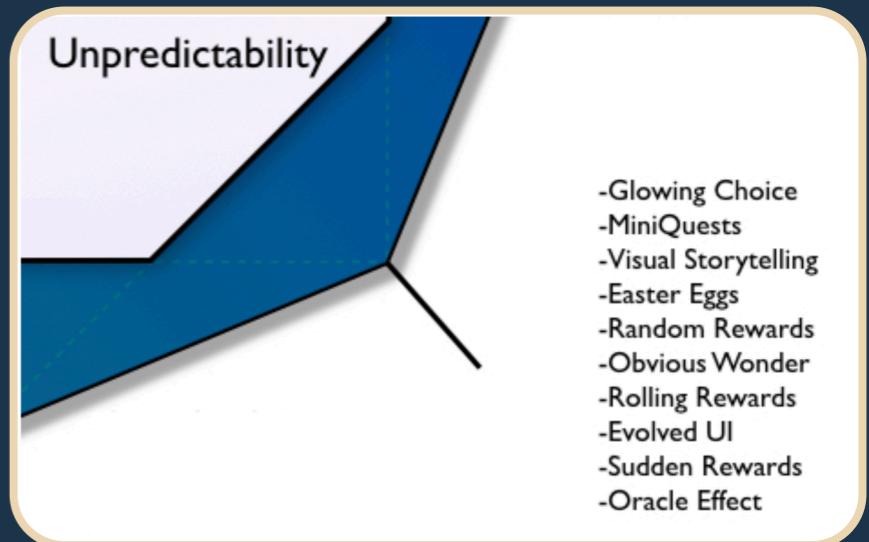
- *How this core drive works:*
- When players want something (even more) because they couldn't have it or that it is not easy to get (recall rule#16 distribute assets asymmetrically)

SCARCITY & IMPATIENCE

- Example of activities driven by this core drive:
- Spend hours trying to obtain / thinking of that particular object which value looks ‘expensive’ just because its rare



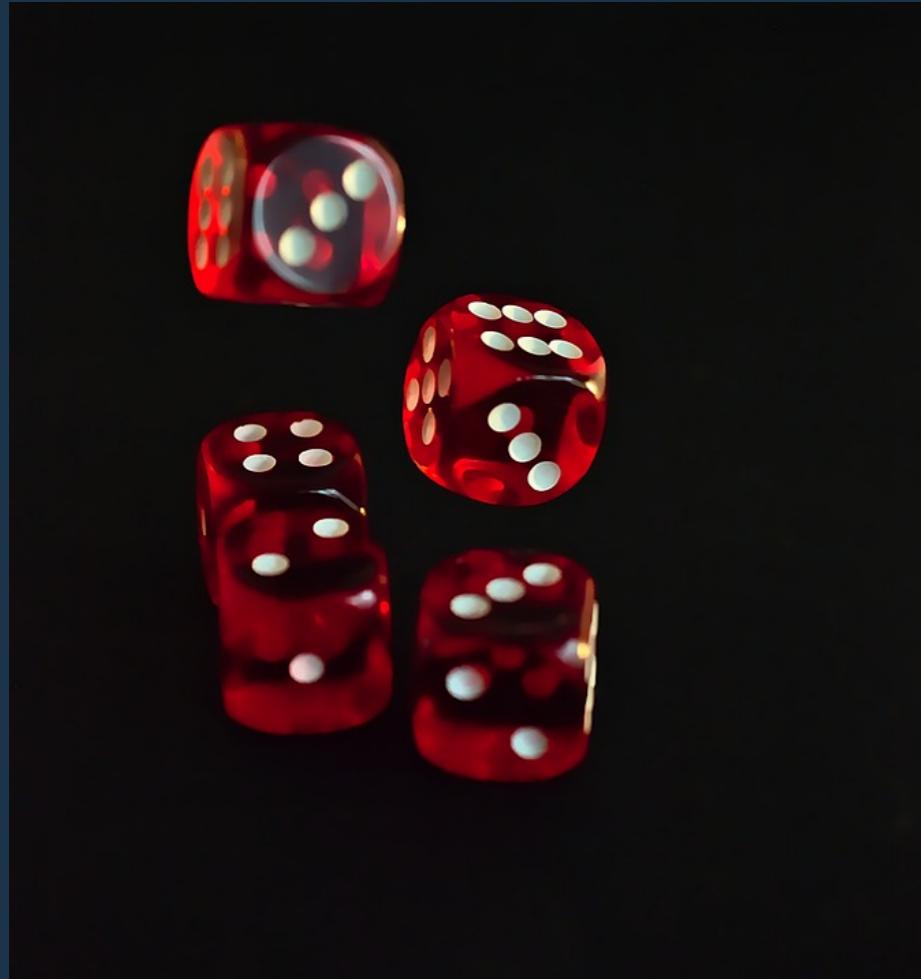
UNPREDICTABILITY & CURIOSITY



- *How this core drive works:*
 - Appeal to players' innate **curiosity** (recall **rule#22** add a small amount of randomness to AI calculations)
 - Invoking the drive of wanting to find out what will happen next, **avoiding boredom**

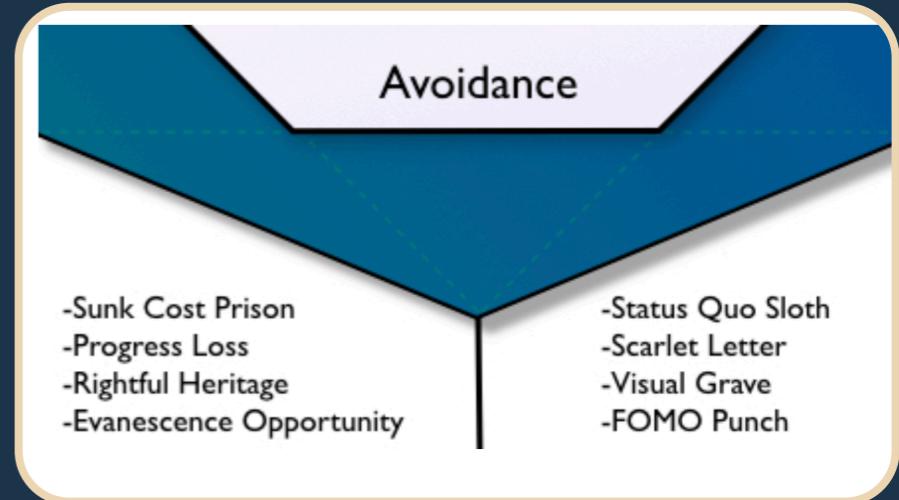


UNPREDICTABILITY & CURIOSITY



- *Example of activities driven by this core drive:*
 - Watch movies, binge watching tv series or read novels
 - Gambling addiction

LOSS & AVOIDANCE



- How this core drive works:
 - When players are **afraid** of something negative happening (such as missing out, losing previous work, gossiped), thus avoiding it will be the first logical thing to do

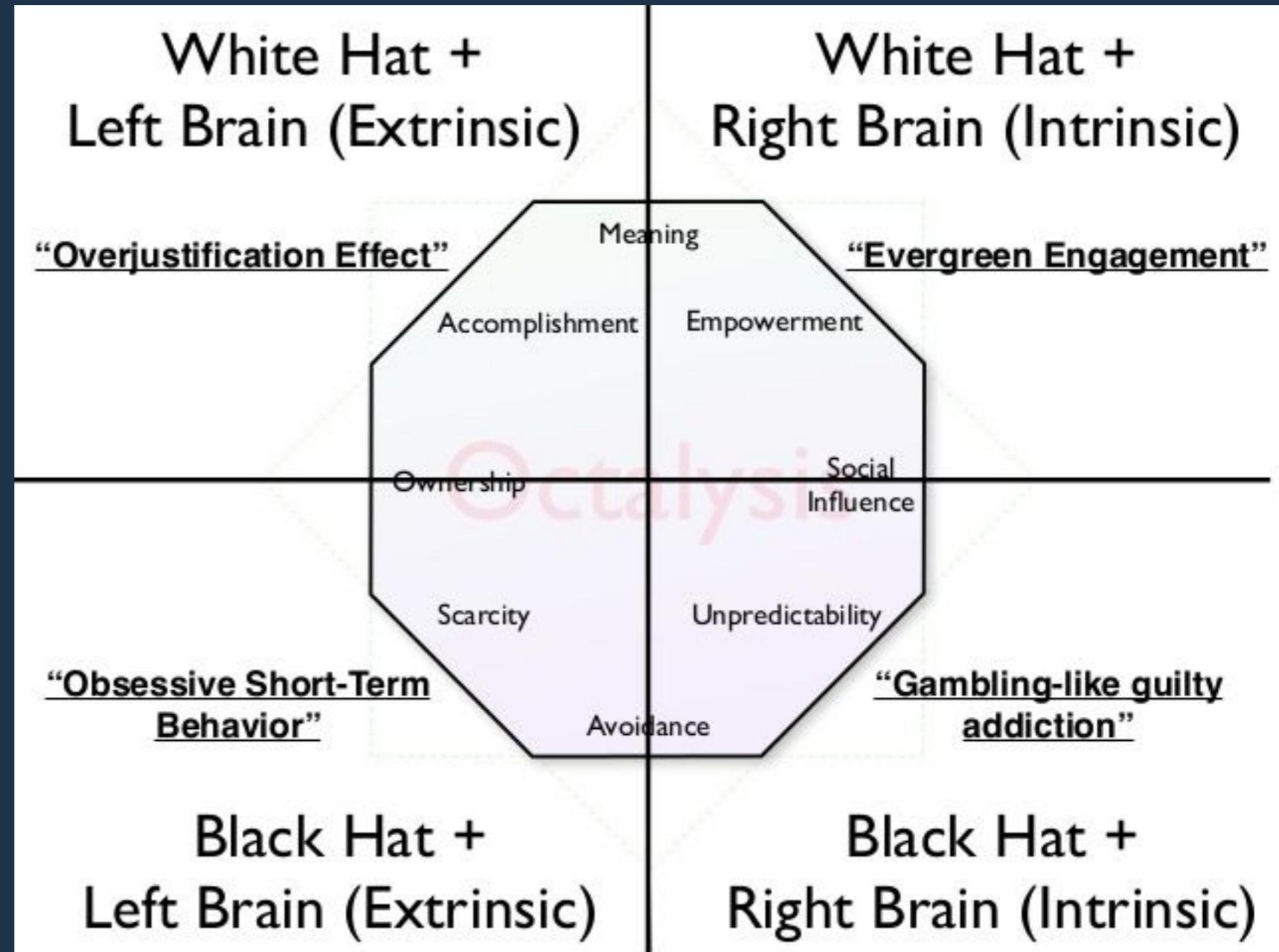
LOSS & AVOIDANCE



- *Example of activities driven by this core drive:*
 - Avoid quitting because one doesn't want to admit that whatever's been done is now futile
 - Fear of missing out in social media hence one constantly use it

ALTERNATE VIEW

- Another way of looking at the Octalysis (besides separating it into 8 sides like we did earlier):



LEFT BRAIN VS RIGHT BRAIN

- Right Brain Core Drives:

- Meaning, Empowerment, Social Influence, Unpredictability, Avoidance
- More related to creativity, self-expression, and social aspects,
- Intrinsic Motivators: you don't need a goal or reward to use your creativity, hangout with friends, or feel the suspense of unpredictability – the activity itself is rewarding on its own.

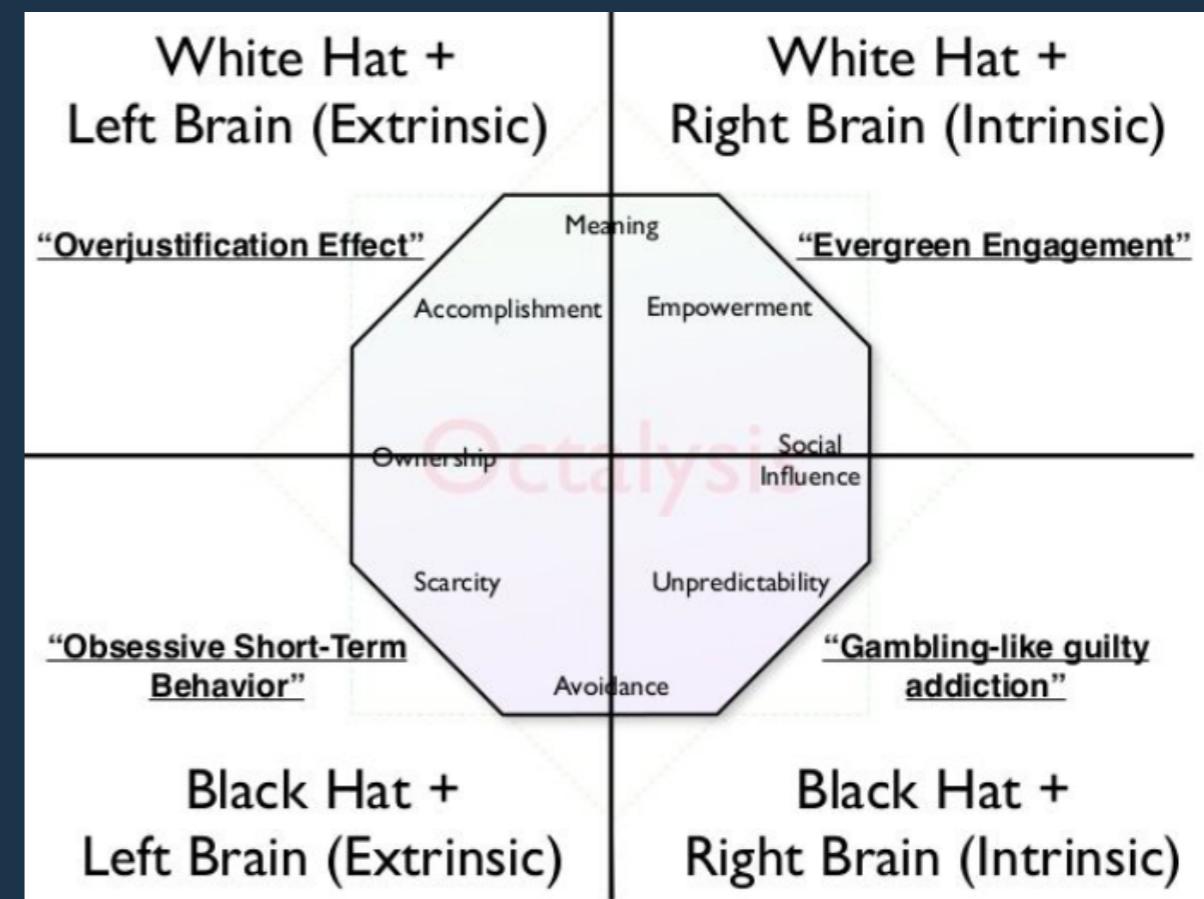
LEFT BRAIN VS RIGHT BRAIN

- Left Brain Core Drives:

- Meaning, Accomplishment, Ownership, Scarcity, Avoidance
- More associated to logic, calculations, and ownership.
- Extrinsic Motivators – you are motivated because you want to obtain something, whether it be a goal, a good, or anything you cannot obtain

WHITE HAT VS BLACK HAT

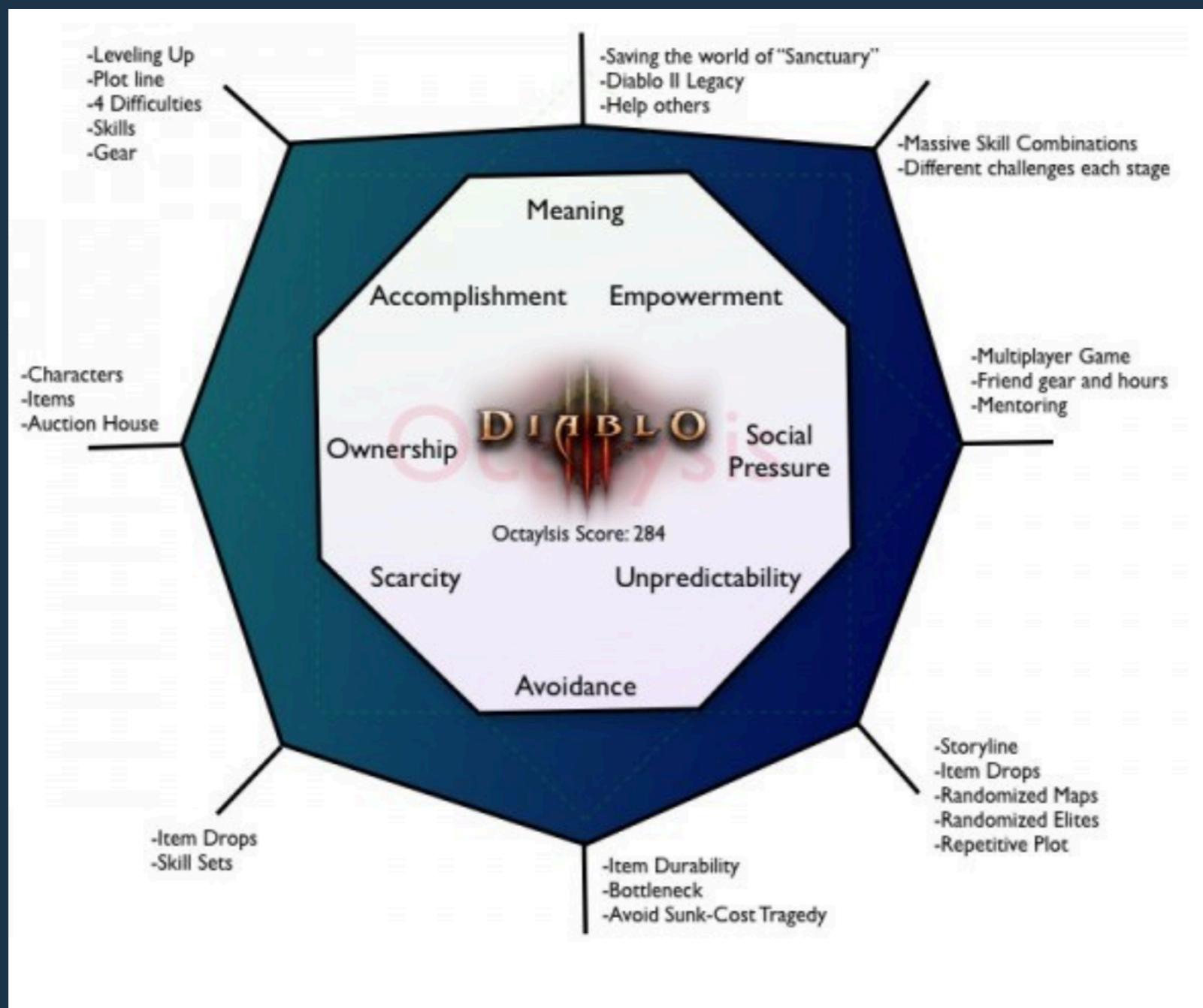
- White Hat Core Drives:
 - Ownership, accomplishment, meaning, empowerment, social influence
 - All are positive motivators
 - Make people ‘feel good’



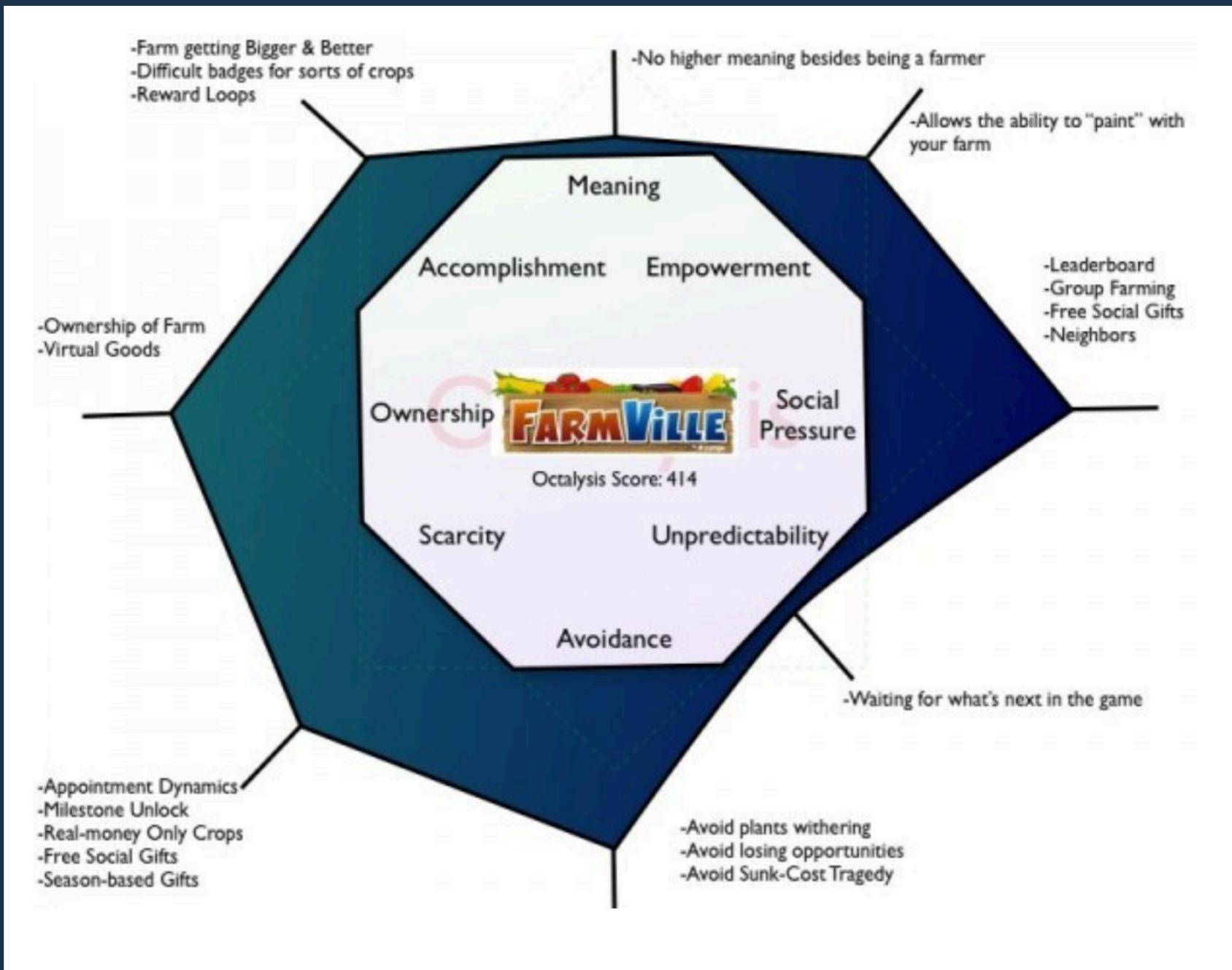
WHITE HAT VS BLACK HAT

- Black Hat Core Drives:
 - Ownership, scarcity, avoidance, unpredictability, social influence
 - All are negative motivators
 - Players do not ‘feel’ good but are motivated because they feel like they do not want to feel worse, just like any addiction

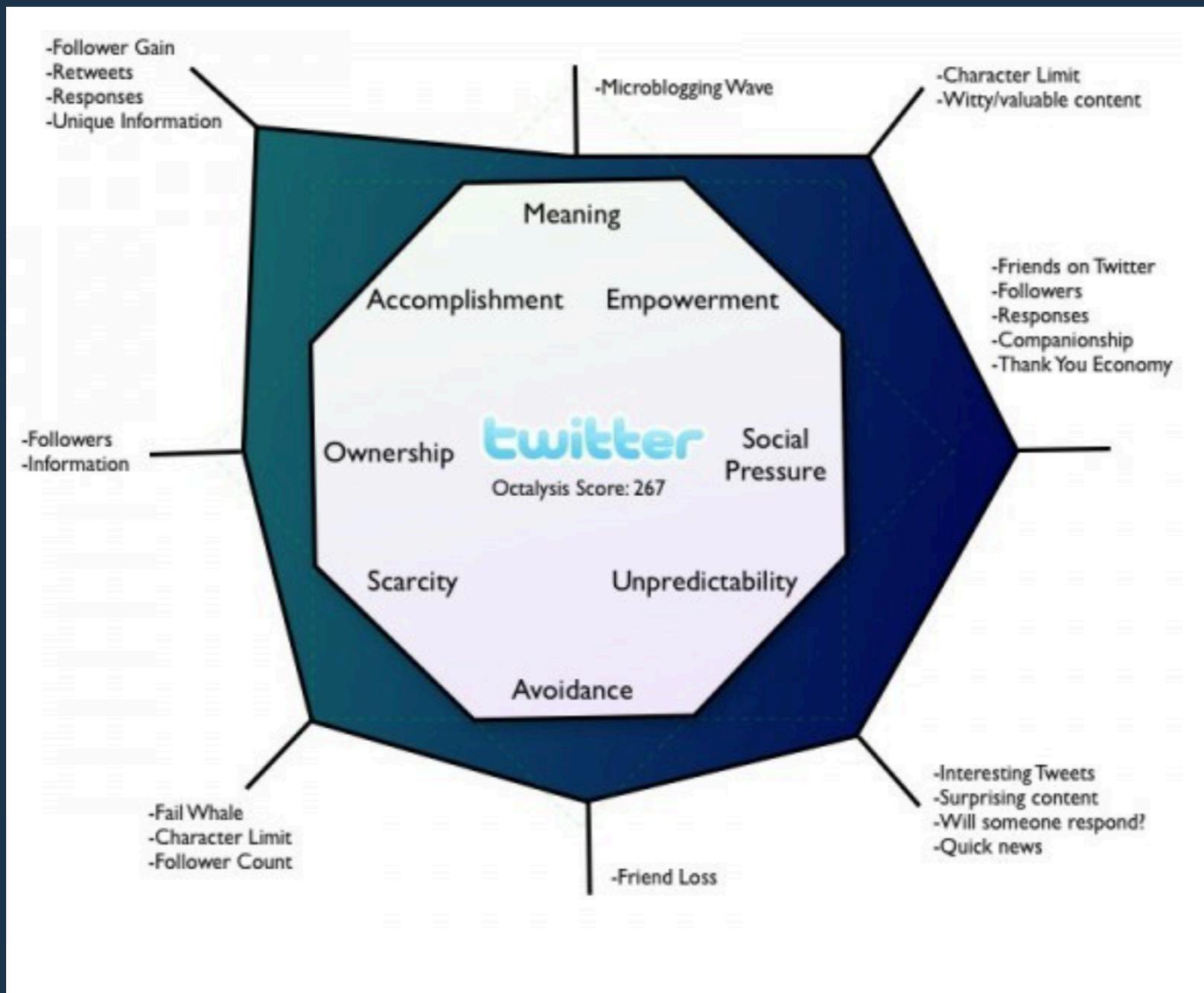
EXAMPLES



EXAMPLES



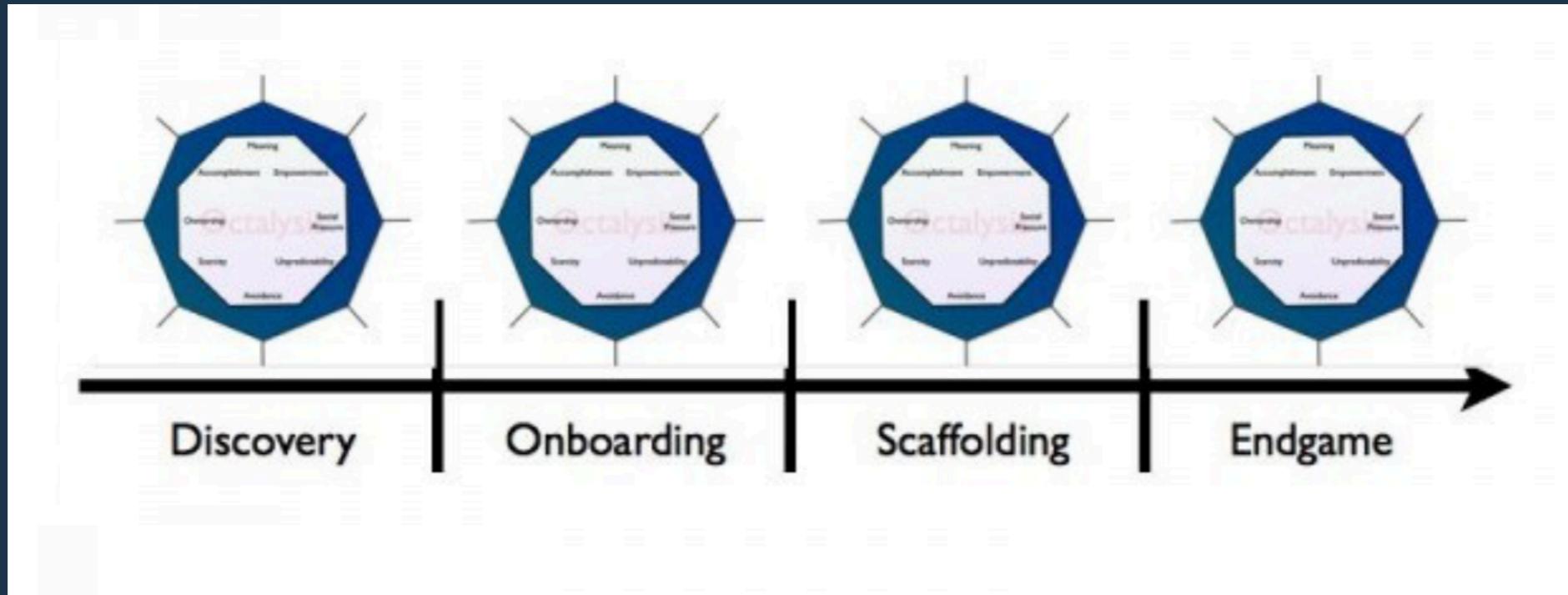
EXAMPLES



APPLYING OCTALYSIS

- Generally, any good and engaging product or system will have at least one of the core drives listed above
- A good Gamification expert will consider all 8 Core Drives on a positive and productive activity so that everyone ends up happier and healthier

LEVEL 2 OCTALYSIS

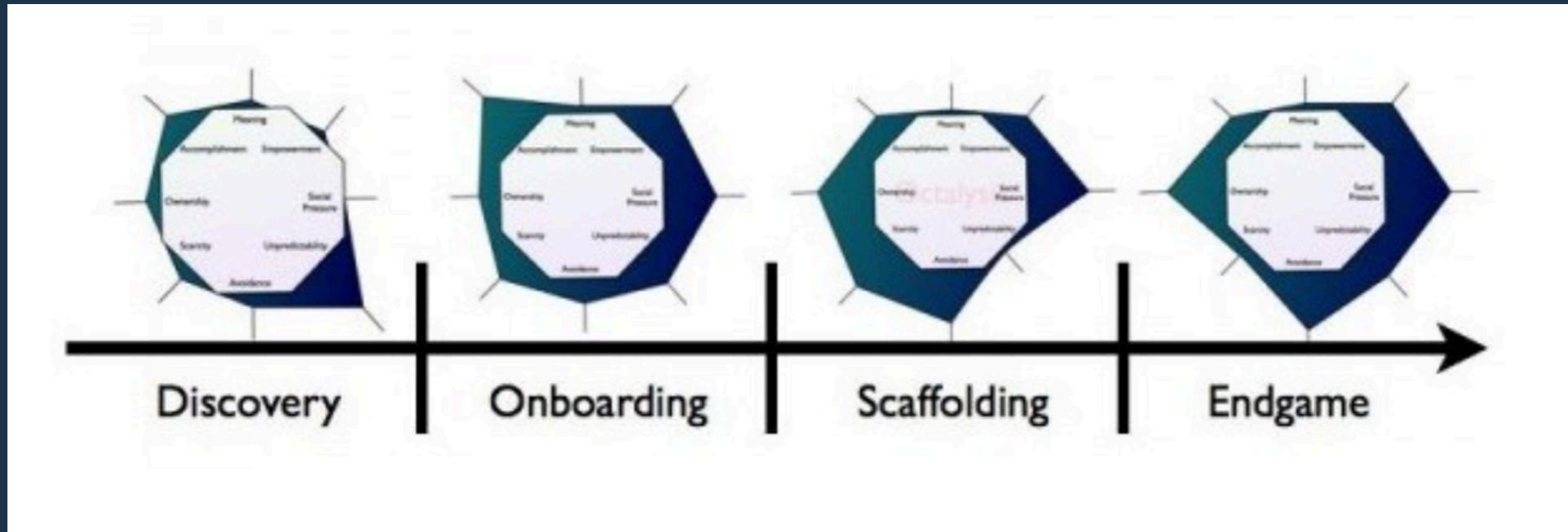


- Apply octalysis to players belonging in each part of the game, instead of the game as a whole
- What we want: existence of at least 1 core drive on each part of the game

LEVEL 2 OCTALYSIS

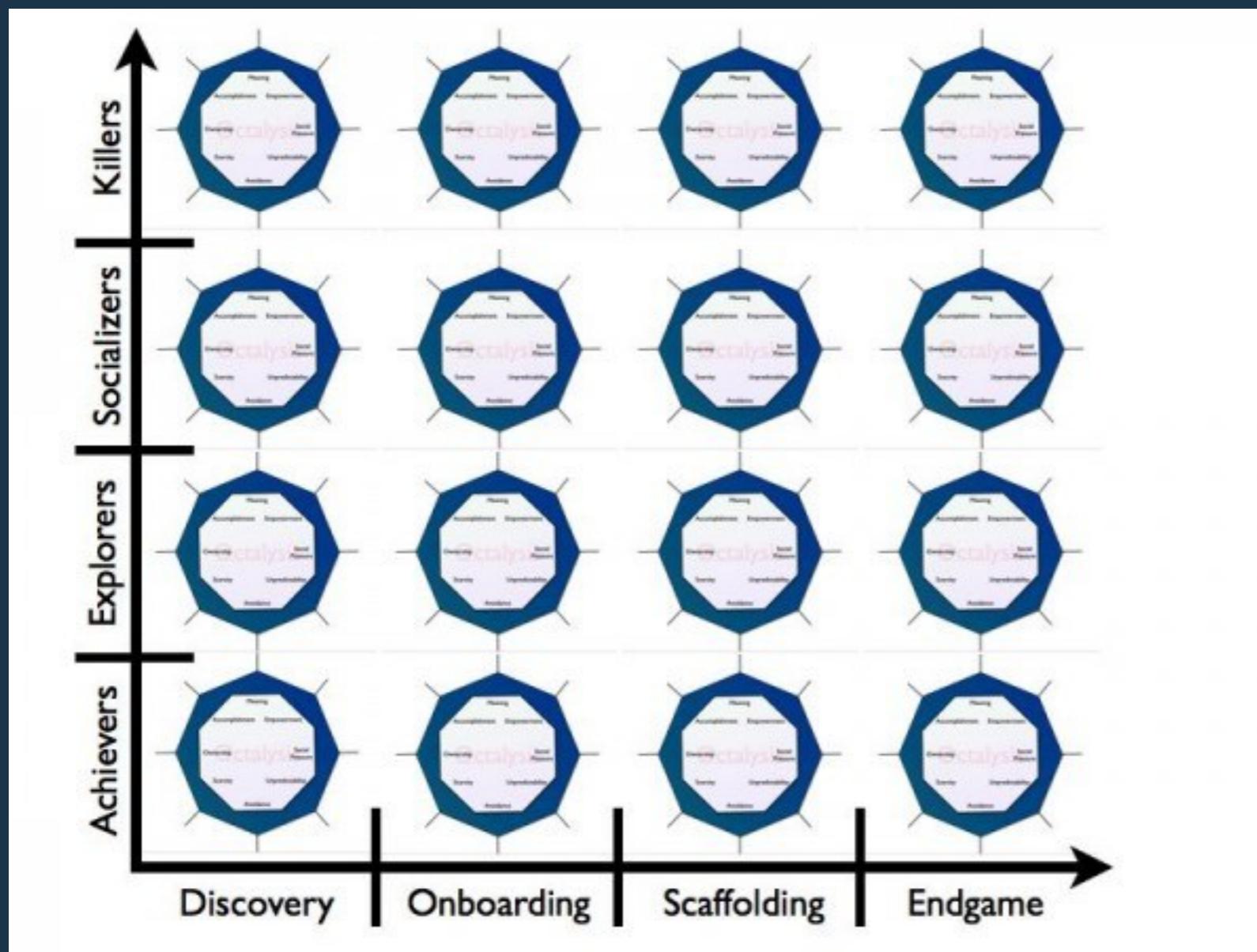
- Motivating players in **different game stages:**
 - Discovery: attracts players to begin the game
 - Onboarding: teaching players the rules of the game and tools to play the game (general gameplay)
 - Scaffolding: maintaining the interest of players when undergoing regular journey of repeated actions towards the game goals
 - Endgame: how to retain the veterans

LEVEL 2 OCTALYSIS



- Apply octalysis to each part of the game (player's journey), instead of the game as a whole
- What we want: existence of at least 1 core drive on each part of the game

LEVEL 3 OCTALYSIS

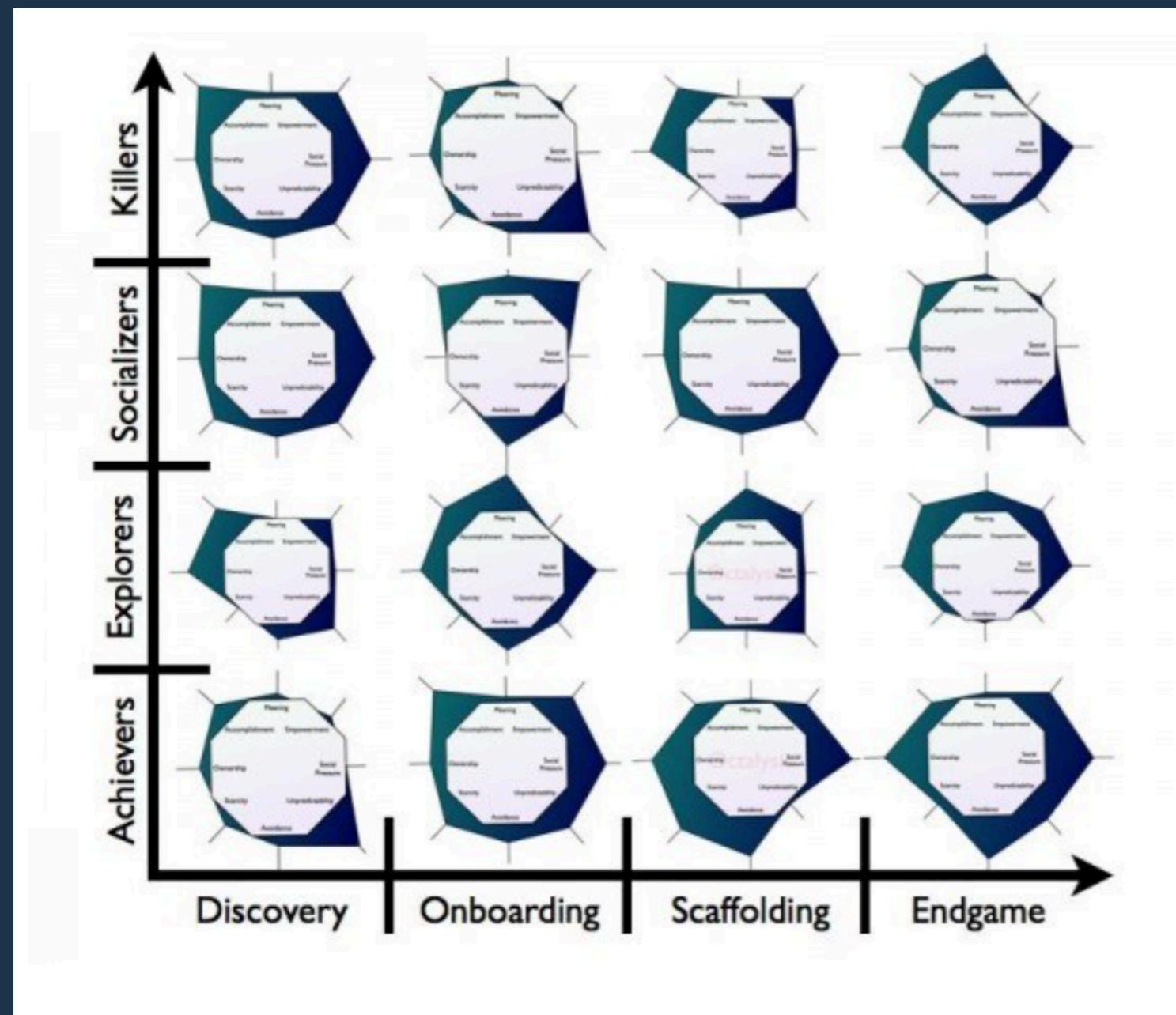


- Factor in different player types
- To analyse how different types of players can be motivated through each phase of the game

LEVEL 3 OCTALYSIS

- Types of players and their core drives:
 - Killers: accomplishment, unpredictability
 - Socializers: social pressure, avoidance
 - Explorers: meaning, empowerment
 - Achievers: ownership, scarcity

LEVEL 3 OCTALYSIS



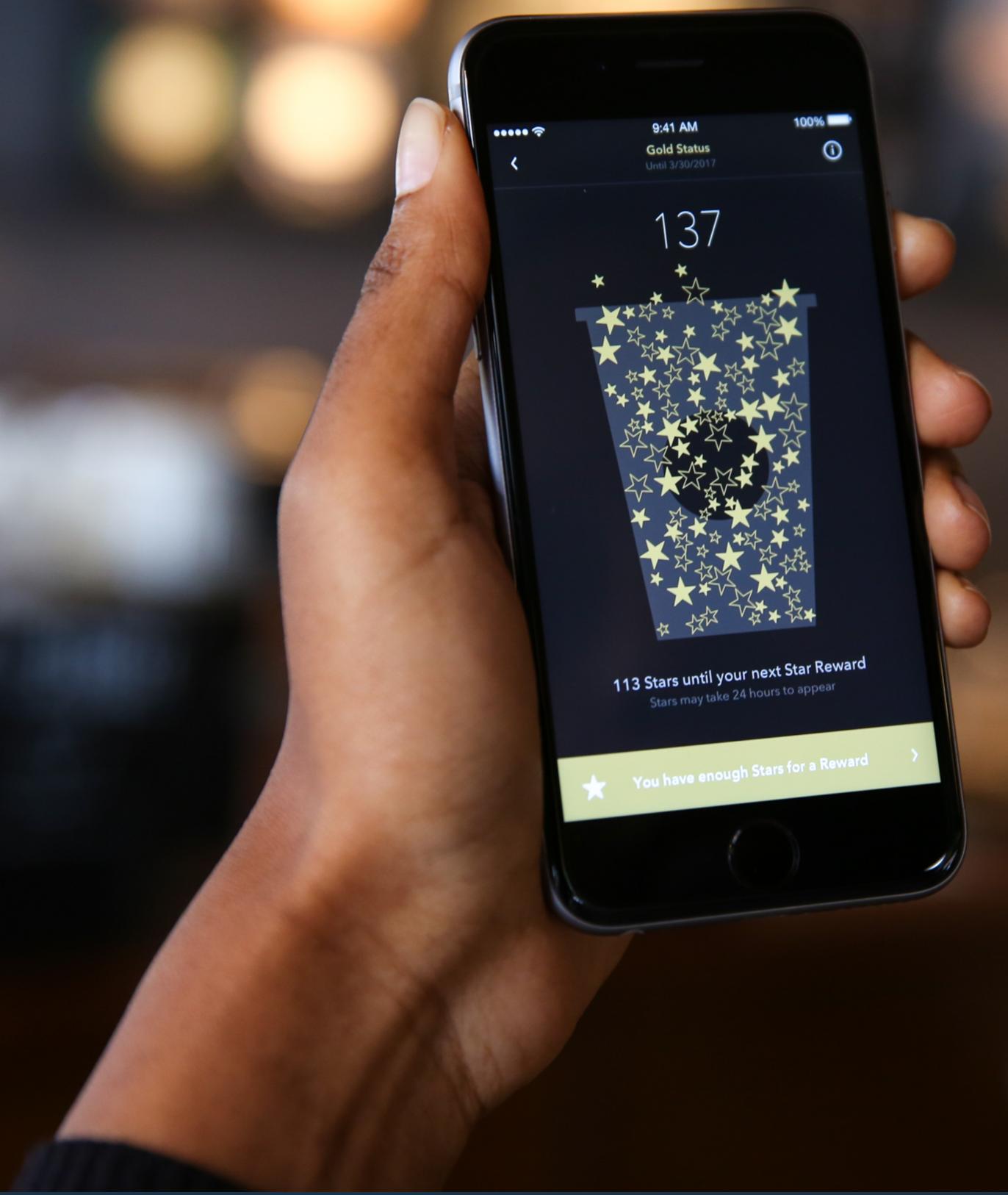
- Factor in different player types
- To analyse how different types of players can be motivated through each phase of the game

CASE STUDIES

- Marketing gamification
 - Typically known as *loyalty programmes* (but its much more!)
- eCommerce / Commerce gamification
 - People shop for fun, don't they?



Some restrictions apply.
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WELCOME

0 - 59 Stars



Buy one get one free drink reward upon
your first 5 Stars

Complimentary drink size upgrade in
birthday month

Pay by phone



GREEN

60 - 299 Stars



Redeem a free drink with every 60
Stars[^]

Complimentary slice of cake with drink
purchased in birthday month

Pay by phone

GOLD

300 Stars and above



Redeem free drink or food^
with every 60 Stars^



Complimentary drink in
birthday month



Complimentary slice of cake
with drink purchased in
birthday month



10% off merchandise in
birthday month*



Complimentary drink
size upgrade on
promotional drink



Complimentary
monthly drink
customization



Bonus Stars upon
upgrade or renewal



Personalized digital
Gold Card



Pay by phone

^60 Stars for Rewards Redemption excludes breakfast sets, selected promotional items and food and drink items that are exclusive to Starbucks Jewel Changi Airport.

*Limited to one-time use only, capped at 8 items in a single transaction.

You've earned it.
Now that you've made it to Gold level
plus exclusive member offers, and best of all,
We've registered the enclosed new Gold level Starbucks Card
to load and earn you more Stars. You can also continue to use any
Card to receive Gold level treatment. Either way you're ready to get started
new level of rewards.

As always, your registered card comes with free balance protection so signing up for
auto-reload means you'll always be ready to earn your next Star.

Enjoy all things Gold.

- Free drink on your birthday
- Refills on iced or brewed coffee and tea
are free while you're in the store
- Many flavored syrups on the house
- Soymilk or breve at your command
- Free tall (12 fl oz) drink when you buy
a pound of coffee
- Special offers and coupons
(be sure to opt in to "email")
- A free drink every 15 Stars!



Your account online, visit
only to Starbucks Cards.

A little history: your "Cardholder Since" reflects
the date you first registered a Starbucks Card.





STAR PLAYER

THE WORLD'S FIRST
**GLOBAL, LIVE
DUAL-SCREEN
FOOTBALL GAME**



INSIGHT

More than a billion people worldwide watch the UEFA Champions League. Over 70% watch on their own, at home.

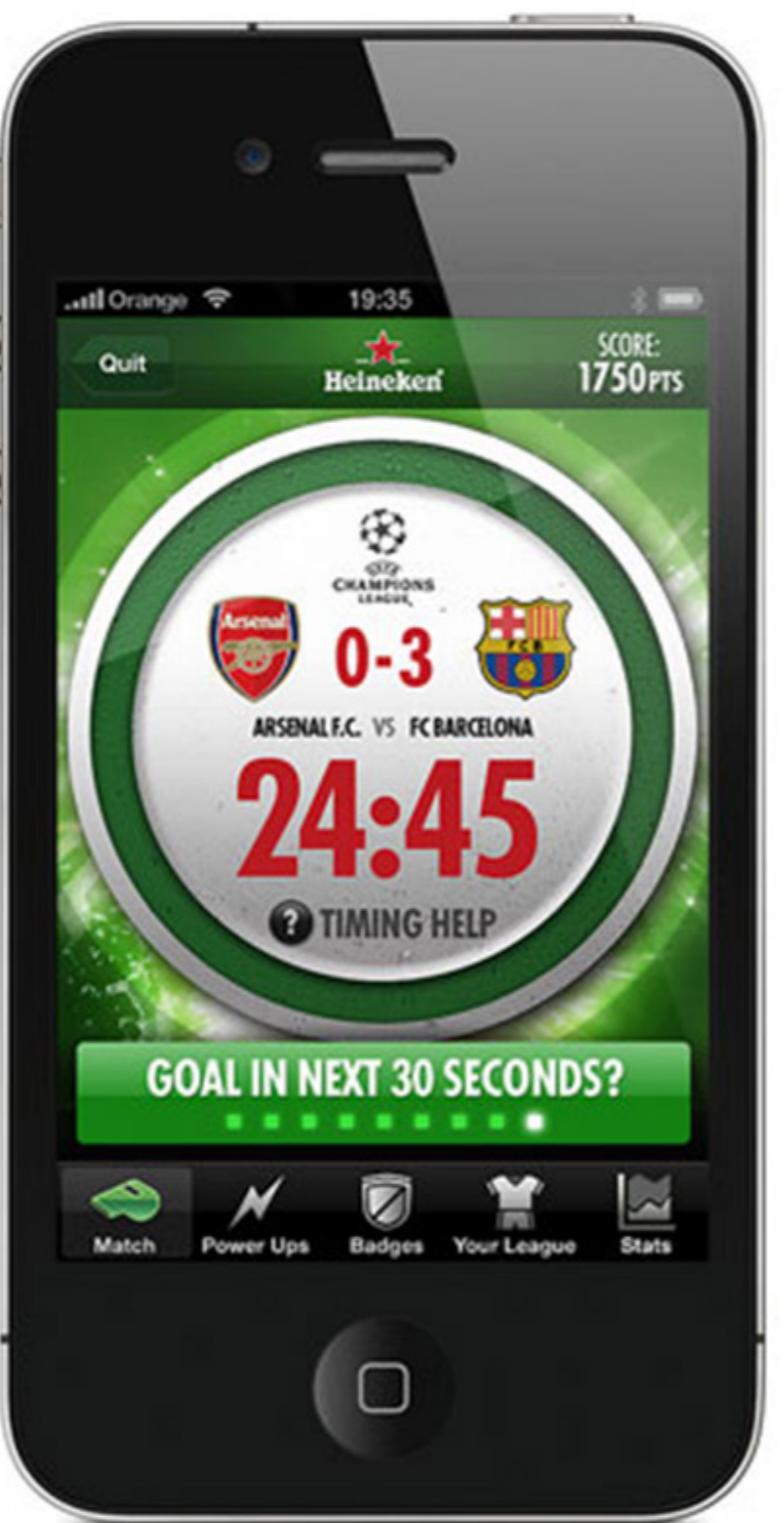
IDEA

Heineken Star Player transforms watching football on TV into a live, social experience. The world's first dual-screen football game lets viewers play along live on Facebook and iPhone, and anticipate the outcome of match moments in real time. Players can create leagues to compete against friends, and take on the world in any live fixture.

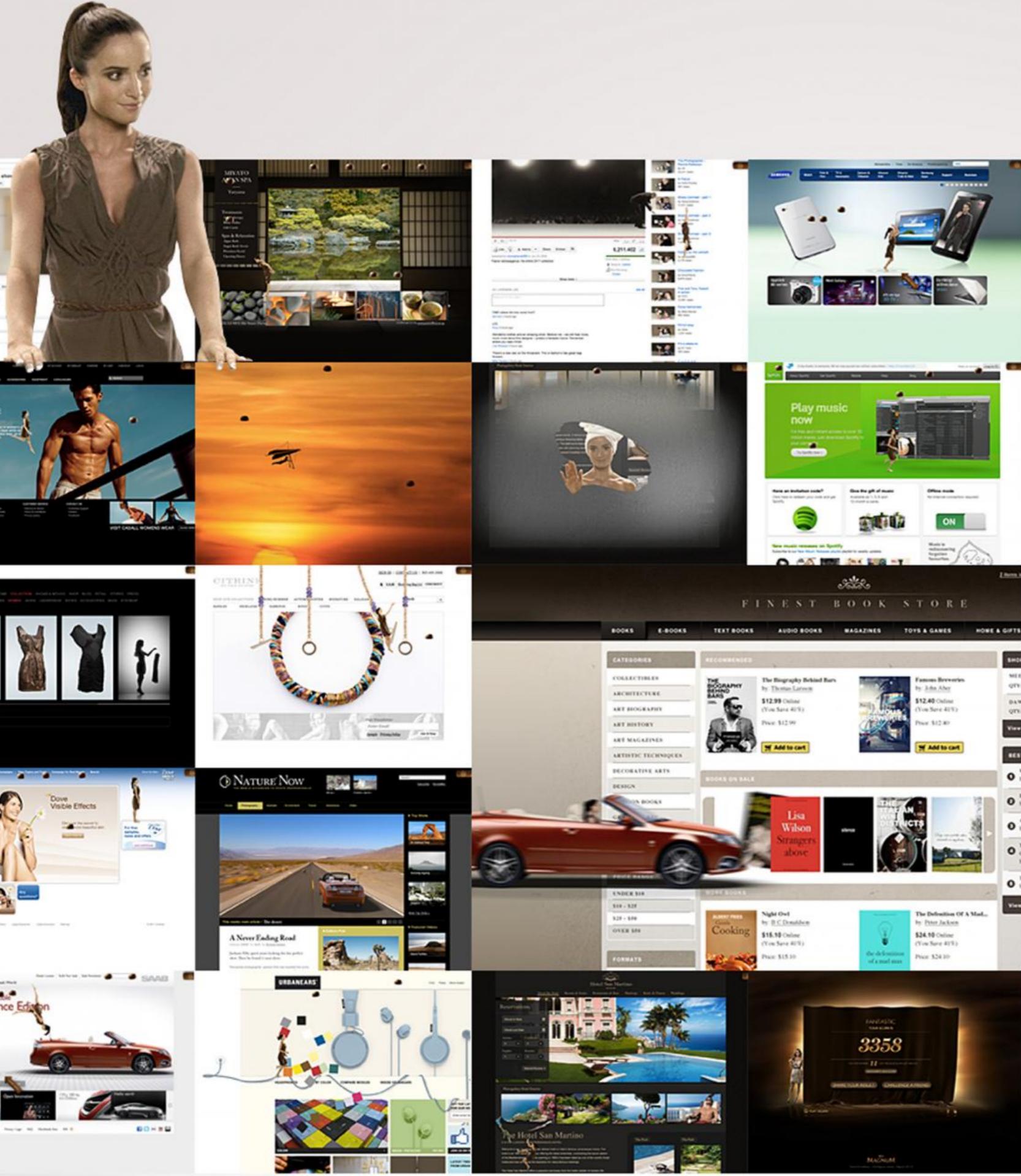
IMPACT

Star Player changes the way football is watched forever, delivering a full 90 minutes of brand engagement every game.









Brief:

To launch the new Magnum Temptation and a new brand promise: "For pleasure seekers". The solution should engage the target audience making them willing to pass it along to their friends.

Solution:

Internet is a place where all kind of pleasures exists. We wanted to build a light hearted story in which Magnums new ice cream came out as superior to everything else out there: Internets ultimate pleasure.

The mechanic is inspired from something that has engaged and united people for decades: classic platform games. But this time with a totally different platform: the Internet. The user controls a young woman literally running trough the Internet collecting the ingredients to her ultimate pleasure, the Magnum Temptation.

Result:

In its first week the Pleasure Hunt had 1,038,573 visitors, spending an average of 7.58 minutes on site. Thursday April 14, 2011, three days after launch, it was the most tweeted URL in the world. Six months later the site has:

- Over 5 million visits.
- A Google search for "Magnum Pleasure Hunt" gives over 186 000 unique pages.
- Over 365 000 shares on Facebook with over 60 millions impressions.
- 50 000 tweets reaching 35 million followers.
- And in total consumers around the world spent amazingly 425 566 hours with the brand participating in the game.

The online-game is just one piece in the global launch campaign, and Magnum only measures business goals as a whole, but so far their sales has increased with 4,5% globally. The huge amount of visitors from North America has made it a key component in the ongoing US launch.

03

Share

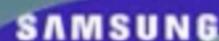
03



COLLECT AS MANY
BONBONS AS YOU CAN.



SKIP INTRO

[Mobilt](#)[Foto &
Film](#)[TV &
Hemmabio](#)[Datorer &
Tillbehör](#)[Vitvaror
Kök](#)[Vitvaror
Tvätt & Städ](#)[Samsung
Apps](#)[Support](#)[Business](#)[Upptäck
NX-serien >](#)[Meet Galaxy >](#)[Allt om nya
3D-TV >](#)[En riktigt
stilren dator
SF310 >](#)

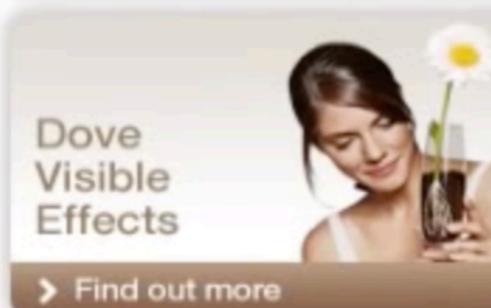
[Products](#)[Current Campaigns](#)[Tips, Topics and Tools](#)[Campaign for Real Beauty](#)[Search](#)[Dove for M](#)

Dove
Visible Effects

Discover the secret to
visible more beautiful skin.

Click here ►

1 | 2 | 3 | 4



Any
questions?

For free
samples,
news and offers



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© 2011 Unilever



1:58 / 4:56

The image shows the eBay logo in its signature 3D, colorful font. The letters are mounted on a dark grey wall. The 'e' is red, the 'b' is blue, the 'a' is yellow, and the 'y' is green. The 'o' is slightly taller than the other letters. The background features a clear blue sky and some bare trees.



Mouse over image to zoom

 Have one to sell? [Sell it yourself](#)

embers from the Notre Dame fire grab a section of the fire of notr

Condition: --

Time left: 6d 20h (23 Apr, 2019 12:31:41 BST)

£0.99 0 bids

Enter your max. bid

Submit bid

 [Add to watch list](#)

Posts from United Kingdom



Collect 1 Nectar point
[Redeem your points](#) | [Conditions](#)

Postage: £0.61 [Economy Delivery](#) | [See details](#)

Item location: Bicoester, United Kingdom

Posts to: United Kingdom

Delivery: Estimated between Sat. 27 Apr. and Mon. 29 Apr. 

Payments:      Processed by PayPal

 [Get more time to pay.](#) [See payment information](#)

Returns: No returns accepted | [See details](#)

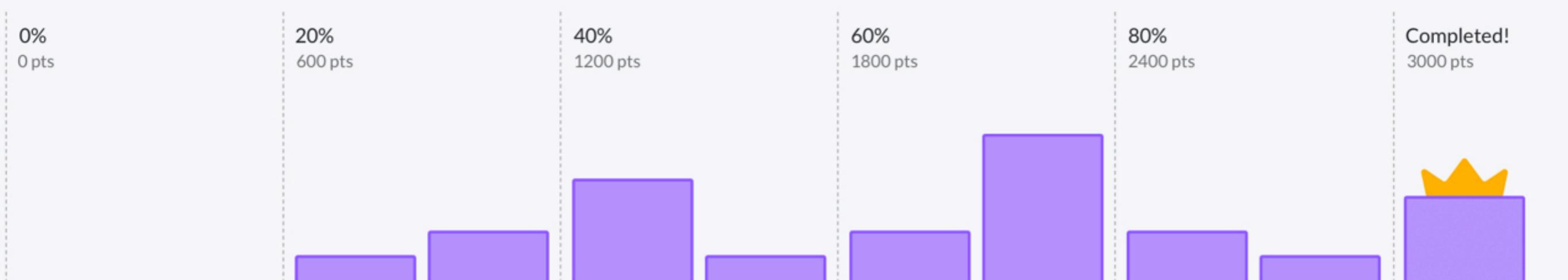


KHAN

ACADEMY

Geometry foundations

Unit mastery

[Show students](#)


Skill mastery ⓘ

Skills	Not started	Struggling	Familiar	Proficient	Mastered
Identify rays, lines, & line segments	4 students	4 students	5 students	4 students	5 students
	Amit Singh Celine Leroy Kiara Kelly Miuna Khalid	Darcy Martin Lee Austin Imani Coleman Thomas Greene-Beck	Aparna Rao Blair Walsh Carlos García López Celine Leroy Torrance Davis	Alexei Popov Jasmin Lee Kareem Lim Wanda Wu	Ana Maria Rodríguez Lee Austin Yuki Inoue Veronica West Vanya Petrov
Draw rays, lines, & line segments	4 students	0 students	7 students	5 students	5 students
	Amit Singh Darcy Martin Imani Coleman Thomas Greene-Beck		Aparna Rao Blair Walsh Carlos García López Celine Leroy	Celine Leroy Kiara Kelly Miuna Khalid Kareem Lim	Ana Maria Rodríguez Lee Austin Yuki Inoue Veronica West

Hexadecimal numbers



You got 75%

You reached Practiced!
Get 4 correct to reach 100%.



You got 325 energy points

Points for questions +225

4 problems answered 75% correctly



Points for completion +100

Bonus points earned for completing this task

Points for

4 problems

Points for

Bonus poi

Practice again

Hexadecimal numbers



You got 100%

Nice work!

You got 4 out of 4 correct.



You got 120 energy points

Points for questions +20
4 problems answered 100% correctly

Points for completion +100
Bonus points earned for completing this task

Practice again

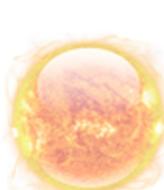
Practice again



Challenge Patches



Black Hole Badges



Sun Badges



Earth Badges



Moon Badges



Meteorite Badges

Meteorite badges are common and easy to earn when just getting started.

Badges Earned

Sam's badges he has earned.



Hang Ten

Last achieved 15 days ago in The World of Math



Fingers or Toes

Last achieved 16 days ago in The World of Math



Persistence

Last achieved 16 days ago in Finding percents



Tinkerer

Last achieved 21 days ago



High Five

Last achieved 21 days ago in The World of Math



Ten to the Fourth

Last achieved 30 days ago



Act I Scene I

Last achieved 30 days ago



Making Progress

1000

Last achieved about a month ago



Just Getting Started

100

Last achieved about a month ago



Challenge Accepted

Last achieved about a month ago in The World of Math



Math Pretest Champion

Last achieved about a month ago



Five is Alive!

Last achieved about a month ago in The World of Math



Picking Up Steam

100

Last achieved about a month ago in Multiplying by multiples of 10



Makes Perfect

Last achieved about a month ago in The World of Math

Possible Badges



Picking Up Steam

100

Quickly & correctly answer 5 skill problems in a row (time limit depends on skill difficulty)



Just Getting Started

100

Achieve mastery in 3 unique skills

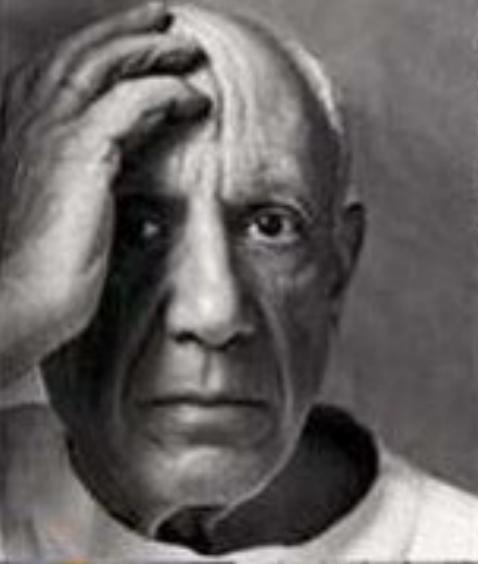
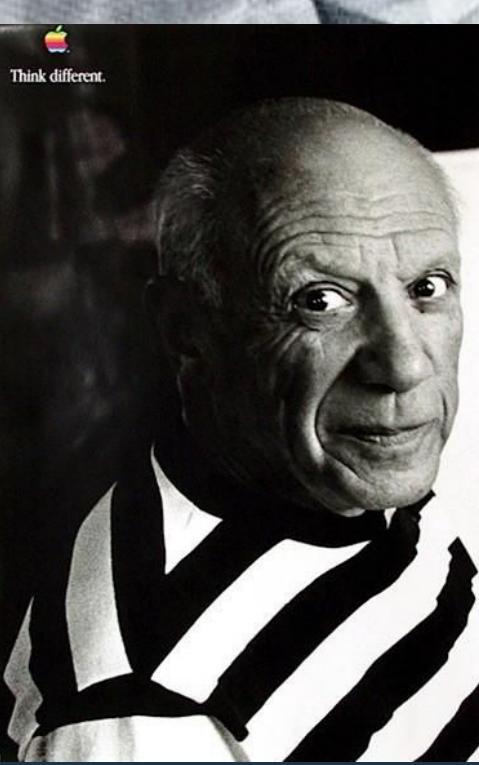
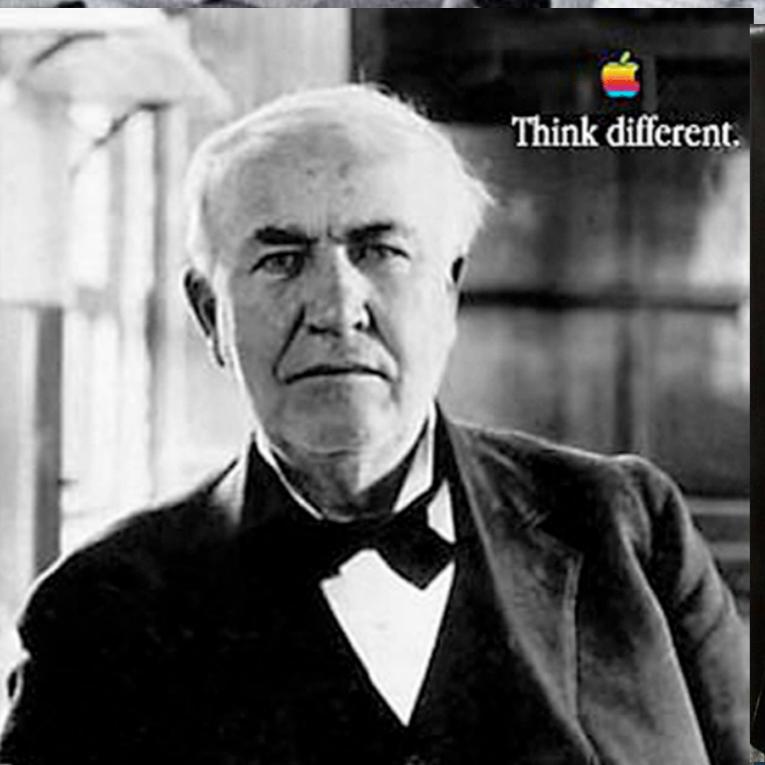


Inspiration

500

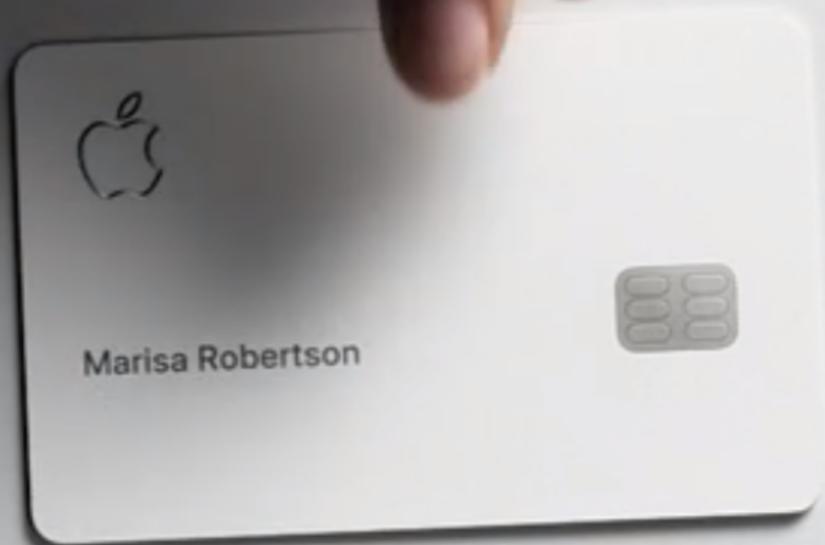
Another user created a program based on one of yours





Think different.





SUMMARY

- Gamification framework : definition & purpose
- The 8-core drives: Octalysis
- Applying octalysis (examples)
- 2-level Octalysis
- 3-level Octalysis
- No ‘good’ or ‘bad’ core drives, these are just *motivators*

EXERCISE

- Think about a bunch of video games that are always appealing to you
- Figure out the octalysis behind those games
- Find out what are your dominant core-drives
- Choose one favourite game, figure out the level 2 Octalysis
- Find out what type of player are you
- Choose another favourite game, repeat level 2 and 3
- Find out if you're the same type of player, or if you have multiple characteristics

50.033

Foundations of
Game Design
and Development

RULES & PLAYERS

Rule characteristics, 3 levels of rules,
Player types, The 5 factor model and
the 5 domains of play,
Breaking the rules

PLAYING A GAME

- Players *voluntarily submit* to the game
- Then, **limit** their behaviours to specific **restrictions** imposed by game rules
- Once game starts, players are enclosed within game world: context of the game ('*Magic Circle*')
- Must adhere to rules in order to *participate*
- If not, they're *leaving* the game

DEFINING RULES

- Formal structures that **constitute the game function**, *not tips or tricks on how to own the game*
- Sometimes, it is all you need to begin playing a game (tic tac toe)
- Fixed and authoritative rules makes games seem a bit constraining and inefficient, but like any other real life situation, rules are important to **define order**, and eventually so that it works

GENERAL CHARACTERISTICS

● Rules **limit** player action



- In the game *Monopoly*, you have a pair of dice
- You can do anything with the dice: eat them, throw them away, destroy them, light them on fire, etc
- But no, in *Monopoly* rule: you throw them and take note of the number, then move your avatar
- When you start a new game in *Diablo 3*, your character begins at level 1
- The virtual character has the *potential* to do a lot of things: fly, jump, crouch, combat, cast magic skills, etc
- But no, in *Diablo 3*, your character actions are limited since its only level 1

GENERAL CHARACTERISTICS

- Rules are **explicit** and **unambiguous**
 - Not HASS class
 - Rules are literal, no room for interpretation
 - E.g: in *Diablo 3*, no profanity can be entered to the chat window
 - Not equal to ‘how’ you play the game, which allows room for creativity

GENERAL CHARACTERISTICS

- Rules are **shared** by all players
 - Just like legal laws, all players act under the same set of rules
 - All rules might not be applicable to *all players* but they understand the set of rules as a whole
 - E.g: in *Diablo 3*, you can't take the loot of other people's
 - In real-life games (basketball, soccer, etc) this is more apparent
 - When players don't share the same rules, they enter a **disagreement**
 - Game comes to a *halt* until disagreement is resolved

GENERAL CHARACTERISTICS

- Rules are **fixed**
 - They don't change as the game is played
 - E.g: In *Diablo 3*, a wizard staff cannot be equipped to a demon hunter
 - Sudden rule improvisation shouldn't happen
 - Again, if rules are changed unpredictably during gameplay, it will lead to *disagreement*

GENERAL CHARACTERISTICS

- Rules are **binding**
 - By right, they *have to be followed* to ensure that the game works properly / in the *normal* way
 - The reason why rules have to be shared and fixed is because they have to be binding
 - If players don't feel that rules are binding, they will *cheat*
 - Ultimately spoiling the game
 - Spoiling the game isn't ideal for most games, but not *all* games (e.g: it feels good to apply cheat codes when playing TheSims, we will talk about breaking the rules later)

GENERAL CHARACTERISTICS

- Rules are **repeatable**
 - *Repeatable* from game to game and are *portable* between sets of different players
 - Eg: Every time you restart *Diablo III*, your character still cannot hold weapons specific to another class

GENERAL CHARACTERISTICS

- Rules **limit** player action
- Rules are **explicit** and **unambiguous**
- Rules are **shared** by all players
- Rules are **fixed**
- Rules are **binding**
- Rules are **repeatable**



3 KINDS OF RULES

- So far we have talked about general *characteristics* of rules
- What kinds of rules are there?
 - Operational
 - Constitutive
 - Implicit

OPERATIONAL RULES

- Our first thought of rules, which is the *rules of play* of a game
- They're in the basic *how-to-play-the-game* documents (tutorials)
- Easiest to follow, **instruct** player what to do
 - E.g : In *Diablo III*, click left button to move, press I to see inventory, press I - 4 to cast skills, click on item to level up, run over to gold to pick it up



CONSTITUATIVE RULES



- Abstract, core mathematical rules of a game
- **Does not explicitly state** how a player will make use of them, thus allowing creativity
- **Guide**, instead of *instruct*
- Exists *below the surface* of operational rules
- E.g: in *Diablo III*, you begin the game at level 1 with 0 XP, and you can play the game indefinitely. You can cast combo skills

OPERATIONAL VS CONSTITUATIVE

- Constitutive rule: concerned with **internal** events (events related to the processing of a choice)
- Operational: rule concerned with **external** events (events relating to the representation of a choice).

IMPLICIT RULES

- The **unwritten rules** of a game
- For *etiquette* and *behaviour* sake, usually is unstated in a game
- E.g: taking turns when playing a game, ‘undo’ some moves, sportmanship
- Depends on *context* (professional game, playing with children, casual games, culture)

GAME IDENTITY

- Implicit rules aren't unique to one game
- Operational and constitutive rules are important in determining game **uniqueness**
- The *true and unique* identity of a game comes from the **interaction** between operational and constitutive rules
- *When establishing rules, think about how they become the formal identity of the game*

GAME IDENTITY

- The key in establishing the formal identity of a game is the **specificity** of the rules
- The **exact** and **unambiguous** nature of the constitutive and operational rules allow a game to be *this game and not that game*
- E.g: *Diablo III* isn't *World of Warcraft*. They have different classes, items, ways to level up, quest types, even though they're both MMORPG games

ELEGANT RULES



- Elegant rules allow players to **focus on the experience of play** rather than on the *logic* of the rules (good if it can be natural or intuitive)
- Designing meaningful play involves **building discernable** (perceivable) and integrated relationships between action and outcome into all levels of the rules of a game
- Example: In traditional *Monopoly*, each destination is placed within a bounding box for easy counting when you need to make a move.

DIGITAL GAMES RULES

- The general characteristics of rules seem rather **intrinsic** (by default) in digital games:
 - Rules **limit** player action
 - Rules are **explicit** and **unambiguous**
 - Rules are **shared** by all players
 - Rules are **fixed**
 - Rules are **binding**
 - Rules are **repeatable**
- Its rather impossible for players to violate these rules in digital games (unless we use cheat codes, but, cheat code is created by the designer so it is just a predictable alteration of the rules)

DIGITAL GAMES RULES

- Operational & Constitutive rules: has to be manifested in code
- But **not all parts of codes are rules**,
 - e.g: how to shade objects in the scenes isn't part of game rules 
- Implicit rules are common sensical in real life, but they may need to be explicitly programmed in digital games:
 - E.g: camera follows character, mouse cursor corresponds to mouse movement, game will not damage the computer resources, allowing undo movements

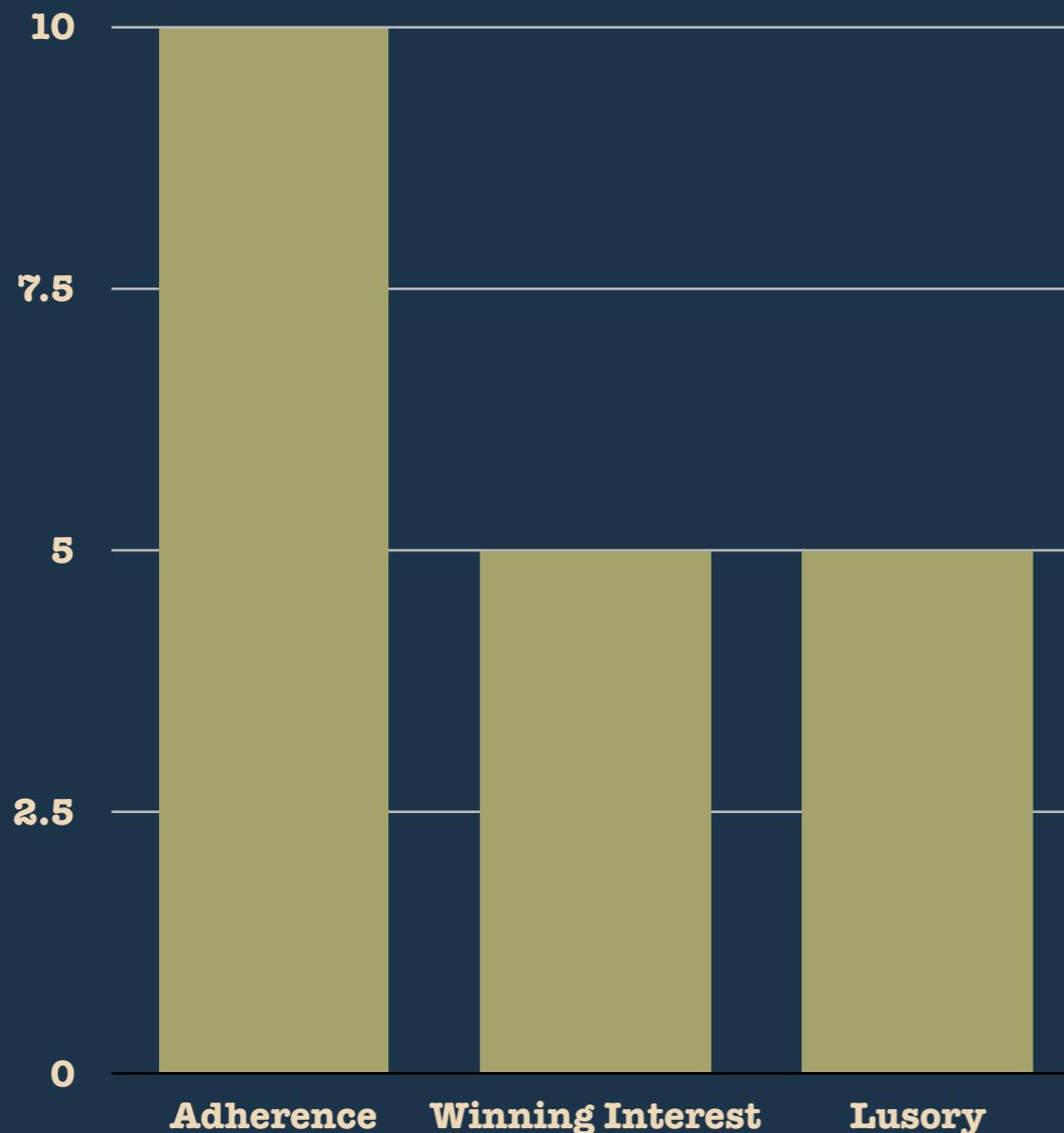
BREAKING THE RULES

- Phenomenon that occurs in almost **every kind** of game.
- Game designers need to **recognize** that rule-breaking is a common phenomenon in gaming and **incorporate** it into their game design thinking
- One solution, which comes from the New Games Movement, is to empower players to be more like game designers by **creating games with rules that are meant to broken and modified**
- Encourages cheating, gives sense of satisfaction and fun

PLAYER TYPES

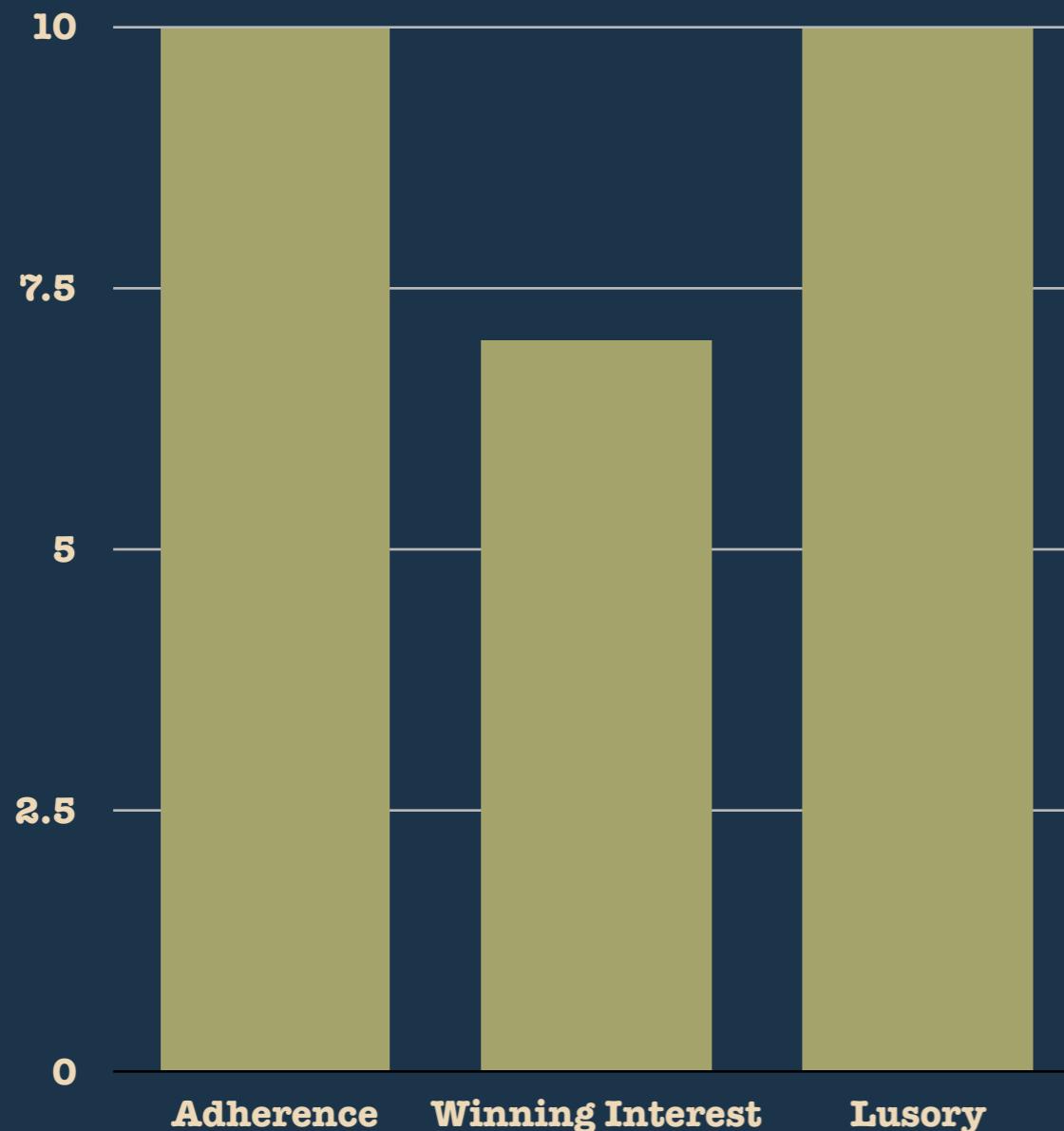
- By knowing player types, we can consider the ways rules are broken
- Player types depend on the combination of these elements:
 - adherence to the rules
 - interest in winning
 - degree of lusory attitude : state of mind required to enter into the play of a game, to accept unnecessary (inefficient) obstacles and have fun

STANDARD PLAYERS



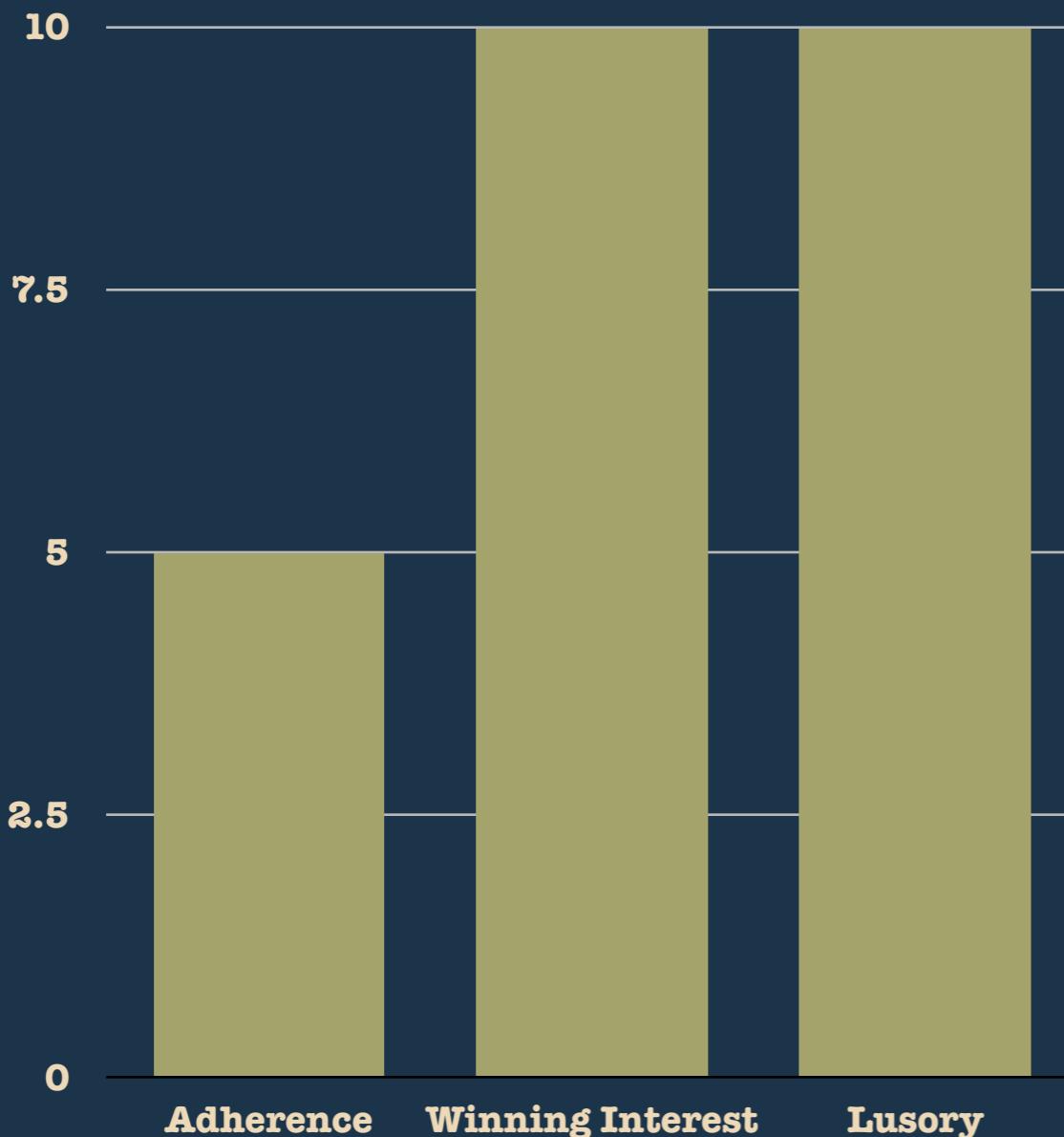
- Casual players
- Honest
- Play games as it was designed to be played
- In fact, this is the majority of players

DEDICATED PLAYERS



- Hardcore version of standard players
- Testing out strategies, perfect their play while still adhering to the rules
- Taking games a bit too seriously
- Doesn't seem enjoyable to casual players

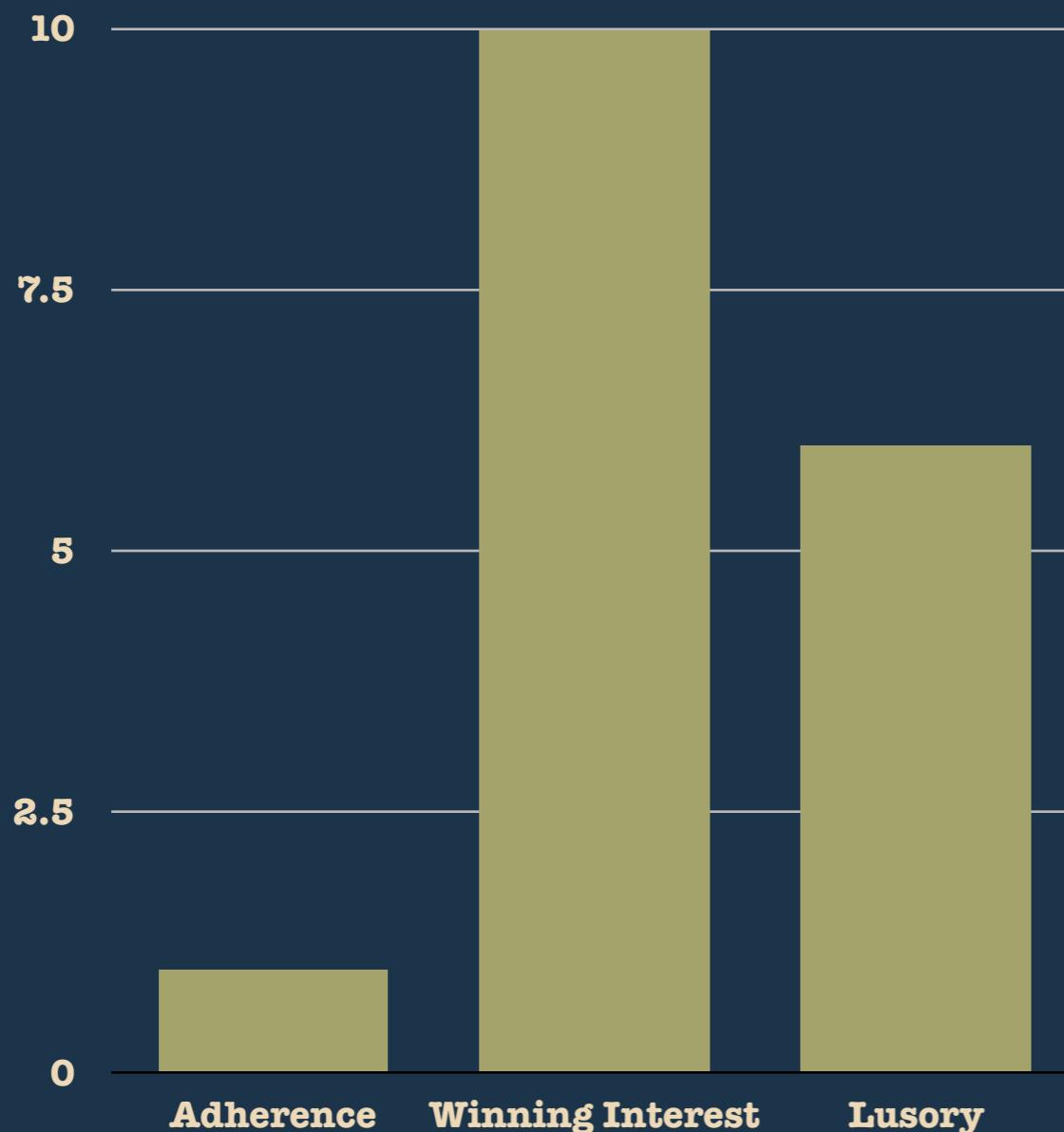
UNSPORTSMANLIKE PLAYERS



- *Unethical* version of dedicated players
- Do anything they can to win
- Try to find *loopholes*, most likely almost (but not) violating the rules
- Violates the *spirit* of the game: the implicit, unspoken game rules

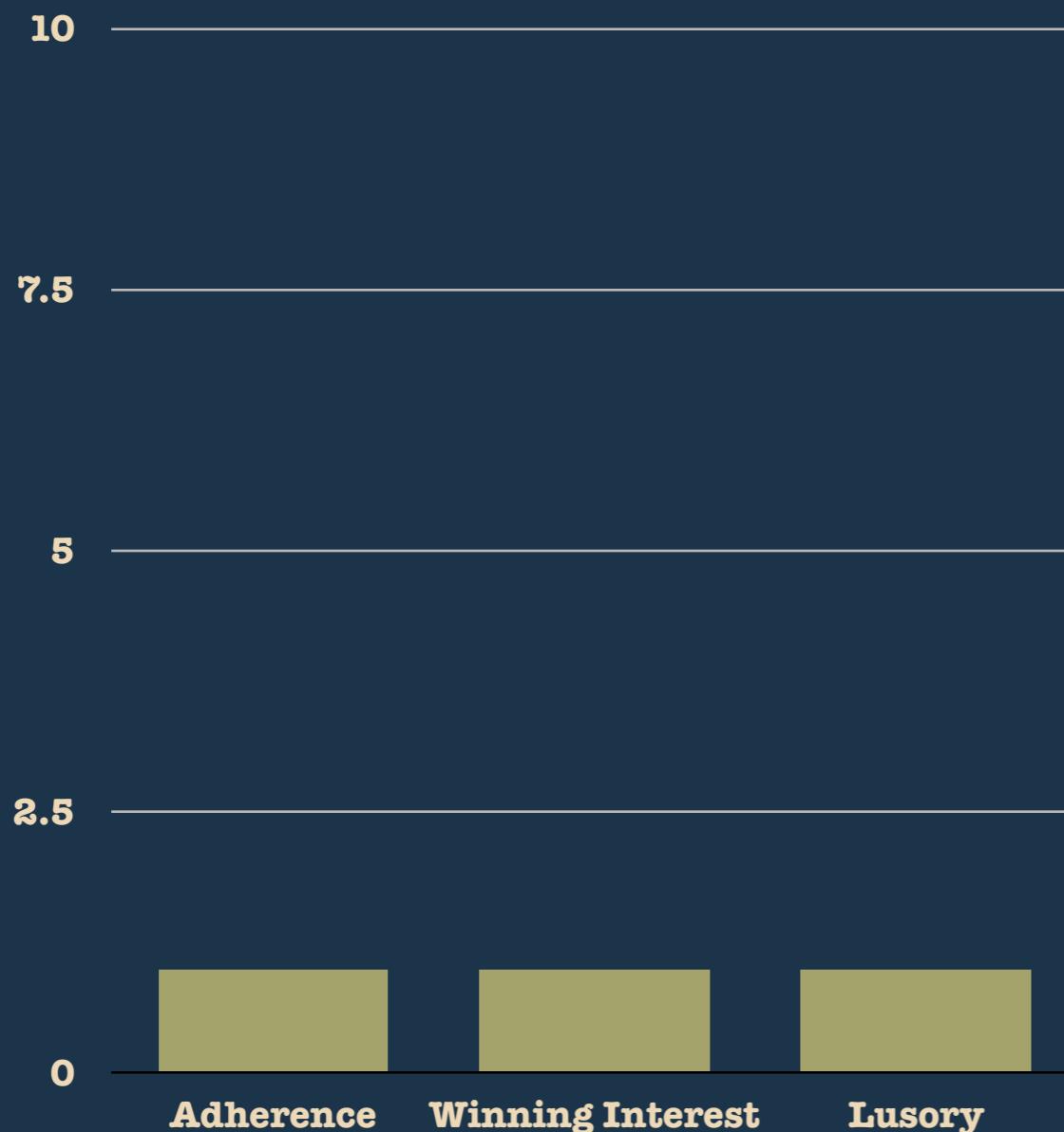


CHEAT PLAYERS



- Breaks the rules altogether to gain advantage
- A cheater however, is still playing the game while pretending to adhere to the rules
- Crave winning so much such that breaking the rules is acceptable

SPOIL-SPORT PLAYERS



- Breaks the rules
- Doesn't accept the rules (refusing to acknowledge the game)
- Doesn't attempt to conceal the fact that they are breaking the rules
- You can't play multiplayer games with spoil-sport players

THE FIVE-FACTOR MODEL

- A well known psychological model of human personality traits
- Explains personality traits in terms of five nonoverlapping domains:
 - **openness to new experiences,**
 - **conscientiousness,**
 - **extraversion,**
 - **agreeableness,**
 - **neuroticism**

MOTIVATION

- Player motivation model is related to game design decision model
- We want to make games that people will play
- But, who? *What kind of players?*
- *We need to get to know our target players first through qualitative experiments — to find out their traits*

OPENNESS TO EXPERIENCE

- Distinguishes imaginative, creative motivations from down-to-earth, conventional ones.

CONSCIENTIOUSNESS

- Deals with the way we control, regulate, and direct our impulses.

EXTRAVERSION

- Deals with the tendency to seek out stimulation and the company of others.

AGREEABILITY

- Reflects differences in concern with cooperation and social harmony.

NEUROTICISM

- Reflects a tendency to experience (or not experience) negative emotions.

THE FIVE DOMAINS OF PLAY

- VandenBerghe proposed a way of understanding different kinds of players and why they choose the games that they do.
- His work is based on the Five Factor Model.
- He explained that the five traits of the Five Factor Model can be correlated with five domains of play that **might fulfill them**—which can also be thought of **as aspects of a game that players might be motivated to seek out.**



“The 5 Domains of Play: Applying Psychology’s Big 5 Motivation Domains to Games,” delivered at the 2012 Game Developers’ Conference (VandenBerghe, 2012)

NOVELTY

- Correlates with: openness to experience.
- Players who seek novelty like games that include a lot of variety and **unexpected** elements.
- People who don't like novelty seek **familiarity** instead: games that offer them a *comforting sameness*.

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CHALLENGE

- Correlates with: conscientiousness
- High-challenge players prefer games that are **difficult** and require **precision to win**. Their conscientiousness drives them to act, to *accomplish things*, and perhaps to try to complete everything in a game.
- Low-challenge players like **sandbox games** and others in which the player is free to fool around without being required to achieve something.

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STIMULATION



- Correlates with: extraversion
- Particularly stimulation via social engagement
- These players enjoy party games and others that involve **interacting** with other players.
- Those who prefer to avoid stimulation prefer games they can play alone, games that let them be the only real person in the game world.

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HARMONY



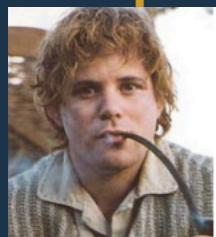
- Correlates with: agreeableness
- Harmony can be described as a **quality** of a game, the feeling that all parts of the game belong to a single, coherent whole.
- Players who tend to have high level of agreeableness like cooperative games, whereas those who don't love highly competitive games

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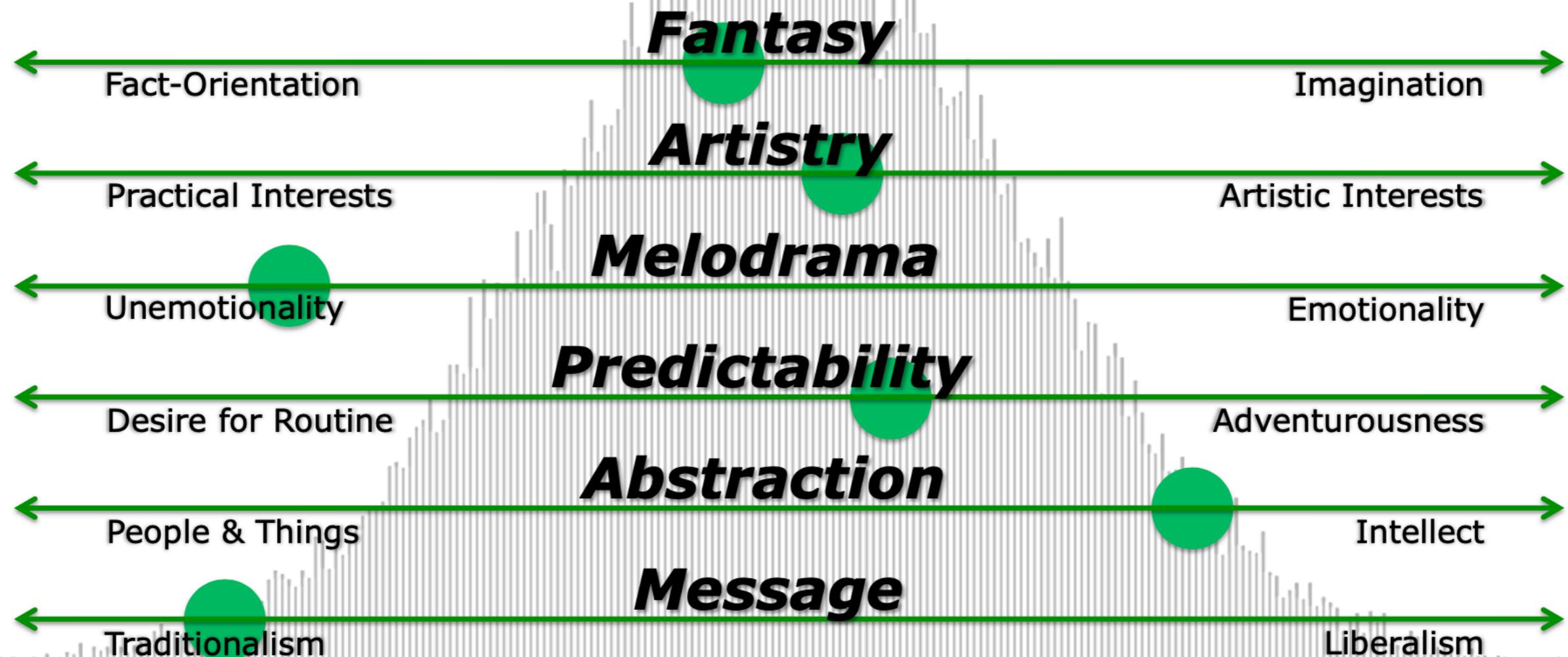
THREAT

- Correlates with: neuroticism
- The game quality of threat (an element of danger, or frightening content—anything that is likely to generate unpleasant emotions) is popular with people who have *high neuroticism scores*

MAPPING NOVELTY

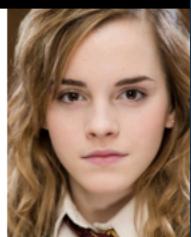


Novelty (Openness to Experience)



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MAPPING CHALLENGE



Challenge (Conscientiousness)



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MAPPING STIMULATION



Stimulation (Extraversion)

Expression

← Reservedness

→ Friendliness

← Non-gregariousness

→ Gregariousness

← Receptiveness

→ Assertiveness

← Activity Level (low)

→ Activity-Level (high)

← Excitement-Aversion

→ Excitement-Seeking

← Inexpressiveness

→ Cheerfulness

Crowds

Role

Pace

Thrill

Joy

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MAPPING HARMONY

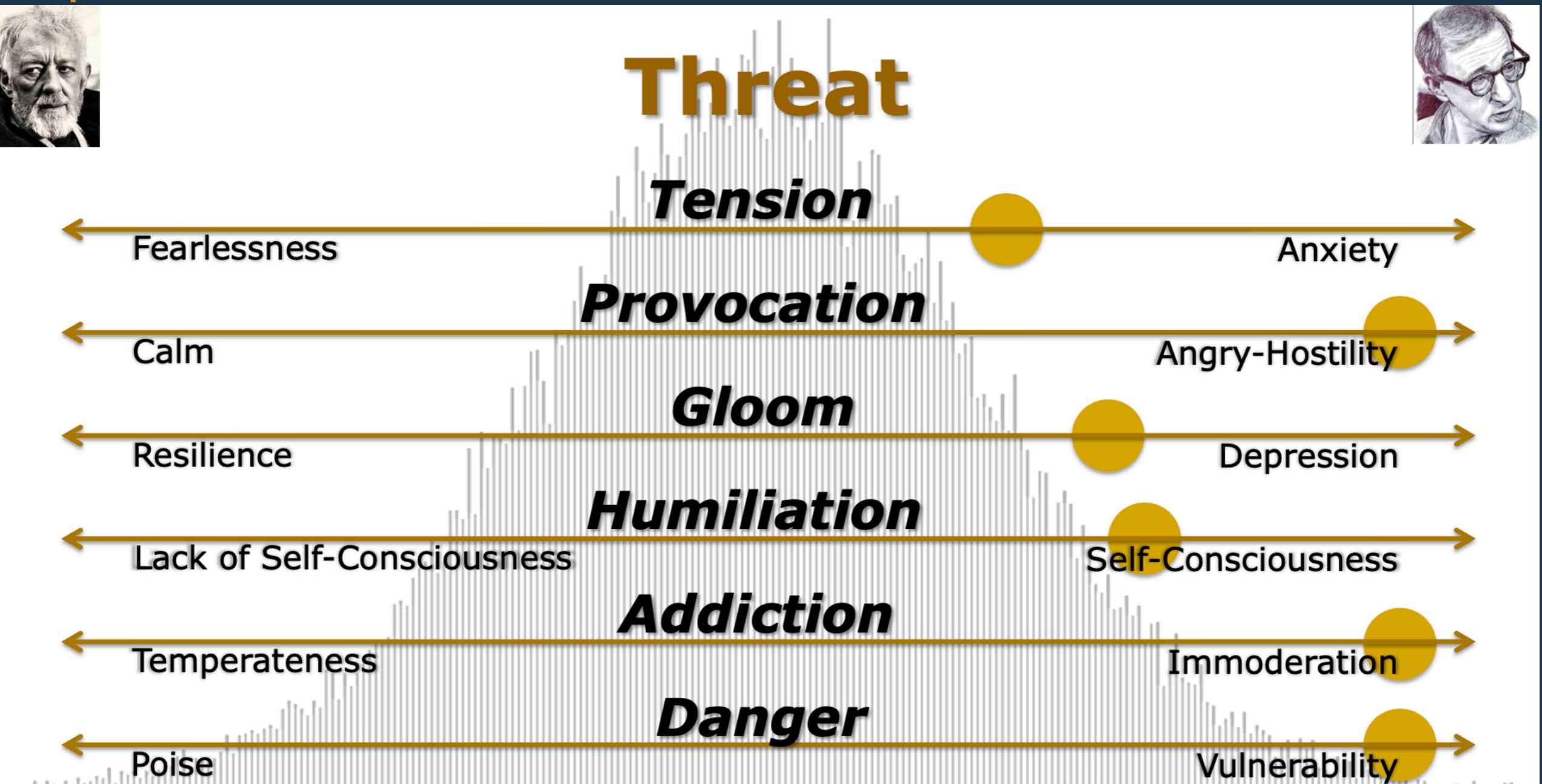
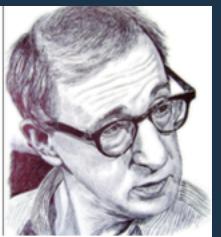


Harmony (Agreeableness)



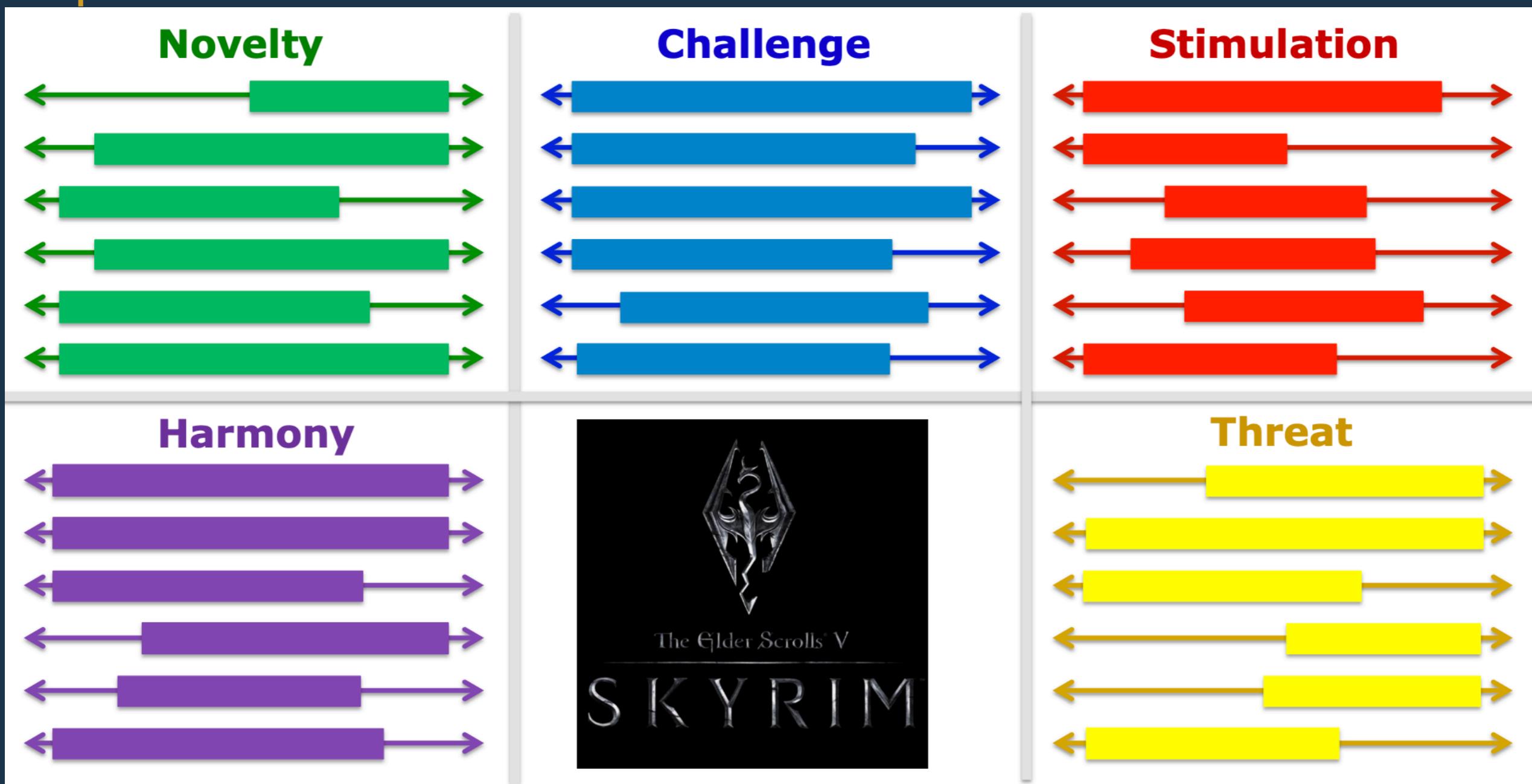
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delivered at the 2012 Game Developers’ Conference (VandenBerghe, 2012) **44**

MAPPING THREAT



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EXAMPLE



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delivered at the 2012 Game Developers’ Conference (VandenBerghe, 2012) **46**

EXAMPLE



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CONCLUSION

- The 5 domains of play — mapped to 30 facets of play (6 each, to characterise the game)
- “We tend to play for the same reasons we live”

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delivered at the 2012 Game Developers’ Conference (VandenBerghe, 2012) **48**

CONCLUSION

- The 5 domains of play — mapped to 30 facets of play (6 each, to characterise the game)
- **“We tend to play for the same reasons we live”**
- **“Game design has techniques for targeting most of human motivation”** — octalysis is just another tool to analyse your game like this

CONCLUSION

- The 5 domains of play — mapped to 30 facets of play (6 each, to characterise the game) — can be used to guide us to design games that will satisfy our target audience.
- **“We tend to play for the same reasons we live”**
- **“Game design has techniques for targeting most of human motivation”** — *octalysis is just another tool to analyse your game like this*
- **“To reach a larger audience, target both sides of the spectrum”** — *but if you can’t its okay. We cannot satisfy everybody*

“The 5 Domains of Play: Applying Psychology’s Big 5 Motivation Domains to Games,”
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DEGENERATE STRATEGIES

- Takes advantage of a weakness in the game design, so that the play strategy guarantees success
- Usually fixed by patches in online games
- It is **not** cheating
- Done by dedicated and unsportsmanlike players
- Degenerate strategies put **certainties** on the the **outcome** (formal elements) of the game, thus making it uninteresting

RULE BREAKING IN GAME DESIGN

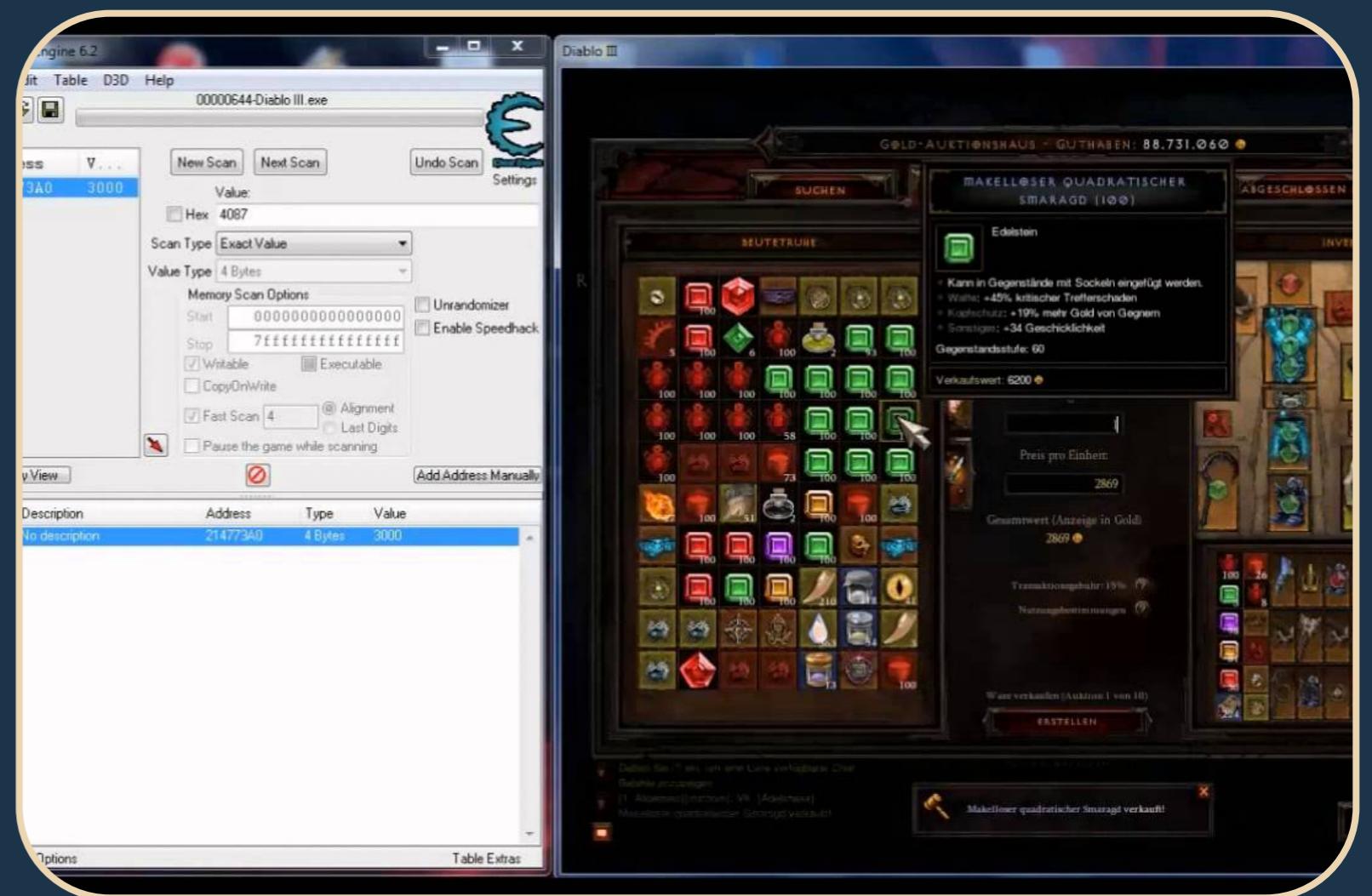
- **Easter eggs:** hidden secrets in the game to discover, but doesn't impact game strategy

Whimsyshire
Diablo III
(Unicorn level)



RULE BREAKING IN GAME DESIGN

- **Cheat codes:**
impacts the
strategies of the
game
- Depends on games,
might have
consequences
(account banned)



RULE BREAKING IN GAME DESIGN

E.g: Easy experience, money, and items

- **Game guides and walkthroughs:** smart, complete guides to get through the game efficiently
 - Play "The Legacy Of Cain - Explore Cellar" quest in Act I. Take the waypoint to The Old Ruins and go north, then east. Go down the cellar to encounter a named mob (Captain Daltyn) and his minions. Kill him for at least one magic item and some coins. Loot the cauldron for at least one health potion. Talk to Leah for quest completion experience and gold. A loot chest also appears 40% of the time. Exit and repeat as many times as desired. The pathway will never change, but you will keep hearing a Tristram Militia whining about how he promised to save Marko but did not. -
- Might be seen as unfair and break the spirit of the game

Read more: <http://www.cheatcc.com/pc/diablo3cheatscodes.html#ixzz5Dfp3hegF>

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RULE BREAKING IN GAME DESIGN

- **Workarounds:** taking advantage of game flaws that were unforeseen by game devs, especially apparent in video games
- Usually fixed by patches, depending on degree of severity
- Example: Playing Diablo III with PS4 Controller for easy navigation + skill combos, force attack (attack monsters without having to click them)

RULE BREAKING IN GAME DESIGN

- **Rule-breaking can be fun and harmless**
- In some games (*The Sims*), it might also be encouraged : gives the player a sense of authority
- For game designers, this means that you should *never take players' behaviour for granted*
- Need to consider the fact that your game will be *played by all kinds of people*
- Some of these player types can help **expand** your game's space of possibility, whereas others can **wreck** the game for everyone involved

TRUE CHEATING, HACKINGS, AND SPOIL-SPORT HACKING

- These acts usually result in your account being banned (for multiplayer games)
- Not going to have much dire consequences for single-player offline games since it doesn't involve other people, but it spoils the potential 'fun' of the game
- How you sanction rule breakers depends on the *context* of the game (PvP? Does it involve cash? MMORPG? MOBA?)

SUMMARY

- Defining rules
- General characteristics of rules
- Types of rules
- Types of players
- The 5 factor model and the 5 domains of play
- Breaking the rules in game design