

Introduction to Game Design

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Your Lecturer

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- Game related courses; Game Industry, Introduction to Game Design



What is a Game?

What is a Game?

- A goal: specific outcome that the players can work to achieve
- Rules: limitations on how they reach that goal
- A feedback system: showing how close that goal is
- Voluntary participation: willingly accepting goal, rules and feedback



[Jane McGonigal
Reality is Broken: Why Games Make Us Better
and How They Can Change the World
2011] or
Youtube: Gaming can make a better world |
Jane McGonigal

Definitions for Games

Definitions for games can be divided into three types:

- Games as activities
- Games as formal systems
- Games as social constructs

Games as Activities

Play is “a free activity standing quite consciously outside "ordinary" life as being "not serious", but at the same time absorbing the player intensely and utterly. [..] It proceeds within its own proper boundaries of time and space according to fixed rules and in an orderly manner. It promotes the formation of social groupings which tend to surround themselves with secrecy and to stress their difference from the common world by disguise or other means.”

[Huizinga Homo Ludens 1938]

Games as Formal Systems

“[..] a game is a closed formal system that subjectively represents a subset of reality.

- the game is complete and self sufficient as a structure
- the game has explicit rules
- A game's collection of parts which interact with each other, often in complex ways
- a game represents something from subjective reality, not objective

[Crawford, C. (1984). The art of computer game design.]

Games as Social Constructs

“Games are semi-bounded arenas that are relatively separable from everyday life, and what is at stake in them can range from very little to the entirety of one’s material, social, and cultural capital. They are certainly, at times, productive of pleasure, but they can also be productive of many other emotional states.”

[Malaby, T. M. (2007). Beyond play: A new approach to games. *Games and culture*, 2(2), 95-113.]

Game Types and Genres

Game Types: Technology

- card and dice games
- pen and paper games
- board games
- computer games
- mobile games

[Järvinen, A. (2008). Games without frontiers: Theories and methods for game studies and design. Tampere University Press.]

Game Types: Player Relationships

- single player
- two players
- multiplayer
- massively multiplayer
- massive single player

Game Genres [1]

Game genres are categories of games characterized by particular **kinds of challenge**, regardless of setting or game-world content.

- Action games
- Game simulations
- Games of chances
- Puzzle games
- Role-playing games
- Sports games
- Strategy games

[Adams, E. (2014). Fundamentals of game design. Pearson Education.]

[Järvinen, A. (2008). Games without frontiers: Theories and methods for game studies and design. Tampere University Press.]

Game Players

6%
65+

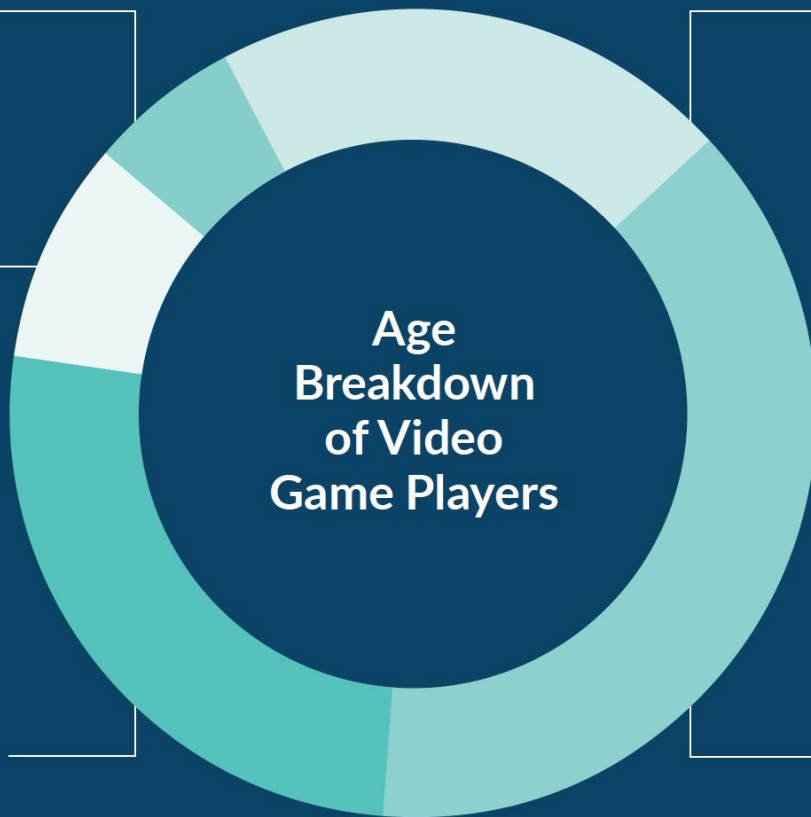
21%
under 18

9%
55-64

**Age
Breakdown
of Video
Game Players**

26%
35-54

38%
18-34



Game Demographics [1]

- 0–3: Infant/Toddler - interested in toys
- 4–6: Preschooler - playing games with parents
- 7–9: Kids - age of reason, decision what games they like
- 10–13: Preteen or “ Tween ” - age of obsession, passionate about their interests
- 13–18: Teen - significant divergence between male and female interests
- 18–24: Young Adult - taste about the kind of play and entertainment they enjoy, time and money on their hands

Game Demographics [2]

- 25–35: Twenties and Thirties – peak family formation, casual game players vs hardcore gamers
- 35–50: Thirties and Forties – casual players, expensive games, consoles, playing together with family
- 50+ : Fifties and Up – empty nesters, have a lot of time on their hands, strong social component

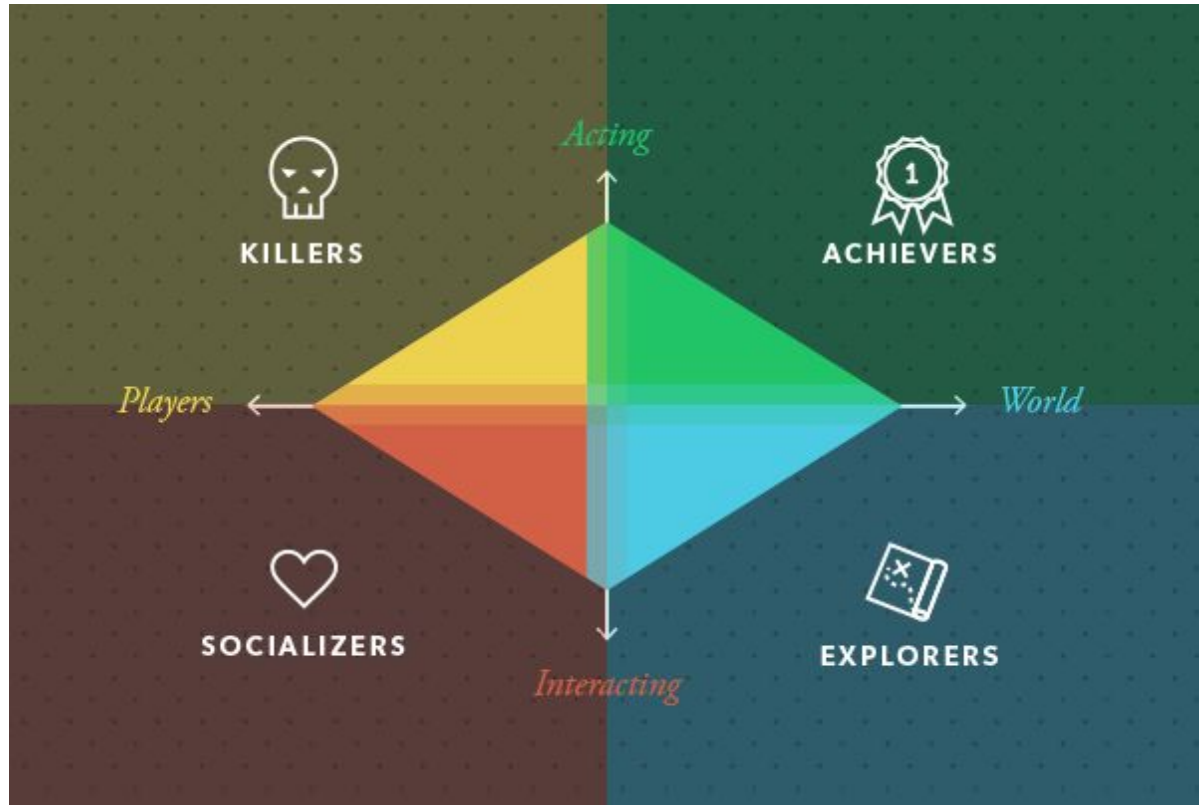
What males like to see in games

- **Mastery** - it doesn't have to be something important or useful — it only has to be challenging
- **Competition** - males really enjoy competing against others to prove that they are the best
- **Destruction** - males like destroying things. A lot.
- **Spatial Puzzles** - studies have shown that males generally have stronger skills of spatial reasoning than females
- **Trial and Error** - males tend to have a preference for learning things through trial and error (not reading directions)

What females like to see in games

- **Emotion** - females like experiences that explore the richness of human emotion
- **Real World** - females tend to prefer entertainment that connects meaningfully to the real world
- **Nurturing** - females enjoy nurturing
- **Dialog and Verbal Puzzles** - it is often said that what females lack in spatial skills they make up for in increased verbal skills
- **Learning by Example** - just as males tend to eschew instructions, favoring a trial and error approach, females tend to prefer learning by example

Player types (by R.Bartle)



Gamer Segmentation



13%
of gaming
enthusiasts

THE ULTIMATE GAMER

"Gaming is in my DNA! There are few things I love more. I spend my free time and money on games."



9%
of gaming
enthusiasts

THE ALL-ROUND ENTHUSIAST

"I am interested in all forms of gaming, from playing to watching and everything in between."



19%
of gaming
enthusiasts

THE CLOUD GAMER

"I enjoy playing high-quality games, preferably free-to-play or discounted titles. I will only spend on hardware when necessary."



4%
of gaming
enthusiasts

THE CONVENTIONAL PLAYER

"I do not watch other people play games much. I own plenty of hardware, so I would rather be playing myself."



9%
of gaming
enthusiasts

THE HARDWARE ENTHUSIAST

"I am always following the latest hardware news and trends. Whether it's for work or play, I want an optimized experience."



13%
of gaming
enthusiasts

THE POPCORN GAMER

"Playing video games may not be my favorite hobby, but I definitely enjoy watching others play."



6%
of gaming
enthusiasts

THE BACKSEAT VIEWER

"I used to game a lot. Whenever I watch a big esports event and watch others playing games, that passion is reignited."



27%
of gaming
enthusiasts

THE TIME FILLER

"I only game when I have time to spare or at social events. Mobile games are my go-to."

TARGET AUDIENCE

ACTUAL AUDIENCE

CALL OF DUTY
BLACK OPS II



POKÉMON



my LITTLE PONY

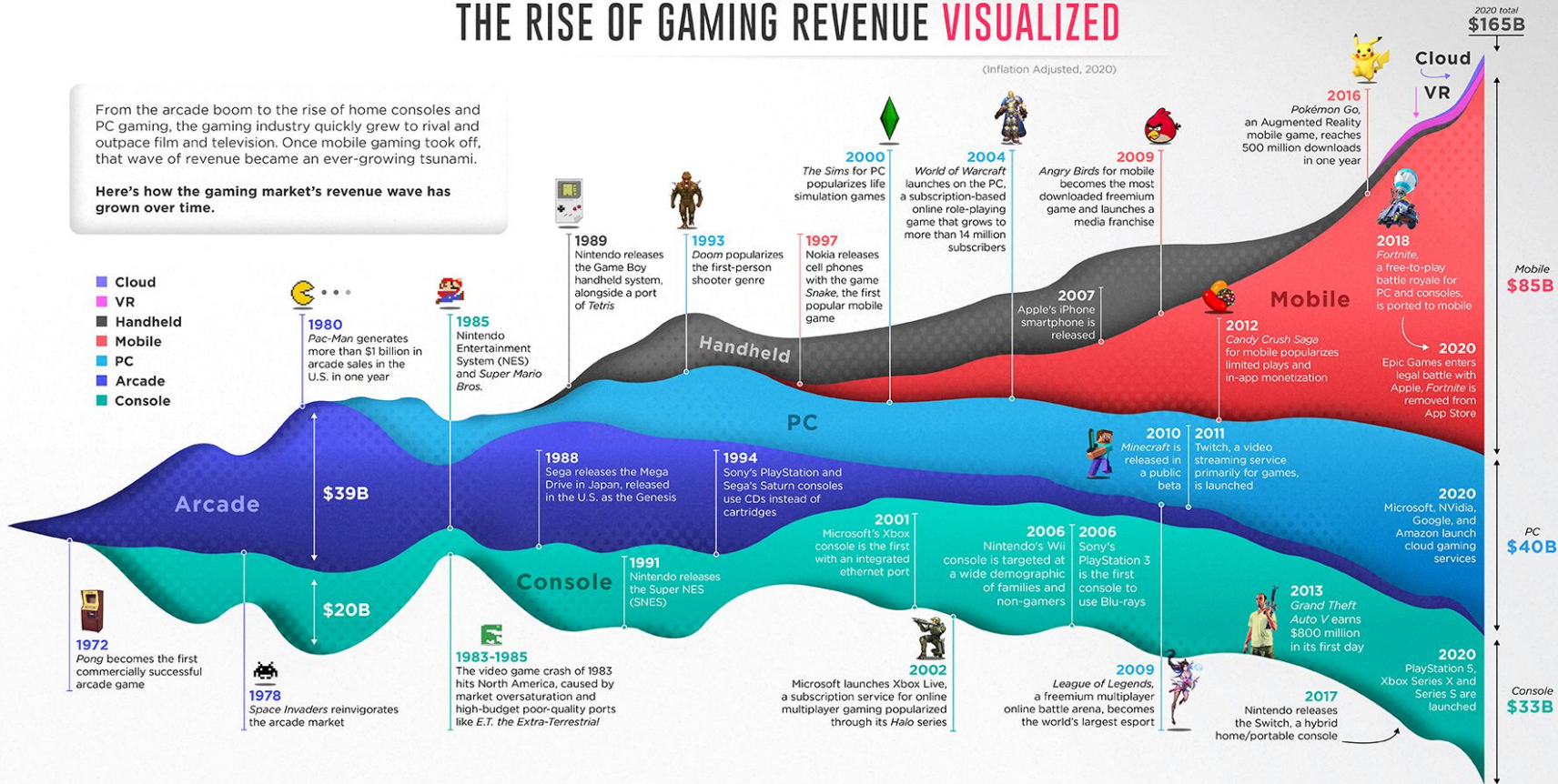


Game Industry

THE RISE OF GAMING REVENUE VISUALIZED

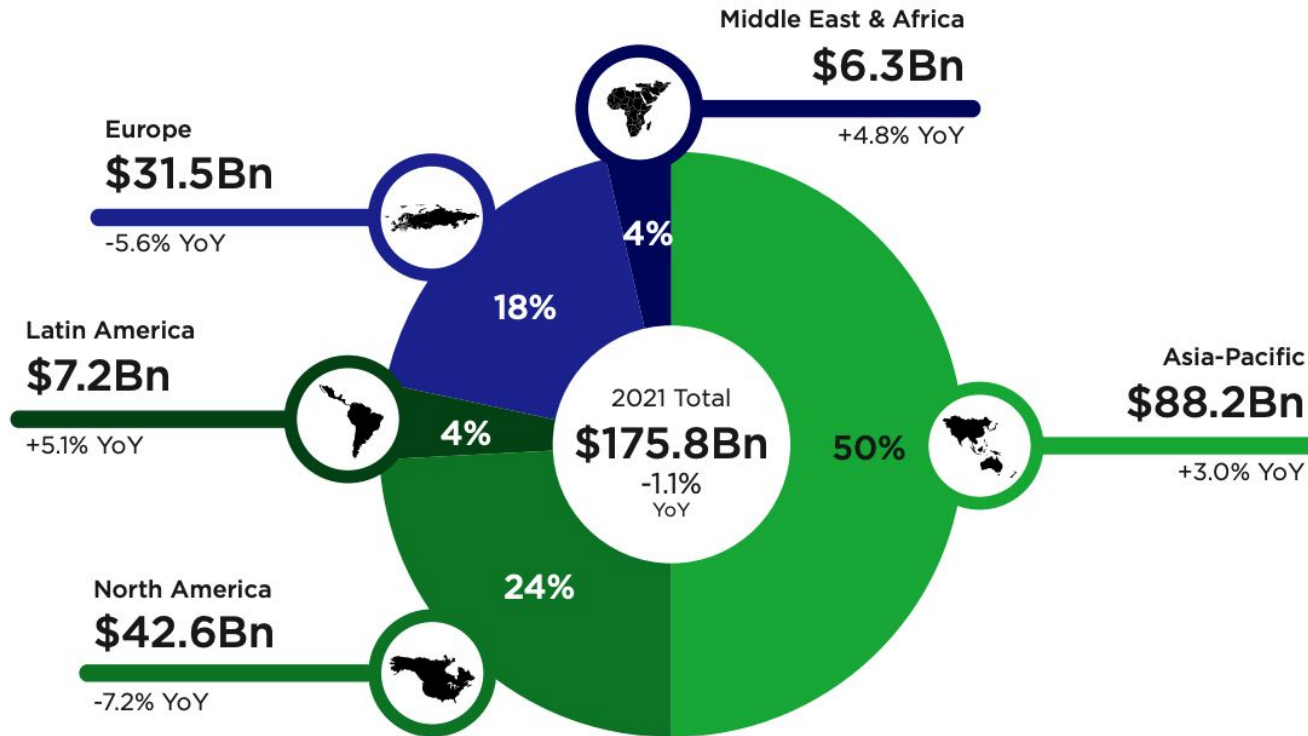
From the arcade boom to the rise of home consoles and PC gaming, the gaming industry quickly grew to rival and outpace film and television. Once mobile gaming took off, that wave of revenue became an ever-growing tsunami.

Here's how the gaming market's revenue wave has grown over time.



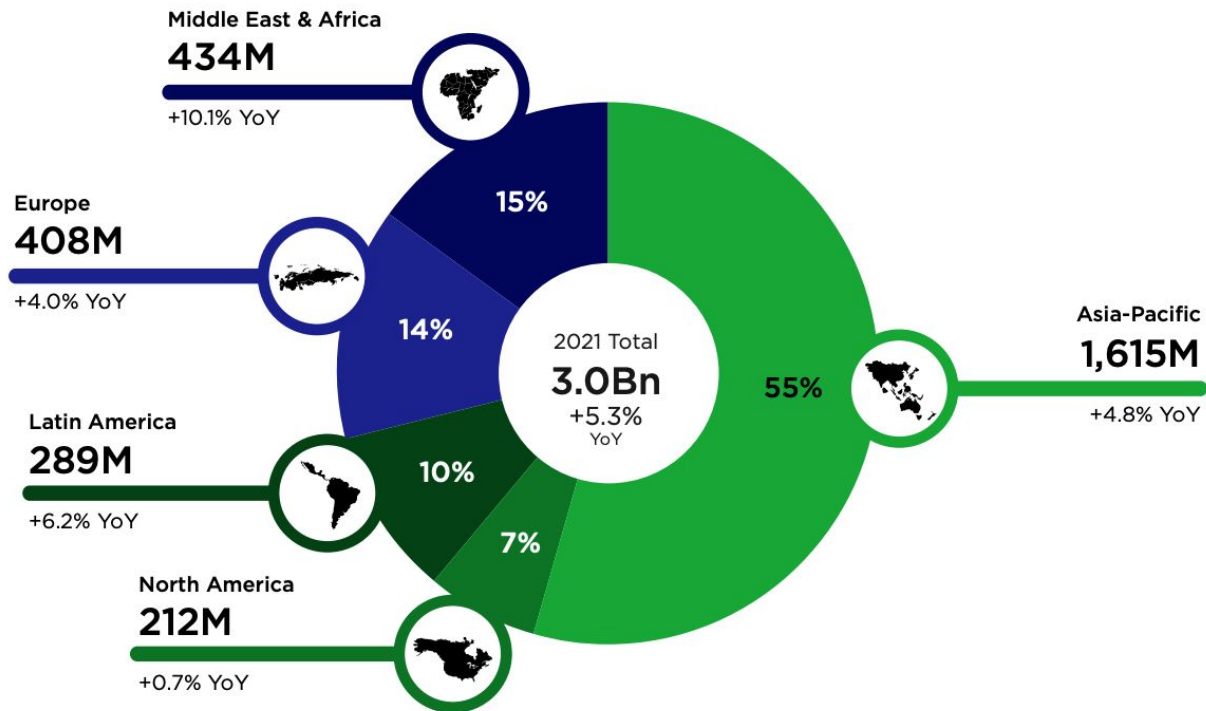
2021 Global Games Market

Per Region



2021 Global Players

Per Region

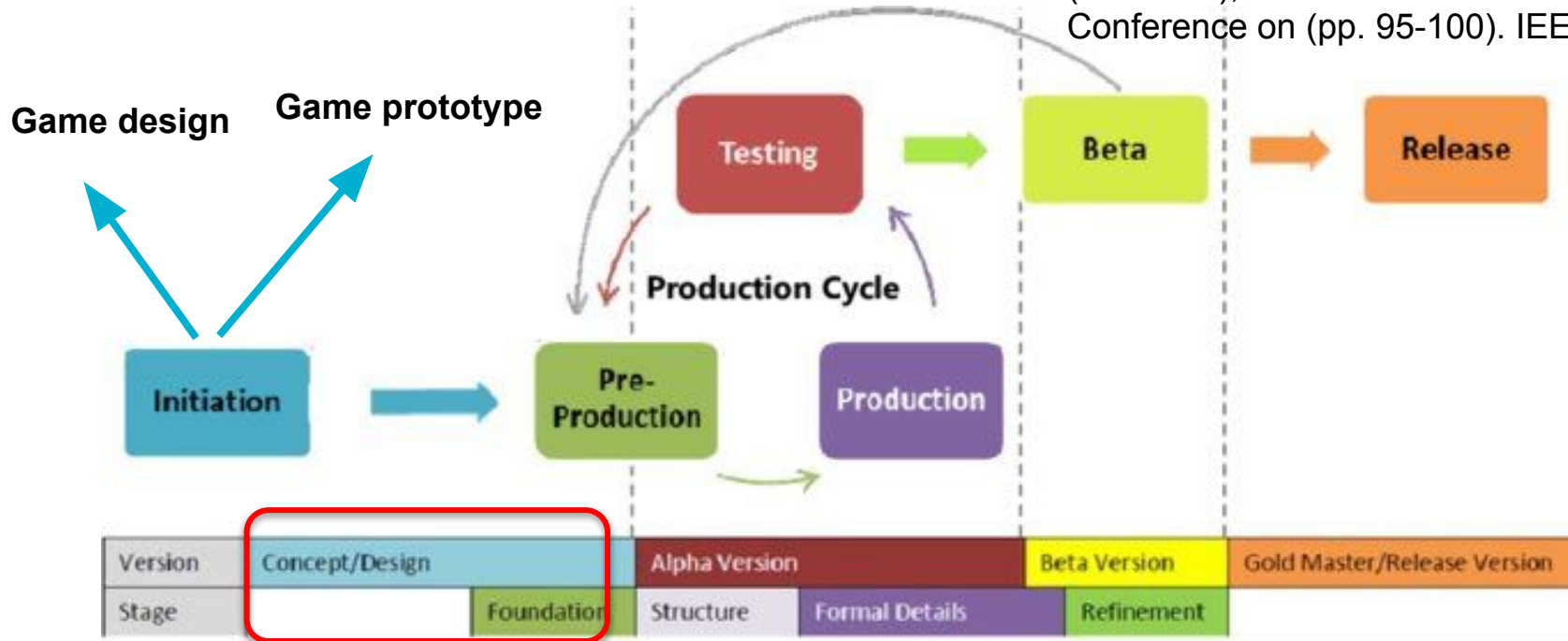


| Rank | Company | HQ | Q1 (\$M) | Q2 (\$M) | Q3 (\$M) | Q4(\$M) | 2020 (\$M) | YoY Growth |
|------|----------------------|----|----------|----------|----------|---------|------------|------------|
| 1 | Tencent | CN | 6,683 | 6,733 | 7,293 | 6,733 | 27,441 | 34% |
| 2 | Sony | JP | 3,373 | 4,762 | 4,009 | 5,353 | 17,498 | 27% |
| 3 | Apple | US | 2,556 | 3,180 | 3,526 | 3,758 | 13,020 | 19% |
| 4 | Microsoft | US | 2,148 | 3,125 | 2,950 | 3,473 | 11,695 | 34% |
| 5 | Google | US | 1,880 | 2,309 | 2,525 | 2,428 | 9,142 | 23% |
| 6 | NetEase | CN | 1,941 | 1,985 | 1,990 | 1,924 | 7,839 | 16% |
| 7 | Nintendo | JP | 1,557 | 1,716 | 1,704 | 2,471 | 7,449 | 49% |
| 8 | Activision Blizzard | US | 1,662 | 1,759 | 1,870 | 2,108 | 7,399 | 27% |
| 9 | Electronic Arts | US | 1,387 | 1,459 | 1,151 | 1,673 | 5,670 | 5% |
| 10 | Take-Two Interactive | US | 761 | 831 | 841 | 861 | 3,294 | 15% |

Game Design Concepts

Game Development Life Cycle

[Ramadan, R., & Widayani, Y. (2013, September). Game development life cycle guidelines. In *Advanced Computer Science and Information Systems (ICACSIS)*, 2013 International Conference on (pp. 95-100). IEEE.]



Game Design Focuses on Defining:

- game genre
- gameplay
- mechanics
- storyline
- characters
- challenges
- fun factors
- technical aspects
- its elements documentation in game design document (GDD)

MDA Model [1]

[Hunicke, R., LeBlanc, M., & Zubek, R. (2004, July). MDA: A formal approach to game design and game research. In Proceedings of the AAAI Workshop on Challenges in Game AI (Vol. 4, No. 1, p. 1722).]



The MDA framework formalizes the consumption of games by breaking them into their distinct components:



...and establishing their design counterparts:



MDA Model [2]



THE MDA FRAMEWORK

Mechanics

- Amount of bullets
- Amount of damage the bullets do
- Amount of enemies faced
- Relative strength of these enemies

Dynamics

- Play alone
- Play together
- Play alone with others
- Play against each other
- Play with each other
- Fight each other
- Talk to each other
- Play alone, with others, and help each other
- Make long term plans
- Help each other
- Move
- Form Teams
- Compete Team vs Team
- Show expertise
- Perform acts outside of comfort zone

Aesthetics

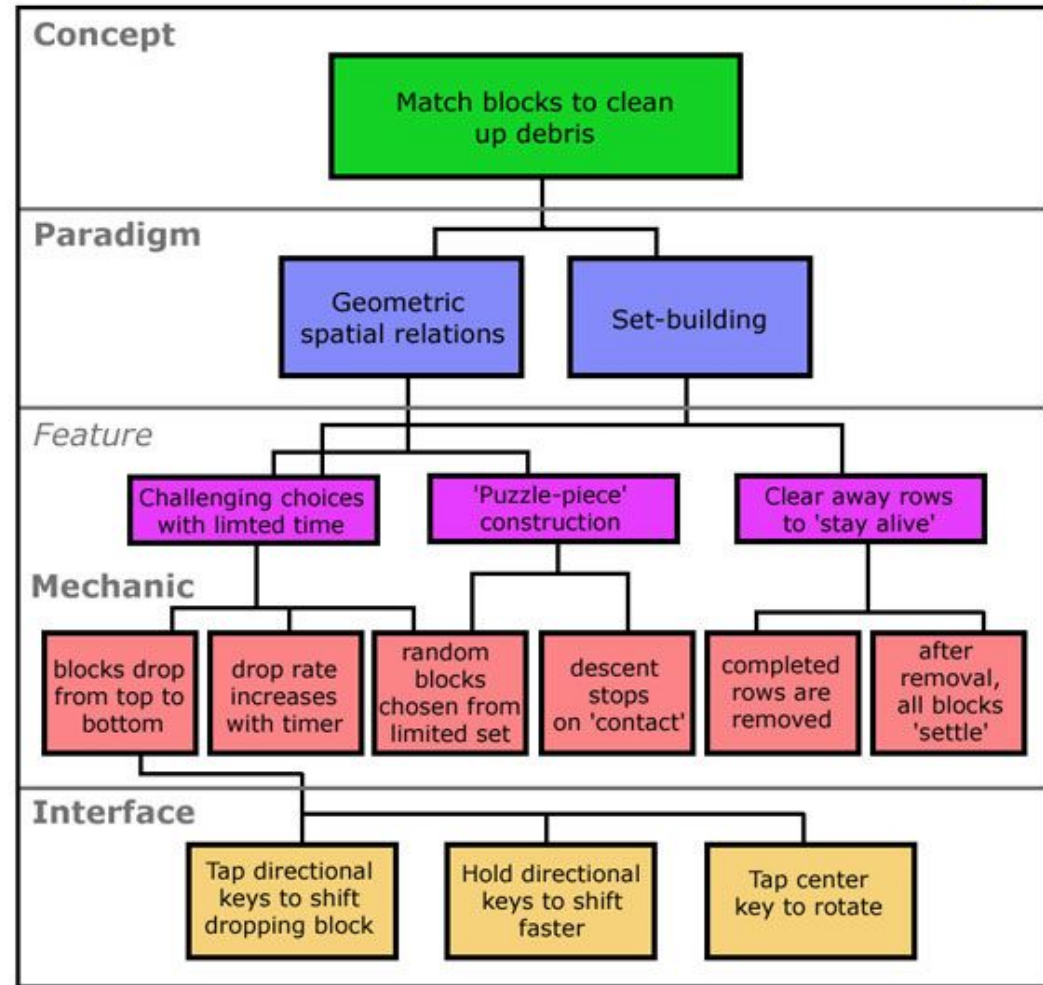
8 kinds of fun:

1. Sensation: Game as sense-pleasure
2. Fantasy: Game as make-believe
3. Narrative: Game as drama
4. Challenge: Game as obstacle course
5. Fellowship: Game as social framework
6. Discovery: Game as uncharted territory
7. Expression: Game as self-discovery
8. Submission: Game as pastime

Four Layers of a Game

- Concept
- Paradigm
- Mechanics
- Interface

[Ventrice, T. (2009, May). The Four Perspectives of Game Design: Insight from the Mobile Fring. Gamasutra]



Concept

- The basic premise and idea of the game
- Concept can be (and often is) conveyed through other games
- Game is “sold” via its concept - it tells a story
- Good games can fail when their concept is not clear for the audience
- What are the most compelling aspects of the game, and how to communicate them?
- Concept is usually communicated via pitch

Concept is about marketing

Paradigm

- Paradigm can be the most difficult to point out
- Paradigm is the perspective for the user interaction
- Hunting, hiding, collecting, building - experiences that form a paradigm
- Player intuitively knows objectives and hazards to a given paradigm
- What paradigms does first-person shooter have?
- Many concepts suggest obvious paradigms
- Sometimes paradigms are mixed with game mechanics

Paradigm is about psychology

Mechanics

- Rules of the game are defined by game mechanics
- Momentum, match-three, shooting, reload, building...
- The player affects in the game world via mechanics
- Features are usually lump of mechanics put together
- Mechanics working together for dynamics of the game, i.e. gameplay
- Does more mechanics and features mean a better game? Not necessarily because player has limited time, money, and interest in the game
- Artistic vision makes mechanics work together

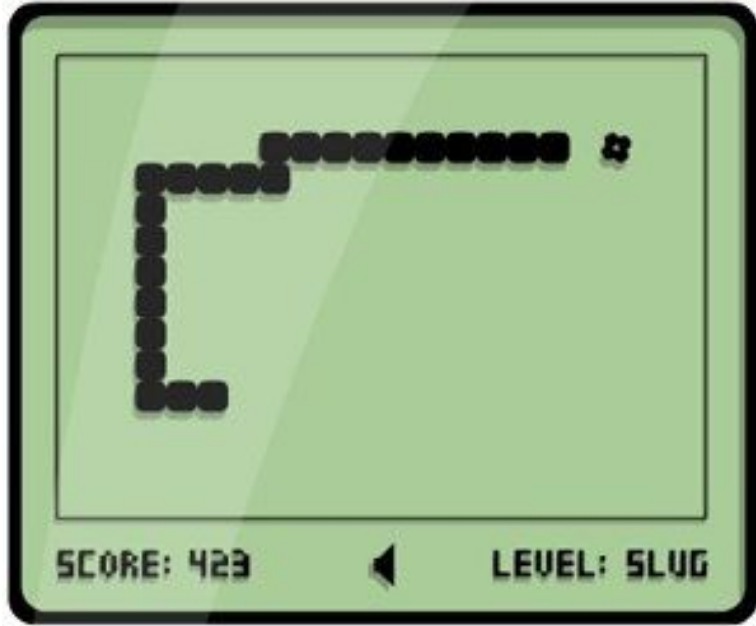
Mechanics are about game design and playability

Interface

- Interface provides the means for the player to interact with the game via feedback loop
- Physical, visual, audio – sometimes even smell or taste!
- Interface matches inputs with game mechanics
- Understanding earlier conventions is essential – sometimes breakthroughs do happen
- Technology provides opportunities and challenges for interface design
- Goal is to make interface intuitive – as transparent as possible

Interface is about usability

Four Layers of Candy Crush Saga and Snake



Games as Systems

[Fullerton, T., Swain, C., & Hoffman, S. Game Design Workshop—Designing, Prototyping, and Playtesting Games, 2004.]

- Games are systems with interactive elements
- These elements work together to produce dynamic experience in which the players engage
- Basic elements of a system are:
 - Objects
 - Properties
 - Behavior
 - Relationships
- Systems can be either very simple or very complex
- Systems can produce predictable or unpredictable results

Objects

- Basic building blocks of the system
- Physical, abstract or both
- Pieces, concepts, players, representations
 - A chess piece
 - Bank in Monopoly
 - Forward in hockey
 - Avatar in an online game
- The game space - environment, area, or terrain can be also seen as object
- Objects have **properties** and **behavior**
- They also have **relationships** with other objects

Properties

- Qualities and attributes that define objects
- Set of values that describe capabilities
 - Queen in chess - color, position, and movement
 - Player character in Fallout 3 - S.P.E.C.I.A.L attributes, skills, and perks
- The amount of properties can vary greatly
 - Checkers piece - color, position, man/king
 - Numerous character attributes, skills, and perks in RPGs
- Usually in complex systems the properties of an object change over the course
- More complexity promotes less predictable relationships with other objects

Behaviour

- Behaviors are the potential actions that an object might perform in a given state
 - Bishop can move diagonally radiating from its position until it captures or is blocked
 - In Fallout 3, we can recognize many behaviors like moving, fighting, talking, using items etc.
- Again, the more behaviors, the more unpredictable the results are
- Like properties, behaviors can change during a game (usually due change in its properties)
 - The switch from man to king in checkers
 - Leveling up and getting new skills/perks in RPGs

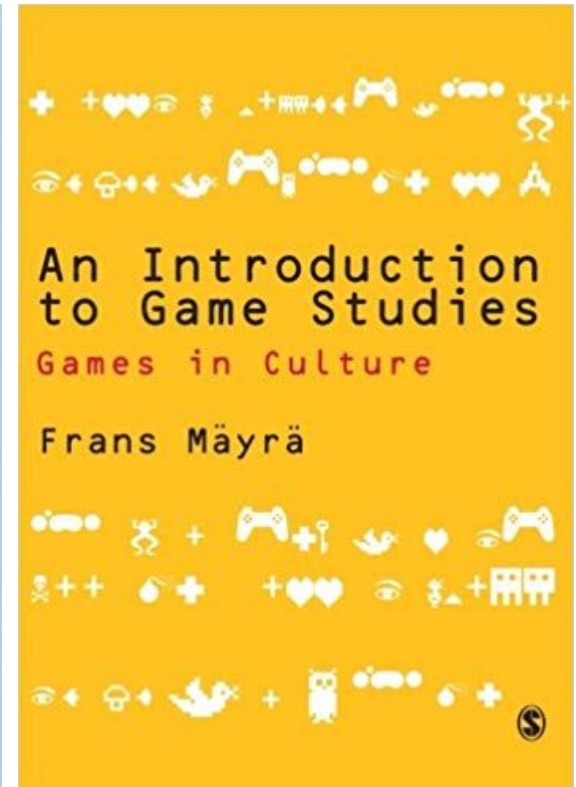
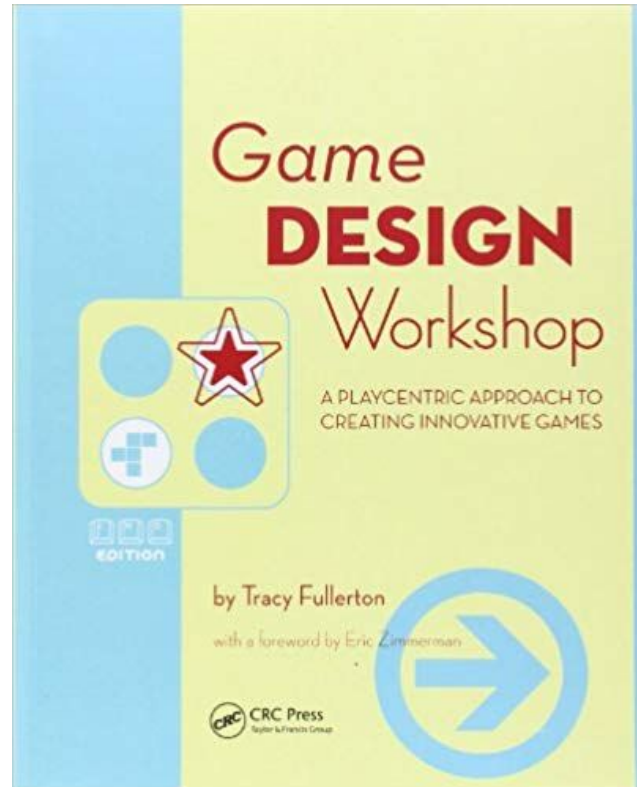
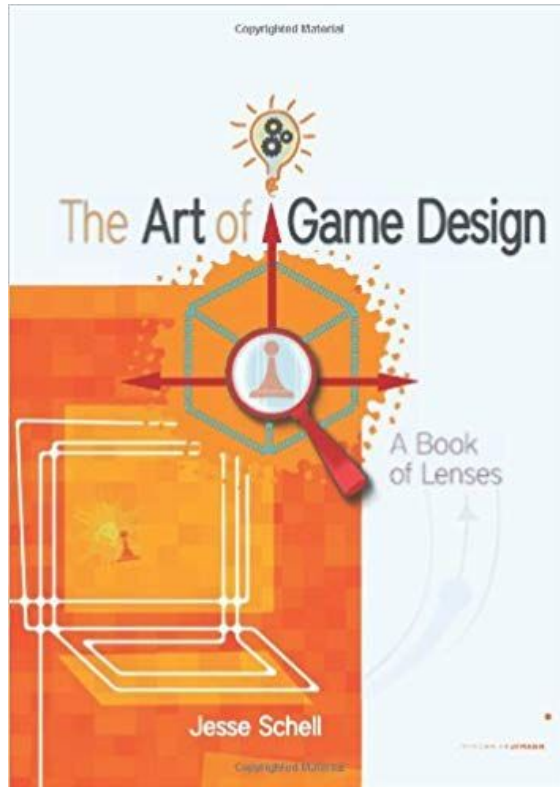
Relationships

- Systems have relationships among objects - otherwise they would not be systems but merely collections
- Relationships between objects can be expressed in different ways
 - Spatial relationships - checking in chess
 - Hierarchical relationships - poker hands
- Relationships between objects can be in constant flux
 - Spatial relationships in checkers
- Many complex games use element of chance in relationships
- Strategy game combat algorithms
- Weaker units have a theoretical chance against stronger units

System Elements of PAC-MAN and Super Mario



Literature



Questions?

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