

The Evolution of Computer Gaming



From Space War! to Spore

1st Edition

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I. Introduction

Welcome to the Evolution of Computer Gaming

You will find within this web-book a concise yet descriptive history of computer games in all of their forms.

To begin we should describe what a computer game is...

Katz and Yates describe it as "...a competition involving one or more machine or human opponents under rules using interactive electronic technology. An electronic game must have a goal, one or more obstacles to the attainment of that goal, and a means by which the goal can be achieved."

At first it appears that this description does not apply to simulation games like flight simulators, but Katz and Yates also state that "The player competes against him- or her-self in a test of skill, not against an opponent. In simulation games, winning is not a decisive moment: it is the successful achievement of a high skill level over the course of the computer's scenarios."

Now that we have established what a computer game is, let's talk about the different methods we play them.

Methods of Computer Game Play

- ☞ “Games of Agility” (Action/Arcade) is the most common gaming method and require eye-hand-controller coordination. Winning means being more agile than your opponent(s).
- ☞ “Games of Command” (Strategy/Sim) require resource collection and/or organization, and utilizing these resources in an efficient manner. Winning means being a better planner than your opponent(s).
- ☞ “Games of Wonder” (Adventure/Puzzle) require deductive reasoning, abstract thought, and simple persistence. Winning means solving the problem or puzzle as quickly as possible.

A fourth Method of games exists but was not included here.

“Traditional Games” are those card, board, and mind games that are converted into a computer game format. They typically involve luck and guessing and are not considered true computer games. Why do games engage us? Play Elements is the answer.

Computer Game Play Elements - Goal/Reward

As described earlier, every game must have a goal. From the player's perspective, the goal is just the final reward in a series of rewards. So, if a Role Playing Game has the stated goal of vanquishing an evil wizard, the player will also enjoy the creation of characters and investing their time to accumulate treasure, gain levels, etc. There are three Goal/Reward Play Elements:

- ☞ Score - the player's time and effort will be rewarded with some form of recognition such as a high score, new character levels, treasure, etc. (most computer games contain some form of this play element).
- ☞ Knowledge - the player exercises their cognition and develops competency to understand a complex topic. (Flight simulators, etc.).
- ☞ Creativity - the player creates fictional characters and builds infrastructures like castles and cities. (Sim City, RPGs, etc.)

Computer Game Play Elements - Obstacle/Challenge

The second part of a computer game are its obstacles, or challenges. The following Play Elements are ways to challenge and engage the player. A player who enjoys fiction will tend to be attracted to games that require imagination while players who want realism will stay away from chess because it is so abstract. There are four Obstacle/Challenge Play Elements:

- ☞ Realism - the player wishes to understand a detailed control system and appreciate "realistic" or "believable" game play. (Flight simulators)
- ☞ Abstract - the player prefers abstract game mechanics so to more easily appreciate the game. (Archon, Chess, etc.)
- ☞ Imagination - the player wishes to become immersed in a fictional story or world. (Ultima, Myst, etc.)
- ☞ Exploration - the player wishes to explore new levels and worlds. (Mario Bros. 2, Tomb Raider, etc.)

Computer Game Play Elements - Victory Method

The final aspect of computer games is the means to overcome the obstacles. There are three Victory Method Play Elements:

- 👉 Conflict - defeat hostile opponents to win. (95% of computer games involve some element of conflict and competition)
- 👉 Puzzles - solve puzzles to win. (Myst, Lemmings, etc.)
- 👉 Self-Defined - you choose your own goals. (SimCity, Flight Simulator, etc.)

Play Elements are a good way to understand the components that makeup a computer game. When you analyze them you will find yourself attracted naturally to certain games. But it is not descriptive enough to identify the Computer Game's Method or Play Elements, the use of Settings plays a huge role in appealing to gamers. The two Settings are Time and Place.

Computer Game Settings (Time)

There are five distinct Time Settings that computer games can be held in. Some games can span multiple eras. Some players prefer fantasy settings whereas others prefer historically accurate settings.

- ☞ Space/Science Fiction
- ☞ Fantasy/Horror
- ☞ Post Nuclear Holocaust/Alternative History
- ☞ Historical
- ☞ Modern (since 1950)

Computer Game Settings (Place)

There are seven distinct areas of play ranging from the technical Screen setting to metaphysical Dimensions setting.

- ☞ Screen/Board/Table
- ☞ Track/Arena/League
- ☞ Dungeon/Space Station
- ☞ Town/City
- ☞ Kingdom/Continent
- ☞ Planet/Solar System
- ☞ Galaxy/Universe/Dimensions

Once again this is another good way to define your gaming preferences. Some players prefer the more concrete play of single screen action whereas others want to explore worlds.

Since all of gaming is made up the the three gaming Methods, they attract players differently and will interact together. The following illustration attempts to capture this dynamic.



A New Computer Game Typology

It is now possible to create a new Typology of Computer Games when we use the three Methods, ten Play Elements, and two Settings. Here are some examples of what this would look like.

Game: Pac-Man
Method: Action/Arcade
PE Goal: score
PE Obstacle: abstract
PE Victory: conflict
Time Setting: n/a
Place Setting: Screen

Game: Warlords III
Method: Strategy/War
PE Goal: score
PE Obstacle: abstract, imagination
PE Victory: conflict
Time Setting: Fantasy
Place Setting: Continent

II. The Chronology of Computer Games

The Chronology of Computer Games

Computer games can be summarized into four “generations” that outline their evolution from the most rudimentary games to the most complex form of entertainment that civilization has developed. You will notice that these generations closely correspond to advances in hardware.

- ☞ First Generation (1962 - 1984) - The appearance of mainframe games, the rise of the arcade, the establishment of home game consoles and early 8-bit computers.
- ☞ Second Generation (1985 - 1992) - The great game console shakeout with the re-establishment of a Nintendo world, the new 16-bit computers and home game consoles including the Amiga, Atari ST, 486 PCs, and Turbo-Grafix.
- ☞ Third Generation (1993 - 1998) - The domination of Wintel PCs and their use of multimedia, the new 32-bit consoles including the Playstation, N64, Sega Saturn.
- ☞ Fourth Generation (1999 - present) - The rise of Massive Multi-player games, etc, the introduction of 64/128-bit consoles including the PS2, X-Box, etc.

What follows is a detailed chronology of computer game development. It is focussed on the various milestones of the industry, it is not intended to track every game that has been developed.

The First Generation 1962 - 1984

The appearance of mainframe games, the rise of the arcade, the establishment of home game consoles and early 8-bit computers.

Chronology of Computer Games 1962 - 1970

1962

Space War developed by Steve Russell on a mainframe computer, was the first ever computer game!

1966

Ralph Baer develops video badminton game. Magnavox would later purchase his game and use it in its Odyssey home game console.

1967

Trek developed on a mainframe computer, was the first strategy game.

1970

Kingdom/Hammurabi developed on a mainframe computer, was the first city management game.

Life developed by John Conway on a mainframe computer, was the first artificial intelligence sim game.

Chronology of Computer Games 1970 - 1972

1970

Lunar Lander developed on a mainframe computer, was the first flight sim game.

1971

Computer Space (based on Space War) is developed by Nolan Bushnell for the arcade. It was the first video arcade game and was a commercial flop.

1972

Adventure/Colossal Cave developed by Will Crowther on a mainframe computer, was the first adventure game.

Hunt the Wumpus developed by Gregory Yob on a mainframe, was the first role-playing game.

1972

Magnavox releases the Odyssey, the first home game console.

Chronology of Computer Games 1973 - 1976

1973

Pong released by Atari for the arcade, was a huge success and instantly created the video arcade.

1974

Tank released by Atari for the arcade, which was another great success.

1974

Atari and dozens of other competitors develop hundreds of home Pong consoles which seriously hurts the Odyssey.

1975

IMSA releases the Altair 8800 which is the first ever personal computer. It depended on toggle switches and blinking lights for input/output but it was a start.

1976

Breakout released by Atari for the arcade.

1976

Fairchild releases the Channel F console, the first to use a microchip for cartridges.

Atari pays Magnavox a licensing fee for use of the Pong patent.

Chronology of Computer Games 1977 - 1979

1977

Atari releases the Atari 2600, which revolutionizes the home video console market.

Magnavox releases the Odyssey² console.

Apple releases the Apple II, which is the first personal computer with color graphics.

Tandy releases the TRS-80 personal computer.

Commodore releases the PET personal computer.

1978

Adventureland released by Scott Adams for the TRS-80, was the first commercial computer game.

Space Invaders released by Taito for the arcade. It created the first video game craze.

Starfleet Orion released by Automated Simulations (Epyx) for the PET, was the first tactical combat strategy game.

Empire released for the mainframe, was first wargame.

1979

Adventure released by Atari for the Atari 2600, was the first console adventure game.

1979

Mattel releases the Intellivision console.

Atari releases the Atari 400/800 personal computers.

Chronology of Computer Games 1979 - 1980

1979

Asteroids released by Atari for the arcade.

Temple of Apshai released by Automated Simulations for PET, was the first ever graphic role-playing game.

Zork released by Infocom for the TRS-80, revolutionized adventure games.

1980

Battlezone released by Atari for the arcade, was the first ever 3D game.

Pac-Man released by Namco for the arcade, created the first video game celebrity.

Classic arcade games released include **Defender, Missile Command,** and **Tempest.**

Mystery House released by Sierra for the Apple II, was the first ever graphic adventure game.

1979

Dozens of computer game software companies are formed including Activision, Sierra, and others.

1980

Commodore releases the VIC-20 which becomes the first massively popular personal computer.

Sinclair releases the ZX80 personal computer.

Chronology of Computer Games 1981 - 1982

1981

Classic arcade games released include **Frogger** and **Centipede**.

Kaboom! released by Activision for the Atari 2600, was the first catch-em type game.

War of Nerves released for the Odyssey², was the first action strategy game.

1982

Classic arcade games released include **Donkey Kong**, **Q*Bert**, **Joust**, **Tron**, and **Zaxxon**. Mario, the hero of **Donkey Kong** becomes the new ambassador for computer games.

Pitfall! released by Activision for the Atari 2600, was the first action adventure game.

1981

IBM releases the IBM PC personal computer, which creates a new standard for personal computing as within a year it would be cloned and dominate the market.

1982

Bally releases the Astrocade console.

Coleco releases the Colecovision console.

Milton Bradley releases the Vectrex console.

Commodore releases the Commodore 64 personal computer.

Chronology of Computer Games 1983 - 1984

1983

Classic arcade games released **Dragon's Lair**, **Pole Position**, and **Punch-out**. The use of the laser disc revolutionized graphics and animation but **Dragon's Lair** remained the only laser disc success.

M.U.L.E. released by Ozark Software for various personal computers.

1984

King's Quest released by Sierra On-Line for various personal computers, was the first adventure game with an onscreen character.

1983

Apple releases the Lisa, the first PC with a graphical user interface. It would fare poorly.

TCP/IP is developed by ARPANET which becomes the first true internet of computers.

1984

The "Console Crash" is created due to a combination of consumer indifference and a flood of sub-par games. None of the first generation consoles would survive.

Apple releases the Macintosh personal computer which succeeded where the Lisa failed.

IBM releases the IBM-AT, the first PC based on Intel's 80286 CPU.

The Second Generation 1985 - 1992

The great game console shakeout with the re-establishment of a Nintendo world, the new 16-bit computers and home game consoles.

Chronology of Computer Games 1985 - 1987

1985

Gauntlet released by Atari for the arcade, was the first four player cooperative game.

Defender of the Crown released by Cinemaware for various computers, was the first to use cut scenes.

Ultima IV released by Origin Systems for various computers, was the first RPG to employ ethical roleplaying.

1986

Street Fighter released by Capcom for the arcade, was the first megahit martial arts combat game.

1987

Sim City released by Maxis for various platforms, was the first graphical city building game and software toy.

1985

Sega releases the Sega Master System console.

Nintendo releases the Nintendo Entertainment System console.

Atari releases the Atari ST personal computer.

Commodore releases the Amiga personal computer.

1986

Compaq releases the Deskpro 386, the first PC based upon Intel's 80386 CPU.

Microsoft releases Windows for Intel compatible personal computers.

1987

IBM releases the VGA standard for graphic display use.

Chronology of Computer Games 1988 - 1989

1988

Tetris is released by Spectrum Holobyte for arcade, consoles, and personal computers. It redefined the action puzzle genre.

1989

Manhole is released by Activision for the personal computer, was the first CD-ROM game.

Populous is released by Bullfrog for various platforms, was the first true god game.

1989

Sega releases the Genesis, the first 16-bit console.

NEC releases the Turbo-Grafx 16 console.

The portable console market is created with the arrival of Atari's Lynx, Nintendo's Gameboy, and Sega's Game Gear.

Intel releases the 80486 CPU for personal computers.

Sound cards by Ad Lib, Roland, and Creative Labs are released for Intel personal computers.

Chronology of Computer Games 1990 - 1992

1990

Super Mario Bros. 3 for the NES is the best selling console game of all time.

1990

Console cartridge rental is allowed and becomes common practice.

1991

Civilization is released by Microprose for various platforms, revolutionized strategy games.

1991

Nintendo releases the Super Nintendo Entertainment System console.

Wing Commander is released by Origin for Intel PCs, revolutionized space opera games.

1992

Mortal Kombat is released by Acclaim for the arcade, creates brand new controversy about violence and video games.

Wolfenstein 3D is released by id Software for Intel PCs, revolutionized first-person shooters.

Dune II is released by Westwood for Intel PCs, the first Real-Time Strategy game.

The Third Generation 1993 - 1998

The domination of Wintel PCs and their use of multimedia, the new 32-bit consoles including the Playstation, N64, and Sega Saturn.

Chronology of Computer Games 1993 - 1995

1993

Doom is released by id for the Intel PCs, it revolutionizes gaming forever in terms of atmosphere and intense multiplayer action.

1994

Virtua Fighter is released by Sega for the arcade and other platforms, and is the first fighting game to use polygons for its characters.

Myst is released by Broderbund for Intel PCs, combines great graphics and challenging puzzles.

1995

Command & Conquer is released by Westwood Studios, revolutionizes Real-Time strategy.

1993

Panasonic releases the 3DO console.

Atari releases the Jaguar, the first 64-bit console.

Intel releases the Pentium CPU for personal computers.

1994

Sega releases the Saturn console.

Sony releases the Playstation console.

CD-ROM drives are made a standard peripheral in personal computers.

1995

Microsoft releases Windows 95 for Intel PCs, and changes the face of computer gaming by killing off DOS games.

Chronology of Computer Games 1996 - 1998

1996

Quake is released by id for Intel PCs, expanding upon the Doom legacy with better graphics and more multiplayer action.

1996

Nintendo releases the Nintendo 64 console.

3D graphic accelerator cards becomes a major sub-marketplace within the personal computer industry.

1997

Ultima Online is released by Origin for Intel PCs, establishes the Massive Multiplayer Online Role Playing Game.

1998

Half-Life is released by Sierra for Intel PCs, revolutionizes first player shooters with a compelling story.

1998

Sega releases the Dreamcast, the first 128-bit console.

The Fourth Generation 1999 - present (06/2001)

The rise of Multi-player games, the introduction of 64/128-bit consoles including the PS2, and X-Box.

Chronology of Computer Games 1999 - 06/2001

1999

Everquest is released by Sony for Intel PCs. It revolutionizes massive multiplayer gaming.

2000

The Sims is released by Maxis for the Intel PCs. It revolutionizes simulation gaming.

2000

Intel releases the first 1 GHz Pentium CPU for personal computers.
Sony releases the PlayStation2 console.

2001

Black and White is released by Lionhead Studios for the Intel PCs. It revolutionizes the god genre.

III. The Rise of the Modern Game Genres

The Evolution of Modern Game Genres

Our modern game genres can be traced using a flow chart. It is fascinating to see how the games relate and flow together. Like in biology, it is system of concurrent evolution - there is no single computer game that evolved into everything else. Instead, Space War inspired others to create their own masterpieces.

To understand the flowcharts, time is tracked from top to bottom of the page. Solid lines identify a direct connection or evolution. When a lineage is influenced by another gaming Method or Play Element then it will "shift" and the influence will be identified.

The Evolution of the Action/Arcade Method (Genre)

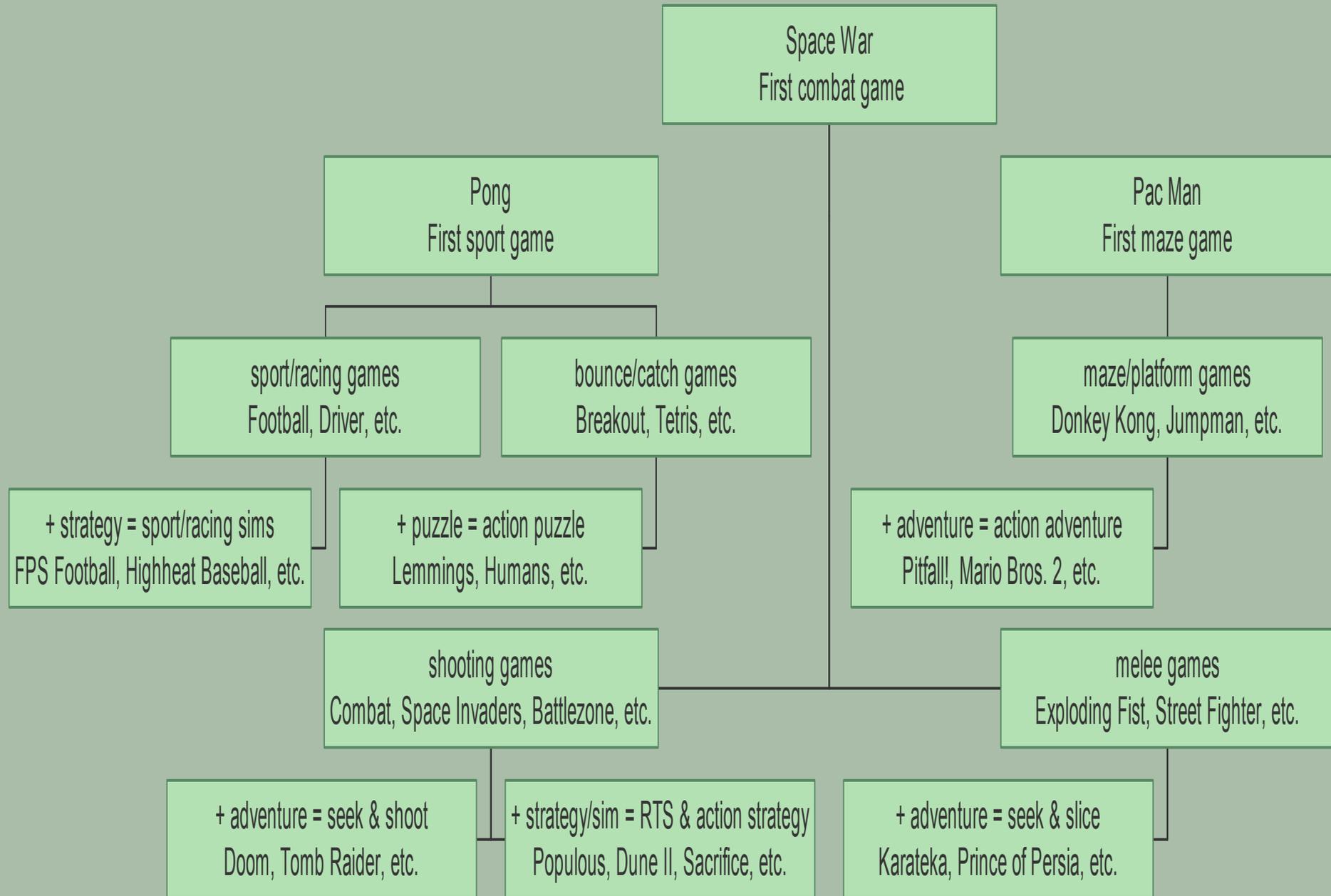
Three main games have established and influenced the Action/Arcade genre. They are Space War, Pong, and Pac-Man.

- ☞ Space War created the Shooting Combat sub-genre where combatants use ships, tanks, guns, and other weaponry. This sub-genre was revolutionized with the addition of a first person perspective which created games like Battlezone and Wing Commander.
- ☞ Melee Combat is very similar to Shooting games except player uses a fighter with martial/wrestling attacks. There are some first person games in this sub-genre.
- ☞ Pac-Man created the Maze/Platform sub-genre which are defined by restricting play to a single screen.
- ☞ Pong created the Catch/Bounce sub-genre inspiring games like Kaboom!, Breakout, and Tetris.
- ☞ Pong also influenced the development of non-violent games in the form of the Sports/Racing sub-genre.

The Action/Arcade method has become infused with Strategy and Adventure play elements:

- ☞ Agility + Command = The creation of Real Time Strategy, Action Strategy, and Sport/Racing Simulations sub-genres with games like Command & Conquer, Sacrifice and Highheat Baseball.
- ☞ Agility + Wonder = The creation of Seek & Shoot/Slice, Action Adventure, and Action Puzzle sub-genres with games like Tomb Raider, Doom, Lemmings, and Donkey Kong Country.

Evolution of the Action/Arcade Method



The Evolution of the Strategy/Sim Method (Genre)

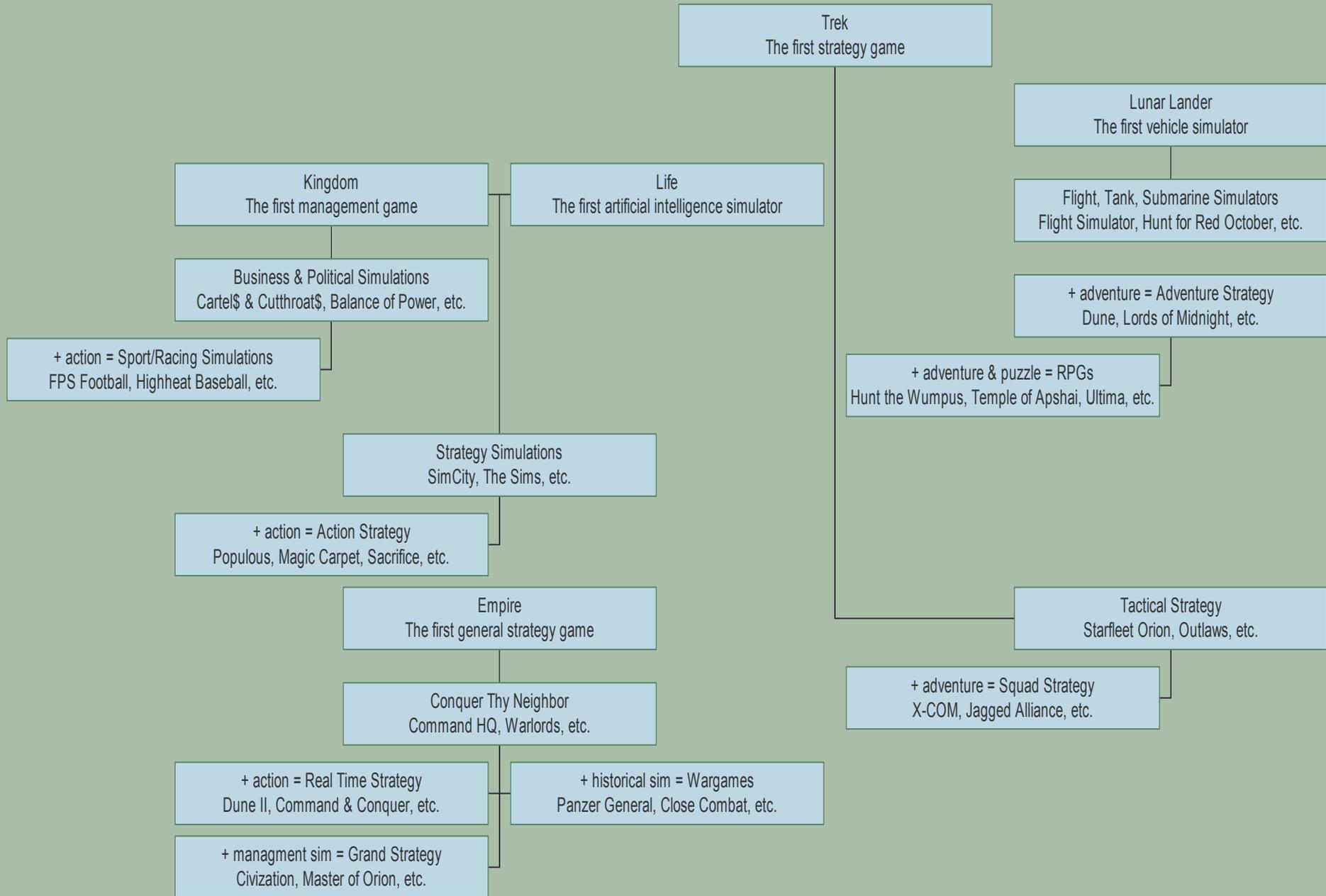
Five main games have established and influenced the Strategy/Sim genre. They are Trek, Life, Kingdom, Empire, and Lunar Lander.

- Trek created the Tactical Strategy sub-genre with its focus on tactics to win the game and requiring minimal resource management.
- Empire created the Conquer-Thy-Neighbor sub-genre with its focus on developing strong armies, taking over resources, winning through conquest.
- Lunar Lander inspired the creation of various Vehicle Simulators sub-genre.
- Kingdom inspired the creation of the Business/Political simulations sub-genre. While the Strategy Simulations sub-genre was inspired by the combined elements of Life and Kingdom.
- Empire and Kingdom created the Grand Strategy sub-genre with its focus on developing strong civilizations, trade/research, winning through conquest, diplomacy, and economics.
- Empire and the grognards demand for detail created Wargames which simulate historical/abstract battles and tend to place realism above playability.

The Action/Arcade method has become infused with Strategy and Adventure play elements:

- Command + Agility = The creation of Real Time Strategy, Action Strategy, and Sport/Racing Simulations sub-genres with games like Command & Conquer, Sacrifice and Highheat Baseball.
- Command + Wonder = The creation of Role Playing Games, Adventure Strategy, and Squad Strategy sub-genres with games like Ultima, Dune, and X-COM.

Evolution of the Strategy/Sim Method



The Evolution of the Strategy/Sim Method (Genre)

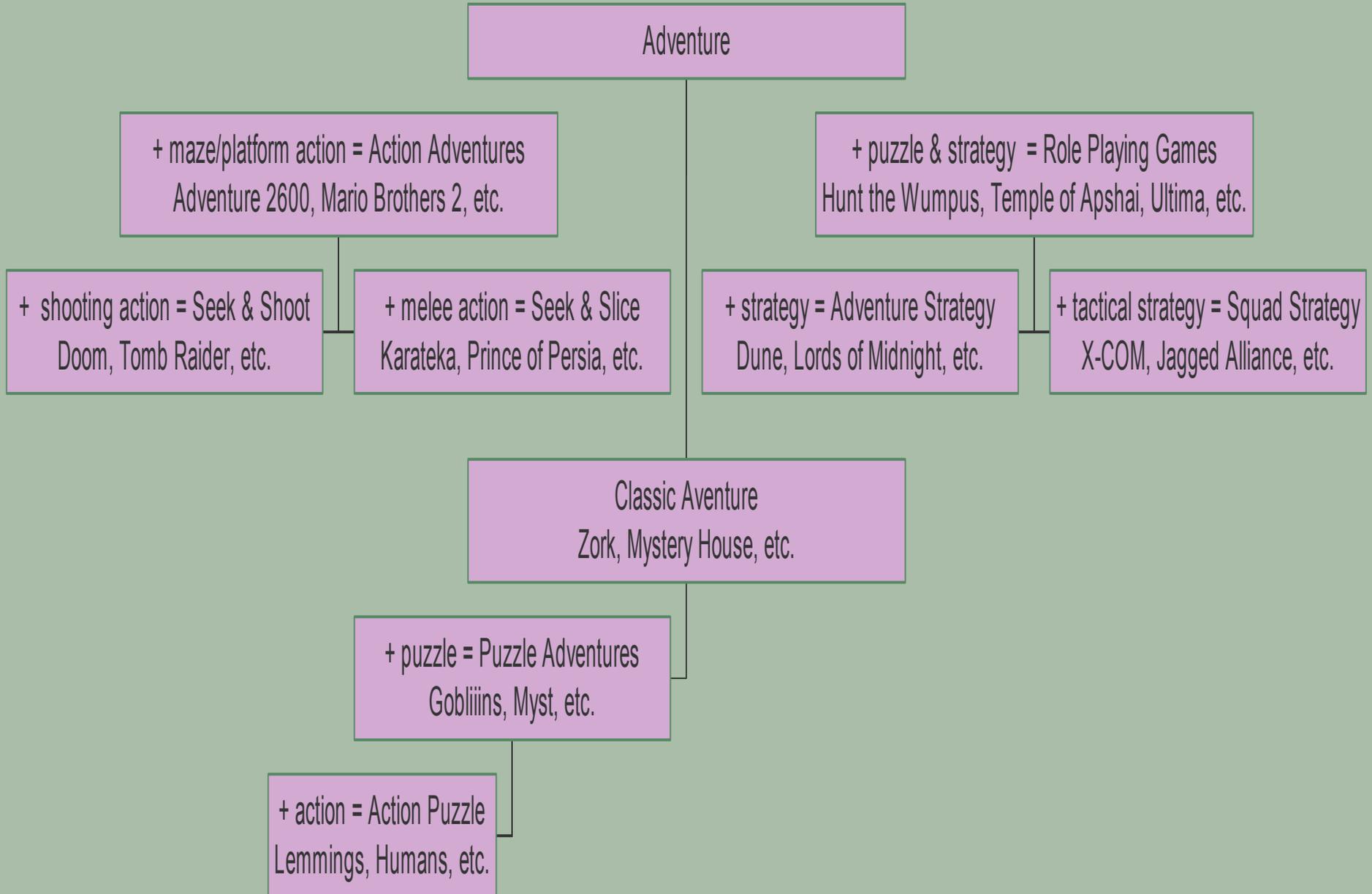
One game was critical in establishing Adventure/Puzzle genre. It is aptly called Adventure.

- Adventure created Classic Adventure sub-genre which consists of both Interactive Fiction and Graphical Adventures like Zork, and King's Quest.
- Adventure also inspired the Puzzle sub-genre which focuses on solving puzzles in games like Myst, and Gobbliins.

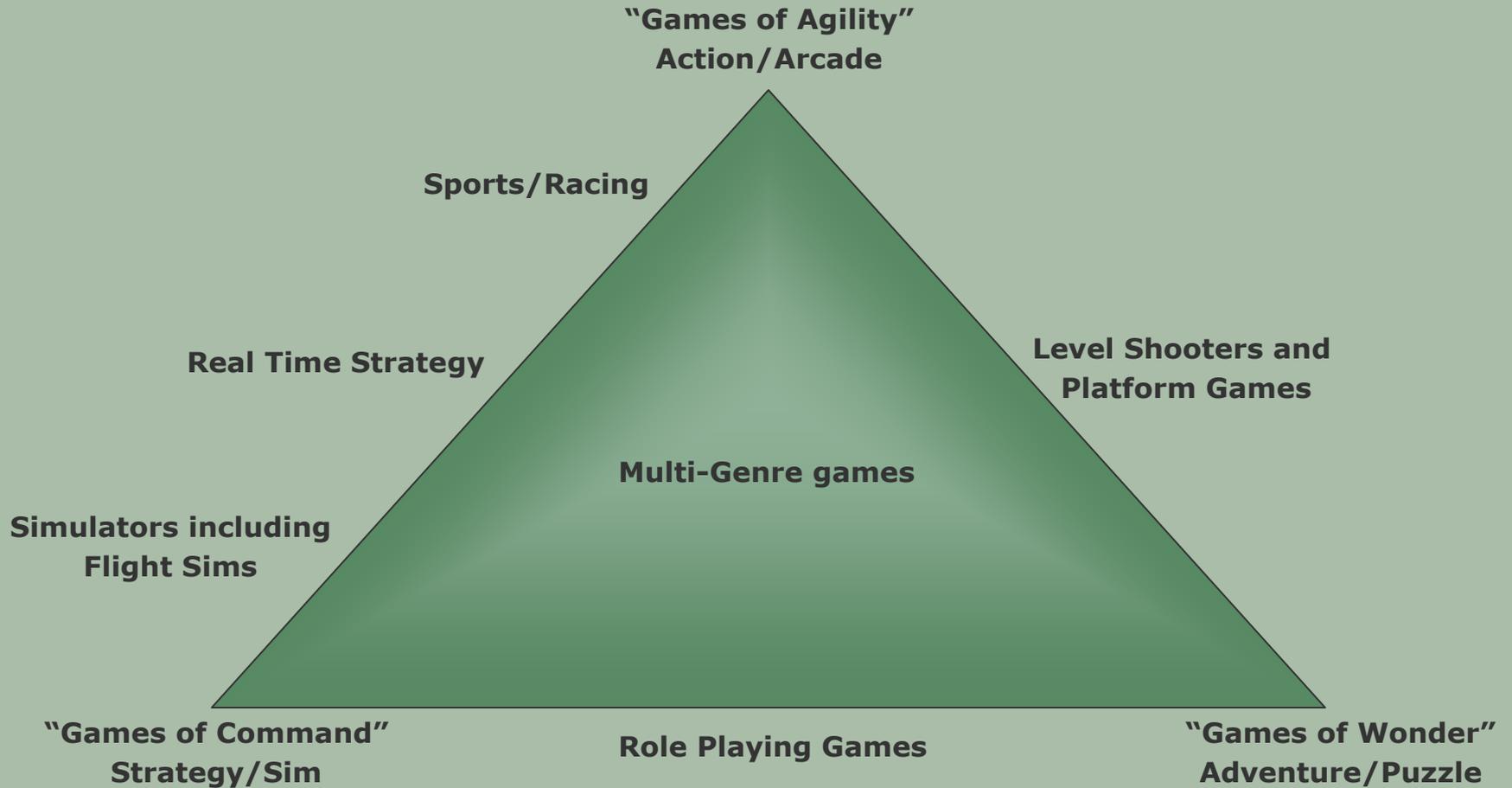
This Adventure/Puzzle method has become infused with Action and Strategy play elements:

- Wonder + Agility = The creation of Seek & Shoot/Slice, Action Adventure, and Action Puzzle sub-genres with games like Tomb Raider, Doom, Lemmings, and Donkey Kong Country.
- Command + Wonder = The creation of Role Playing Games, Adventure Strategy, and Squad Strategy sub-genres with games like Ultima, Dune, and X-COM.

Evolution of the Adventure/Puzzle Method



The Computer Game Genre Pyramid (How they fit)



IV. Conclusion & Appendices

Thanks for Reading!

- Thanks for checking this e-book out. Hope you enjoyed it.
- The Evolution of Computer Gaming is a work in progress. I am not a console player, so if there are recent console games that were milestones that I left out, drop me a line @ gamer@accidentaldesign.com.

▪ **About the Author and this Work**

- The author is Chris Billows, a being who is fascinated with systems. From advocating for ecological foresight to enjoying complex computer games, he is a sucker for systems theory.

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