



*SCHOOL OF ECONOMICS
AND MANAGEMENT
Lund University
Department of Business Administration*

SEVEN GENERATIONS OF GAMING
Erik Persson & Jonas Medin

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Christer Kedström

Abstract

Title: Seven generations of gaming

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Authors: Jonas Medin, Erik Persson

Advisor: Christer Kedström

Key words: Console, Key factors, Game, Installed base, Lockout, Lock-in, Strategic Management, Strategy, Success, System, Videogame

Purpose: The purpose is to identify the key factors of success during the history of home video games. Once these factors have been identified, they are analyzed to see whether differences between generations can be established.

Methodology: The research of this thesis is based on a qualitative methodology. The empirical foundation and theoretical framework has been used in an inductive course of action.

Theoretical frame of reference: In order to capture the full nature of the home video game industry the following theories are used: Technological lockout, Dominant design and increasing returns of adoption, Core capabilities, Absorptive capacity, Installed base, Complementary goods, Competitor patents, Timing of entry, Switching costs, Blue Ocean Strategy, the Product Lifecycle and the Marketing Mix.

Empirical foundation: The data is mainly of secondary nature and collected through the Internet, scientific articles and literature covering the subject.

Conclusions: A table presents the key factors of success during the history of home video game consoles, which is followed by a concluding discussion.

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Conceptual explanations

<i>Bit</i>	Binary digit, which is a basic unit of information storage and communication in digital computing.
<i>Bluetooth</i>	Open wireless protocol for exchanging data over short distance
<i>Cartridge</i>	Removable case used as a storage medium.
<i>Compact flash</i>	Storage device format used in portable electronic devices.
<i>Controller</i>	Link between to parts of a home video game console used to manage the operations of the system.
<i>Console</i>	Term used to distinguish a machine designed to play video games from a personal computer and arcade machines. Personal computers has numerous other functions and arcade machines are large machines often place in arcade halls charging users each time they want to use it.
<i>CPU/Processor</i>	Central processing unit is an electronic circuit executing computer programs.
<i>EBay</i>	Online auction and shopping website
<i>Ethernet</i>	Family of frame-base computer networking technologies
<i>Killer app</i>	Software that is so necessary that it is the core value of a larger technology

Abbreviations

<i>CPU</i>	Central Processing Unit
<i>CD</i>	Compact Disc
<i>DVD</i>	Digital Video Disc
<i>GB</i>	Gigabyte
<i>GTA</i>	Grand Theft Auto
<i>GCE</i>	General Consumer Electronics
<i>HD</i>	High Definition
<i>HDD</i>	High Definition Display
<i>IDSA</i>	Institute for Defense Studies and Analyses
<i>MIT</i>	Massachusetts Institute of Technology
<i>NES</i>	Nintendo Entertainment System
<i>N64</i>	Nintendo 64
<i>SMS</i>	Sega Master System
<i>SNES</i>	Super Nintendo Entertainment System
<i>PCE</i>	PC Engine
<i>PS</i>	PlayStation
<i>PS2</i>	PlayStation 2
<i>PS3</i>	PlayStation 3
<i>ROM</i>	Read Only Memory
<i>TG-16</i>	TurboGrafx-16
<i>USB</i>	Universal Serial Bus
<i>VES</i>	Video Entertainment System
<i>VCS</i>	Video Computer System
<i>VHS</i>	Video Home System

1. INTRODUCTION

In this first chapter the subject is introduced. A background story and a presentation of the identified problem will fall into the main purpose of the thesis. The first chapter closes with an explanation of the delimitations of the thesis.

1.1 Background

Young people today might find it hard to believe that once there was a world without video games. Its history is said to have begun with the launch of a white torpedo into empty space in an MIT basement in 1961. Three MIT employees divided their time between working, reading Edward E. Smith science fiction novels and watching Asian B-movies. These men fantasized about bringing Smiths novels to the big screen and one day they were enlisted to create a demonstration program to impress MIT-visitors. A task and demand that later led to the development of steadily more interactive programs. The classic story is the white torpedo crashing into the enemy spacecraft, with no horns that sounded and no drums shaking the ground. This was the first volley of attack in what would later be known as *Spacewar*, a game based on three men's dream of how their favorite sci-fi book might be adapted to movies. But beyond that MIT basement, the human race paid no notice to the fact that video games had been born.¹

Spacewar was played on the first computer that focused on the interaction with its user, called PDP-1. This computer would come to play an important role as it changed the computer industry and foreshadowed what would become an entirely new class of computer, the *minicomputer*. By the mid 1960s, the minicomputer industry flourished as it allowed more people to access a computer than before.² Due to the availability and popularity of *Spacewar*, little happened to video games in the 1960s. However, one innovation stands out. In 1966 there were 80 million television sets installed in North American homes. Ralph Baer, a television engineer, considered the possibility

¹Egenfeldt-Nielsen, Simon et al, Understanding video games: The essential introduction, Routledge, New York, 2008

² <http://pdp-1.computerhistory.org/pdp-1/index.php?f=theme&s=1>

of using these sets to play games. By 1967 he had a prototype that plugged into an ordinary antenna terminal to display a game called *Fox and hounds*. The player was meant to navigate one spot (the fox) to capture the other (the hound). In 1968, Ralph and his employers had a salable console but encountered resistance from TV manufacturers. A combination of stubbornness and luck made them eventually land a deal with Magnavox but nothing would come out of it until the next decade.³

Today we are currently experiencing what is commonly known as the 7th generation of home video game consoles⁴. The market is dominated by three multinational giants; Sony, Microsoft and Nintendo, which annually turns over approximately \$40 billion⁵. People of all ages gather in front of the television to enjoy a phenomenon unknown to the general public during the 1960s. Even if the hand controller initially is thrown across the living room, once people practice it will suddenly become an extension of their hands and the gaming process an important source of learning. There is little or no doubt about its popularity. The game console has become a natural part many living rooms and often entertain us for several hours per day. Studies made on the US market by IDSA, showed that approximately 145 million people uses a console on a regular basis and that the average age of the player is 28.⁶ The technology has taken an enormous leap forward from the simplistic fox and hound concept and the industry has developed at an incredible speed compared to similar industries.⁷

To fully understand the viewpoint of this thesis the next part describes the special characteristics of the industry and why it is considered to be of special interest.

1.2 The home video game industry

The Video game industry continues to grow with a rate faster than the entertainment and media industry and the global business has an annual turnover of \$40 billion. With a growth rate of ten percent it is expected to reach revenues over \$60 billion by

³ Egenfeldt-Nielsen, Simon et al, Understanding video games: The essential introduction, Routledge, New York, 2008

⁴ <http://bright-horizon.org/computers-and-technology/seventhgeneration-gaming-consoles.html>

⁵ <http://www.joystiq.com/2008/08/18/analyst-game-industry-to-hit-63-2-billion-in-revenue-by-2013/>

⁶ Newman, James, VideoGames, Routledge, London, 2004, p 49ff

⁷ Tan, S & Li, M The Market Structure of the Video Game Industry: A Platform Perspective, International Conference on Service Systems and Service Management, IEEE, 2008, p 1

2013.⁸ Dimensions that have not been found in any other industry characterize the video game industry. The essential features of the industry are that has restarted with a new generation of competition every 5-10 year. Historically every generation consists of three to five competitors but only one winner often ends up with more than 50 percent of the market. To understand the industry one preferably separates between hardware producers and software producers. The prior one contains firms that actually produce the video game console and the latter consists of firms producing video games. The software market is almost perfectly competitive and its firms are referred to as third party producers. Traditionally the hardware market is described as an oligopoly and at the moment it is dominated by three giants: Nintendo, Sony and Microsoft. The sale of hardware and software is highly correlated, as the quality of the games will have a large positive effect on the numbers of consoles that have been sold. Furthermore, economists see the market as a two-sided market from a platform perspective. The supplier, for example Nintendo, provides customer with consoles at a low price. The game producers on the other hand, Sega for example, gains a lot of money from customers but have to pay royalties to the hardware producer.⁹

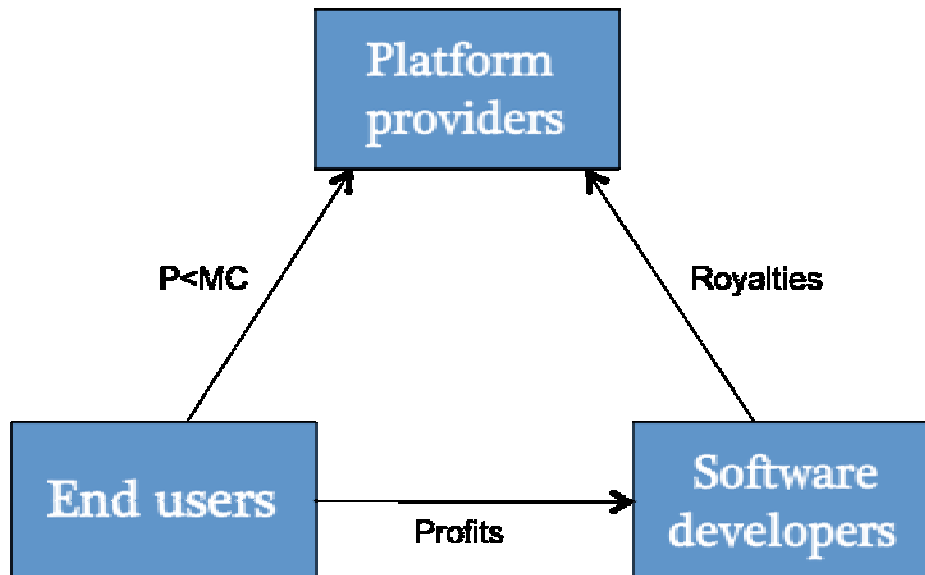


Figure 1: The relation between hardware and software producers.¹⁰

⁸ <http://www.joystiq.com/2008/08/18/analyst-game-industry-to-hit-63-2-billion-in-revenue-by-2013/>

⁹ Tan, S & Li, M The Market Structure of the Video Game Industry: A Platform Perspective, International Conference on Service Systems and Service Management, IEEE, 2008, p1

¹⁰ Ibid

In this way the business become a battle of getting the largest consumer base especially in the key regions of Europe, Japan and the US. As one platform gathers the largest consumer base it will increase game sales and trigger game developers to produce games for the current platform.¹¹

1.3 Prior research

The industry for home video game consoles are in no way a blank paper as it has attracted the attention of numerous researchers. Schilling study what characteristics a new entrant need to possess and what strategies it has to deploy to maximize its chances for success. The study is done over three generations of the US video game industry and it concludes that technological leapfrogging require more than a technological advantage. It requires a whole system of value components.¹²

Gallagher and Park make a historical observation of the US home video game industry to examine the competitive dynamic in the industry. The paper focuses on theoretical issues of switching costs, installed base and complementary goods. These are all considered to be critical factors of dominant designs and firm success in industries characterized by network effects. The analysis reveals the different stages of technological innovation, changes of market leadership and industry standards during the short history of the industry.¹³

Other researchers such as Corts and Lederman investigate the scope of indirect network effects in the industry arguing that increasing prevalence of non-exclusive software give rise to indirect network effects. Shankar and Bayus¹⁴ build on the resourced-based view as they investigate if a firm's customer network can be a strategic asset. Their results provide a possible explanation for how Nintendo, a smaller company, was able to overtake the sales of Sega, which was a firm with a larger network.¹⁵

¹¹ Egenfeldt-Nielsen, Simon et al, Understanding video games: The essential introduction, Routledge, New York, 2008, s14

¹² Schilling, Melissa A, Technological Leapfrogging: Lessons from the U.S Video Game Console Industry, California Review Management, 2003, Volume 45, Issue 3

¹³ Gallagher, S & Ho Park, S Innovation and competition in standard-based industries: A Historical analysis of the U.S. home video game market, IEEE Transactions on Engineering Management, Volume 49, Issue 1, 2002

¹⁴ Shankar, Venkatesh & Bayus, Barry L, Network effects and Competition: An Empirical Analysis of the Home Video Game Industry, Strategic Management Journal, Volume 24, Issue 4, 2003

¹⁵ Corts, Kenneth S & Lederman, Mara, Software exclusivity and the scope of indirect network effects in the U.S home video game market, International Journal of Industrial Organization, volume 27, issue 2, 2009

The history of any industry expands as time passes and a continuous flow of studies needs to be done in order to fully identify its present nature and the historic evolution. With the help of established theories such as the Product Lifecycle and the Marketing Mix combined with concepts put forward by Melissa A. Shilling, this thesis aim to contribute to this continuous process. The research made by Schilling, Gallagher and Park carries a resemblance to this study. However, the tools used differ and none of prior research covers up until the seventh generation with its distinct and dominant players.

1.4 Problem discussion

Even if researchers start to be more interested in the subject of how to compete in standard based industries those markets seems to be surprisingly unexplored especially among scholars and in the world of academics. The reason for this should, according to Newman, be the features of the industry. It is considered childish and does not require any demand of investigation. The second reason given by the same author is that video games are referred as low art, lacking the credibility of traditional media.¹⁶

Markets symbolized by strong network effects differ from conventional markets in how companies pursue their strategies. The coexistence of incompatible products in these markets tends to be unstable, often with a single standard dominating the market. VHS battle against its rival Beta-max in the videocassette recorder technology is a classical example. The market was not big enough to hold both players and VHS won the standard battle despite Beta-max superior technological features.¹⁷

During its history, the home video game industry has experienced several different stages of revolution and changes of markets standards. Market leadership has shifted dramatically along with the waves of technological innovation. About every five years a standard war has been fought with new entrants forced to offer products significantly more advanced than existing products. Historically, even the most

¹⁶ Newman, James, VideoGames, Routledge, London, 2004, 5f.

¹⁷ Besen, Stanley M & Farrell, Joseph, Choosing How to Compete: Strategies and Tactics in Standardization, The Journal of Economic Perspectives, Vol 8, No 2, 1994, p 118

successful firms have struggled to sustain their dominance for more than one generation. This kind of situation is not commonly observed in other industries.¹⁸ The industry has grown and matured over its 40 year lifetime but still the distinct battle for dominance seem to have remained. Although, there are a few general themes in the home video game market that are consistent across generations, each generation has its unique aspects.¹⁹ This is why it is interesting to ask:

1. *What have been the factors of success during the history of video games?*
2. *Has these factors differed between generations?*

1.5 Purpose

The purpose is to identify the key factors of success during the history of home video games. Once these factors have been identified, they are analyzed to see whether differences between generations can be established.

1.6 Delimitations

This study will be based on the history of the home video game console industry. A console that has been produced but never commercially released is not covered. Furthermore, *Amiga CD32* and *Sega SG-1000* has been deleted from the empirics due to insufficient information.

¹⁸ Tan, S & Li, M The Market Structure of the Video Game Industry: A Platform Perspective, International Conference on Service Systems and Service Management, IEEE, 2008, p1

¹⁹ Gallagher, S & Ho Park, S Innovation and competition in standard-based industries: A Historical analysis of the U.S. home video game market, IEEE Transactions on Engineering Management, Volume 49, Issue 1, 2002 , p70

2. CHOSEN METHODOLOGY

In this second chapter the approach of this thesis is presented. It is followed by a description of how the data has been collected and categorized. The chapter ends with a presentation of how certain information has been sieved and an assessment of the quality of this thesis.

2.1 Method and approach

This study is of *qualitative*²⁰ nature and conducted from a *hermeneutic approach* enabling the purpose of this thesis to be answered. The purpose is to identify key factors of success within the home video game industry and see if these have differed cross generations. By analyzing and *interpreting* the empirical findings and match them against chosen theories the intention is to bring this to light. Studies that move from empirical observations of data towards creating a linkage to existing theory is said to take an *inductive* stance. As the majority of qualitative studies²¹ this thesis also entails such an inductive approach. Once the empirical material has been collected the structure of the theoretical frame of reference will be generated based on this data. As the empirical framework is predicted to be extensive the theoretical framework will not be introduced to the reader until after the empirical foundation. This is done in order to enable the reader to get a *flow* while reading and not be disrupted by analytical thoughts.

2.2 Collection of data

The empirical data collected in this thesis is solely of secondary nature. The main tool used to gather data is the Internet, which provides an enormous amount of articles, databases and enthusiastically written fan-homepages. Due to this, it is crucial to use a predetermined framework for how to collect the data. The starting point is taken in two of the largest sources of information on the Internet; *Google* and *Wikipedia*.

²⁰ Bryman, Alan, Bell, Emma, Företagsekonomiska forskningsmetoder, Liber, Slovenia, 2005, p 297

²¹ Ibid

Wikipedia was established in 2001 and it is known as *the free encyclopedia that anyone can edit*. It is based on a social web application allowing viewers to add information to the encyclopedia. It aims to create high-quality digital information products with the help of large numbers of contributors.²² Wikipedia has been criticized of having severe quality problems and to be an unreliable reference of information. Denning et al questions whether its collaborative editing process can produce accurate and authoritative information.²³ Gorman withholds that Wikipedia cannot be called an encyclopedia, and without regulation of its article-writing process, the information is unreliable.²⁴ However, some consider it to be a reliable source of reference. The best-known scholarly assessment of Wikipedia is made by Giles. It compares 42 selected articles in Wikipedia and Encyclopaedia Britannica and the difference were minimal. The study showed that Wikipedia had an average of four errors while Britannica had three.²⁵

Contemplating this, the following *triangular*²⁶ process is chosen to collect the data:

1. Reviewing the history of video games on *Wikipedia*
2. Using the *Google* search engine to find cross-references
3. Assuring this information can be found on two different sites other than *Wikipedia*
4. Further use the *Google* search engine to find information not found on *Wikipedia*
5. Assure this information can be found on two different sites.

Triangulation refers to the usage of more than one source of data to increase the reliability of the information²⁷. It is considered of outmost importance to use such a triangular data collection process to secure that the information collected in this thesis is valid. Furthermore, scientific articles found in the database *Elin* through Lund University and books written within the subject complements this data.

²² Okoli, C, A Brief Review of Studies of Wikipedia in Peer-Reviewed Journals, Third International Conference on Digital Society, IEEE, 2009, p 155

²³ Denning, P, et al, Wikipedia risks, Association for Computing Machinery, Communications of the ACM, vol. 48, Dec. 2005, p 152

²⁴ Gorman, G, A tale of information ethics and encyclopædias; or, is Wikipedia just another internet scam?, Online Information Review, vol. 31, 2007, p 273

²⁵ Giles, J, Internet encyclopaedias go head to head, Nature, vol. 438, 2005, p 900-901

²⁶ Bryman, Alan, Bell, Emma, Företagsekonomiska forskningsmetoder, Liber, Slovenia, 2005, p 310

²⁷ Ibid

2.3 Categorization of generations

One of the definitions on the word *generation* offered by Encarta is:

*“New type: a particular stage in the development of a product or technology, especially one marking a significant advance”*²⁸

There is a widespread and commonly accepted classification of the consoles release during the history of video games, although altered version exists. This classification corresponds to the definition above, why it will be used. One generation are often replaced by another when consoles with highly improved technology are released. As an example, this happened when the 16-bit processor was launched and outcompeted the prior and less advanced 8-bit processor. In this study all generations will be covered, including the ongoing generation. This generation has been up and running for almost five years and the three firms that compete in the market have already reached high sales figures. It is important to stress that this generation is not finished yet but already a crucial part of the history and of this thesis.

2.4 Sieving of information

Except for sales figures, no information is used that has been directly published by the console manufacturers to avoid information that has been slanted. However, there is always a possibility that information found has been directly or indirectly affected by information released by manufacturers. Further, sites published by fanatic gamers who clearly favor one system over others are not considered of worth to this study.

2.5 Reliability and Validity

Reliability and validity are two measures frequently used in assessing and establishing the quality of research. According to Bryman and Bell it is sometimes difficult to assess these measures in qualitative studies. LeCompte and Goetz writes about two types of reliability in qualitative research; external and internal. *External reliability* refers to the degree a study can be replicated and this criterion is often difficult to achieve in qualitative studies.²⁹ However, as this thesis solely relies on secondary data available to others it carries a high degree of external reliability. *Internal reliability*

²⁸ http://encarta.msn.com/dictionary_1861674828/generation.html

²⁹ Bryman et al, p 410

refers to whether or not members of a research team agree about what they see and hear, when there is more than one observer. Qualitative studies often require subjective judgment and more observers can facilitate consistency in the empirics.³⁰ To ensure that the empirical material carries a high level of internal reliability the intention is that it is jointly collected and reviewed.

LeCompte and Goetz suggest the assessment of validity in two ways; external and internal. If a study has a high degree of *internal validity* it matches observations with the theoretical ideas in a satisfying way. LeCompte and Goetz argue that this tends to be the strength of qualitative research as it allows the researchers to ensure congruence between observations and theory.³¹ Empirics are found by extensively searching the Internet, Elin and accessible libraries, which ensures a satisfying level of data. By combining the findings with relevant theories the study will therefore reach internal validity. *External validity* refers to if the finding can be generalized across social settings. The amount of data collected is considered satisfactory enough to generalize the findings.³²

³⁰ Ibid

³¹ Ibid

³² Ibid

3. EMPIRICAL FOUNDATION

In this third chapter the empirical information is presented. It is categorized into seven distinct generations to provide a solid ground for a subsequent analysis.

3.1 First generation of home videogames (1972-1977)

In 1972 the first video game for domestic use was introduced to the public. People were given an alternative to the arcade halls and could now enjoy a similar experience in their own home. This time period, known as the first generation of home video games, would see the first mover struggle while its follower dominated the market. As the success became well known, several clones flooded the market.

3.1.1 The Odyssey (1972)

It was not until May 24th 1972 that Magnavox introduced the first home video game system, called the *Odyssey*.³³ Many incorrectly think of Atari and its home version of PONG as the first home videogame console. Nolan Bushnell, the founder of Atari, is often credited as the father of video games but this title should actually go to Ralph Baer.³⁴ The Odyssey was analogue, operated through batteries and the images were in black and white. Unfortunately it had no sound capability³⁵, a feature that was added later by PONG.³⁶ Colors could be added through plastic sheets attached to the TV screen. The system produced square shaped controllable objects enabling Magnavox to create games such as *Table Tennis* and *Ping-Pong*.³⁷ It was advertised heavily and sold over 130,000 during the first year. Unfortunately the advertisement let the customers believe that the Odyssey would only work on a Magnavox TV set. It was said that this was done to increase the sale of their own TV sets but it backfired and confused potential customers. The console was sold alongside other Magnavox products and sales personnel were not trained in how to sell the consoles. To them it was just another electronic gadget. Extra games were typically stuck under the counter, which did not help sales. Another 200,000 units were sold before the system

³³ <http://www.pong-story.com/odyssey.htm>

³⁴ <http://classicgaming.gamespy.com/View.php?view=ConsoleMuseum.Detail&id=1&game=12>

³⁵ <http://www.wisconsinhistory.org/museum/artifacts/archives/002558.asp>

³⁶ <http://www.pong-story.com/atpong2.htm>

³⁷ <http://www.gamingdump.com/consoleevolution.html>

was discontinued in 1975 much due to the entry of *PONG* coin-up machines.³⁸

3.1.2 PONG (1976)

When Magnavox introduced the Odyssey at *The Magnavox Profit Caravan* they had a visitor that would come to play a very important role in the video game industry, Nolan Bushnell. In June that year, Bushnell founded the company Atari and together with Al Alcorn he built a prototype of a coin-op machine called PONG. The machine was first installed in a local Sunnyvale bar and became very popular.³⁹ PONG was in no way the first coin-operated videogame but it would turn out to be the first commercially successful one, flooding pubs and arcades from 1972 to 1976.⁴⁰ The success of the machines made Bushnell push his employees into creating new products⁴¹ and in 1974 Atari started to design a home version of PONG. Since customers had been dissatisfied with the Magnavox system, Atari initially struggled to attract toy and electronics manufacturers. They decided to contact Tom Quinn, who worked at Sears and after several meetings Sears ordered 150,000 PONG systems for Christmas in 1975. Assembled by Atari but sold under Sears label called *Tele-Games*, the console was a hit. The system had an important feature that others lacked: the use of a chip that provided games with on screen scoring and an attractive sound.⁴² Once Atari saw that the console attracted customers they went on to release their own version of PONG in 1976. Magnavox did not appreciate the success of PONG and sued Atari in 1975 for copyright infringement. Bushnell insisted that he had not copied PONG from the Odyssey but the court ruled in favor of Magnavox and Atari had to pay royalties in order to market its games.⁴³

3.1.3 PONG Clones

Following Atari's success several companies released their own versions of PONG seeing as Atari had not trademarked it. The chief among the clones were Coleco, which released its first video game console Telstar in 1976. The console was based

³⁸ <http://www.pong-story.com/odyssey.htm>

³⁹ <http://www.pong-story.com/o1faq.txt>

⁴⁰ http://www.klov.com/game_detail.php?game_id=9074

⁴¹ Ellis, David, *A Brief History of Video Games, Official Price Guide to Classic Video Games*, Random House, 2004, pp 3–4.

⁴² <http://www.pong-story.com/atpong2.htm>

⁴³ <http://www.pong-story.com/o1faq.txt>

upon Atari's PONG and used the General Instrument's AY-3-8500 chip.⁴⁴ This chip was revolutionary as it was a low cost chip, playing several different versions of PONG and two other games but more importantly, it was made available to any manufacturer.⁴⁵ Compared to competing systems, which had sold for no less than \$100, the Telstar was cheaper selling at a retail price of \$50.⁴⁶ An interesting detail about the Telstar was how Coleco decided to pack it. It was made electronically ready to play but the buyer had to put knobs, stick and the decorative stickers onto the plastic case themselves. To this day, only Coleco is known to have released their consoles in this way.⁴⁷

□

3.1.4 Summary of the first generation

Despite being the first mover, Magnavox did not manage to take advantage of this. Poorly constructed advertisement combined with untrained sales personnel is considered to be the main factors to its failure. Atari could take advantage of the poorly managed launch of the Odyssey and its dissatisfied customers. The company managed to build on the success of its arcade predecessor by distributing it through Sears. When Magnavox sued Atari for copyright infringement, the licensing fee was a small price to pay for such a major success that PONG turned out to be. In retrospect Atari biggest failure was that PONG was not trademarked until other copies had already flooded the market. None of the clones reached sales levels of the Sears and Atari branded games. However, they all managed to steal a fair number of customers from Atari during Christmas of 1976 due to the lack of trade marking.

3.2 Second generation of home videogames (1976-1984)

The second generation of home video games is referred to as the *early 8-bit era* or to a lesser extent *the 4-bit era*. It would see the release of several consoles from new players such as Fairchild Semiconductor, Mattel, Smith Engineering and Coleco. It was the generation when advanced cartridges were introduced and arcade games ported to home systems. During this time period the industry would see impressive sales figures but it would all come to an abrupt end in 1984.

⁴⁴ <http://www.gamingdump.com/consoleevolution.html>

⁴⁵ <http://www.pong-story.com/gi.htm>

⁴⁶ <http://www.gamingdump.com/consoleevolution.html>

⁴⁷ <http://www.pong-story.com/coleco.htm>

3.2.1 Channel F (1976)

Channel F is known as the console that changed home video games. It revolutionized the industry but later had to suffer for it. In 1976 the industry, driven by PONG-games, started to decline in popularity due to oversaturation caused by copying companies flooding the market with imitations.⁴⁸ When Fairchild released their first console, VES, in August that year it was the first console to feature an interchangeable cartridges system.⁴⁹ The cartridges contained ROM chips with microprocessor code rather than dedicated circuits which had been used in previous systems. This new feature meant that instead of a short shelf life common to PONG systems, the console could now be continuously renewed with the simple plug-in of a game cartridge. The cartridges carried labels that contained the game instructions and a unique number to identify which cartridge number in the series it was. With the possibility of new game cartridges released continuously, the extended lifetime of the console was attractive. On earlier systems, dials had been mounted directly on the unit forcing users to hunch over while sitting on the floor in front of the TV. Although some detached controllers had appeared, Channel F, as it was renamed in 1977 due to the release of Atari's VCS system, took this one step further. The controllers were handheld, easy to grip and with a triangular fire button on top. Connecting these to the console were 8-foot long wires.⁵⁰ Considered the most important side-effect coming from Fairchild's release of VES was its enormous impact on Atari. Caught off guard and with their own prototype in the works Atari realized they had to put more money into research and development. When Atari released the 2600, Channel F did not stand a chance. Video game consoles were a rather seasonal business selling mostly over Christmas. When Atari 2600 was launched it made Channel F's graphic look obsolete. Sales started to slip for Fairchild and in an attempt to cut costs work started on a scaled down model replacing Channel F. A lot of cheap handheld consoles flooded the market, which further contributed to low sales and eventually the discontinuation of Channel F after the Christmas season of 1977.⁵¹

⁴⁸ <http://classicgaming.gamespy.com/View.php?view=ConsoleMuseum.Detail&id=6&game=12>

⁴⁹ <http://www.gamingdump.com/consoleevolution.html>

⁵⁰ <http://gamingmuseum.classicgaming.gamespy.com/channelf.html>

⁵¹ Ibid

3.2.2 Atari 2600 (1977)

As *PONG*'s popularity had started to decline Atari realized that the market for consoles that could only play one game was fading. In 1976, Atari began project *Stella*, the construction of a new cartridge-based home videogame system. Atari would use the capital gained on *PONG* to develop the new console but during the project Fairchild released their console Channel F. Atari realized that they lacked enough money to finish a superior console and get it into production. More funds were needed in research and development. Nolan Bushnell, the founder of Atari, decided to solve this problem by selling the company to Warner Communications for \$28 million in 1976. *Stella* was dubbed the Video Computer System or VCS and featured, just as Channel F, a CPU enabling its users to shift games by shifting cartridges. Atari used the deal they had set up with Sears when distributing its home *PONG* console to boost initial sales. The agreement was that Sears could sell its own versions of VCS and its cartridges while Atari would in turn get tremendous exposure for its console in the hundreds of Sears stores in the US. The VCS was released with a retail price of \$200 and nine games were available for its launch. Despite the deal with Sears, sales were initially disappointing. A large number of inexpensive handheld electronic games flooded the market at this time, which contributed to the low sales figures. What happened next would turn this negative trend around completely. In 1980, Atari became the first company to port an arcade game to a cartridge. The game was called *Space Invaders* and as it filled the shelves in January 1980, it was a huge hit and many people bought the VCS just to play it at home.⁵² At this time Atari completely dominated the home video game market with 80-90 percent market share between 1979-1981.⁵³ The programmers were however rather disappointed with Atari's policy of giving little or no credit to its game creators which led to four of the company's most successful programmers leaving Atari to form their own company, Activision. In 1982 Atari released the follow up system called Atari 5200 and due to this fact VCS changed name into Atari 2600.⁵⁴ The Atari 2600 would go on to sell more than 30 million units during its time and dominated the market until the mid-1980s.⁵⁵

⁵² <http://classicgaming.gamespy.com/View.php?view=ConsoleMuseum.Detail&id=8&game=4>

⁵³ Herman, Leonard, *Phoenix The Fall and Rise of Video Games*, Rolenta Press, 1997

⁵⁴ Cohen, Scott, *Zap! The Rise and Fall of Atari*, McGraw-Hill, 1984

⁵⁵ http://www.boston.com/bostonglobe/ideas/articles/2009/03/08/a_talk_with_nick_montfort/

3.2.3 The Odyssey² (1978)

Magnavox had started the revolution of video games in 1972 with its release of the Odyssey, the worlds first home video game system. It took five years and numerous variants of Magnavox first system before the announcement of the Odyssey². The system was released in 1978 and was said to be *The Ultimate Computer Video Game System*. Graphically the Odyssey² had several characters built into its ROM code, which gave its games a very similar appearance. Screen resolution was smaller and player sprites larger than comparable systems giving the games a blocky look. However the graphics were sharp and there were no trace of screen flicker that usually was seen on competing consoles. Unlike any other system at the time the Odyssey² also featured a full alphanumeric membrane keyboard. Seeing as it was the beginning of the home computer revolution, the keyboard was a strong selling point for the console. The keyboard was appealing to parents since it could be used for educational games, of which Odyssey² had many. It could also be used to select games, game configuration, maze programming and entering names for high scores. The Odyssey² had a very significant accessory called *The Voice*, which was a module that added voice and sound to the games. *Type & Tell* was the most famous game in which the player typed in a word and got it phonetically pronounced. In other games it shouted out encouraging phrases or insults depending on how you played. Odyssey² pioneered in the fusion of board and video games with its *The Master Strategy Series* releasing games such as *Quest for the Rings* with a story line reminiscent of J.R.R Tolkien's *The Lord of the Rings*. The Odyssey² had a game that had enormous potential called *K.C. Munchkin*. It was made to look like *Pac-Man* but differently enough to avoid copyright laws. Atari, who owned the rights to *Pac-Man*, sued Magnavox without success. Later when Atari appealed the decision Magnavox was so sure of winning the case that no real effort was put on it. Unfortunately the court overturned the original ruling and Magnavox had to stop selling *K.C. Munchkin*. A game that had made more money in its two months than any other game made for the system.⁵⁶

Odyssey² had few third-party games with the only licensees being Imagic and Parker Brothers. The system had a minimal market share why third-party developers were

⁵⁶ <http://classicgaming.gamespy.com/View.php?view=ConsoleMuseum.Detail&id=13&game=12>

drawn to develop games for its competitors instead. In the US, the system achieved moderate success, at least during the early years. However, by the early 1980s Odyssey² had fallen behind its competitors and it was the third place system during the early 1980s.⁵⁷

3.2.4 Intellivision (1980)

When Mattel Electronics released its system *Intellivision* in 1980 it was armed with better graphics and sound than its competitors. It also came with a promise that a compatible keyboard was going to be released, enabling users to turn it into a home computer. The slogan was *Play games and balance your checkbook* and the sight was set on the highly successful Atari 2600. Mattel got off to an excellent start, selling out the first run of 200,000 units quickly. However, those who bought the system with the plan to turn the system into a computer once the keyboard was released were up for a surprise. Despite huge marketing campaigns, months and then years passed while the keyboard still remained *under development*. In late 1981 it was released in a couple of test markets but the price skyrocketed and customer reaction was poor. Mattel decided to scrap the keyboard plans the following year but faced government pressure and in 1983 the long awaited computer expansion, *Entertainment Computer System*, was released. Mattel promised a keyboard, memory extension modules, a music synthesizer, data recorder, printer and an adapter allowing the user to play Atari 2600 games. The memory expansion modules, printer and data recorder were never released and the synthesizer only had one software title. The best feature, the adapter, could already be found on the system ColecoVision. It was not good enough and too late.⁵⁸

3.2.5 Atari 5200 (1982)

Atari 5200 is the successor to the Atari 2600, which dominated the first wave of cartridge-based systems. The graphics and several features of the 5200 could not be found on any other system. At the heart of the system was, in essence, an Atari 400/800 computer. This was the most powerful 8-bit home computer system of its era and Atari could, after making small modifications, release the same games for their home video game system. When launching the 5200, Atari made an attempt at

⁵⁷ Ibid

⁵⁸ <http://classicgaming.gamespy.com/View.php?view=ConsoleMuseum.Detail&id=17>

revolutionizing joysticks by crossbreeding the track-ball and a conventional joystick. The new joystick offered a full 360 degrees of mobility compared to the usual 4 or 8 positions. There was also a speed control built-in, which allowed the players to speed up the action while playing a game and a *pause* button enabling users to put games on hold. The attempt did however not turn out to be a complete success. Even though the controllers offered new options, some of the popular games became significantly harder to master. In addition, the joysticks became infamous for being some of the most unreliable controllers ever made. In addition to the joysticks, Atari had made several other advancements in hardware design. The 5200 had a switch box where the power supply plugged directly into the box and not the system. It was automatic which meant that the user did not have to walk up to the back of the TV and select between *TV* and *Game* each time. Furthermore, a special feature that could only be found on the 5200 system put the screen on silent black when you changed cartridges instead of raspy white noise.⁵⁹

3.2.6 ColecoVision (1982)

In August 1982 Coleco released a new system called *ColecoVision*. Coleco introduced two breaking ideas on the market, first the ability to expand the hardware and second the fact that games of competing systems could be played on the console. It had superior graphics to Atari 2600 and Intellivision but it was other factors that would create its success. The first strategic move that Coleco decided upon was to include a copy of the game *Donkey Kong* with every console. *Donkey Kong* was licensed from Nintendo and it had previously been an arcade-hit, which helped boost initial sales of the system. The second feature of the ColecoVision that stood out from its competitors was its expandability. The system had three different expansion modules of which the first helped capture a large part of the market from Atari 2600. This module made the system compatible with the Atari 2600, which meant that all users of that system could use their Atari game libraries on Coleco's machine. Further, Coleco released a driver expansion consisting of a steering wheel, gas pedal and a pack-in game called *Turbo*. The third module could be used to convert the system into a full-fledged computer system, complete with keyboard and a disc drive.⁶⁰

⁵⁹ <http://www.atarihq.com/5200/5200faq/>

⁶⁰ <http://classicgaming.gamespy.com/View.php?view=ConsoleMuseum.Detail&id=24&game=8>

As for many other consoles the video game crash was too hard to survive even for ColecoVision. The console struggled in late 1984 but up to that moment they succeeded to sell almost six million consoles and were superior to both Atari and Mattel. The main problem of ColecoVision during the mid 80s was an inefficient installed base.⁶¹

3.2.7 Vectrex (1982)

When General Consumer Electronics (GCE) released *Vectrex* in 1982, it was not an average game console. It has even been said that to this day, there has never been a videogame system quite like it. The system had a nine times eleven inch built-in vector monitor and a detachable keyboard, a look that would be copied two years later in 1984 when Apple released its *Macintosh*. The Vectrex was unique because it was a completely vector graphics based system. Competitors used raster graphics, which utilizes pixels. The beam inside the television scans across horizontally from the top down drawing each row of pixels. Vector graphics on the other hand draws to exact coordinates using x/y or vector values. The graphic was comparably sharp and produced visual effect such as rotation and scaling but with the drawback of showing colors only in black and white. GCE wanted to capture the home arcade feel but color vectors would have been difficult and expensive to produce. The company compensated this by adding a plastic overlay to follow each game. Joysticks was also designed with the arcade experience in mind, shaped as rectangular boxes large enough to sit on a lap or a desktop. Four full sized arcade buttons were mounted on them and a firm top-heavy joystick. Another upside with the system was that its built-in screen enabled users to play without tying up the family TV set.⁶²

3.2.8 Summary of the second generation

As the first cartridge based system ever made, one would think that Channel F would have done better than it did. Atari, who had a prototype in the works when Fairchild launched their system, quickly managed to gather more money to put into their development. Consequently, the year after Channel F was released Atari introduced its 2600 system that made Fairchild's blocky graphic look completely obsolete. Sales of the 2600 were also boosted by the deal Atari had with Sears to distribute it. This

⁶¹ http://www.maniacworld.com/game_console_history/Colecovision.htm

⁶² <http://classicgaming.gamespy.com/View.php?view=ConsoleMuseum.Detail&id=20&game=12>

enabled Atari to get enormous exposure through the hundreds of Sears's locations nationwide. This did not have any major effect until 1980 when Atari became the first company to port an arcade game to a cartridge. When the game *Space invaders* hit the shelves that year it was a huge hit. Atari gave very little credit to its game creators and many of them left to create their own companies. This diminished Atari's dominance in the software market. The Odyssey² had some interesting features but Magnavox lacked third-party support, which kept the number of games very limited. Furthermore, the ignorant behavior during the legal issues of the game *K.C. Munchkin* contributed to the moderate success of the console.

Intellivision got off to a good start announcing upcoming features that was under development. Among them were a keyboard that would enable users to turn the console into a computer, a strong selling point that made the initial production of 200,000 units sell out quickly. Despite the fact that the keyboard and many of the other promised features never was released combined with poor marketing the system sold over three million units.

Instead of Atari giving its 5200 system the resources it required they continued to back up the 2600, a system on its last leg. The company did not have the means to support four product lines (2600, 5200, 400/800, coin machines) with quality games. The fact that it was not made backward compatible turned many gamers off since they had a large library of 2600 games. By the time Atari realized this and released an adapter it was to late.

Much of the success of ColecoVision had to do with the decision to include a copy of the arcade hit Donkey Kong. Secondly it gave the user the option to expand the system with three different extension modules. These made it possible to play other games on it as well, as an example Atari's games could be played on Coleco's console. Secondly it gave the user the option to expand the system with three different extension modules. Vectrex on the other hand was launched with exceptionally lousy timing. It showed initial popularity but the videogame crash the year after its release brought the system and its competitors down.

3.3 The Video Game Crash of 1984

At the height of the video game industry in 1982, it employed hundreds of thousands of people and generated over two billion dollars worth of sales. But then, unexpectedly, it all collapsed, virtually overnight. What had happened? What made an industry this large, fail so quickly and completely, without any obvious calamity to cause its downfall? Three major factors have been pointed out, none of them significant enough to do more than moderate damage on their own but combined, they proved to be fatal.⁶³

3.3.1 The game glut

The success of Activision and Imagic, the two first third-party cartridge companies, dazzled the accountants. Low start-up costs combined with large mark ups meant huge potential profits. Because of this, dozens of companies were rushing into the cartridge business in the early 1980s. Most of these companies assumed that name recognition meant everything to a game and as long as you had a recognizable character it would be enough to carry a mediocre game. This led to millions of dollars being spent on license fees to get famous characters but almost no attention was given to quality control and play testing. Enormous quantities of low quality games were dumped into the market with little regard for how many games customers demanded.⁶⁴

3.3.2 Computer price wars

In 1980, an affordable home computer was a fairly expensive investment costing around \$800. But this was before Commodore Business Machines introduced its *Commodore 64* in 1982, its most advanced home computer to date. Surprisingly it was technologically inferior to other systems on the market. It could only show 16 colors that could not be altered, disc access was slow and the voice chip was only capable of three voices. But the Commodore 64 offered one thing its competitors did not, affordability. The computer was cheap and offered people a chance to be part of the computer revolution. What followed the launch of the Commodore 64 was a price war among home computer companies. It would turn out that the war would only have two survivors, Atari and Commodore, and both companies had been severely

⁶³ <http://www.videogameconsolelibrary.com/art-crash.htm>

⁶⁴ Ibid

hurt by the experience. A decent computer sold for \$150 when it was all over which led consumers to ask themselves a valid question. Why should we buy a game machine when a computer costs just as much? The graphics and sound did not differ, computers were capable of playing more sophisticated games and offered other features beyond game play.⁶⁵

3.3.3 Consumer apathy

By 1984, the industry had evolved tremendously over its short lifetime of twelve years. Instead of only PONG-games on the market the customers were given endless possibilities. Especially the Atari 2600 sent consumers on a buying frenzy of both consoles and cartridges. New systems had appeared every year and with it came new innovations, new ways of doing things. By 1982 the situation was out of control with new buzzwords invented by software and hardware companies every week and shelves were getting crowded. At this point there were many systems on the market and consumers had finally had enough. One system could be hailed as the ultimate in gaming only to be replaced by another the following week. Many customers decided to wait and see which machine would become dominant and then buy it. Older systems had reached a saturation point with low sales at best. New systems had the features consumers' demanded but low sales of older consoles made companies reluctant to spend money on R&D. It was a vicious cycle that could not be broken. Due to the fact that there were so many players within the industry at this point, companies had to market new systems furiously for them just to be seen by the public. These systems had comparably small game libraries, an indirect effect that marketing expenses had on money left for game development. Manufacturers could not lure enough customers into the stores to sustain the console industry. As sales plummeted the machines in development had to be cancelled and the majority of the console manufacturers withdrew from the market. Some, like Mattel, did it by choice and others, like Coleco, were forced out by bankruptcy.⁶⁶

3.4 Third generation of home videogames (1983-1992)

The crash of 1984 had wiped out or severely hurt the major players within the home

⁶⁵ Ibid

⁶⁶ <http://www.videogameconsolelibrary.com/art-crash.htm>

video game industry and computers were becoming more and more popular⁶⁷. Despite the increasing popularity of home computers it was not long before people realized there was a reason for owning both a computer and a game machine. Kids could use the game machine while the elder used the computer. But by this time the big players had left the market. Atari was under new ownership and had left the game business and both Mattel and Magnavox had shut down their operations. Manufacturers of cartridges and accessories had either filed for bankruptcy or moved to the computer business. By the time the public was ready to accept game machines again the only competitive system on shelves was the *Nintendo Entertainment System*.⁶⁸

3.4.1 Nintendo Entertainment System (1985)

Nintendo is a Japanese company that started out in 1889 selling playing cards⁶⁹. The company entered the video game industry in 1983 when it launched its *Famicom* system in Japan. The games were strictly one-screen action games such as *Donkey Kong*, *Balloon Fighter* and *Mario Bros*. The games had very limited graphics and were only produced by Nintendo.⁷⁰ However, the system did very well in Japan and had sold 2.5 million systems by 1984. With this in mind and ignoring the recent crash, Nintendo decided to release the system, named *Nintendo Entertainment System* (NES), in the US in 1985. Initially it was hard for Nintendo to sell the system to American retailers who had the crash of the entire market fresh in their minds. To bypass this problem the console was designed to look more like a device that would fit in with peoples home entertainment appliances rather than a videogame console. Furthermore Nintendo agreed to buy back all unsold inventory from retailers, hence bearing all the risk. The original release date was pushed back but after test marketing in New York the system was released nationwide in February 1986. Two different bundles were released. The first at \$249 and contained a R.O.B (Robotic Operating Buddy) unit, *Gyromite* (R.O.B game), two controllers, a light gun, the games *Duck Hunt* and *Super Mario Bros*. The other sold at \$199 and contained two controllers and *Super Mario Bros*. The impact of *Super Mario Bros* was enormous and totally revolved the whole industry of video games. It was the first bona fide star of the video game industry and might have been essential for the business to survive the crash of

⁶⁷ <http://classicgaming.gamespy.com/View.php?view=ConsoleMuseum.Detail&id=26&game=5>

⁶⁸ <http://www.videogameconsolelibrary.com/art-crash.htm>

⁶⁹ <http://classicgaming.gamespy.com/View.php?view=ConsoleMuseum.Detail&id=26&game=5>

⁷⁰ http://www.gamersgraveyard.com/repository/nes/history/nes_timeline.html

the mid 80ths.⁷¹

Nintendo instituted a very strict licensing system for its third-party game developers. They did not intend to make the same mistakes as their predecessors who had ended up with a flood of games over saturating the market and bringing on the crash of 1984. One aspect of the policy was that no Nintendo games were to be sold legally without bearing its *Seal of Quality*. In reality the seal was not a measure of how good a game was. It meant that the developer had paid a licensing fee and that the game did not contain adult material. In addition to this, Nintendo initially had an equally strict policy for its programmers. If you programmed for Nintendo you did not program for anyone else, a policy that killed off most the systems early competition. The third-party developers were limited to releasing two games per year. In addition to this, all manufacturing of NES cartridges would be done by Nintendo to assure total control of production.⁷²

To control what NES-compatible games was manufactured, Nintendo used a lockout chip. A microchip inside of every console prevented cartridges from functioning unless they contained a similar chip. The authenticating processor was a Nintendo patent, which meant that only Nintendo could provide this component to companies willing to produce NES-compatible cartridges.⁷³

Getting around these strict policies was tough but the pirate market outside of the US grew. Often *multicarts*, cartridges with many games on one cartridge, was sold but some pirates also made completely new games. In the US, distributing unlicensed NES software had been almost impossible. But in 1988 Tengen, an Atari Games subsidiary, announced that they had bypassed the lockout chip and intended to manufacture and distribute games independently. Nintendo then decided to sue Atari Games for copyright infringement, claiming that they had illegally copied the lockout chip technology. The case settled in 1991 with the court siding with Nintendo but the damage had already been made with Tengen releasing several games in the meantime. Later, Color Dreams figured out a way to bypass the lockout chip and by this creating a loophole that enabled them to legally make NES games and selling them at a lower

⁷¹ http://www.gamespot.com/gamespot/features/video/15influential/p6_01.html

⁷² <http://classicgaming.gamespy.com/View.php?view=ConsoleMuseum.Detail&id=26&game=5>

⁷³ Ibid

cost. Despite this fact, the games produced by Color Dreams never posed a major threat to Nintendo. Customers did not like the quality and many retailers were afraid of enraging Nintendo by carrying them.⁷⁴

All in all, the NES enjoyed tremendous popularity throughout the 1980s, outcompeting all other systems. Nintendo ruled its empire with an iron fist by heavy control of advertising, production, distribution and pricing which gave both power and led the company to numerous lawsuits.⁷⁵

3.4.2 Sega Master System (1985)

Sega had witnessed the enormous success of the NES and decided to battle Nintendo for a share of the US market. The previously released system *Mark III* was redesigned into a 8-bit system named *Sega Master System* (SMS) and maybe most important of all, it was in contrast to NES backward compatible⁷⁶. It was released in 1986 not long after NES and it was a technically superior system with better graphics and sound quality. SMS played both cartridges and its credit card sized *Sega Cards*, which retailed cheaper than cartridges but contained less code. Some interesting accessories like the 3D glasses were also released, even a pink version was released with the intention to attract girls.⁷⁷ However, at the time of its launch Nintendo owned 90 percent of the market and SMS was up against a giant⁷⁸. NES had a head start and carried the popular titles due to its software restrictions to third-party developers. Once a game had been developed for NES that developer were not allowed to start making games for SMS. This resulted in Activision and Parker Brothers being the only outside developers for the SMS, which weakened the competitiveness of the system⁷⁹. Few exiting games combined with poor marketing from Tonka Toys, the company that Sega originally sold its US rights to, led to SMS never managing to give NES a battle for the market.⁸⁰

3.4.3 Atari 7800 (1986)

The Atari 7800 is by many considered to be Atari's most overlooked and under-

⁷⁴ Ibid

⁷⁵ <http://classicgaming.gamespy.com/View.php?view=ConsoleMuseum.Detail&id=26&game=5>

⁷⁶ <http://www.lycos.com/info/sega--sega-master-system.html>

⁷⁷ <http://emu.kulichki.net/console/sms/>

⁷⁸ <http://classicgaming.gamespy.com/View.php?view=ConsoleMuseum.Detail&id=28&game=10>

⁷⁹ <http://www.dcemu.co.uk/vbulletin/showthread.php?t=85454>

⁸⁰ <http://classicgaming.gamespy.com/View.php?view=ConsoleMuseum.Detail&id=28&game=10>

appreciated console. It was announced in May 1984 and the new CPU that would power the system would be capable of displaying 256 colors and move 100 objects on screen at the same time. Atari announced that the system was going to be more powerful with arcade-quality graphics, easy to use and packaged in a slim and compact design.⁸¹ Atari promised that twelve new software titles and a special cartridge, which for the first time would allow gamers to save high scores, would accompany the system. The 7800 would also be 100 percent backward compatible with the huge library of the Atari 2600. In July, two months after announcing the system, Jack Tramiel purchased the home videogame division of Atari. Tramiel did not agree with existing licensing arrangements why these negotiations had to start over. During this time the videogame market crashed and orders were cut from retailers across the board. It would take two years before the Atari 7800 was ready to go in 1986, the same year Nintendo released its Nintendo Entertainment System. While the NES was a smash hit, Atari struggled with only three games released and poor distribution. Retailers were skeptic due to Atari's history of making announcements and not following through, why it was not surprising when a number of additional titles that was announced never made it to stores. Especially add-ons like the keyboard and the high-score cartridges were canceled and therefore became a waste for the company. Not even the attractive design became reality, instead Atari launched a grey and meaningless console compared to the prototype promised.⁸² All in all 7800 were an excellent machine for its time when it comes to graphics, even surpassing NES and SMS in some respects, but in retrospect it was barely a blip on the videogame market.⁸³

3.4.4 Summary of the third generation

There are a lot of factors explaining why Nintendo managed to get almost monopoly power during the third generation. Initially an agreement was reached to buy back all unsold inventory from retailers. Removing their risk was crucial after the market crash of 1984. To attract customers Nintendo redesigned the Famicom to look less like a videogame console and more like other home entertainment appliances. The consoles were bundled with the successor Super Mario Brothers and to avoid a flood

⁸¹ <http://www.atari7800.com/7800/>

⁸² <http://www.atari7800.com/7800/history.htm>

⁸³ <http://www.atariage.com/7800/history.html>

of games on the market a very strict licensing policy for third-party developers was arranged. Two games per year could be released and if you programmed for Nintendo you were not allowed to program for anyone else. All manufacturing of NES cartridges were then done by Nintendo to assure total control of production. Even though SMS was a technically superior system with better graphics and sound it was never able to battle NES for the market. Nintendo had a head start and carried all the popular titles. Due to Nintendo's restrictions SMS only had two outside developers, which weakened the competitiveness of the system. Few exiting games and poor marketing is considered the two main reasons why SMS never became very popular. The Atari 7800 struggled with only three games released with the console and poor distribution. The retailers were skeptic due to the company's history of making announcements and not following through. Atari 7800 was an excellent machine that due to other circumstances did not become more than a bleep on the videogame radar.

3.5 Fourth generation of home videogames (1987-1996)

In home video gaming it was the time to leave the third generation 8-bit systems and enter a new era. The fourth generation would come to be a generation symbolized by 16-bit computer architecture and a new battle between Nintendo and Sega. A battle that would be fought by a hedgehog named Sonic and an Italian named Mario.

3.5.1 TurboGrafx-16 (1989)

Shortly after Nintendo introduced its *Famicom* system in Japan the electronics giant NEC entered the market. NEC introduced its *next generation* system called *PC Engine* (PCE) boasting a 16-bit graphics card displaying a maximum of 256 colors on screen. The PCE was the first console that used a CD-ROM, which enabled it to play full soundtracks and full motion video. It also provided the option of playing games on credit-card-sized games, called HU-Cards.⁸⁴ PCE did not have a stronger CPU but it featured graphics and sound superior to the *Famicom*. Due to its immense popularity in Japan, outselling the *Famicom* system by a significant margin, NEC announced plans in 1989 to bring the PCE overseas. The US videogame market was booming and with a huge library of software the outlook for success was good. At the time, NES was the number one system and although SMS had some success in

⁸⁴ http://www.pinkgodzillagames.com/retro_reviews/pc_engine_1987.php

Europe it never captured the hearts of the US gaming public. Arcade and computer games had begun to set new standards in visual and aural experience. This made NES look primitive and NEC figured that the public was hungry for a new system, but they were not alone. Shortly after NEC stated its entry oversea, Sega announced that they would launch a system called *Genesis* in the US. Genesis had been launched in Japan but was outcompeted by the PCE. It did not seem to pose any threat to the success of the *TurboGrafx-16* (TG-16), which was the American name for the PCE. The TG-16 had a greater variety of games and could take advantage of the massive storage capacity of the CD-ROM. The stage had been set for the battle of the next generation and in Christmas of 1989 the war began.⁸⁵

Initially NEC did not have the arcade library of Sega to back up their console and they were slow to translate their popular Japanese games. It was said among gamers that the TG-16 was not a true 16-bit system as its CPU was only 8-bit. Even though its graphics were superior, gamers in general considered the system to be inferior due to lower sound and speed quality. Despite the fact that NEC had a policy of only releasing the *best of the best* Japanese games, a lot of low quality games slipped through. Adding to this was the fact that Nintendo's exclusive licensing policy was in effect during this time. It meant that if a game was available on NES, other companies were not allowed to produce versions of that game for their system. This hurt TG-16 tremendously in the early stage of its life. The console became very dependent upon games developed by Hudson and even if they produced several top games of the generation this was not enough in the highly competitive 16-bit era.⁸⁶

3.5.2 Sega Mega Drive / Genesis (1989)

When Sega entered the market again in 1989 they did not want to repeat the failure of its Master System, which did not make a lasting impression. They based their new console on a 16-bit system and made it backward compatible with its successor, the SMS.⁸⁷ Superiority would not be enough this time, Sega new they had to gather a lot of third-party developers. The new system, introduced as the *next generation* system in 1989, was known as *Genesis* in the west and *Mega Drive* in the east. To increase

⁸⁵ <http://classicgaming.gamespy.com/View.php?view=ConsoleMuseum.Detail&id=32&game=15>

⁸⁶ http://www.pinkgodzillagames.com/retro_reviews/pc_engine_1987.php

⁸⁷ <http://www.consoledatabase.com/consoleinfo/segameadrive/>

the selling Sega took some initial moves and launched an online banking system together with a answering machine, called *Sega Answer*. At the same time they released a couple of new peripherals and games to further boost the numbers.⁸⁸ Sega worked hard to make people aware of the tremendous speed and power of the system, how *cool* it was to buy a Genesis. At the same time they dropped the price and included *Sonic the Hedgehog*, its first *killer app*, into the package.^{89 90}

Sega began an aggressive marketing campaign to customers but more importantly also to developers. TG-16 beat the Genesis to the market by four months but Sega regained lost ground quickly. This was thanks to a quality line of up arcade conversions, sports games and not least the full support of Trip Hawkins and Electronic Arts. It was an outspoken strategy by the US CEO Michael Katz to release games based on recognizable characters like celebrities and sportsmen.⁹¹ By the end of 1990 Sega had over 30 third-party developers creating games for the new system, compared to four for the TG-16. During 1990 and 1991, the Genesis was more or less the only console on the market. In 1990 Sega released the *Sega CD*, it was the company's first add on application, which would go on to sell six million units during its lifetime. Nintendo concentrated on developing games for NES, which delayed the launch of its follow up system, Super NES. Once it was launched it was criticized for having a much slower processor speed compared to Genesis with its Motorola 68000 processor. Sega used this publicity in 1992 when they revealed their secret project, *Sonic the hedgehog*. It had stunning visuals, pushed Genesis to the limit and earned the title of the fastest videogame in history. Sonic was a major blow to Nintendo because it proved that the Genesis was not as primitive as Nintendo wanted everyone to think.⁹² The Mega Drive is undoubtedly one of the most important pieces of the video game history due to the competitiveness they brought to the market at that time. It was this console that forced Nintendo to upgrade NES.⁹³

3.5.3 Neo Geo (1989)

Sega Genesis allowed gamers to get a taste of the arcade feeling in their own living

⁸⁸ http://www.sega-16.com/feature_page.php?id=68&title=Retroinspection:%20Mega%20Drive

⁸⁹ http://www.sega-16.com/feature_page.php?id=245&title=Tom%20Kalinske:%20American%20Samurai

⁹⁰ <http://www.consoledatabase.com/consoleinfo/segamegadrive/>

⁹¹ http://www.sega16.com/feature_page.php?id=298&title=Behind%20the%20Design:%20Joe%20Montana%20Football

⁹² <http://classicgaming.gamespy.com/View.php?view=ConsoleMuseum.Detail&id=36&game=11>

⁹³ http://www.sega-16.com/feature_page.php?id=68&title=Retroinspection:%20Mega%20Drive

room. The Japanese company SNK had an idea to take advantage of this desire but without making any compromises on CPU and memory, which other consoles had done. In 1991, the company released a single cartridge unit called *NeoGeo Advanced Entertainment System* (AES). Initially the system was only available for rent or for use in hotels but SNK quickly began selling the system to the public. Customer feedback had suggested an untapped market of grown-up gamers willing to pay extra to get the real arcade experience in their own home. If you compared the NeoGeo AES to its competitors it was a beast. It featured two CPUs and specialized audio and video chipsets. The video chipset allowed the system to display 4096 different colors compared to 64 colors for the Genesis. Furthermore, its Yamaha 2610 sound chip provided 15 channels of CD-quality sound and seven of those were reserved for digital sound effects only. With its premium prices on both the console and games, most gamers were not able to afford it why it was only available to a niche market. The console was launched as a 24-bit system but it actually was a 16-bit system with added technology to speed up graphics and sound capabilities. The development process had been very costly for SNK and they were forced to sell the console at \$650 and separate games for \$100-\$300. At those prices people could not afford the system and SNK had to go back to its original business of producing arcade games.⁹⁴

3.5.4 Super Nintendo Entertainment System (1989)

When Sega announced the release of their 16-bit Sega Genesis in 1988, Nintendo executives were not interested in making a new system. Their concentration was on making games for the highly successful NES but as Genesis slowly took over the market in North America the executives were quick to change. Nintendo realized that Genesis large library of games as well as its superior technology was a serious threat to the company's position.⁹⁵ The *Super Famicom* was first released in Japan in 1990 but the US release had to wait until the following year due to a shortage of supplies. During this time the Genesis continued to grow while the public had to wait for the *Super Nintendo Entertainment System* (SNES), as Nintendo would name it.⁹⁶ Nintendo decided not to make the SNES backward compatible with NES. This made

⁹⁴ <http://www.giantbomb.com/neo-geo/60-25/>

⁹⁵ <http://team47goman.blogspot.com/2006/10/nintendo-snes-history.html>

⁹⁶ <http://www.consoledatabase.com/consoleinfo/snes/index.html>

current Nintendo owners hesitant to buy the console because their libraries of NES games would become obsolete. In addition, Sega had managed to get many popular titles for their new Genesis console. Their main attraction was *Sonic the hedgehog*, a character that competed with Nintendo's Mario on his higher *coolness factor*. Nintendo maintained a family-friendly image and with Mario and other icon characters the system was popular throughout the 1990s but it never reached the heights of NES.⁹⁷ In the end, the library for SNES was larger than the Genesis and the total amount of consoles sold was higher why Nintendo could be named the winner of the 16-bit war.⁹⁸

3.5.5 Summary of the fourth generation

It took NEC a substantial amount of time and effort to translate their popular Japanese games. Among gamers the TG-16 was never considered to be a true 16-bit system and even though its graphics were great its sound and speed quality was considered inferior to other systems. NEC also let a lot of bad games get released despite having a policy of releasing only the *best of the best*. Furthermore, TG-16 was hurt in its start up face as none of Nintendo's developers were allowed to develop games for it. Some considered the failure of the TG-16 not to be a question of bad management but one of bad timing. Some say it would have been more popular had it been priced lower. What can be said is that nobody predicted that the Genesis would win the hearts of the US public after its failure in Asia. Sega, who did not want to repeat the failure of SMS, gathered a lot of third party developers through furious marketing campaigns. The success of the console was much due to line up of popular titles from their arcade section and new such as Sonic the hedgehog. The delay of SNES gave Genesis a head start and Nintendo made a mistake when the SNES was not made compatible with NES. Switching costs for its users were now lowered and the new features of the Genesis attracted many. Even though SNES outsold the Genesis, Nintendo lost some momentum and a considerable share of the market.

3.6 Fifth generation of home videogames (1993-2002)

The fifth generation is often referred to as the 3D era and it had three dominant players; Nintendo, Sony and Sega. During this generation, 3D was introduced and

⁹⁷ <http://team47goman.blogspot.com/2006/10/nintendo-snes-history.html>

⁹⁸ <http://www.consoledatabase.com/consoleinfo/snes/index.html>

designers started to transform popular 2D games into 3D.⁹⁹ More advanced games were developed and it was time for CD to replace cartridges, with Nintendo as the last actor to change.¹⁰⁰

3.6.1 3DO (1993)

When Panasonic released the *3DO Interactive Multiplayer System* in 1993 it was the first next generation 32-bit game system introduced. The quality of the console was obvious and by the end of the year *Time Magazine* had named 3DO *the number one product of the year*.¹⁰¹ 3DO was designed to be the next step in home entertainment.¹⁰² The CD-ROM based console offered a superior storage capacity compared to both NES and Sega Genesis.¹⁰³ 3DO was not launched as a traditional videogame console, rather a high-end audio-visual system. The 3DO Company developed the actual hardware and licensed the manufacturing to electronics giants. This concept was used in order for it to achieve its goal. To become as successful as the VCR and by that, be the next step in home entertainment. However, this was not an easy task. 3DO was introduced at a high price, \$700. Many saw it as a very expensive console and kept with the cheaper 16-bit consoles.¹⁰⁴ The high price limited third-party developer support why the console suffered from a small game library. The market was saturated with consoles and customers did not pay \$700 when a handful of other systems were available at a lower cost.¹⁰⁵ The price was eventually lowered to \$399 in order to make it more attractive but the price drop was pointless. The console had a deep reputation of being the *rich mans console* and 3DO only lasted two years on the market. There is no doubt that 3DO was ahead of its generation with solutions not even standard on today's consoles. As an example, Panasonic developed a built-in stereo headphone in the controllers. But superior technology is not a sure way towards the top within the game console industry.¹⁰⁶

3.6.2 Atari Jaguar (1993)

In the 1990s Atari ran development of both a 32-bit console called the *Panther* and a

⁹⁹ <http://www.gametunnel.com/good-enough-why-graphics-arent-number-one-article.php>

¹⁰⁰ <http://www.videogameconsolelibrary.com/pg90-n64.htm>

¹⁰¹ <http://www.allgame.com/platform.php?id=18>

¹⁰² <http://classicgaming.gamespy.com/View.php?view=ConsoleMuseum.Detail&id=38&game=12index.shtml>

¹⁰³ http://videogames.lovetoknow.com/wiki/3DO_Interactive_Multiplayer

¹⁰⁴ <http://classicgaming.gamespy.com/View.php?view=ConsoleMuseum.Detail&id=38&game=12index.shtml>

¹⁰⁵ http://videogames.lovetoknow.com/wiki/3DO_Interactive_Multiplayer

¹⁰⁶ <http://classicgaming.gamespy.com/View.php?view=ConsoleMuseum.Detail&id=38&game=12index.shtml>

64-bit system called *Jaguar*. Eventually the decision was made to drop the development of the Panther in favor of the more powerful Jaguar. At first the two systems were developed simultaneously but Jaguar proceeded faster so there were not any advantages of continuing with the 32-bit Panther console.¹⁰⁷ Before the launch of Jaguar, Atari informed the market about its technological features. The Jaguar was the first 64-bit home video game console.¹⁰⁸ It would be the most technologically advanced machine on the market and according to Atari it would be sold at the very competitive price of \$100-\$150.¹⁰⁹ It was developed after three years of research and manufactured by IBM. When Jaguar launched in November 1993 the price was \$250 and included the game *Cybermorph*, an AC adapter, a television RF switch box and a controller.¹¹⁰ The slogan *Do the match* referred to 32 bit + 32 bit = 64 bit, claiming superiority over other competing 16 bit systems.¹¹¹ However, retailers and media were not optimistic, as they doubted the firm's ability to live up to expectations. This was also the view of many users. Some argued that the Jaguar console only had a 32-bit processor while others were impressed of the powerful machine. However the console faced even larger problems when it was found difficult for developers to program for Atari. Therefore, many developers decided not to develop any games and those who actually did were often delayed if they even got the game out to the market. Unable to produce sufficient software it became a tricky start for Atari's Jaguar. They did not get as much out of the advanced technology as desired since many of the games looked like 16-bit games. Only a small bundle of games brought in money to the firm. Several juridical procedures against Nintendo and Sega made things look better for Atari but the question was if the damage already had been done. Gamers continued to spend money on NES and Sega Genesis consoles pushing Jaguar even more behind.

3.6.3 Sega Saturn (1994)

Like many other actors, Sega started to develop its fifth generation 32-bit console in the early 1990s. Even though the introduction price was as high as \$490 there were people in Japan standing in line for two days to get their hands on the new console called *Saturn*. To meet the extreme Japanese demand Sega had put more than 120,000

¹⁰⁷ <http://www.atariage.com/Jaguar/history.html>

¹⁰⁸ <http://www.faqs.org/faqs/games/video-games/atari/jaguar/>

¹⁰⁹ <http://www.atariage.com/Jaguar/history.html>

¹¹⁰ <http://www.faqs.org/faqs/games/video-games/atari/jaguar/>

¹¹¹ <http://www.consolepassion.co.uk/atari-jaguar.htm>

units in its pipeline, which all were sold on preorder. For the immediate sale they delivered more another 250,000 consoles to resellers. Every single console that had been produced to meet the demand were sold within two days and the release has been called the most successful ever in Sega's history. Sega ruled the market during the next six months despite the fact that Sony released a new system called *PlayStation* only two weeks later. The immense popularity of the game *Virtue Fighter* was the main contributor to Saturn's initial success.¹¹² After this period Saturn lost its position as the number one console. PlayStation captured more and more of the market as Sega struggled with production problems causing shipment delays. Things continued to go wrong when Sega by every means possible wanted to launch the Saturn on the US market before the PlayStation. The goal was achieved when Saturn was introduced one week before Sony got the PlayStation out to resellers. But gamers were only able to buy the popular *Virtue Fighter* at the release of the console. During the next five months there were only two other games developed for the system. Sega had rushed out their console on the market and game developer was forced to bring forward games. This resulted in insufficient games and bad reputation for Saturn as a video console. Many of these games were re-released later in a more complete version. During Saturn's first year on the market, Sega, Nintendo and Sony held an equal market share of 33 percent. However, Sony PlayStation soon took over more and more, especially after its release of the popular game *Final Fantasy VII*. Saturn was considered to be a 3D console but it also played 2D games on it and has been viewed as the best 2D console ever released. Technologically speaking, it had some advantages to the PlayStation such as the feature to handle polygons and its larger texture memory. In combination with problems in advertising the console, it had the potential to become bigger than it did.¹¹³

¹¹² <http://www.eidolons-inn.net/tiki-index.php?page=SegaBase+Saturn+p2&bl=y&PHPSESSID=gp0lpaa13lpsr21klndsbn7935>

¹¹³ <http://www.consoledatabase.com/consoleinfo/segasaturn/index.html>

3.6.4 Sony PlayStation (1995)

The *PlayStation* (PS) was a project that was initiated by Nintendo who asked Sony to develop a CD-ROM add-on for its *Nintendo 64*. Nintendo later decided to break the deal and co-operate with Phillips instead, which naturally enraged Sony.¹¹⁴ Even though it seemed sudden from the outside, there had been issues boiling internally of how the revenues were going to be collected. Left stranded, Sony decided to improve the PS into a complete console, which in retrospect is a decision they would not regret. Before entering the market Sony knew it was of great importance to sign up with many third-party developers and quickly gathered more than 250 in Japan and over 100 in the US. The relations with game developers such as Namco, Konami, and Williams had the purpose to enhance competitiveness and getting the ability to supply popular games like *Ridge Racer* and *Mortal Combat III*. The latter was first meant for Nintendo but Sony took over the relationship. Furthermore, Sony's acquisition of the rather unknown European game producer Psygnosis would turn out to be a very important strategic move. Psygnosis later became a key player inside Sony, developing some of the best selling PS games.¹¹⁵

By using CDs, Sony had a cost advantage compared to competing systems using more expensive cartridges. CDs appealed to publishers because of the lower productions cost but also the increased flexibility of changing production to meet demand. These lower costs could then be passed on to customers. Unfortunately, with the CD would the risk of illegal copying increased.¹¹⁶

The release of Sony PS in Japan in 1994 was a great success and at the time seen as the most important product since the launch of the *Walkman*. It sold 100,000 units the first week and 300,000 after one month when Sega Saturn had sold 400,000. After six month it reached the threshold of one million units. At launch there were three games available for the console. In contrast to Saturn, many praised the gray and slim design of the PS and its controllers were much further developed. The launch price of Saturn was \$440 compared to \$390 for the PS. Every single unit of the PS was sold with a

¹¹⁴ <http://www.gamersgraveyard.com/repository/snes/history/snescdrom.html>

¹¹⁵ <http://psx.ign.com/articles/060/060188p1.htm>

¹¹⁶ <http://www.ps4spy.com/history-of-playstation.php>

deficit, which was a clear step aside from Sony's traditional business model. The strategy was to gain as much profit as possible from software sale.¹¹⁷

When PS was released in the US in 1995 more than 100,000 consoles were presold and it had 17 games already available. In addition to console sales, Sony sold numerous new games, memory cards and second controllers across the country. At Christmas 1995 the PS had outsold Saturn by approximately 400,000 units since May that year.¹¹⁸ Sony was very clear about that the target group should be older than the former group of 8-16 year demographic. \$40 million was spent at its launch on marketing, trying even harder to focus on a more adult group. As a step in this process Sony was one of the main sponsors of the *1995 MTV Music Awards*. Many former Nintendo gamers bought the PS instead of waiting for the launch of Nintendo 64. As a result, many became fans of Sony's console and at Christmas of 1996, it had sold seven million units worldwide and had over 200 games available. At the 31st of March 2007, the PS had shipped 102,490,000 units sold worldwide, at this point the most sold console ever produced.¹¹⁹

3.6.5 Nintendo 64 (1996)

Nintendo unveiled its *Nintendo 64* (N64) at an exhibition in Japan 1995 where two games were demoed with impressive graphics. The public however, raised doubts whether Nintendo would be able to finish the games in time for its intended launch. Nintendo had promised that the console was to be on the shelves later that year. As it would turn out, the skeptics were right as the console was delayed and not launched until 1996.¹²⁰ The slogan used by Nintendo was *Get N or Get Out*¹²¹. Just before the release Nintendo presented the game *Mario 64* that would follow the console. The game was loved by gamers straight away, which made up for a lot of the negative news that had surrounded N64. The 64-bit console would still be using cartridges. Even though this was a more expensive solution, Nintendo believed there would be essential network effects. Their position was going to be strengthened if Nintendo was

¹¹⁷ <http://www.edge-online.com/magazine/the-making-of-playstation?page=0%2C4>

¹¹⁸ Ibid

¹¹⁹ <http://www.gametunnel.com/good-enough-why-graphics-arent-number-one-article.php>

¹²⁰ http://www.cyberiapc.com/vgg/nintendo_n64.htm

¹²¹ <http://www.vivalogo.com/logo-library-design/list-of-advertising-slogans.htm>

the only supplier of cartridges on the market.¹²² A cartridge was more expensive to produce than a CD but in compensation, Nintendo were able to charge higher fees to licensed partners. At the same time they would benefit from the fact that the cartridge games lacked the disadvantage of piracy.¹²³ The solution also had some advantages such shorter loading times and Nintendo were convinced that this was what gamers wanted.¹²⁴ Unfortunately the advantages did not manifest themselves prominently and were nullified by the cartridge's shortcomings. This turned off customers and developers alike. It especially turned off the latter, because it was both costly and difficult to develop for ROM cartridges. This had to do with their limited storage capacity, which constrained the game content.¹²⁵ Cartridges could only hold a fraction, 64 MB¹²⁶, of data compare to the capacity of the CD, 650 MB¹²⁷, used in competing systems. Many of Nintendo's third-party developers decided to switch to Sony PlayStation. Two of these were Square and Enix whose games *Dragon Quest VII* and *Final Fantasy VII* had been pre-planned for N64 but now released to PS.¹²⁸ New game releases for the N64 were infrequent while Sony presented new games with a rapid pace for its PS. Most of N64's biggest successes were developed in-house or by second-parties of Nintendo.¹²⁹

3.6.6 Summary of the fifth generation

The 3DO system was the first mover of the fifth generation and it had great ambitions to be the new leader in the video game industry. The console was launched as a multiplayer system and aimed to be as successful as the VCR one day. 3DO was however launched at a too high price and despite price dumps, it kept its reputation as the rich mans console.

Atari's Jaguar was introduced at a more sophisticated price of \$250 but struggled in other areas as third-party developer had problem to program games. It became hard to develop high qualitative games and the ones that managed to reach the market were

¹²² http://www.cyberiapc.com/vgg/nintendo_n64.htm

¹²³ <http://www.consolepassion.co.uk/nintendo-64.htm>

¹²⁴ http://www.cyberiapc.com/vgg/nintendo_n64.htm

¹²⁵ <http://www.videogameconsolelibrary.com/pg90-n64.htm>

¹²⁶ <http://n64.icequake.net/>

¹²⁷ <http://www.pcguides.com/ref/cd/mediaCapacity-c.html>

¹²⁸ <http://www.lostlevels.org/200510/>

¹²⁹ <http://www.videogameconsolelibrary.com/pg90-n64.htm>

not better than a random 16-bit game. Jaguar struggled with those problems as its competitors Sony and Nintendo released their fifth generation consoles. Atari then fell to far behind and were never able to catch up.

At its launch, just a couple of weeks before the release of PlayStation, people were standing in line to buy Sega's new console Saturn. With the help of the popular game *Virtue Fighter*, Saturn became the leading console on the market during its first six month. Sega rushed the release of the console on the US market so when retailers got a hold of it the game developers was unable to supply games as fast as the market demanded. A competitive console had been put on the market with only two games available and Sega pushed their game developers to produce and release games faster. As a result of this the quality of the games became insufficient and Sega soon struggled with a bad reputation.

Sony PlayStation is the second most successful console ever produced with more than 102 490 000 units sold. It was not the most technological advanced system but Sony succeeded in every aspect competitors failed. Several contracts were set up with third-party developers and once the system was released in the US more than 17 games were available. The console design were considered outstanding and its supply of software superior to competitors. To sell the hardware below production price was against the traditional business model of Sony but this was made possible due to an outstanding supply of software, which generated the revenues.

Even though the Nintendo 64 console was more technologically advanced it could not compete with the PlayStation. Nintendo had difficulties to deliver on time and disappointed both customers and developers several times. Gamers were fed up with waiting and decided to buy the PlayStation instead. Once the console hit the market it was to late.

3.7 Sixth generation of home videogames (1998-PRESENT)

New updates, features and players symbolized the sixth generation of videogames. Sony would release a new version of its successful PlayStation and Microsoft entered the industry with the first console ever to feature a hard drive. One of the historically successful players would be forced out of the console business while another battled

Microsoft and Sony head on.¹³⁰

3.7.1 Sega Dreamcast (1999)

When Sega Dreamcast was released in 1998, one year ahead of competition, it was Sega's fifth video game system. Dreamcast's tagline brazened *It's thinking* as it was the first console to include a built in modem and support for *online gaming*.¹³¹ When launched it had to defeat the negative reputation that Sega had gained during the Saturn, Sega 32X and Sega CD. Many gamers and third-party developers doubted the company's ability to deliver but despite this, Sega managed to create a very celebrated library of games.¹³² The intention from Sega was to make Dreamcast everything the Saturn was not: sleek, small, powerful and easy to design and program for.¹³³ It was widely hailed as ahead of its time with the online capability and four controller ports. But Dreamcast was never the success Sega hoped for and in 2001 the Japanese game-maker decided to end production. Business was restructured to focus on solely selling software to its previous rivals Sony and Nintendo. It was transforming itself into a third-party developer that would focus on its advantage in the networked gaming arena. According to company statements it had become difficult to run business both for hardware and software. In order to secure profitability the company decided to implement a more content-oriented business in order to secure profitability.¹³⁴ Although the console initially sold fairly well manufacturing shortages, initially few games and the constant speculation about the release of Sony's PlayStation 2 hampered it.¹³⁵

3.7.2 Sony PlayStation 2 (2000)

The development of *PlayStation 2* (PS2) was announced to the public in 1999. At its heart it featured the *Emotion engine*, a chip that was optimized for fast graphics processing. Furthermore, it had DVD-playback¹³⁶, backward compatibility with PlayStation's games and controllers¹³⁷ and a dramatically different design. Sony met a couple of tough months leading up to the launch of the console. Previews of its games

¹³⁰ <http://www.buzzle.com/articles/history-home-video-game-consoles.html>

¹³¹ <http://www.chronicgames.net/articles/dreamcast-museum.aspx>

¹³² <http://www.gamepro.com/article/features/111822/the-10-worst-selling-consoles-of-all-time/>

¹³³ <http://archive.gamespy.com/articles/july03/25smartest/index17.shtml>

¹³⁴ <http://news.bbc.co.uk/1/hi/business/1145936.stm>

¹³⁵ <http://www.gamesindustry.biz/articles/playstation-a-history-b>

¹³⁶ *Ibid*

¹³⁷ <http://www.gamefaqs.com/console/ps2/file/915821/9781>

had not been well received and a rumor had spread that the system was difficult to code for. There seemed to be legitimate doubt about Sony's ability to sustain their dominance on the market. But competition from the Dreamcast ultimately proved to be short-lived. Sega had financially exhausted itself by propping up the Saturn and became a victim of Sony's success. However, another threat lurked around the corner as Bill Gates announced the release of Microsoft's first home videogame console called Xbox, shortly after the PS2 was released. The Xbox would not arrive on the market until two years later and by that time Sony had established a substantial installed base and the initial price of the Xbox seemed too high to threaten the PS2. However, Microsoft decided to focus on online gaming, which made Sony readdress the online capability of the console. One of the actual threats to launch day sales of the PS2 came from Sony themselves as they had a shortage of consoles in supply. When it launched in Japan 2000 there were massive scenes of hysteria as 600,000 consoles sold out quickly and many gamers had to leave empty handed. Sony later faced allegations that they had manufactured a stock shortage to drive up demand. Despite this trouble Sony could, from 2001, count on the success of titles such as *Rockstar*, *Gameplay Sandbox*, *GTA III* and an increasingly diverse game portfolio. As with the PS, Sony had managed to cover every sector of the market, from simple puzzle games to sports games and from family friendly game titles to stylish action games.¹³⁸

3.7.3 Nintendo GameCube (2001)

Nintendo announced the initial specifications for its next-generation console, code name *Dolphin*, at Electronic Entertainment Expo in 1999. It was made clear that the system would not use cartridges as the Nintendo 64. Despite the fact that it had done well with the format, Nintendo felt it alienated some third-party developers and that the games were rather expensive. IBM designed and manufactured the console processor, ArtX the graphics processor and the graphics chip was manufactured by NEC. The console was revealed in 2000 at Nintendo Spaceworld. It was officially named *GameCube* and introduced as one of the smallest systems ever released. The GameCube's most potent asset would be displaying textures. It used 6-to-1 compression allowing texture data shrunk to one-sixth its original size with no hit on

¹³⁸ <http://www.gamesindustry.biz/articles/playstation-a-history-b>

the hardware. Nintendo chose not to utilize the DVD storage format and movie playback that rivals were using. The company defended this strategy by stating that they had created a next-generation gaming system that was both powerful and easy to understand. This was their only focus and they did not want to get associated with using the DVD standard or movie playback. The GameCube was a game console and that was all there was to it. Nintendo managed to launch it \$100 cheaper than both its competitors PS2 and Xbox.¹³⁹ The console was available in two colors, the default color *Indigo* and another called *Jet Black*. It used memory cards for saving data and its controllers had a wring grip design to fit well into people's hands.¹⁴⁰ In Japan initial sales were low and the fact that only three games were released was said to be the major contributing factor. When it was time to release the system in the US, Nintendo made sure that more titles were made available. GameCube was released only a few days after Microsoft's Xbox and 700,000 units and eight titles were available. Despite the fact that two other next-generation consoles were on the market Nintendo still managed to sell out its initial shipment and a European launch followed in 2002. As rivals revealed online gaming strategies, this did not appear to be part of Nintendo's overall strategy at this point. The company focused on *connectivity* and unveiled new forms of connecting the system of its popular handheld *Game Boy*. Main focus was on releasing quality game titles and towards the end of 2002 the system saw many quality games released. Popular franchised characters helped push sales for the console well into 2005 and Nintendo did fairly well in continuing their legacy. However, they did not manage to reach the level of dominance once held.¹⁴¹ The family friendly appeal and lack of third party support is said to have skewed the console towards a younger market representing a minority of the gaming population.¹⁴²

3.7.4 Microsoft Xbox (2002)

As Sony were bashing Nintendo to a second place and Sega struggling to keep their Dreamcast floating, Bill Gates decided to enter the picture. In March 2000, when Gates announced that Microsoft would enter the console race with a new system

¹³⁹ <http://console-history.dcemu.co.uk/dcemu-asks-nintendo-gamecube-a-history-amp-whats-the-greatest-gamecube-game-ever--82866.html>

¹⁴⁰ <http://demo.echocurrent.com/nintendo/nintendo-gamecube/>

¹⁴¹ <http://console-history.dcemu.co.uk/dcemu-asks-nintendo-gamecube-a-history-amp-whats-the-greatest-gamecube-game-ever--82866.html>

¹⁴² <http://demo.echocurrent.com/nintendo/nintendo-gamecube/>

called *Xbox* no one knew if he was mad, brave or just deluded. The console was said to be three times as powerful as the PS2. It would be the first console to carry a hard drive and promised to transform the way people consumed electronic entertainment. Developers and industry veterans were less enthusiastic and a lot of prejudices would trail the company until the console was finally launched. In September that same year Microsoft revealed an impressive support for its console as 156 developers pledged support for the system. Twelve months prior to the launch of Xbox, EA pledged to release at least ten games a year for the system. This secured titles such as *Madden*, *FIFA* and *NASCAR* prior to its introduction. For a new console to be successful it needs the support of major publishers. In 2001 at the Tokyo Game Show, Microsoft announced what would come as a shock to many; it would exclusively publish eleven Sega games. Microsoft's dollars had played a part in the deal but even more the fact that Sega ceased to manufacture its Dreamcast system that same year. It was seen as a gutsy move but a clear sign that Microsoft was taking the Japanese market seriously. When Xbox hit the US stores in November 2001 the event saw massive crowds queuing to get their hands on an Xbox, at the low price of \$299. With quality games such as *Halo*, *Amped* and *Dead or Alive 3* many bought multiple games on day one. Despite concerns regarding the ugly look of the console and its big controllers the Xbox went on to sell over one million units in three weeks with Nintendo releasing their GameCube in the US just three days prior to Xbox.¹⁴³

Microsoft received a lot of critique for how large the Xbox was. The cooling system was the main factor that contributed to the console's robust size.¹⁴⁴ It ran on an operative system that had its roots in Windows 2000¹⁴⁵ and its controller design, which was rather large, was initially criticized as ill suited to people with small hands. Microsoft responded to this critique and when the Xbox launched in Japan a smaller controller followed.¹⁴⁶ Ironically, the company was criticized for putting so much effort into charming the Japanese audience. This delayed the launch in Europe, a market considered to be more receptive than the Japanese. However, the company has

¹⁴³ <http://www.computerandvideogames.com/article.php?id=131066>

¹⁴⁴ <http://electronics.howstuffworks.com/xbox-three-sixty4.htm>

¹⁴⁵ <http://www.windowsfordevices.com/news/NS3988467635.html>

¹⁴⁶ <http://www.gamer20.com/features/150/4>

also received praises for the acquisition of Bungie prior to launching the Xbox. This gave them the game *Halo*¹⁴⁷ as a launch title, which turned out to be successful.

3.7.5 Summary of the sixth generation

The Dreamcast initially sold fairly well but manufacturing shortages, few games ready at launch and the constant speculation among consumers waiting for Sony to release PS2 hampered the Sega. It became too hard for them to run businesses for both hardware and software and they decided to exit the game console industry.

Releasing the follow up to the most successful console ever made might initially seem like a tough task. But Sony managed to create hysteria among its fan base and the console was made backward compatible with PS creating switching costs for its users. Sega shot themselves in the foot when pumping in money into the Saturn, financially exhausting the company when funds were needed for the Dreamcast. Microsoft is a financial giant and its entry on the market was not to be taken lightly. But the release of Xbox waited two years after its initial announcement and by that time PS2 had been able to establish a substantial installed base. It had an extensive game portfolio that covered most of the areas demanded by gamers.

Only three games were available at Nintendo's launch of GameCube in Japan, why sales were low initially despite an attractive introduction price. This mistake was not repeated at its US launch. Nintendo did not use the DVD standard and it did not have online gaming as a part of their overall strategy as competitors. However, the system reached decent sales figures and in some respect continued their legacy but still far away from the success of NES.

The Xbox was indeed powerful and delivered the first console ever that featured a hard drive. Microsoft worked hard to get the support of third-party developers, something that had been of utmost importance historically. At its introduction it had a line up of quality games and an attractive price tag. The Xbox did not have the sleek look of the PS2 but Microsoft still managed to capture 15 percent of the videogame console market.

¹⁴⁷ <http://archive.gamespy.com/articles/january04/Xboxtimeline/>

3.8 Seventh generation of home videogames (2005-PRESENT)

Giants pushed computing power and high-definition graphics during the start of this generation. One of the players chose to compete by other means than technological power and it has successfully attracted new audience. This is the generation of today and so far large advertisement and distribution channels have characterized it. Interestingly all three players survived the sixth generation and new competition is yet to be spotted.

3.8.1 Microsoft Xbox 360 (2005)

Microsoft's Xbox 360 was the first console to be launched in the seventh generation and as a first mover the company hoped to gain a lot of new adopters. The introduction was made almost simultaneously across the globe and the console reached the US, Europe and Japanese market within one month.¹⁴⁸ During its first year on the market, the Xbox was launched in 36 countries, more than any other system during such a short time.¹⁴⁹

When the decision was made to develop a new console, Microsoft decided to rebuild the Xbox from the ground. With different hardware and features it was going to be a radically different and more powerful console than its predecessor. When introduced it was a total media center allowing its users to play, rip, stream, network and download all types of media such as movies, music, pictures and game contents. The 360 were basically a computer with hardware and software dedicated to run video game software. The system first came in two different configurations, *Arcade* and *Premium/Pro*. The Arcade version is the basic package whereas the Premium has a hard drive with either 20 or 60 GB storage. It enabled users to save games, log on to *Xbox Live* and store data such as photos, music or other downloadable content. In 2007 Microsoft added a third configuration called *Elite* featuring a black system with a 120 GB hard drive.¹⁵⁰

Its predecessor Xbox was more or less a Windows PC. The difference was that the Pentium III processor had been slightly modified, graphics and audio hardware had been advanced and it used a slightly modified version of Microsoft's operating system

¹⁴⁸ <http://www.vgescape.com/features/86/xbox-360-release-date>

¹⁴⁹ <http://www.systemdisc.com/what-xbox-360>

¹⁵⁰ <http://www.gamespot.com/console-resource/xbox360/?tab=config>

Windows 2000. All of these components had been upgraded in the 360 making it a very advanced gaming machine.¹⁵¹ It featured the possibility of having four wireless controllers at once and three USB jacks where the controllers could be connected and its batteries charged. The ports could also be used to connect devices such as digital cameras. An Ethernet port enabled users to connect to the Internet and play games online. The audio features were well talked about as it enabled users to play or stream music during game play no matter what game was played. In contrast to the Xbox, where the hard drive had been built into the console, it had now been made removable. Microsoft had also received a lot of criticism for the size of Xbox, which was much due to the cooling system that kept the processor cool. This was changed for the 360 in order to keep the design more stylish and slim.¹⁵²

During 2007 Microsoft decided to change the strategy of its Xbox 360 in order to reach a wider range of customers and thereby increase competitiveness against Nintendo *Wii*. The intention of producing a more family oriented console would not affect their approach to advanced users. By inspiring third-party producers to keep developing highly advanced games the Xbox would still be attractive to more tech-aware users. Microsoft's choice to set up cooperation with Disney was a clear step in its new strategy. At same time they lowered the price by \$20-\$30¹⁵³ to get it more like a video game console and not an expensive multimedia console.¹⁵⁴

The market watcher iSuppli estimated that the Xbox 360 cost one third more to make than it retailed for. The company stripped down the console to find out how much its components cost and according to their findings Microsoft pays at least \$525 in parts alone. This implies a loss of \$126 before the cost of assembly, distribution, packaging and marketing has been added and retailers cut deducted.¹⁵⁵

During its time the Xbox 360 has faced rather serious construction problems and resellers has argued that between one third and one fourth of all consoles had been sent back for service. This can be compared with numbers below two percent for

¹⁵¹ <http://electronics.howstuffworks.com/xbox-three-sixty.htm>

¹⁵² <http://electronics.howstuffworks.com/xbox-three-sixty4.htm>

¹⁵³ <http://news.digitaltrends.com/news-article/13791/microsoft-lowers-xbox-360-price-by-50>

¹⁵⁴ <http://www.informationarbitrage.com/2007/07/how-to-get-micr.html>

¹⁵⁵ http://www.theregister.co.uk/2005/11/24/xbox360_component_breakdown/

PlayStation 3 and Wii.¹⁵⁶ The console has been accused of having overheating problems and to be generally unstable system. The main problem has been *the red ring of death*, which refers to a series of red lights flashing the face of the console. It is a general hardware failure that freezes up the console.¹⁵⁷ To get rid of the problem Microsoft extended the warranty from one to three years and during 2007 approximately \$1,5 billion was spent to lower the amount of defected consoles.¹⁵⁸

3.8.2 Nintendo Wii (2006)

In 2006 it seemed like Nintendo were disappearing from the market, outcompeted by Sony and Microsoft's more powerful consoles. Nintendo's sales on the US market had shrunken to almost half what it was twenty years ago even though the industry was larger than ever with \$30 billion in total revenues.¹⁵⁹

The idea of *Wii* started when engineers on Nintendo decided to create something new instead of the traditional controller. The format of consoles had not changed radically since the release of NES. When the decision was taken to change the way controllers interacted with the console it forced developers to rebuild the whole system.¹⁶⁰ Nintendo wanted to increase the feeling of being inside the game. By offering qualitative graphic that made movements more realistic the developers tried to go beyond the classic feeling of playing video games. At the same time Nintendo spent a lot of effort to bring forward a console that made people in all ages is more interactive. Parents would not have to be worried that their kids being too inactive.¹⁶¹

It was decided to build the console up on a similar chip that had powered the GameCube. This was considered a risky step since the chip was not very powerful and it meant that if Wii was released it was not going to compete on groundbreaking graphics. Nintendo's game designer, Shigeru Miyamoto put it this way:

*"We started with the idea that we wanted to come up with a unique game interface. The consensus was that power isn't everything for a console. Too many powerful consoles can't coexist. It's like having only ferocious dinosaurs. They might fight and hasten their own extinction."*¹⁶²

¹⁵⁶ http://www.associatedcontent.com/article/309005/microsofts_xbox_360_problems_continue.html

¹⁵⁷ <http://editorials.teamxbox.com/xbox/1651/The-Red-Ring-of-Death/p1/>

¹⁵⁸ <http://news.digitaltrends.com/news-article/13791/microsoft-lowers-xbox-360-price-by-50>

¹⁵⁹ http://money.cnn.com/magazines/business2/business2_archive/2007/05/01/8405654/?postversion=2007042509

¹⁶⁰ Ibid

¹⁶¹ <http://www.wiifirst.net/wii-console/the-nintendo-wii-a-history-155/>

¹⁶² <http://n-europe.com/news.php?nid=9774>

Nintendo put much effort into the design of the console. The traditional console was transformed into a sleek white outside with the purpose of appealing to a wider range of customers. Nintendo's CEO, Satoru Iwata, argued for the console to be much smaller than what the market were used to. He believed people would hesitate to place it beside a flat screen television if it was too large.¹⁶³

Nintendo made it clear from the very beginning that the Wii should be able to attract the whole family and therefore it was important to keep its price at a level that an average family could afford.¹⁶⁴ In the marketing campaigns Nintendo did not only spend money to attract young customers. The target group was people between the age of 25 and 49 on which 70 percent of Nintendo's US television budget was spent. To reach the group under 25, communities such as *MySpace* and other similar social-network channels was used. Nintendo's most successful trick in reaching as many customers as quickly as possible was to include one game with the console. At a total price of \$250 Nintendo made a profit of \$50 on every unit. It was this marginal that made room to include this one game, *Wii Sports*.¹⁶⁵

Initially Nintendo struggled with an inefficient supply chain and could not meet the high demand on the market.¹⁶⁶ In the mid 2006 the demand was so high that stores could not get a hold of enough consoles for the holiday weekends. This led to people paying thousands of dollars to buy the console on *eBay*. Both the console and the way Nintendo introduced it on the market left competitors worried but other companies that have tried to copy it has failed. Since mid 2007 Nintendo Wii has been the best selling console on the market¹⁶⁷ and during 2008 it had the top four best selling games:¹⁶⁸

1. *Wii Play* (5,28 million units)
2. *Mario Kart Wii* (5 million)
3. *Wii Fit* (4,53 million)
4. *Super Smash Bros Brawl* (4,17 million)

¹⁶³ <http://www.wiifirst.net/wii-console/the-nintendo-wii-a-history-155/>

¹⁶⁴ *Ibid*

¹⁶⁵ http://money.cnn.com/magazines/business2/business2_archive/2007/05/01/8405654/?postversion=2007042509

¹⁶⁶ *Ibid*

¹⁶⁷ <http://www.wiifirst.net/wii-console/the-nintendo-wii-a-history-155/>

¹⁶⁸ <http://www.mcvuk.com/news/32963/NPD-2008-video-game-revenues-top-21bn>

3.8.3 Sony PlayStation 3 (2006)

Sony released its seventh generation console called *PlayStation 3* (PS3) in Japan on November 11, 2006 and during the first day 81,639 units were sold.¹⁶⁹ At launch, two different consoles were available. One featured a hard drive with a storage capacity a 20 GB and the other 60 GB.¹⁷⁰ Sony priced the 20 GB console at \$499 and the 60 GB at \$599. Compared with production costs of \$805,85 and \$840,35 respectively meant that every console was sold at loss of \$250.¹⁷¹ The high production costs was due to the advanced technology that included both a blue-ray reader and a RSX graphic card.¹⁷² Selling consoles with deficit is nothing unusual and is explained by high production costs in the beginning of the timeline. As production has improved over time due to a more efficient production with greater economic of scale the first console sold at profit was in the third quarter of 2008.¹⁷³

Sony added several technical features to its new console and the most important was:

- Powered by Cell (The microprocessor)
- CD, DVD, Blue-ray Disc
- Bluetooth, WiFi, Ethernet
- Dolby Digital Surround Sound
- Wireless controller (Up to seven players)
- Preinstalled HDD
- USB, Memory Stick, SD, Compact Flash¹⁷⁴

Sony made the PS3 compatible with Blue-ray, which is seen as a great feature that competitors cannot provide. The Blue-ray technology makes it possible to create larger games with more details on them.¹⁷⁵ To match the demand of today the machine is made to be a multimedia tool that also can be used for video chat, Internet

¹⁶⁹ <http://kotaku.com/gaming/sony/japanese-ps3-sales-data-also-depressing-214864.php>

¹⁷⁰ <http://ps3.ign.com/articles/709/709973p1.html>

¹⁷¹ <http://ps3.ign.com/articles/746/746482p1.html>

¹⁷² Ibid

¹⁷³ <http://www.thesixthaxis.com/2009/01/29/sonys-game-division-in-profit/>

¹⁷⁴ <http://ps3.ign.com/articles/709/709973p1.html>

¹⁷⁵ http://www.planetxbox360.com/article_710/Xbox_360_versus_PS3_The_Debate

web browsing, digital photo viewing, digital audio and video. This leads to non-gamers buying the console and since they do not buy a lot of games the losses made on the hardware is not covered.¹⁷⁶ Sony decided to change online tactics compared to the predecessors within the series. Similar to the Xbox 360, PS3 also has an online gaming service called *PlayStation Network*. Unlike Xbox Live this service is free of charge although some game developers are allowed to charge a service fee. The *PlayStation Store* was created to supply gamers with a place where they could purchase games and game enhancements. When creating the PS3 Sony decided to make it connectable with its handheld console called *PlayStation Portable*, which might lead to a great network effects. How much influence on revenue this connectivity will have is still too early to say but it has an upside of possibilities.¹⁷⁷ The console is currently available in five different models referred to by the size of their storage capacity: 20, 40, 60, 80 and 160 GB models.¹⁷⁸

3.8.4 Summary of the seventh generation

The powerful Xbox 360 was first to enter the seventh generation in 2005. The strategy of being the first mover was clear and quite successful but not without consequences. The console has had larger and more errors than competitors and this have been costly for Microsoft to deal with. However, their first mover strategy meant a lot of consoles sold during their first year on the market. As the Nintendo Wii was launched in 2006 it outcompeted Xbox 360 as number one, which lead to Microsoft changing its approach to a broader customer base. Nintendo Wii was a success from its very beginning. Nintendo went pass the traditional thinking of increase the power in the console and instead put more focus on changing how people actually play. Keeping the price down has strengthened its position on the market as a console that attracts a wide range of users.

As Sony introduced its PS3 in 2006 it was launched as a powerful console with several technological advantages with the Blue-ray compatibility as the most revolutionized. It was the most expensive console on the market with an introduction price between \$499-\$599. At the same time it would serve as a multimedia station and

¹⁷⁶ <http://www.videogameconsolelibrary.com/pg00-ps3.htm>

¹⁷⁷ <http://ps3.ign.com/articles/709/709973p4.html>

¹⁷⁸ <http://www.us.playstation.com/PS3/Features#fbid:oAmicGnq-Xi>

not just as video game console. In this way Sony would gain from its unique technology and thereby have an advantage on its competitors. The Xbox had been introduced one year earlier at similar \$399 and with almost the same technological standard. In the beginning both Xbox and PS3 were trying to reach the same kind of customers but after two years on the market the Xbox have changed strategy to become more competitive against the Wii as well. Since Nintendo introduced its console at \$249 they have been practicing a more diversified strategy against its competitor.

4. THEORETICAL FRAME OF REFERENCE

In this fourth chapter the theoretical framework will be motivated and explained.

4.1 Introduction and motivation of chosen theories

Melissa A Shilling has developed the first model used in this thesis. It is found to be an efficient tool as it covers several unique factors that are central to this study. It offers explaining factors to why some actors within the industry are able to sustain dominance during generations. Based on the rather chaotic history of the videogame industry it should offer distinct features that differ from other industries and the modeling of *technological lockout* seems to fit well to the business of video games. Further, the model did not put enough emphasis on *switching costs* why a part covering this phenomenon was added. It is a well-known concept present in many other industries that will add an understanding of consumer behavior and support the framework of Shilling. The concept put forward by Shilling will be followed by the theory of *Blue Ocean Strategy*. This theory is chosen to enable an explanation how and why firms try to deviate from its peers and thereby serve a new type of customers. Signs of similar behavior have been identified in different stages of video game evolution, especially the current. Furthermore, the *Product Lifecycle* model is considered a necessary tool when highlighting conscious actions taken by the manufacturers during the different stages of their products lifetime. The model helps to create an understanding of how some consoles managed to stay on the shelves for a very long time when others barely made a blip on the radar. The *Marketing Mix*, a tactical tool kit that can be used when striving for a strong position in the market, complements the lifecycle to deliver a complete picture.

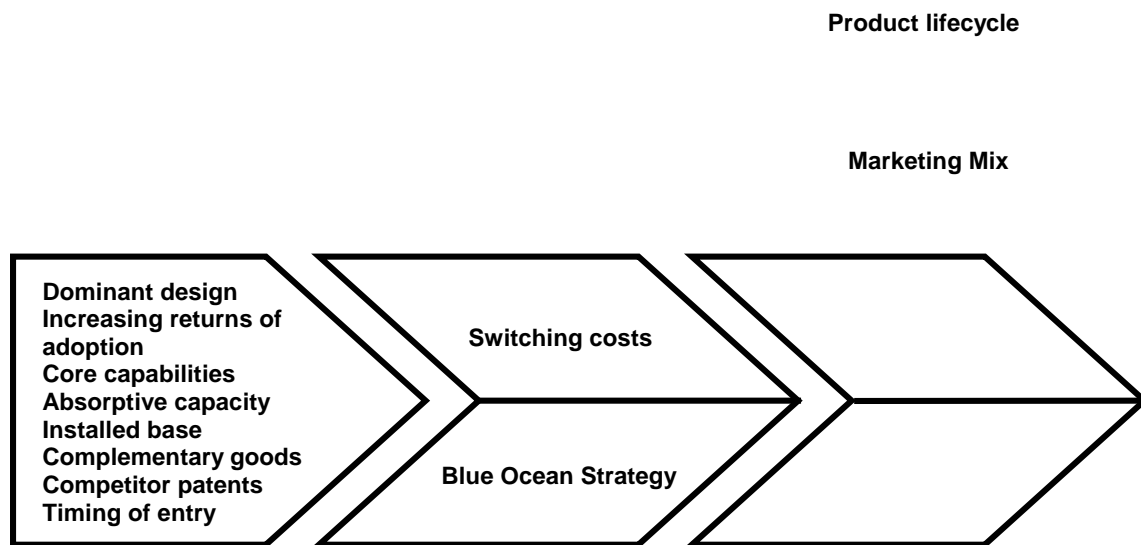


Figure 2: Connectivity of the theoretical frame of reference

4.2 Network markets

Technological markets are featured by extreme path dependence where some events will determine whether a technology will succeed or fail. The factors that influence technological lockout in this kind of market are not randomly decided or out of control from the firms' perspective. They have been used as Shilling created her model presented in the section below.

4.2.1 Technological lockout

Technological markets are often characterized by a dominant design or a standard, which lockout deviating actors and their products. The lockout situation occurs when one technological standard is rejected and another preferred by the market. Melissa A. Shilling presents a model that decides and describes the relations between factors that increase the likelihood of technological lockout. When developing the model, knowledge was gathered from a range of literature including industrial organization economics, strategic management and marketing strategy.¹⁷⁹

¹⁷⁹ Melissa A. Shilling, Technological Lockout: An Integrative Model of the Economic and Strategic Factors Driving Technology Success and Failure, *The Academy of Management Review* vol 23, No 2, 1998, p 267

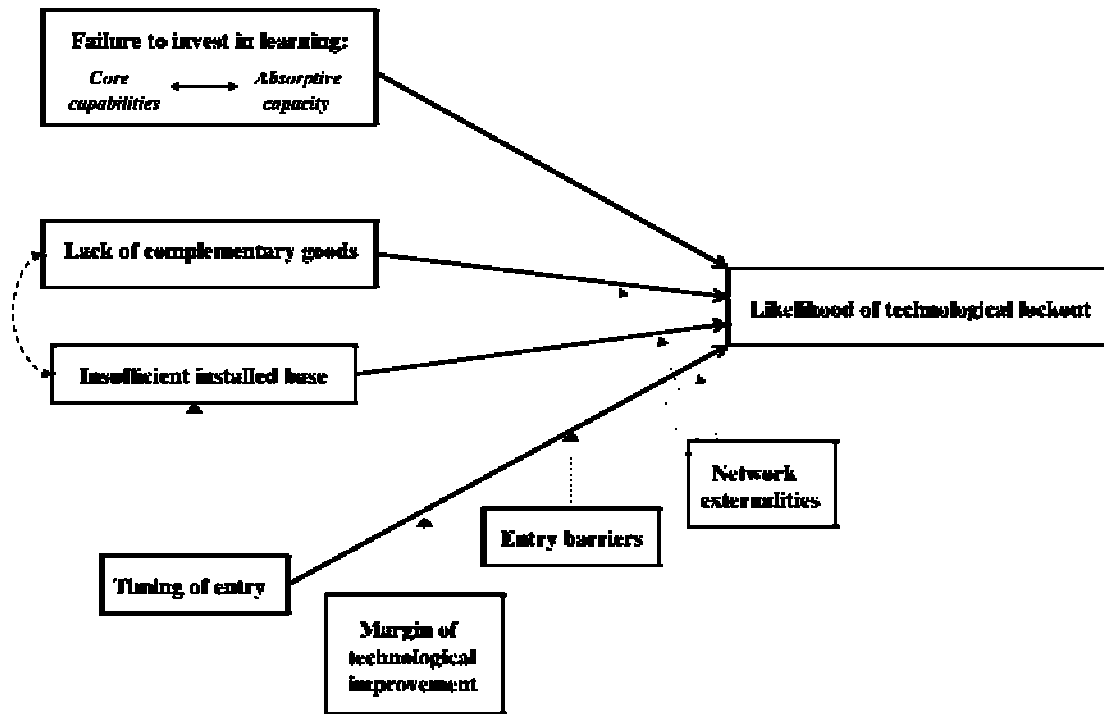


Figure 3: Factors affecting the likelihood of technological lockout.¹⁸⁰

In fast moving industries products can become obsolete very fast and if an actor fall behind its peers it can be almost impossible to catch up. Even though the quality and technical advantage is important there are other factors that might be relevant. These could be timing problem, early technology offerings and how and by whom the technology is sponsored. If a large and powerful firm decides to sponsor a technology it could gain market share very fast. By this, suppliers and distributors can be forced and convinced that this technology is the one and only. A sponsor may try to penetrate the price with the purpose of making the technology a dominant standard. Lockout may then occur for competitors, who are not capable of producing the technology that one or a few firms protect and because of that has become dominant. This can take months but it can also occur in several years. During this process, before one standard become *locked in*, a number of actors might have been *locked out*.¹⁸¹ Shilling define technological lockout as:

*“a situation in which a firm finds itself unable to develop or competitively sell products to a particular market because of technology standards”*¹⁸²

¹⁸⁰ Ibid, p 272

¹⁸¹ Shilling, p 268ff

¹⁸² Ibid

4.2.2 Dominant design and increasing returns of adoption

When several technological options become available on a market, technological superiority is not a requisite to become the dominant design. However, it is common that the rise of a dominant design will exhibit a situation of extreme path dependency. The gradual beginning of a dominant design is often a sign of an established market taking shape. As one technology becomes more popular, the learning will increase about the technology and the demand of future technology within the same area will be strengthened. There are many reasons for a dominant design to be adopted, thereby included:¹⁸³

- Increasing returns to adoption
- Pressures for compatibility
- Government regulation

The phenomenon of increasing returns of adoption is divided into two categories of effects. The first category says that as a technology become more and more used it will be improved and generate higher returns which further can develop the technology. Additional adopters will increase the knowledge about the technology, which also makes it possible to improve the technology. As it become more used and accepted the supply of complementary goods will increase and further strengthen the dominating position. A phenomenon of *self-reinforcement* has then occurred and the gap to competitors will become even wider. The range of adopters will be larger and indirect improve the technology further. The second category includes *network externalities*. In network markets, a consumer benefits when many people purchase the same product. This can occur in many different ways, for example if the technology requires specific training or if the technology is combined with complementary products and after sales service. Also all kind of physical networks will have a positive effect on the network externalities. This kind of industries often has got to hold on and be in line with one single dominant design.¹⁸⁴

Reasons for rejection of a technology standard can according to Shilling be:¹⁸⁵

¹⁸³ Ibid, p270

¹⁸⁴ Shilling, p 270

¹⁸⁵ Ibid, p 271

1. Standards fail to meet consumer expectations of quality, features, or price
2. There are network externalities in the market, and the technology's installed base or availability of complementary goods is insufficient
3. Timing or market entry is either too early or too late.

It is not always easy for firms to predict what consumer expectations are and therefore problems might occur about how the technology standard will look like. Some firms will supply wrong type of products because they do not understand what customers demand. Others lack the core capabilities that are required to produce the right standard. However, if they succeed to produce it, they also have to deliver on time or before its competitor.¹⁸⁶

¹⁸⁶ Ibid, p 271f

4.2.3 Core capabilities

The core capabilities of the firm describe how a firm's strategy differs from its competitors. In the core capabilities one can see how the firm has chosen to diversify it self against competitors.¹⁸⁷ Core capabilities will make it possible for a firm to create a whole product line and a successive platform. Firms that act in a specific area tend to exploit their operations in closely related business and therefore develop a technology that is similar to what they have done in the past. This developing process increase knowledge and is often more valuable to the firm than the project in itself and the action taking by the firm in the past will have great influence of what the firm will be able to perform in the future. If a company ignore to invest in new projects it also fail to develop new core capabilities and this could in the end be a strong reason for falling behind its peers. If the scenario repeats the company will be unable to compete and react to a changing technology leading in the end to a lock out of the market.¹⁸⁸

4.2.4 Absorptive capacity

Absorptive capacity is the process when individuals are learning and therefore becoming better at fulfill its knowledge in the future. Further on the absorptive capacity of a firm is its ability to value information, assimilate it and apply it on investments of new products. It is of outmost importance that the firm takes actions of learning. The knowledge in itself is not essential. Learning trigger learning and the process will make it easier to gather knowledge in the future. Firms that ignore and do not work with absorptive capacity risk falling behind the technological frontier and have problems to catch up. The process of investing contributes with a lot of experience and knowledge about what strengths and weaknesses a firm got. Knowledge that can be crucially when deciding what project that should be continued. A firms core capabilities and ability to deliver products before its competitor could be seen as a function of learning.¹⁸⁹

¹⁸⁷ Shilling, p 273

¹⁸⁸ Ibid

¹⁸⁹ Ibid, p 273f

4.2.5 Installed Base

In network markets consumers will be interested in how many adopters there are. As many consumers' leads to several benefits for every single user a technology with large installed base is preferred to a small. If consumers gain more value from one product, the installed base of this product will grow. Firms can according to Shilling affect and reinforce the installed base by:¹⁹⁰

- Being well vertically integrated and have good contact with many distributors.
- Spreading the technology through licensing arrangement and open systems.
- Aggressive advertisement.
- Timing of entry

4.2.6 Complementary goods

A technological product often offers an extensive amount of complementary goods. Some firms produce both the core product and its complements while other rely on other firms to bring forward complementing products. A greater installed base will lead to a higher amount of complementary goods and vice-versa. Manufacturers of complementary goods show willingness to invest in and produce products that are suitable to the technology that got the largest installed base. As one technology get additional complements it also increases the interest of new consumers to adopt and further grow the installed base. This tends to have a repeating effect and make the position of the dominant technology even stronger. The combination of installed base and complementary good seems to have self-reinforcing effects on each other. The producers of complements often face transaction costs that can be reduced by setting up contracts with the dominant technology manufacturer. This type of alliances is not unusual in the video game industry and it works like a sales guarantee by the producer of the technology. Problems may arise if companies do not want to produce complementary goods to a specific technology. The company of the technology then risks being technologically locked out of the market.¹⁹¹

¹⁹⁰ Shilling, p 274f

¹⁹¹ Ibid, p 275f

4.2.7 Competitor patents

The existence of patent on a market that is characterized by a dominant design will increase the probability of lockout among the competitors that do not protect their technology with a patent. If firm B got patent rights they can stop firm A to produce compatible products. A second generation of a technology will be delayed, if it ever will be reality, because of one firm's strong patent protection. It is important to stress that there are several types of patents and they got different degrees of protection. How the patent is structured will decide the firms' ability to lock out competitors and protect its position.¹⁹²

4.2.8 Timing of entry

Within a technological industry where companies are highly dependent on the amount of adopters, the timing of entry will have a great influence on the likelihood of success. In industries with increasing return to adoption it is important to be an early mover. However, according to research it is not necessary to be the first mover. Even the second mover got equal chances of becoming the dominant design producer. Arguments not to enter the market as the first actor have been raised. A later entry enables the firm to fine tune demands of consumers and design their products due to that.¹⁹³

Schilling explains that the relationship between timing of entry and technological lockout has interesting interaction with the state of the industry and customer expectations.¹⁹⁴ In early stages of a technological life cycle the demand of consumers will be unknown and the technology undeveloped. Few complementary products will exist and the chance of becoming the dominant design is low. Studies show that technological discontinuity never becomes the dominant standard. Subsequent improvements seem to be benchmark of the industry and as time goes by these improvements will also meet consumers expectations and one actor's standard will be dominant. When a technology proves to be valuable competitors will try to take market share from the leader. Most of those who try this will not be able to fulfill expectations and therefore struggle behind the learning curve. Shilling presents the

¹⁹² Shilling, p 279f

¹⁹³ Ibid, p 276

¹⁹⁴ Ibid

relationship between timing of entry and likelihood of technological lockout in a U-shaped curve.

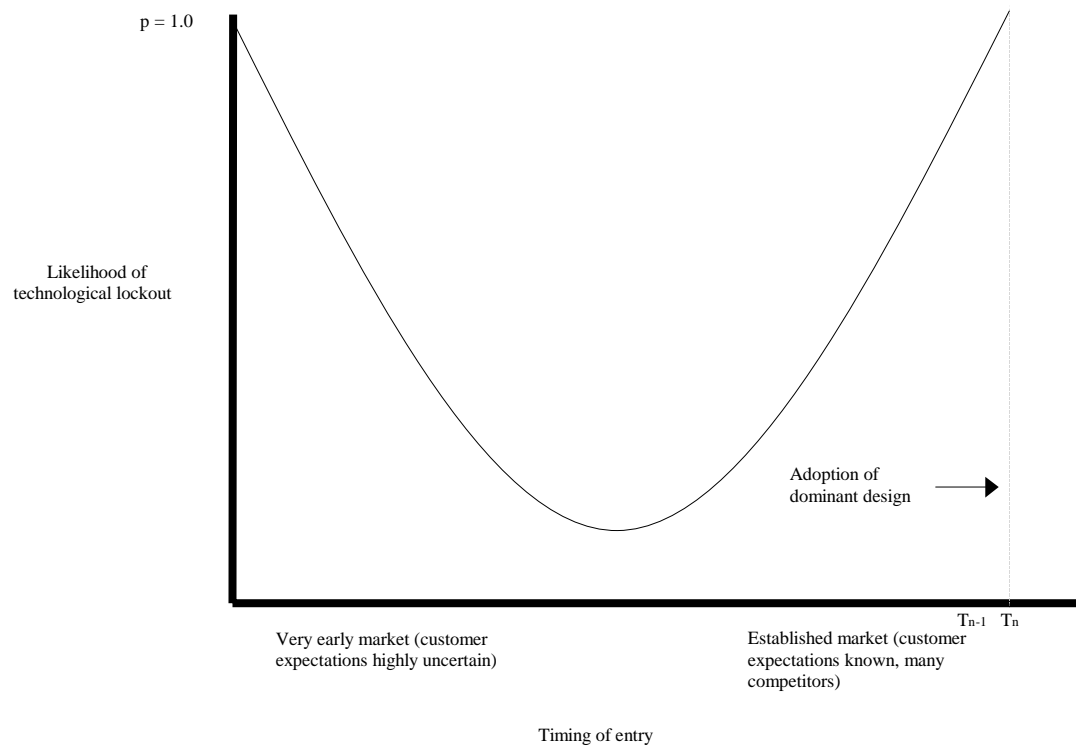


Figure 4: The relation between timing of entry and technological lockout. ¹⁹⁵

It is crucial to find the deflection point that is dependent on customer awareness and agreement on product features. The slope of the curve will depend on:

- Network externalities in the industry
- Barriers to competitive entry
- Margin of improvement of new technology compared with existing

When the amount of network externalities is increasing this will shorten the time until one single standard become dominant and the second part of the U-shaped curve will be steeper. Higher barriers of entry will slow down this effect and exclude competitive entries. The same situation will occur if patents protect a technology. On the other hand one can argue the opposite that fewer alternatives make it easier for costumer to choose one standard. However, when the new technology is far better

¹⁹⁵ Shilling, p 277

than the previous it will have a dampening effect on the first half of the curve. The same thing happens when a technology got similar functions and gain customers acceptance very fast. In those situations the firm will be aware of customers expectations earlier and therefore they can enter the market earlier.¹⁹⁶

4.3 Switching costs

When a dominant design has been established it is crucial to arrange for switching costs. This is the cost that occurs when a customer changes from one product to another and it is created either by complementary products or network effects. When firms provide customers with complementary products characterized by interconnectedness it has a *lock in* effect on the current technology. To enter a market like this one has to offer a considerably more advanced technologically than the present product.¹⁹⁷

4.4 Blue Ocean Strategy

Normally a market consists of a red ocean where all actors compete around the same customers. Then there are blue oceans, an unknown market place where the industry does not exist at the moment.¹⁹⁸ In red oceans competitors use traditional methods to gain market share and outperform peers. High competition leads to a reduction in growth and profits as the commodities become more and more similar to each other. One always has to acclimate in the line of competitors and because supply is greater than demand it is not enough to just be a high performing company.¹⁹⁹

A blue ocean refers to an untapped market area with opportunities to create demand. When red ocean markets become over-crowded one will have to extend traditional boundaries to survive. A blue ocean strategy might be the only alternative. If a firm succeeds to create demand it is also possible to gain higher profits. Those kinds of markets do not have predefined rules and therefore there is no competition to comply with. The issue of how to succeed in Blue Ocean markets is essential when firms

¹⁹⁶ Shilling, p 277

¹⁹⁷ Gallagher, S & Ho Park, S Innovation and competition in standard-based industries: A Historical analysis of the U.S. home video game market, IEEE Transactions on Engineering Management, Volume 49, Issue 1, 2002, p 68f

¹⁹⁸ Kim, Chan W & Mauborgne, Renée, Blue Ocean Strategy: From Theory to Practice, California Management Review, Vol 47, No 3, 2005, p 106

¹⁹⁹ Kim et al, p 106

decide to improve beyond conventional barriers. Firms will strive to minimize the risks while opportunities are maximized. Still strategies of how to compete in red oceans are dominant and there are several analytical tools to use when deciding how to compete in those markets. This might keep companies in the same pattern as before and prevent them from exploring the business.²⁰⁰

In comparison to firms at traditional markets, blue ocean actors have made competition unnecessary and instead found a loophole to create value for them self and for consumers. The whole framework of blue oceans is not fixed yet and industry players can therefore reconstruct it in then line of their preferences. This is called the reconstructionist view and is an untraditional way of how firms create value. The more traditional method of creating value is a choice between differentiation and low cost. In the reconstructionist view the focus will shift from supply to demand and step aside from the competition.²⁰¹

4.4.1 The Four Action Framework

Chain Kim et al has developed what they call *The Four Action Framework* with the intention to create a new value curve. To challenge an industry's strategic logic and business model, following questions must be asked:²⁰²

- Question 1* Forces a company to consider eliminating factors that companies in an industry has long competed on.
- Question 2* Forces a company to determine whether products or services have been over-designed in the race to match and beat the competition.
- Question 3* Pushes a company to uncover and eliminate the compromises an industry force customers to make.
- Question 4* Help a company to discover entirely new sources of value for buyers and to create new demand and shift the strategic pricing of the industry.

²⁰⁰ Kim et al, p 108

²⁰¹ Ibid, p 109

²⁰² Ibid, p 113

It is in the answers of the two first questions that the firm will get the knowledge of how to drop its costs structure against its competitors. The other two questions provide the firm with insight about how to create new demand and buyer value. The whole framework will create an understanding of how to offer customers new experience and reconstruct buyer value in unexplored industries while keeping their cost structure. The actions of eliminating and creating are of great value as a company decides to go beyond traditional value maximization exercises.

4.5 Product Lifecycle Strategy

The product lifecycle is a tool that can help explain the course of a product's sales and profits over its lifetime, from design to obsolescence. The cycle can be represented by a curve that is divided into five distinct stages: *product development*, *introduction*, *growth*, *maturity* and *decline*.²⁰³

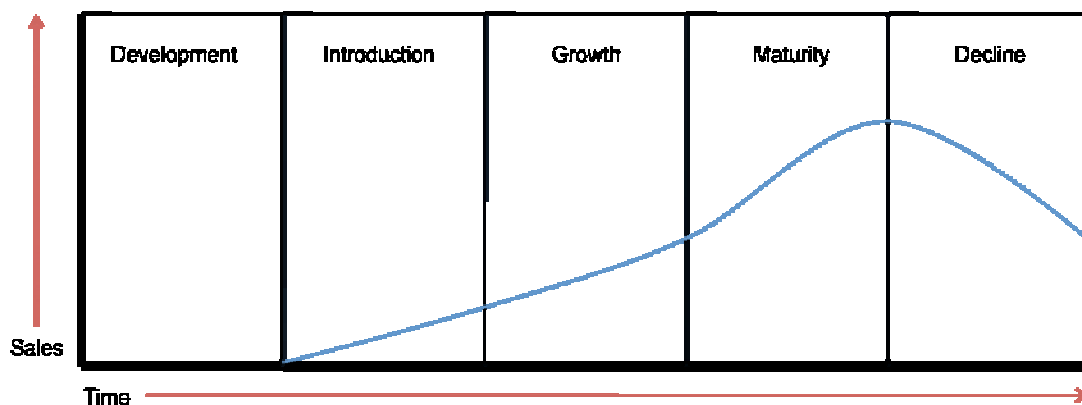


Figure 5: The product life cycle

4.5.1 Development

The product development stage begins when a company has found and started to develop a new-product idea. Sales are zero during this stage and the company's investment costs mount.²⁰⁴

²⁰³ Armstrong, Gary & Kotler, Philip, Marketing an introduction, Pearson International Education, Ninth edition, 2009, p 278

²⁰⁴ Armstrong et al, p 278

4.5.2 Introduction

The introduction stage is said to begin when the product is first launched. Introducing a new product can take time and the growth in sales are often slow at this stage. Profits are negative or low due to low sales and high promotion and distribution costs. Often promotion spending is high to inform customers of the product and getting them to try it. It is important for a company to choose a launch strategy that is consistent with the intended positioning of the product. The initial strategy is just the first step in the grand marketing plan for the product's entire lifecycle. To build and retain market leadership it is important to play the cards right from the beginning.²⁰⁵

4.5.3 Growth

If the product manages to survive the introduction stage and satisfy the market it will enter a *growth stage* in which sales climbs quickly. Those that have adapted to the product will continue to buy while later buyers starts to follow their lead. This effect will depend on if the product is favorably spread by word of mouth. New competitors will enter the market, attracted by the opportunity to make profits. Competition will bring new product features and the market expands. Prices remain fairly stable and a slight increase in promotion spending might be seen. The market still needs to be educated but the difference is that the competition also has to be met. Profits increase during this stage as the promotion costs can be spread over a larger volume and as manufacturing costs per unit fall. There are several strategies to sustain growth as long as possible. Improving quality, adding new features and models, entering new market segments and using new distribution channel are only a few examples. In the growth stage the firm faces a trade off between high market share and profit. If it decides to spend a lot of money on product improvement, distribution and promotion the company might be able to capture a dominant position. However, by doing so it gives up maximum current profit, something that is hoped to make up for in the next stage.²⁰⁶

4.5.4 Maturity

Eventually, a product's sales growth will slow down and when it does the product enters a *maturity stage*. This stage normally last longer than previous stages and poses

²⁰⁵ Armstrong et al, p 280

²⁰⁶ Ibid

a challenge to the marketing management of a firm. Due to the slow down in sales growth the market will have an overcapacity that will lead to greater competition. Prices are marked down, advertising and sales promotion increased and product development budgets increased to find better versions of the product. All of these steps lead to decreasing profits and some of the weaker competitors are forced to drop out. Eventually the industry only contains well-established competitors. Most successful products evolve during this stage to meet the changing customer needs. Managers need to do more than defend their products. By *modifying the market*, the company can try to increase the consumption of the product by searching for new users or market segments. New ways of increasing usage among current customers is another way of addressing this problem. Instead of modifying the market a company could chose to *modify the product*. By changing the characteristics such as quality, features, style or packaging it might be able to attract new users and inspire present customers. Finally, the company can try to improve sales by *modifying the marketing mix*. New or improved services can be offered, prices cut or better advertising campaigns launched.²⁰⁷

4.5.5 Decline

The sale of most products eventually dips. It might be a slow decline or rapid and sales might plunge to zero or remain at a low level for many years. This stage is called the *decline stage*. There are many reasons why sales decline such as technological advances, increased competition or a shift in consumer tastes. Companies that remain might alter their product offerings. They may drop to a smaller market segment or cut promotion budget and reduce prices further. To carry a weak product can be costly to a firm and the task is to identify products in the decline stage by reviewing sales, market shares, costs and profits trends on a regular basis. The decision can then be made whether to maintain, harvest or drop the product at hand.²⁰⁸

²⁰⁷ Armstrong et al, p 281-282

²⁰⁸ Armstrong et al, p 282

4.6 Marketing Mix

The marketing mix is a set of controllable and tactical marketing tools used to produce a response in a targeted market. In other words, it everything the company can do to influence demand for its product. These possibilities can be categorized into four groups known as the *four P's*; *product, price, place* and *promotion*.²⁰⁹



Figure 6: The marketing mix²¹⁰

- Product:** *The combination of goods and services offered to the target market.*
Variety, Quality, Design, Features, Brand name, Packaging, Services
- Price:** *The amount of money customers has to pay to get the product.*
List price, Discounts, Allowances, Payment period, Credit terms
- Promotion:** *Ways to communicate benefits of the product so customers will buy it.*
Advertising, Personal selling, Sales promotion, Public relations
- Place:** *Activities that make the product available to the targeted consumers.*
Channels, Coverage, Assortments, Inventory, Transportation, Logistics

An effective marketing mix blends the elements into a coordinated program that delivers value to the consumers. It is a tactical tool kit that is used to establish a strong position in target markets.²¹¹

²⁰⁹ Armstrong et al, p 52

²¹⁰ <http://www.provenmodels.com/13/four-principles-of-the-marketing-mix/mccarthy>

²¹¹ Armstrong et al, p 53

5. ANALYSIS

In this fifth chapter an in depth analysis of each generation and the video game crash of 1984 will be presented. The empirical foundation will be interpreted and analyzed using the theoretical frame of reference presented in chapter four.

5.1 First generation

The timing of entry is often crucial in an industry where the amount of adopters is of utmost significance. However, it might not be necessary to be the first mover in this type of industry to gain dominance. According to theory, the second mover often has equal chances of becoming a producer of the dominant design. In accordance, Magnavox produced and sold the first home videogame console ever made but were not able to dominate. Two of the three reasons for rejection mentioned by Schilling apply. Despite not actually failing to meet customer expectations, consumers refused to buy the product because they thought it had a feature they did not want. It was said to only work on a Magnavox TV set. Secondly, Magnavox entered the market first but never succeeded to get a large installed base. There are a number of ways Magnavox could have affected the Odyssey's installed base but it mainly failed in three of the areas mentioned in Schillings model. The company failed to create a good contact with distributors, an area where Atari succeeded. Secondly, even though the console was aggressively advertised the promotion was badly formulated. Hence, Magnavox managed to fulfill three out of the four parts of its marketing mix. Thirdly, being a fist mover in a completely new market no actor had made any errors before Magnavox. The creator, Ralph Baer, was first to come up with the idea but Magnavox never managed to take advantage of moving first. During the introduction stage of its lifecycle the customers were given misleading information and because of many were not attracted to try the console. However, Magnavox managed to prolong its lifecycle and stayed on the market for three years selling over 300,000 consoles before it was discontinued.

PONG on the other hand became very successful and later gave rise to an extreme path dependency. Atari's console lived up to all of the prerequisites for dominant

design and increasing returns, in Schillings model. Quality, features and price all appealed to consumers and because Atari moved secondly they could avoid the traps that had caught Magnavox. One of these was the contact with distributors. Atari, being the second mover, could study Magnavox failure and thus set up a deal with Sears that would give the console enormous exposure. Spreading the technology through such licensing arrangement is one of the four ways Shilling's model says a firm can affect and reinforce the installed base.

Often a late entry enables the firm to fine tune demand and the products and this was the case in the first generation. Atari also had a big advantage as the console featured a game people had played in the arcades before. However, Atari never protected its product with a patent, which of course decreased the possibility of lockout. If Atari had gotten patent rights the clones could have been stopped before they flooded the market. The lifecycle of the product could have been extended and the second generation of consoles delayed. In total, Magnavox managed the promotion of their console in a really awful way. Atari studied and took advantage of the mistakes Magnavox did but in the end made fatal errors of their own. The installed base was not enough to lure customers away from buying clones, nor was any complementary products put forward.

Furthermore, this was the first generation of videogame consoles and the demand of customers were fairly unknown and the technology undeveloped. Shilling describes the lack of complementary products and the difficulty of setting a standard in such times, a parallel which can be drawn to this first generation. Complementary products were rare and the games were built into the consoles. This meant that manufacturers could not use game libraries to increase network externalities and switching costs among its customers.

5.2 Second generation

The second generation also brought a first mover, Channel F, which despite being launched one year ahead of competition did not manage to dominate the market. The reasons for rejections mentioned by Shilling that were present in the case of Channel F are very interesting. Fairchild managed to introduce a feature that no other console

had before, one that would become standard for a long time, the cartridge system. But during its one-year head start the company did not manage to quickly set up an installed base. One reason for this could have been insufficient contact with distributors. More probable is the fact that handheld consoles flooded the market at the time, why the timing of Fairchild's entry could have been better. Atari, who had a console in its pipeline, was surprised by the entry of Channel F. To be able to outcompete the system, Atari spend a lot of money on development. Once the 2600 system hit the market it made the graphic of Channel F look obsolete. The market for consoles was still very seasonal at this time why Channel F's lifecycle was short.

Shilling states that in network markets, the consumers will be interested in the number of adopters. A large installed base is desirable as many customers lead to several benefits for every user. During its product development stage, Atari put a lot of money into making the console superior to Channel F. Once it hit the market the console featured a superior graphic quality. Atari had what Fairchild lacked, a good distribution channel. Through Sears both the 2600 system and its complementary goods got an enormous exposure though the many stores. This is one of the prerequisites to quickly set up an installed based as mentioned by Shilling. More adopters of the technology will increase the knowledge. This combined with a larger amount of complementary goods will according to Schilling's model lead to self-reinforcement.

Manufacturers will show a willingness to invest and produce products that reflect the size of the base. Atari, with its large base, managed to gather a lot of third party game developers, which was a large part of its success. Initial sales were low and it was not until Atari decided to port the game Space Invaders that sales took off. The game had been an arcade hit and were the first to be ported to a cartridge. During 1979-1981, which can be considered the growth stage of the 2600 system, Atari enjoyed almost monopoly power on the market. The importance of the relationship with third-party developers would be shown as some of Atari's game developers felt they got very little credit for their work. Four of the company's most successful programmers left Atari during this stage to form their own company, Activision. This probably was the beginning of the end for Atari's software dominance.

The Odyssey² entered the market with interesting features such as the keyboard and impressive graphics. The keyboard was a smart move during the introduction as it appealed to parents in educational purpose, a somewhat marginal niche. However, the timing of entry was probably the major reason why the system never succeeded. Atari 2600 had taken a firm grip of the market and with few third-party developers wanting to create games for the system it was hard for it to attract gamers. Maybe the story would have been different had the game *KC Munchin* been the success it had the potential to be.

When Mattel Electronics introduced its console Intellivision they knew what would attract customers into buying the product. During its introduction stage a follow up keyboard was to be released. This promise combined with a huge marketing campaign led to promising sales figures as the console entered the growth stage. However, the keyboard stayed *under development* for a very long time and when it finally came it was not good enough and the console was already disappearing. It was too little and too late.

When Atari launched its 5200 system it was meant to replace the highly successful 2600. The main reason why it did not manage to fill out this rather large jacket was that Atari failed to manage its *product* in its marketing mix. The company was so afraid of letting go of its 2600 system that it continued to develop games and put money into the console. Atari basically wanted to prolong its lifecycle, terrified that it would move into a decline stage. But by doing so the company did not give the new system, 5200, enough resources in its introductory stage. Supplying the 2600, arcades and its computer system with games there was little money left for the 5200. Since it was not compatible with the 2600, the small game library available for the system did not attract gamers.

ColecoVision introduced two groundbreaking features. First it offered options of expansion with different type of modules but most importantly it could play games of Atari 2600. By doing so Coleco eliminated switching costs for people who had built up large game libraries of this popular system. It also featured a proven concept of success; an arcade hit game ported to its console at launch. The game was *Donkey*

Kong, which became immensely popular. The system had great sales figures during its lifecycle and its uncertain if it could have done anything different to reach greater success. By 1982 the situation on the market was out of control with new consoles crowding the shelves. Too many systems were on the market and customers seemed to have had enough. One system could be said to be the ultimate in gaming only to be replace by another right after. Customers could not be lured into the stores to sustain the industry and ColecoVision, Vectrex and many other systems could not survive the crash.

5.3 Video game crash of 1984

Almost every actor disappeared during the crash. In retrospect it is quite clear that something had to happen and the industry needed a reformation. During the crisis there were an enormous amount of low quality games but after the crash these were gone and the era of Nintendo was born. The crash worked like a clean up of non-serious actors and it also make people understand what they really wanted was one home computer system and one home video game system for the children.



Figure 7: The video game crash

5.4 Third generation

It was after the crash that Nintendo decided to launch its new console called NES. Nintendo initially faced some obstacles during its introduction phase because American retailers had the crash fresh in their minds. Nintendo did a smart thing and designed the system to fit with other home electronic equipment rather than looking like a game console. More importantly, Nintendo agreed to buy back all unsold inventory from retailers, which shifted the risk. Once the system hit the stores it was not long until it would enter a tremendous growth stage and start its journey to become the number one system.

Especially Super Mario Bros changed the market totally and was exactly what the business needed after a couple of hard years. This game played a central role for the

success of NES and became a corner stone in the firms market mix. Because game developers were restricted only to work for Nintendo, this killed the competition and led to a lockout of other firms. Nintendo was sensitive and listened carefully to what the market demanded after the crash and they offered only high quality games. NES was the first console released after the crash and faced difficulties of persuading people that they needed a game console. As it would turn out, Nintendo's entry was a perfect match to what people waited for. This is probably one explanation to why the growth state of the console became so high and extended. In some way Nintendo succeeded to tune in what people wanted and as a first mover they did not face fierce competition. This further strengthened Nintendo's ability to become a dominant design producer. The company was the first during the history of the industry to take advantage of the role as first mover.

The slope of the U-shaped curve presented by Shilling is decided by three different factors: network externalities in the industry, barriers to competitive entry, margin of improvement of new technology compared with existing technology on the market. Nintendo offered a console in line with a new generation and also technologically superior than consoles on the market. Third party developers were tied up and restricted to only develop games for Nintendo. This move clearly raised the barriers of entry for competing firms. Fewer actors were able to enter, which gave Nintendo the time to establish a dominant design on the market. With a greater amount of customers due to for example the supply of complementary products they were able to benefit from and increase network externalities on the market. By fulfilling the three factors they were able to lockout competitors from the market and dominate the industry with a 90 percent market share. Further on, the fact that Nintendo promised its retailers to buy back all unsold consoles was another important step to become more vertical integrated and through that gain from a large installed base. Nintendo overviewed the whole process and were in charge of production, advertising and distribution. Competitors were kept far behind why time in the maturity stage was extended and the position as industry leader sustained. Nintendo had put in a patent to protect NES processor and a lockout chip was built in to further extend the lifecycle of the console.

Sega developed its Mark III system into an 8-bit console that was backward compatible in contrast to the NES. This was only one of its features that were superior to Nintendo's console. The Master System offered superior graphics, sound system and other important peripherals, but it could not compete with the NES. Nintendo had through its licensing arrangement prevented its third party developers from cooperating with any other system. This meant that Sega only having two developers working for them, leading to a lack of complementary products and further on an insufficient installed base. Even though Sega's core product and its price was in line with the demand, the fact that they could not offer a wide range of games rendered trouble. In spite of Nintendo, Sega succeeded to take the console into the growth stage and became a producer of the dominant design that characterized the market at the time. However, an incomplete marketing mix due to poorly managed promotion combined with lockout actions from Nintendo was the reason why Sega never became a successful participant of the third generation. Sega Master System is a good example of an actor being able to produce a console with a technology that was in line with peoples demand but at the same time being almost locked out by another firm.

Atari 7800 console faced even larger problems than the Sega Master System. Atari 7800 promised the market several features that it was not able to live up to. Even though Atari offered a superior product in many ways, for example its great graphic that surpassed both NES and SMS, the market was fooled with promises sent out that never became reality. The system was launched in a time when Nintendo had monopoly power and Atari were never able to attract game developers, which lead to only three available games as the console reached the market. With a lack of complementary goods it was hard if not impossible to catch up on Nintendo and the whole situation turned into a vicious circle. The three consoles of the third generation were all launched at the same price of \$200 and even if the products were similar Nintendo did everything else right. The other two actors fought not to be locked out of the market.

5.5 Fourth generation

When moving into the fourth generation the pattern of first movers not being able to dominate the market is resumed. At first the TG-16, which was the first console to

feature the CD-ROM, looked promising as it outsold Nintendo's Famicom in the Japanese market. NEC who manufactured the console was convinced that it would render the same success in the US market, but as Shilling states: it is important to deliver on time and before competitors. This is where NEC failed. It was too slow in translating the games that had enabled the success in the Japanese market. Genesis quickly followed TG-16 into the US market and during its introductory stage it had a quality line up of games ported from arcades that NEC could not match. In addition to this, NEC let many bad games slip through despite having an expressed policy of only releasing the *best of best* games. Nintendo's licensing policy shrunk the availability of game developers, which was another contributing factor. It could be said that NEC was locked out of the market due to a combination of their own stupidity (not transferring quick enough) and the fact that Sega and Nintendo had secured important third party developers. Other might claim that the failure of TG-16 was not a question of bad management but one of bad timing. But if it was, how come Sega managed to succeed? Nobody predicted that their Genesis would win the hearts of the US public since Sega had failed to charm the Japanese market with its equivalent Sega Mega Drive. What Sega started was an aggressive marketing campaign during the introduction stage of the product. Sega pushed for the speed and power of the console and why it was *cool*. More importantly this campaign was not only directed at customers but also to developers. Maybe Sega had studied NES and decided that having many third party developers was one of the most important factors of success. Nevertheless, in the beginning of 1990 Sega had, despite Nintendo's licensing policy, managed to gather 30 game developers compared to TG-16 four. By doing this, Sega were able to offer a great amount of complementary goods that would strengthen the installed base and further also the knowledge about the product. Once again the market could see the phenomena of self-reinforcement. Nintendo made a complete miscalculation as it continued to develop games for its NES even though Sega announced its new system. Between the times they realized that they had to put forward a new console and its launch date, Genesis was almost alone on the market increasing its installed base. The lack of competitors will, according to Shilling, make it easier for the market to coalesce around the technology that is available. As this was the situation for Sega they could benefit from network externalities and strengthen the position on the market with an even greater installed base. Once the SNES actually came it was said to be a much slower system than the Genesis. Sega used this when it

marketed its most famous game character, *Sonic the hedgehog*, which starred in a game famous for its tremendous speed. Another mistake that SNES did was that it did not make the console backward compatible with NES. This meant that the switching costs for the millions of users that had a NES system and extensive game libraries were erased. Why would they choose SNES when the Genesis obviously was a *cooler* system featuring a speed and power that Nintendo could not match. Furthermore, Nintendo lost 30 percent of the market but sustained dominance through a good reputation and experience. SNES did live up to people's expectations in many ways even though it lacked important features like backward compatibility. Sega did not sell as many units as Nintendo but were comparatively more successful during this generation and the battle is considered as divided between the two actors.

NeoGeo is not to forget, as it was a part of this fourth generation even though it made a very small blip on the radar. It was a beast when it came but over estimated the demand for such a high priced and advanced system. Basically people could not afford it.

5.6 Fifth generation

Once again the first mover of a generation would not be the dominant player of that generation. 3DO was a system with an obvious superior quality but despite being named Time Magazine's number one product of the year it is just as obvious why it never was a success. Out of the reasons put forward in Shillings model of why technologies are rejected by the market, one of them is price. The standalone reason for why 3DO failed was due to overpricing. It can of course be hard to predict what consumer expectations might be. However, in a market almost oversaturated by consoles, in retrospect its obvious why no one wanted to pay \$700 for the system. This overpricing also kept game developers away. No one wanted to develop games for the system why the game library was kept small and the vicious cycle completed. There was a price drop but it came in the end of its lifecycle. The price drop was too late, the console had a too bad of a reputation and it was all due the ignorance of one of the P's in the marketing mix.

Atari introduced the Jaguar at the more sophisticated price of \$250. However, the

company had already started to dig their own grave during its development phase. Atari pushed up expectations by turning to the market and promise a revolutionary product. Once it came and was unable to deliver, it is not hard to see why the public turned its back on it. If you look at Atari's marketing mix the *product* could not live up to the *promotion* and this was all due to the complexity of developing games for the system. It is interesting to think of what would have happened, had the system been easier to develop games for. If it had attracted a lot more developers and reached the full technological potential Atari said that it had, the story might have been different.

During the development of the Saturn, Sega managed to create an even bigger hype for its console than Atari had managed. 120,000 units were preordered in Japan and Sega had people cueing outside its stores on launch day. However, Sega managed to live up to its expectations and the console was a hit. This was much due to the fact that it came with the killer app *Virtue Fighter*, which had been a very popular arcade game. After the initial success in Japan, Sega saw its chance to beat competitors to the US market. In retrospect, the Saturn was rushed out on the US market in panic just to beat the PlayStation. Of course it is easy to say that now but Sega knew the history of the industry. It shows that you do not have to be the first mover to gain dominance on the market. What every player that has gained what could be called a dominant position has had though is a decent library of games to offer its customers. When Sega launched the Saturn in the US it only had *Virtue Fighter* and two other games available. Its game developers were then rushed into producing games fast why following games were insufficient and the in the end the console got a bad reputation. The lack of complementary goods and the rush to enter the US market the two main factors to why Sega failed to set up a sufficient installed base. Had Sega taken it a bit slower and given the game developers a little more time to develop quality games, maybe the manufacturer could have given Sony a run for the money. As it was, the PlayStation took over more and more of the market at this point as Saturn sales declined.

Sony PlayStation is the second best selling console ever made, only passed by the follow up PlayStation 2. What was it that Sony did to outcompete the Saturn? A lot of effort was initially put on attracting third-party game developers, a success concept

used by numerous manufacturers before Sony. This factor became even more important for Sony when no gain could be made from backward compatibility because it was the manufacturers first console on the market. The key to attracting these developers was the fact that PS used CDs instead of cartridges. This was appealing because not only did it lower production costs but it also offered the developers a flexibility of changing production to meet demand. As a couple of third party developers coalesce around one single standard it will be easier and less risky for other firms to do the same. Another factor that probably affected these developers was that Sony had a strong brand identity in entertainment and consumer electronics. Their games would probably be helped out on the market by the hands of an extensive distribution network. The timing of entry on the US market could not have been better. Sega had rushed into launching the Saturn with only three games available when Sony launched the PS 17 games was available. During the introduction stage of the products lifecycle in the US over \$40 million was spend on marketing, which was the start of its brand awareness that today is widespread. Three of the most important factors when building an installed base were fulfilled. Sony had good contact with distributors and \$40 million was spent on marketing the console. Furthermore, the PS was released just after Saturn and could outcompete it mainly though a larger game library. All in all, Sony had demonstrated a perfect blend of the different elements in a marketing mix to deliver value to its customers.

The fact that Sony selected CDs while Nintendo 64 used cartridges would turn out to be the key factor to why Nintendo's was unable to retain its dominant position in the gaming market. Cartridges would be harder to copy and featured shorter loading times but this mattered little. Its shortcoming would turn of both their customers and game developers. The higher production cost combined with inferior storage capacity made many game developers switch from Nintendo to Sony who used the cheaper and superior CD format. This led to infrequent game releases and an all in all limited game library for the N64 while PlayStation's kept growing. Predicting consumer expectations and what will be standard is hard but with the history that Nintendo has it is strange that company made such a big miscalculation.

5.7 Sixth generation

Sega entered the sixth generation as the first mover and released its console with a built in modem to support online gaming. This was a very futuristic feature and one of the settlements that would separate the sixth generation from the fifth. The product was in several aspects improved from the manufacturers prior console, the Saturn. Dreamcast was slimmer, smaller, more powerful and easy to design and program games for. It seemed to be exactly what the market demanded. However, the timing of its entry was not perfect. Due to the fact that the giant of video games during this time, Sony, released the follow up console to PlayStation only a year after the introduction of Dreamcast, Sega struggled. The company faced the same problem as they did during the third generation, when battling Nintendo. This time Sega was the first mover but could not take advantage of being the first mover as Nintendo had done with NES, which totally locked out its competitors. Sega on the other hand were not able to offer the market a sufficient supply of complementary goods. With only a few games released together with the console and with rumors about Sony's PlayStation 2 it became impossible for Sega to grow its installed base.

Instead Sony introduced its PS2 and forced Sega to leave the industry as a hardware producer. The new console from Sony did meet the expectation from the market and was made compatible to the prior console. The decision to make it backward compatible was probably the most important move by Sony. As the system was released there were already hundreds of game available due to the library of PS games. This meant that switching costs increased for customers. As the amount of users increased with the amount of complementary goods, Sony was able to gain from the network externalities. Something its competitors could not. One reason for this is probably that it took two years before competitors had the power to challenge it. The PS2 had several advantages and seemed to do everything right during its introduction stage, which soon turned into an extensive growth phase. Sony came from a success and had during the years of PS established a console with splendid reputation. The company entered the sixth generation as the second mover meaning that they were able to tune in what the market wanted. PS2 was launched at a high but reasonable price and implemented through advertisement that targeted a wider target group than

before. Through this step Sony were able to attract even older gamers and the age of the average player increased and thereby also the affordability of the user.

The complementary goods were many but the importance of high selling games like GTA and Rockstar was also in place. Nintendo had it, Sega as well and now also Sony. As the console was launched there soon became a shortage of consoles. Whether or not this was a conscious strategy or not it pushed up the demand even further.

As Nintendo launched GameCube the year after the introduction of PS2 it would show how hard it was to steel market shares from Sony. The GameCube was announced to be the next generation of video games. Once it came only three games was available. This was a mistake that had been repeated throughout the history and would not work this time either. The new console was launched as a different console compared to its competitors. It was said to be one of the smallest ever made and did not provide DVD compatibility. Together with a lower price it was meant to be the new winner of the industry. Nintendo GameCube reached the growth stage but suffered from the insufficient amount of complementary goods and the fierce competition on the market.

The PS2 faced stronger competition when Microsoft released their Xbox. Microsoft had studied the mistakes of both the Dreamcast and the Game Cube and succeeded to tie no less than 156 game developers. One of the most important developers was the prior hardware producer, Sega. With the strongest hardware on the market and a sufficient amount of complementary goods, the Xbox succeeded to sell more than one million units during its first three weeks on the market. Microsoft listened carefully to the market and improved the system in line with what people wanted. With the game Halo Microsoft gained a lot of market shares as it tied customers to the console. Even though the system was successful and technologically superior due to a stronger processor, it had problems to reach same numbers as the PS2. The system of Sony seemed to be locked in and Xbox had to perform it best not to be locked out.

5.8 Seventh generation

Microsoft did not want to redo the mistake of entering the market two years later than Sony and in the seventh and currently ongoing generation, entered the market first with Xbox 360. With a more powerful system the hope was to get a lot of early adopters and increase the installed base fast. The distribution of the console was faster and more effective than anyone had ever seen on the market. The product and its complementary products had been improved in order to gain advantages and lock out its competitors.

When Nintendo Wii was introduced on the market it decreased the growth rate of Xbox 360. In order for the Xbox not to be pushed into a maturity stage Microsoft had to act. At this point, the company decided to change the marketing mix by lowering the price and modify the product so it would attract a wider range of consumers. Even complementary products were renewed to follow the new strategy. A step away from the previous approach had to be taken in order to launch the console as an expensive multimedia console. To meet the competition, or rather to follow in the footsteps of Nintendo, Microsoft had to become more family oriented. However, the step has not been taken fully out. Instead Microsoft now tries to attract more users and at the same time follow Wii into a new blue ocean.

In 2005 it seemed like Nintendo was disappearing from the market and something had to be done. At this point, Nintendo managed to develop a console of a new concept with the intention to attract a wider range of customers. During the last two generations Nintendo had huge problems to compete in the traditional red ocean. What Nintendo did was to benefit from their deep and long knowledge in the industry and extended the technology into a new type of console. A new demand was created enabling them to serve an untapped market. The format of video game consoles had looked the same almost since the NES-generation. Now a console that would make people feel like they were inside the game was introduced. By using the four-action framework it is easy to see how Nintendo has been able to fulfill the grid and answer the four questions in the model. First, in order to offer a new console Nintendo identified eliminating factors of the industry, such as every actor serving same kind of consumer with the same type of console. Every new console tried to outcompete

competitors by providing superior graphics and more powerful processors. It seemed like companies spent too much effort on power, given the current level of technology and graphics. Nintendo avoided running after its competitors and launched its Wii as a console that does not compete on those features. By producing games with a greater feeling customers did not have to strive to get the console with the most advanced technology. The last question has been central considering the development of Wii because Wii provide more value in a new way to customers, who now play video games together as a social gathering.

As the knowledge about the console has grown with the increasing amount of users, more complementary goods have been available which further has strengthened the pole position of Nintendo's Wii. The bundle included the game Sport Wii, which taught people how to play and use the console. This made the self-reinforcement of the product even stronger and the gap towards its competitors has become wider by the day since the mid 2007. Nintendo used new kinds of media, such as MySpace, in their quest to attract more people to play. Physical networks like MySpace is, according to Shilling an important step to get the full positive effect on network externalities. The new marketing mix also included a lower price to be able to attract families to buy the console. The product has been smaller and slimmer to be able to fit in people's living room beside the flat screen television. There are many factors interacting and contributing to the success of Wii. One important factor is the presence of a large amount of attracting complementary goods. Nintendo Wii provided the top four best selling games during 2008 which could be seen as a combination of a great installed base combined with a sufficient amount of high quality games. The amount of sold units is still increasing as Nintendo soon faces the challenge to extend the growth stage before Wii enters a long maturity stage. Nintendo had some problems to distribute the console and in its very beginning there was a shortage of consoles. This might have had a dampening effect on initial sales but it also might have a positive effect and increased the interest for the product.

When Sony released its seventh generation console in late 2006 it was a great improvement from the prior console released by the firm. They had strengthened the marketing mix especially on one point, the product itself offered a superior technology with a number of applications and features that the other consoles lacked.

An improved design had been added and there was hope to be a producer of the dominant design. Both Xbox and Sony offer its users access to their networks. Sony has chosen a more aggressive approach and supplies the network for free to its users. This has reformed the business and made the network externalities even stronger than before. PlayStation 3 is a more expensive console but it is also the most technologically advanced. The market has showed before that they do not rate this feature as the most important. The battle have just started and the future will show if Sony have changed the demand of customers or if customers will change the product offered by Sony.

6. CONCLUSION & FURTHER RESEARCH

In this sixth chapter the research questions will be answered and discussed. Proposals to further research will subsequently round of this thesis.

6.1 Conclusion

The two research questions put forward in the introduction of this thesis was:

1. *What have been the factors of success during the history of video games?*
2. *Has these factors differed between generations?*

The table below presents an overall answer to these two questions.

Key factor / Generation	1	2	3	4	5	6	7
<i>Second mover</i>	x	x				x	x
<i>Distribution / Licensing</i>	x	x			x		
<i>Arcade porting</i>	x	x					
<i>Killer app</i>	x	x	x	x	x	x	x
<i>Exploit competitor slip-up</i>	x			x			
<i>Superior graphics</i>		x	x				
<i>Third-party developers</i>		x	x	x	x	x	x
<i>Complementary goods</i>		x	x	x	x	x	x
<i>Competitor compatibility</i>		x					
<i>Expandability</i>		x					
<i>First mover</i>			x				
<i>Design</i>			x		x		x
<i>Buy-back guarantee (retailers)</i>			x				
<i>Licensing system (third-party)</i>			x				
<i>Programmer policy</i>			x				
<i>Lockout chip</i>			x				
<i>Processor</i>				x			
<i>Aggressive marketing</i>				x	x		
<i>Lack of competition</i>				x		x	
<i>Storage media</i>					x		
<i>Brand identity</i>					x	x	
<i>Low production costs (games)</i>					x		
<i>Backward compatibility</i>						x	
<i>Reputation</i>						x	
<i>Supply shortage</i>						x	x
<i>New consumer base</i>							x

Table 1: Key factors during the history

By taking a brief look at *Table 1* it is possible to point out three factors that has distinguished the dominant players in the majority of generations; *Killer app*, *Third-party developers* and *Complementary goods*. The two latter factors carry a high level of resemblance why it is not hard to see why they are simultaneously present throughout history. Gamers evidently value an extensive game library why it is important to value the relations with third-party supporters. Since the second generation it has been necessary to fulfill all those three factors and without one of them it probably would been impossible to become a winner. However, it is often one or two very popular games that initially attract customers. NES had *Super Mario Brothers*, Sega Genesis had *Sonic the Hedgehog* and PlayStation had its *Grand Theft Auto* to name a few. This once again clarifies how important it is in a business like this to supply sufficient complementary as the business models look like they do. Other key factors that frequently returns through the history is *Second mover*, *Distribution* and *Design*. Many of the factors that were present during NES days of glory such as *Lockout chip*, *Buy-back guarantee*, a strict *Licensing system* and *Programming policy* have not returned. This could be explained by the very different and chaotic situation that manufacturers faced after the videogame crash. These are factors that create possibilities for firms to establish good relations with third-party developers and thereby provide a sufficient game library, which in the generates a lot of money to the firms. It is natural that the key factors of success differ between generations, especially between the first generation and the present. The technology makes it possible to compete on other factors today. For example, we probably just seen the start of consoles providing a internet based network and how it changes user behavior. Firms seem to understand how important this feature is and therefore it will not be one of the factors that are unique for the winner of the seventh generation.

The industry was young during the 1970s but could be considered rather saturated and mature today. Further, the customer segment has changed as today it is not only children that play. These combined with strategic movements from especially Nintendo are one of the biggest changes that have happened during the seventh generation. With its Wii console Nintendo seem to have found a new untapped market to serve and the future will show for how long they will be the only supplier. It is obvious that some factors are crucial to survive on the market. Firms have probably understood and indentified what factors they have to bring to the market. By looking

back on the past generation one can easily see what factors that come back generation after generation and what factors that do not even exist anymore. The key question for firms in the industry will now be to decide what factors that will be needed in the future.

There are also factors that are highly unlikely that they will return as determining key factors; *Arcade porting* and *Backward compatibility* being the two most obvious. Arcades does not have the same impact on the home video game industry as it had in the 1970s. Furthermore, manufacturers have hopefully learned from the mistake of Nintendo not making NES backward compatible. This being said, manufacturers have taken unlikely and retrospectively strange decisions before why it is hard to predict what the future will bring. It is also worth pointing out that the seventh generation has not been settled yet and therefore the key factors pointed out in this generation might be altered. Naturally one would think that the technology in the console would be one of the most important factors. It has played a major role but still it is interesting to see that *Processor* can only be considered a key factor during one of the generations, the fourth.

6.2 Further research

It would have been interesting to study the consoles that did not succeed and by this get a deeper knowledge in why they failed. Instead of analyzing factors of success the study could have covered factors of failure. What went wrong? What could these companies have done differently?

Another idea would be to delimitate a new study to the last three generations and by this smaller amount of empiric material be able to acknowledge a deeper understanding of each single generation. This kind of study would be of most interest once the seventh generation end so that it could be included.

It would also be interesting to contact the three giants of the current generation and study how they approach the three main markets; Japan, the US and Europe. By doing this, the knowledge of how the factors to success vary between markets would be increased.

An interesting aspect within this industry is how the customer segment has changed over the course of its history. When home video games were first introduced they mainly targeted young children, a group that in no way is the main target of today's manufacturers. It would be interesting to study this phenomenon and development more thoroughly.

7. REFERENCES

7.1 Articles

Besen, Stanley M & Farrell, Joseph, *Choosing How to Compete: Strategies and Tactics in Standardization*, The Journal of Economic Perspectives, Vol 8, No 2, 1994.

Corts, Kenneth S & Lederman, Mara, *Software exclusivity and the scope of indirect network effects in the U.S home video game market*, International Journal of Industrial Organization, volume 27, issue 2, 2009

Denning, P, et al, *Wikipedia risks*, Association for Computing Machinery, Communications of the ACM, vol. 48, Dec. 2005.

Gallagher, S & Ho Park, S *Innovation and competition in standard-based industries: A Historical analysis of the U.S. home video game market*, IEEE Transactions on Engineering Management, Volume 49, Issue 1, 2002.

Giles, J, *Internet encyclopaedias go head to head*, Nature, vol. 438, 2005.

Gorman, G, *A tale of information ethics and encyclopædias; or, is Wikipedia just another internet scam?*, Online Information Review, vol. 31, 2007.

Ellis, David, *A Brief History of Video Games*, Official Price Guide to Classic Video Games, Random House, 2004.

Kim, Chain W & Mauborgne, Renée, *Blue Ocean Strategy: From Theory to Practice*, California Management Review, Vol 47, No 3, 2005.

Okoli, C, *A Brief Review of Studies of Wikipedia in Peer-Reviewed Journals*, Third International Conference on Digital Society, IEEE, 2009.

Shilling, Melissa A, *Technological Lockout: An Integrative Model of the Economic and Strategic Factors Driving Technology Success and Failure*, The Academy of Management Review vol 23, No 2, 1998.

Schilling, Melissa A, *Technological Leapfrogging: Lessons from the U.S Video Game Console Industry*, California Review Management, 2003, Volume 45, Issue 3.

Shankar, Venkatesh & Bayus, Barry L, *Network effects and Competition: An Empirical Analysis of the Home Video Game Industry*, Strategic Management Journal, Volume 24, Issue 4, 2003.

Tan, S & Li, M *The Market Structure of the Video Game Industry: A Platform Perspective*, International Conference on Service Systems and Service Management, IEEE, 2008.

7.2 Literature

Armstrong, Gary & Kotler, Philip, *Marketing an introduction*, Pearson International Education, Ninth edition, 2009.

Bryman, Alan, Bell, Emma, *Företagsekonomiska forskningsmetoder*, Liber, Slovenia, 2005.

Cohen, Scott, *Zap! The Rise and Fall of Atari*, McGraw-Hill, 1984

Egenfeldt-Nielsen, Simon et al, *Understanding video games: The essential introduction*, Routledge, New York, 2008.

Herman, Leonard, *Phoenix The Fall and Rise of Video Games*, Rolenta Press, 1997

Newman, James, *VideoGames*, Routledge, London, 2004.

7.3 Electronic

URL	Visited
http://www.allgame.com	27-04-09
http://archive.gamespy.com	24-04-09
http://www.associatedcontent.com	03-05-09
http://www.atariage.com	05-05-09
http://www.atari7800.com	23-04-09
http://www.atarihq.com	28-04-09
http://www.boston.com	10-05-09
http://bright-horizon.org	05-05-09
http://www.buzzle.com	06-05-09
http://classicgaming.gamespy.com	15-04-09
http://www.computerandvideogames.com	18-04-09
http://console-history.dcemu.co.uk	27-04-09
http://www.consoledatabase.com	02-04-09
http://www.consolepassion.co.uk	02-05-09
http://www.chronicgames.net	22-04-09
http://www.cyberiapc.com	02-05-09
http://www.dcemu.co.uk	05-05-09
http://demo.echocurrent.com	21-04-09
http://www.edge-online.com	19-04-09
http://www.eidolons-inn.net	07-04-09
http://electronics.howstuffworks.com	09-05-09
http://emu.kulichki.net	15-05-09
http://www.faqs.org	12-05-09
http://editorials.teamxbox.com	02-05-09
http://encarta.msn.com	02-05-09
http://www.gamingdump.com	03-05-09
http://www.gamefaqs.com	08-05-09
http://www.gamesindustry.biz	07-05-09
http://gamingmuseum.classicgaming.gamespy.com	25-04-09
http://www.gamersgraveyard.com	02-05-09

http://www.gamespot.com	04-05-09
http://www.gamepro.com	25-04-09
http://www.gametunnel.com	08-05-09
http://www.gamer20.com	22-04-09
http://www.giantbomb.com	11-05-09
http://www.informationarbitrage.com	21-04-09
http://www.joystiq.com	02-05-09
http://www.klov.com	04-05-09
http://kotaku.com	15-05-09
http://www.lostlevels.org	04-05-09
http://www.lycos.com	05-05-09
http://www.maniacworld.com	07-05-09
http://www.mcvuk.com	18-05-09
http://money.cnn.com	26-04-09
http://news.bbc.co.uk	26-04-09
http://news.digitaltrends.com	07-05-09
http://n64.icequake.net	14-05-09
http://n-europe.com	12-05-09
http://www.pcguides.com	16-05-09
http://pdp-1.computerhistory.org	11-05-09
http://www.planetxbox360.com	11-05-09
http://www.pinkgodzillagames.com	14-05-09
http://www.pong-story.com	23-04-09
http://www.provenmodels.com	15-05-09
http://psx.ign.com	23-04-09
http://ps3.ign.com	02-05-09
http://www.ps4spy.com	22-04-09
http://samueljscott.wordpress.com	21-05-09
http://www.sega-16.com	18-04-09
http://www.systemdisc.com	04-05-09
http://www.theregister.co.uk	07-05-09
http://www.thesixthaxis.com	03-05-09
http://www.us.playstation.com	15-04-09
http://www.vgescape.com	18-05-09

http://www.videogameconsolelibrary.com	22-04-09
http://videogames.lovetoknow.com	22-04-09
http://www.vivalogo.com	14-05-09
http://www.wiifirst.net	17-05-09
http://www.windowsfordevices.com	06-05-09
http://www.wisconsinhistory.org	27-04-09