Video Game Market Segmentation Based on User Behavior

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ABSTRACT

Games excited generations in various societies: from the very simple physical form – to the latest generation of digital games – in the world where we are living. They always played an important role in every aspect of human life. The initial forces behind games where means as social interaction, pure entertainment, edutainment, or simply to have fun. However, from the initial forces, games emerged towards a tool for empowering creativity and the game industry turned into a largely profitable industry. Within the scope of this paper, we describe the key findings that are indicating the common trends in gaming industry, we evaluate key technologies contributing to the game industry, and try to understand game preferences of game players and the specifics of behavioral patterns in different game genres.

Categories and Subject Descriptors

I.2.1 [**Applications and Expert Systems**]: Games

General Terms

Management, Design, Economics, Human Factors.

Keywords

Digital games, video games, player behavior, market segmentation.

1. INTRODUCTION

Entertainment industry has experienced many changes during the past century. But the one technology that might have been able to really engage the audience was introduced in the beginning of 1970's [5]. It has been turned to a multibillion industry that has attracted different audiences across the globe with different demographic characteristic. It is interesting to notice that how video games have evolved through times, for understanding this it is necessary to investigate the audience behavior.
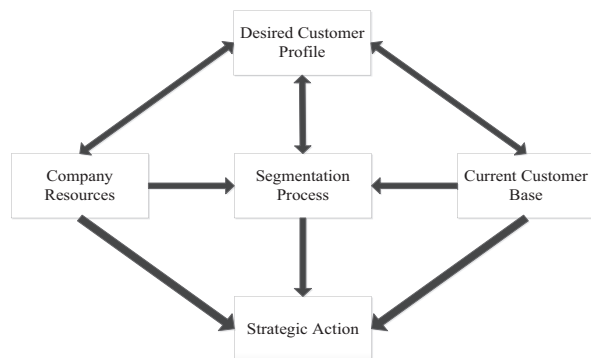
Figure.1. Segmentation Implementation[8].

2. MARKET SEGMENTATION DEFINITION

The fundamental idea behind all business activities is acquiring profit for the firms. For doing so, companies initialize this process by knowing their market. The essential question to be answered here is the definition of the market: "*A market includes consumers both actual and potential, needs, products and services, technologies and competitors.*" [14]

After defining a market, a very important decision has to be made, which parts of that market should the firm focus on? Because of limited resources and capabilities, each company decides to be active in the area in which it can serve the customers in the best possible way. Market segmentation is the process of dividing a heterogeneous market to a set of smaller homogeneous markets in order to respond to different demands and needs of customers and have the best result in customer satisfaction [12]. Kotler proposes the potential advantages of proper market segmentation [3]

- Improved understanding of customer needs

- Proper resource allocation

- Better knowledge of market opportunities

In other words, firms use segmentation to have better understanding of their customers. This knowledge helps them enhance their profitability, increase the number of their customers and as a result experience a growth in their revenue. In addition to that, they seek to make the customers as an important part of their decision making and strategy. The process has been shown in Figure 1 [6].

Video games are today far than only a means of entertainment, gaming is a huge industry creating large amount of revenues. In this section a brief history of video games will be explained. For

acquiring a better understanding, first the definition of video games is given: "*A video game is a game which is played with audio-visual apparatus and is based on a story.*" [1]

According to this definition, a hardware as a platform should be existed in order to run the game. A basic introduction of the platforms will be offered.

•	Personal Computers: Computer games have contributed to the success of PC from the early days. Atari and Commodore were two successful firms which were active in console games first, then introduced an 8 bit computer for gaming, programming and other applications [9]. Today, with ultra-advanced graphic cards, PC games have reached new borders. One of the main characteristics of PC games is that, the hardware requirements are different from one game to another.

•	Handhelds: Hardware which is easy to carry everywhere and has the entire prerequisite to render a game efficiently. Nintendo is a pioneer and market leader in this segment. [13]

•	Consoles: Today large portion of game players have consoles in their homes. Different generations have been in markets during the life cycle of the home video games systems:

Table 1. Video Game Generations [2].

Gen.	Leader(s)	Years	Other famous competitors
1	Atari Video Computer System	1976-1984	Mattel Intellivision, ColecoVision
2	Nintendo Entertainment System	1985-1989	Sega Master System
3	Sega Genesis, Super Nintendo	1989-1994	TurboGrafx-16
4	Sony PlayStation	1994-1999	3DO, Atari Jaguar, Nintendo 64, Sega Saturn
5	Sony PlayStation 2	1999-2005	Microsoft Xbox, Nintendo GameCube, Sega Dreamcast
6	Nintendo Wii	2006-present	Microsoft Xbox, Sony PlayStation 3

In Table 1, the players in each generation have been introduced plus the leader. This is a real example of the concept of evolution and dominant design in the game industry. It should be mentioned that only Nintendo Wii has managed to hold the state of monopoly in competition so far. In all other generations competition has been sever and the competitor has been able to acquire a good market share. In Table 2, the important technologies that have contributed to video games have been introduced.

Table 2. Game Technologies [11]

Game technology	Functions	Effects
3D Engine	Graphic engine, sound engine, tools	• Removing the border between virtual world and reality • Handling graphic and sound
Accessible GUI	Works as the connector between the gamer and game features	• Decreases the difficulty of game play
Physical Models	How real the virtual world is	• Increase the degree of realism
Artificial Intelligence	Sets of elements which create the smart interactions with the player.	• Affects the user experience and how smart the game is.
Networking	Has provided high speed internet with enough bandwidth to satisfy the demand of games with high visual capabilities.	• Has enabled the online market to have considerable growth.
Persistent	It enables the features of an environment even after gamer has left there, next time player can continue the quest from the point of save.	• Continuous development of virtual world • Huge number of players can participate.

3. VIDEO GAMES SEGMENTATION

Games can be segmented based on genres. There are different genres which based on them, design and marketing of the game will be clarified: "Genres are types of communicative actions which are socially known and will be imposed by the members of that community to understand specific social goals." [15]

A research has provided a framework for classification of the game genres which have been shown in Table 3.

Table 3. Game Genres[7].

Genre	Key aspects	Example
Action	Focuses mainly on conflict and physical challenge.	Quake 3
Strategy	Strategic and tactical challenges in resource management.	Civilization 3
Role Playing	Exploring based on a story, logistical challenges.	Arcanum
Sports	Sports based context, physical and tactical challenge.	Madden NFL
Vehicle Simulation	Simulating the piloting of any craft.	Crimson Skies
Construction& management simulation	Resource management and development challenges.	Sim City

Adventure	Exploring and problem solving.	Grim Fandango
Artificial life	Artificial intelligence is the driving engine.	Dogz
Puzzle	Logical challenges.	The incredible Machine
Games for girls	According to girl's tastes.	Barbie Beach Vacation

For having a better understanding of customer behavior, one has to go beyond demographic segmentation. In the case of games, it means that companies should have a clear idea of why theirs customers purchase a certain genre. [4] A thesis work has been focused on this subject, what types of personalities prefer certain genres of games [16]. First step in the study was evaluating different personalities. There have been some theories about different personalities including Hans Eysenck's super-traits, Raymond Cattell's multifactor theory, and the Five Factor Model. According to Five Factor Model, personality is the combination of five traits [10]:

- Introversion-extraversion: it covers the social tendencies of people, extrovert people like to express themselves, are outgoing and enjoy being in gatherings.
- Neuroticism: evaluates emotional stability, in other words how much tolerance an individual has in order not to lose his/her temper easily. Also it is the indicator of the level of stress which is gained by that individual.
- Openness: high level of openness indicates curiosity in an individual and the motivation to have new experiences.
- Conscientiousness: well organized, reliable
- Agreeableness: trusting, helpful, sympathetic

This model has been applied in the form regression equations, the coefficients of this equation have been calculated by the result of a couple of questionnaires. The questions have challenged the players in different aspects from their desire to competition to individual approaches and the different reasons why they play game. These questionnaires have been answered based on the responses of 545 gamers in 36 countries across the globe. For example five of the questions that were used in the questionnaire: I prefer games with fast pace, I enjoy games where I can move my units tactically, it is important for me to get high score, I prefer games where I can shoot, and I prefer to control only one avatar at a time. For each genre, the coefficients have been put into the equation and the analysis of the results has declared the prevailing characteristics in each genre. The distribution between casual and hardcore gamers has been even with 53.8% for casual and 46.2% for hardcore. 72% of them had PC as the first platforms, 23.3 had consoles and 4.4% had portable devices. This is the equation which has used for the index calculation.

Dependent variable = constant + (coefficientiv1) independent_variable1 + (coefficientiv2) independent_variable2 + (coefficientiv3) independent_variable3 + (coefficientiv4) independent_variable4

This follows the idea which was explained in chapter two, game producers can start making user profile for different gamers based on their similar interests or need, then the content can be provided with more focus and accuracy. Then the complementary products that can be offered for users, in this case similar games are recognized. Then comes a critical step in which it is identified that how many of potential gamers have common characteristics which result in their interest towards a special genre. Estimation in this case refers to numerical calculation which has resulted in having the coefficients. Finally, future behaviors of gamers can be acquired based on the feedback of current games. The findings for different genres have been summarized in Table 4.

Table 4.Game preference based on personality traits [16]

Genre	Extraversion	Neuroticism	Openness	Conscientiousness	Agreeableness
Action shooting	+	+	-		-
Action no shooting	+	+		+	-
Action Fighting	+	+			-
Strategy turn based			+		
Strategy real time	+				-
RPG		+			
Sports	+	+	-		-
Simulation vehicle				-	
Simulation construction	NS	NS	NS	NS	NS
Simulation artificial intelligence			+		
Adventure			+		+
Puzzle			+	+	
Online	+		-		-

- +: in the table means that the trait has a positive slope, meaning that an individual is more interested in that genre if he poses that trait more.

- -: in the table means that the trait has a negative slope, meaning that an individual is less interested in that genre if he poses that trait more.

- For simulation construction none of the traits were significant.

For demographic classification, it can be concluded from the surveys that the market is still iconic self-identified male dominant. The sample which was used for the research contained 83.6% males with age mode value of 19. However, older people between 28-38 are being attracted to gaming. The game designers are able to choose the game mechanism which is appealing to their customers by using the questionnaires which has been used in this research and have their estimations for more efficient game design.

4. CONCLUSIONS

The game industry has experienced a significant boom in the last couple of years. As software and hardware are constantly upgraded and renewed and at the same time their prices are decreasing, games are more accessible for many people. Social experiences are an important part of the game and if the gamer can connect to the platform the tendency of sticking to the game will increase. From business perspective, there are a lot of opportunities; they can only be discovered if companies have a better understanding of customer behavior and what is more appealing to different users.

The segmentation was analyzed and with its applications. Also some hints were offered for appropriate segmentation. Industry was defined along with the technological evolution cycle and evolution patterns. A short history of video games was introduced along with major elements in gaming industry. Finally, game segmentation was discussed in perspective of demographic and user behaviors and preferences. For instance, for the case of Rovio, the company behind the successful game of Angry Birds. Although the market place for this game is somehow clear because it mainly sells its games through the software portals of smart phones, but for having a better understanding of the players and how to increase its market share it is possible to apply this model or similar approaches which evaluate the users based on behavioral variables.

REFERENCES

[1] Esposito, N. A Short and Simple Definition of What a Videogame Is.

[2] Gretz, R.T. 2010. Hardware quality vs. network size in the home video game industry. *Journal of Economic Behavior & Organization*. 76, 2 (Nov. 2010), 168-183.

[3] Kotler, P. 1994. Marketing Management and analysis planning, implementation and control. 8th edition, prentice-hall, London (1994).

[4] Kotler, P. 2000. *Marketing management: The millennium edition*. Prentice Hall.

[5] Laird, J.E. History of Computer Games.

[6] Libraries, A. 2009. Using Market Segmentation for Better Customer Service and More Effective Strategic Planning. *Library*. November (2009).

[7] Lloyd, J. "Book Review: Andrew Rollings and Ernest Adams on Game Design." *Gamasutra*.

[8] Palmer, R. a. and Millier, P. 2004. Segmentation: Identification, intuition, and implementation. *Industrial Marketing Management*. 33, 8 (Nov. 2004), 779-785.

[9] Policy, I.T.U. and Division, T.W. 2011. Trends in Video Games and Gaming. *Technology*. September (2011).

[10] P. Costa and R.R. McCrae, *NEO PI-R Professional Manual. Revised NEO Personality Inventory (NEO PI-R) and NEO Five-Factor Inventory (NEO-FFI)*, Lutz, FL,USA: Psychological Assessment Resources, Inc., 2003.

[11] Smith, R. Game Impact Theory 1. 1-31.

[12] Smith, W. 1956. Product differentiation and market segmentation as alternative marketing strategies. *Journal Of Marketing*. 21 (1956), 3-8.

[13] T, N.S. and Project, M.B.A.F. The Video Game Industry An Industry Analysis , from a VC Perspective. *Online*.

[14] Weinstein, A. 2006. A strategic framework for defining and segmenting markets. *Journal of Strategic Marketing*. 14, 2 (Jun. 2006), 115-127.

[15] Yates, J. A., & Orlikowski, W.J. 1992. Genres of organizational communication: A structurational approach to studying communications and media. The Academy of Management Review. 17, 2 (1992), 229-326.

[16] Zammitto, V.L. 2010. GAMERS ' PERSONALITY AND THEIR GAMING PREFERENCES by THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF In the School of Interactive Arts and Technology Chair □ : *Canadian Heritage*. (2010).