

<http://www.cisjournal.org>

# Video Games Classification Technique

**Razan.H.Hiasat**

Department of Computer System Engineering, Faculty of Engineering, Al-Balqa Applied University, Al-Salt, Jordan

## ABSTRACT

In recent years Video games has gained the attention of researchers worldwide ,due to its increasing influence on the growing generation and economy alike .Many of the current studies have countered a problem regarding the lack of scientific description for the structure and the classification of video games ,as such ,most of these studies had to build their own classifications based on the grouping of current gamers' genre classifications which lacks the professional view of video games as a software structure. In an attempt to address the classification problem, this paper presents a video game classification technique based on the video game story timeline and degree of freedom.

**Keywords:** *Video games, software engineering, multimedia, classification.*

## 1. INTRODUCTION

Video games are an extremely influential form of computer software. They earn enormous amounts of money; generate heated controversy and debate, and their players pour huge amounts of time and effort into them, leading them to become one of the most popular forms of personal and social entertainment [1].

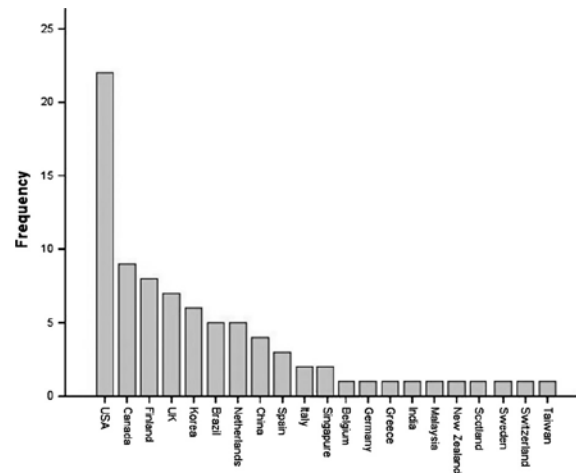
In Europe, computer gaming is a significant industry and market. For example, the UK is the third largest market globally, with total sales in 2004 of entertainment and leisure software of £1.34b. The interactive entertainment industry in the UK is set to grow by 7.5% between 2009 and 2012.

According to the Entertainment Software Association in the US, (1) computer and video game software sales generated \$10.5 billion in 2009, (2) sixty-seven percent of American households play computer or video games,(3) In 2002, over 221 million computer and video games were sold, or almost two games for every household in America[2][3].

As a result; computer game development became one of the fastest growing industries in the worldwide economy. In addition to that, computer games are rapidly evolving in the sense that newer game versions arrive in a very short interval to maximize the profit earned [4].

This level of popular importance has led to a steadily increasing interest from the academic community in understanding how games work, what they do, and what they could do. Human-computer interaction (HCI) has a key role to play in researching video games, but progress has been somewhat limited. Games have long been neglected by academia as a legitimate field of research, with games being treated as a subcategory of existing fields [1].

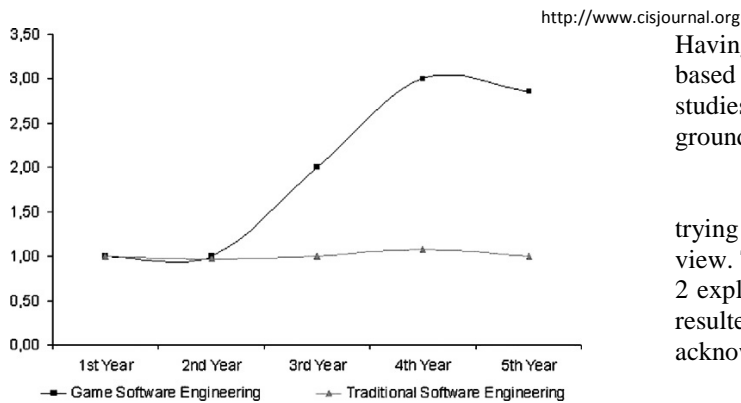
Game software engineering research has increased during the last years.



**Fig1:** the increase in the research activity of software engineering and game software engineering

In Modeling game usage, purchase behavior and ease of use; a comparison of the research intensity between the two domains has been conducted in proportion to the first year of the study (2010) and not with absolute values, because research on game software engineering is a subset of research on software engineering.

As shown in Fig. 2, the research activity of game engineering is growing at a higher rate than software engineering. This fact indicates that during the time period from 2005-2010, game software engineering is an increasing research domain. More specifically, the number of game engineering publications has almost tripled up since 2005.



**Fig 2:** The research activity of game engineering over the period of 5 years

Consequently, historical research conducted during the birth of the gaming industry dealt with games that lacked the graphical richness and realism of today's generation of digital entertainment. These studies were limited to exploring either the design of the game engine or psychological and interaction issues. The majority of current academic game research originates from psychology or cultural and film studies in the field of interactive media. The apparent weakness of these studies is in their conceptual base, that is, there tends to be no agreed definition regarding 'what a game is' and 'why people engage in the game' [2].

It can be argued that digital games can transform education and change the widely shared perspective that games are "mere entertainment". The attitude of today's young people towards their video and computer games is the very opposite of the attitude that most of them have towards school. Yet it is the very attitude we would like all our learners to have: interested, competitive, cooperative, results-oriented, and actively seeking information and solutions. It therefore makes a great deal of sense to try to merge the content of learning and the engaging and thereby motivating strength of games [5].

Therefore, several researchers have come to view entertainment video games as learning experiences that offer excellent educational design with challenge, motivation, and learning principles that may even be used to improve formal educational approaches [6].

For all the previously mentioned factors, video games became an important topic handled by numerous researches, however; most of the current researches that studied video games were focused on the human behavior regarding them [5-13].

Many of the previously mentioned studies have countered a problem regarding the lack of scientific description for the structure and the classification of video games, as such, most of these studies had to build their own classifications based on the grouping of current gamers' genre classifications which lacks the professional view of video games as a software structure [6].

Having a standardized classification for video games based on the structure of video games can speed up the studies regarding the topic, since it provides a common ground that helps when comparing related works.

This research is addressing this problem, by trying to classify video games from a structural point of view. The rest of this paper is organized as follows, section 2 explains the mythology, section 3 explains the research resulted classification and section 4 covers the acknowledgments, section 5 lists the references.

## 2. MYTHOLOGY

The classification method presented in this research was based on the observation of the structure, story map and level of freedom allowed in different video games, as such the empirical investigation through case study approach was used.

## 3. THE RESULTED CLASSIFICATION

In the evaluation process of any multimedia product there are two main perspectives to be considered; the users and the developer's, and the criteria explained by this research can be categorized under the content field in both perspectives.

The classification method presented uses criteria that are based on the story timeline and the level of freedom allowed for the user in the game's world, the two main categories are: the finite video game and the infinite video game.

### 3.1 Infinite Video Games

In the infinite video game, the story is either stuck in a certain point of time or looping endlessly. The games that falls under this category are:

#### 3.1.1 Looping Video Games

The player can continue to level up in the game and with new levels more options are available to the beginner player but after a certain level, the entire world opens up, however, the story of the game world is stuck in a never-ending point, games such as perfect world international and wartune are two examples for this category. These games provide a variety of actions during a fixed period in the game, the actions are almost unlimited while the story itself is in a pause, also Rayman legends falls under this category [14-16].

Figure 3 explains the flowchart of such game, where the player starts in the beginning area of the game and has to level up to open the next area indicated by the number 2 in the figure and so each area has a minimum level required to open, but once that condition is fulfilled the player can always revisit the lower level areas.

http://www.cisjournal.org

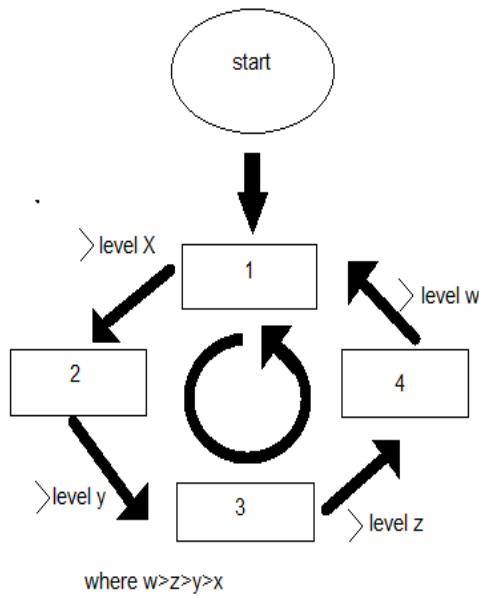


Fig 3: looping video games

3.1.2 Life Simulators

Life simulators which provide a simulation of a real life situation, sports and racing games falls under this category, pro-evolution soccer, the FIFA series, Need for speed series and The Simsseries are all examples for this category [17-28].

In these games the story progresses but doesn't actually ends ,the set of actions allowed for the user is finite (limited) however each course of action will lead to a new branch and eventually will lead to early points near the top of the tree, with only minor differences .

Figure 4 gives as example for such games.

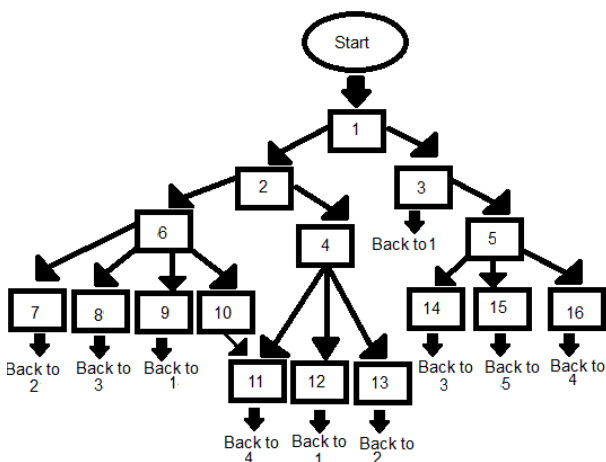


Fig 4: life simulator video game

3.2 Finite Video Games

In the finite video games category the game has an actual ending; such games can be further classified into the following sub-categories:

a. Linear games; in which the story is moving forward to a predetermined ending point and the action permitted to the user are extremely limited due to the game programming with no self pacing allowed (the user can not progress to the next stage without taking the only allowed route ). Old generation games such as Super Mario World, Super Mario World 2: Yoshi's Island...etc [29, 30].

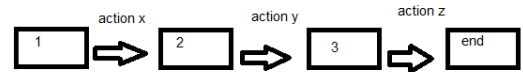


Fig 5: linear video game

b. Non-linear games; the story moves forward according to a certain programmed points where there is a variety of action that the user may choose from; similar to the linear games the story moves to the predetermined ending point but with more than one path allowed for the user to reach the ending .thus allowing more degree of freedom ,and permitting the user to progress in a self-paced scheme , simulators which is used to train players in certain areas ,flight simulators falls under this category , as well as games such as final fantasy series [31-37].

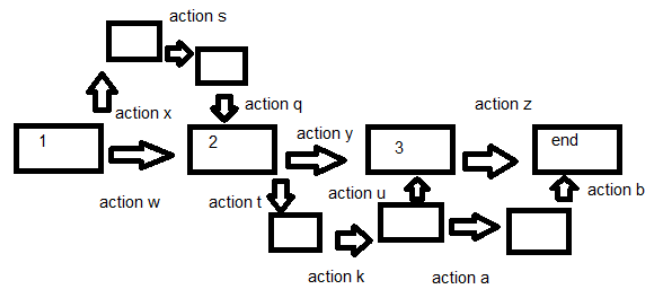
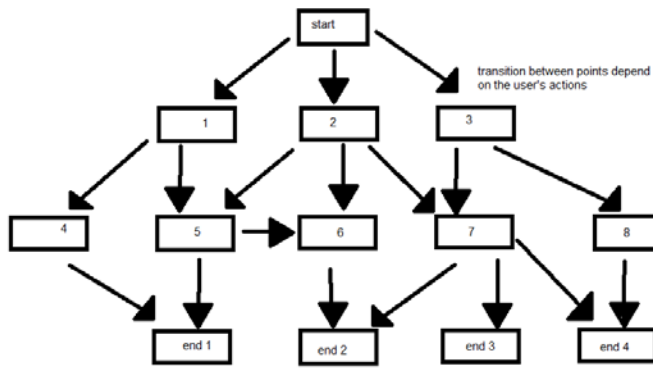


Fig 6: Non-Linear Video Game

c. Semi-linear (adaptive )games ; the story consists of multiple similar story lines and the user can move between these story paths through the user's own choices ,i.e. the story adapt to the user own preferences and results in different endings that depend on the user's actions games such as shadows of destiny and dragon age falls under this category [38,39].

<http://www.cisjournal.org>

**Fig7:** semi-linear video game

- d. Competitive games ;these games consist of a set of matches between more than one player and the game ends with the end of the match ,real time strategy video games such as Company of Heroes falls under this category[40].

## ACKNOWLEDGMENT

The author would like to thank Dr.Omar Al Hiasat and Dr.Mohammad Rasoul al Hadidi for their support and guidance.

## REFERENCES

- [1] Video game values: Human-computer interaction and games. Pippin Barr a, James Noble, Robert Biddle .Interacting with Computers 19 (2007) 180–195.
- [2] Modeling game usage, purchase behavior and ease of use Robert Davis, Bodo Lang. Entertainment Computing (2011)
- [3] The effect of latency on user performance in Real-Time Strategy games Mark Claypool. Computer Networks 49 (2005) 52–70.
- [4] Software engineering research for computer games: A systematic review .Apostolos Ampatzoglou, Ioannis Stamelos. Information and Software Technology 52 (2010) 888–901.
- [5] The concept of flow in collaborative game-based learning Wilfried Admiraal, Jantina Huizenga, Sanne Akkerman, Geert ten Dama. Computers in Human Behavior 27 (2011) 1185–1194
- [6] Children's choices and strategies in video games Karla R. Hamlen. Computers in Human Behavior 27 (2011) 532–539
- [7] Automatic Recognition of Boredom in Video Games Using Novel Biosignal Moment-Based Features Dimitris Giakoumis, Dimitrios Tzovaras, Member, IEEE, Konstantinos Moustakas, Member, IEEE, and George Hassapis, Senior Member, IEEE. IEEE transactions on affective computing, vol. 2, no. 3, July-September 2011
- [8] The effect of violent and non-violent computer games on cognitive performance Christopher P. Barlett, Christopher L. Vowels, James Shanteau, Janis Crow, Tiffany Miller .Computers in Human Behavior 25 (2009) 96–102
- [9] Falling in love with online games: The uses and gratifications perspective Jen-Her Wua, Shu-Ching Wang, and Ho-Huang Tsai. Computers in Human Behavior 26 (2010) 1862–1871
- [10] Identifying usability and fun problems in a computer game during first use and after some practice W. Barendregt, M.M. Bekker, D.G. Bouwhuis, E. Baauw Int. J. Human-Computer Studies 64 (2006) 830–846
- [11] Player behavioral modeling for video games Sander C.J. Bakkes, Pieter H.M. Spronck, Giel van Lankveld. Entertainment Computing (2012)
- [12] Personality and enjoyment of computer game play Xiaowen Fang, Fan Zhao. Computers in Industry 61 (2010) 342–349
- [13] Analysis of revisitations in online games Ruck Thawonmas, Keisuke Yoshida, Jing-Kai Lou, Kuan-Ta Chen. Entertainment Computing 2 (2011) 215–221
- [14] "Perfect world international" [italics]. North America: Perfect World Entertainment September 2008
- [15] "Wartune" [italics]. North America: Aeria Games and Entertainment 2012
- [16] "Rayman legends" [italics]. North America: Ubisoft, September 2013
- [17] "Pro-evolution soccer 2014" [italics]. North America: Konami September 2013
- [18] "FIFA international soccer" [italics]. North America: Electronic Arts July 1993
- [19] "FIFA Football 2004" [italics]. North America: Electronic Arts October 2003
- [20] "FIFA Football 2005" [italics]. North America: Electronic Arts October 2004
- [21] "FIFA Soccer 12" [italics]. North America: Electronic Arts September 2011

<http://www.cisjournal.org>

- [22] "FIFA Soccer 14"[i]. North America: Electronic Arts September 2013
- [23] "Need for Speed II"[i]. North America: Electronic Arts March 1997
- [24] "Need for Speed: Hot Pursuit"[i]. North America: Electronic Arts November 2010
- [25] "Need for Speed: Most Wanted"[i]. North America: Electronic Arts October 2012
- [26] "The Sims"[i]. North America: Electronic Arts February 2000
- [27] "The Sims2"[i]. North America: Electronic Arts September 2004
- [28] "The Sims3"[i]. North America: Electronic Arts June 2009
- [29] "Super Mario World" [i]. North America: Nintendo August 199
- [30] "Super Mario World 2: Yoshi's Island"[i]. North America: Nintendo October 1995
- [31] "Final Fantasy VII"[i]. North America: Eidos Interactive May 1998
- [32] "Final Fantasy VIII"[i]. North America: Square EA January 2000
- [33] "Final Fantasy IX"[i]. North America: Square EA November 2000
- [34] "Final Fantasy X"[i]. North America: Square Enix December 2001
- [35] "Final Fantasy X-2"[i]. North America: Square Enix November 2003
- [36] "Final Fantasy XII"[i]. North America: Square Enix October, 2006
- [37] "Final Fantasy XIII"[i]. North America: Square Enix March 2010
- [38] "Shadows of destiny"[i]. North America: Konami January 2010
- [39] "Dragon Age: Origins"[i]. North America: Electronic Arts November 2009
- [40] "Company of Heroes"[i]. North America: Sega September 2006