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BASIC PRINCIPLES AND ANALYSIS OF HIGH-LEVEL TECHNIQUES FOR DESIGNING COMPUTER PROGRAMS FOR VIRTUAL WORLD



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Abstract. At the beginning of 2020, the world-famous Cambridge Scholars Publishing (Great Britain) published for the first time a scientific monograph called "Virtual World: Creators, Residents, and Tourists". The book contains the results of scientific research that was conducted for four years. The research was carried out at the Belarussian State University of Informatics and Radioelectronics (Minsk, Belarus). Employees of the Department of Human Engineering and Ergonomics, as well as employees of the research group "Systems and devices for environmental monitoring in the management of human life safety" took part in the research.

Part of the research material was not included in the book. In this paper, we present another part of the research that was prepared a little later. It was not published in the book. This part deals with the issues of seriality and simulacra. In our opinion, seriality and simulacrum are currently the basic principles for designing computer entertainment programs in the virtual space.

Keywords: high-level analysis, simulator, seriality, virtual space, epic.

Introduction

At the beginning of 2020, the world-famous Cambridge Scholars Publishing (UK) first published a scientific monograph called "Virtual World: Creators, Residents, and Tourists". [1] The research was conducted at the Belarusian State University of Informatics and Radioelectronics. Here is an abstract of this monograph in the language of Cambridge Scholars Publishing.

The book acquaints the reader with the virtual world, which has become a part of the contemporary entertainment industry, an environment for both professional activity and communication. It discusses the role of computer games in people lives and the results of computer addiction studies. A separate section is devoted to the theme of Scandinavian mythology, the subjects of which are often present in the virtual world, allowing a comparison to be made between images from ancient myths and legends and their reflection in computer games. The book will appeal to a wide audience interested in interaction in the virtual world.

The scientific monograph "Virtual World: Creators, Residents, and Tourists" consists of four chapters [1]. The first chapter is "Virtualization Process Drivers". It deals with the following three issues. 1) The Scientific and Technological Revolution and its Impact on People's Lives. 2) Virtualization Drivers. 3) Information and Transformation.

The second chapter of the scientific monograph [1] is "Gamer's Dreams and Anticipation of Happiness". The chapter is devoted to the following three problems. 1) Oda to Games. 2) The Problem of moral Choice and moral Character. 3) Simulacra of Social media.

The third chapter of the scientific monograph [1] is "Battle with Virtual Life". It deals with the following three issues. 1) Computer Addiction as a multitude of States. 2) The Flow Experience and the Psychological Dominant. 3) The Virtual World in the Life of Students.

The fourth chapter of the scientific monograph [1] is "The Realm of Virtual World Life". It is devoted to the following three problems. 1) Pagan Motifs in the Realm of Virtual World. 2) Who is who in the Virtual World? 3) Vampires and their Incarnations in Various Games.

Scientific research was conducted by the authors [1] for four years. During this time, several dozen scientific articles were published in Russian and English in various scientific journals, in collections of scientific and practical conferences, as well as in the media. However, some of the research material was not included in the book. Therefore, in this paper we present another part of scientific research. It was not published in the book [1].

The aim of this work is to analyze the appearance of such principles as seriality, simulacra, and pagan motifs in the design technologies of computer entertainment (video films and video games).

Results of research and analysis of technologies

In this paper, we attempt to analyze video films and video games from the point of view of two basic principles of their creation: seriality and simulacrum. The rapid development of BIG DATA and cloud technologies has created a number of new phenomena in the development of people and society as a whole.

Figure 1 shows the way (algorithm diagram) to consider the analysis of two phenomena (seriality and simulacrum) that appeared during the development of technologies for creating virtual space (computer videos and computer video games). Let's have a look at these questions in order.

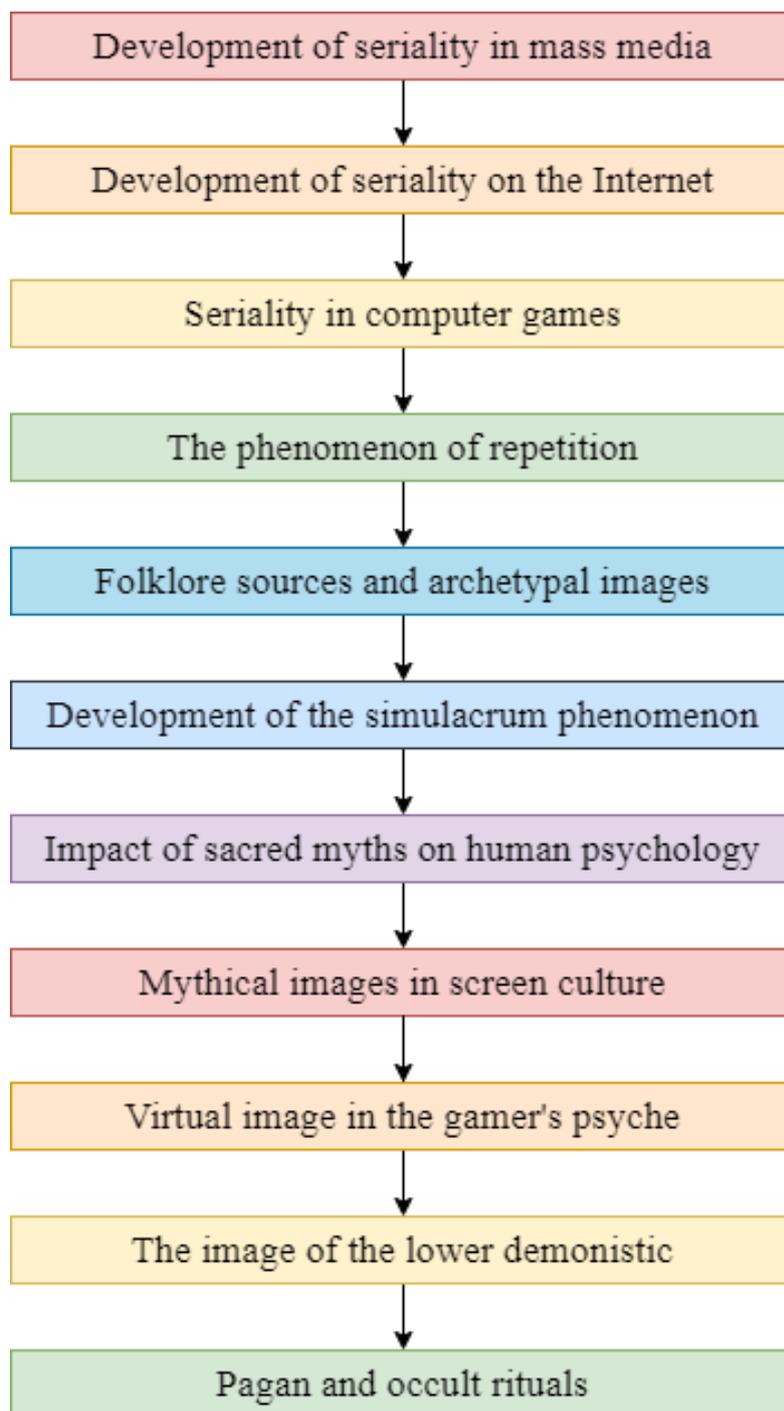


Figure 1. – Algorithm for consideration and analysis of two phenomena – seriality and simulacrum

Development of seriality in mass media. Mass media products placed in the virtual space have their own prehistory of development. Thus, the principle of seriality, embodied in videos and computer games, was actively developed and implemented on television in the middle of the XX century. The American researcher J. Monaco in his book "How to understand a film", wrote that since the 50s, "a series" has been understood as "having developing characters and a continuing narrative", and an episode "presents the same characters in different situations" [2].

Similarly to movies, computer games, as a type of screen art, are also created on the principle of seriality. Scientist A. McCartney considers that source of the series is a form of commercialization of fiction that has reached its height in the mass novel and in magazines published in the nineteenth

century. [3] An important role in the distribution of serial works in European countries was played by the formation of the detective genre, and then fiction.

The implementation of the principle of seriality in products that filled the Internet attracted a mass audience. Over the past decade, a new type of computer addiction has developed – from videos. A game TV movie in digital format is created in the same way, both for TV broadcasting and for information and computer technologies (ICT). The advance release is only due to the commercial capabilities of the broadcasting company.

Italian philosopher and writer Umberto Eco believed that repetition is an integral component of world art [4]. In his book "Innovation and repetition", he provided a classification of repetitions in screen culture. Retake, remake, cara, and episode are listed here. An episode, according to the writer, is an artistic form that can satisfy a new aesthetic sensibility [4].

The particularity of the relationship between technology and culture was analyzed by the classics of media theory V. Benjamin [5], M. McLuhan [6] and R. Williams [7]. In the study entitled "Television: technology and cultural form", R. Williams analyzed the technological, social and media aspects of TV. In the subgenre model, he also highlighted a series and an episode.

Development of seriality on the Internet. In social terms, seriality is implemented at the level of both television and Internet audiences. Russian philosopher V. A. Emelin in his dissertation research "Information technologies in the context of postmodern philosophy" (1999) identified seriality as one of the manifestations of a key characteristic of the postmodern worldview. He called it fragmentary. He also distinguished intertextuality, simulation, and pluralism as other characteristics [8].

The postmodern approach to the problem was used by American researchers A. Croker and D. Cook in the work "Television and the triumph of culture", in which television is called serial culture [9].

Seriality in computer games. The principle of seriality can be traced in all game products created for entertainment in the virtual space: videos, online games, as well as thematic meetings and discussions in social networks. Serial organization of production makes the viewer want to meet their favorite characters, heroes and TV hosts. Gamers are waiting for the next session of the online game and the release of a new version [10].

Similar to television, another type of screen art includes products placed in the virtual space for entertainment. It is no less naturally included in the private space of each user and successfully uses such mechanisms as the effect of presence and trust, which helps to erase the psychological border between the world on the screen and the environment of our perception [11]. At the same time, if watching a TV movie, the viewer to some extent compares himself with the characters, then in a computer game, he identifies himself with the hero of this game.

The phenomenon of repetition. It is known that the appearance of the highest technical possibilities of mass-production and the widest distribution of mass media significantly changed the nature of art. The characteristic features of mass media art are repetition, copying, subordination to a preset scheme, and abundance. The phenomenon of repetition has become particularly relevant. This is due to its widespread use in screen art forms (visual aesthetic space). With the development of ICT, the aesthetic needs of large masses of people have become impossible to meet through the creation of new and original products in art.

Postmodern aesthetics is based on the doubt about the possibility of permanent creation of a large number of works of art by the old methods, as an original product of creativity. Today, sophisticated people have a strong feeling that "everything has already happened". According to the French philosopher J. Baudrillard, modern art has entered the stage of simulation: "We live among countless reproductions of ideals, fantasies, images, dreams, the originals of which are left behind us" [12].

Various techniques of repetition are widely used in the media. In production, seriality is stamping, i.e. identical (literal) repetition of a sample. However, even mass production of material

products in China and other countries is not a perfect repetition of the sample. It is not the same. It is usually of lower quality. These are the so-called "generics". The serial principle in art also generates the non-identical. In this regard, J. Baudrillard states: "There is no more basic rules, no criteria of judgement or of pleasure" [13].

Folklore sources and archetypal images. The popularity of mass culture products is largely due to the use of folklore sources and the reproduction of archetypal images. According to the Russian researcher L. P. Saenkova, "all series and films that have become an example of mass adoration are created on the principle of restoring mythological plots and archetypal schemes" [14]. Some of them, created many years ago and received great popularity among the audience, have left a significant mark on the art of cinema and the memory of people.

The use of these stories led to the appearance of an industry for creating a variety of series. All this contributed to the development of specific terminology. Thus, the continuation, chronologically following the primary text, began to be called a sequel (from lat. sequo – I continue, I follow). Today, sequels are extremely common. These are movies and computer games.

Prequels (from lat. pre- and sequo – preceding to) show events that precede events in the primary text. There was also an extremely extensive network of sequels: the triquel – sequel of the sequel, i.e. the third in a series of chronologically developing sequels. The quadriquel is the fourth continuation, and finally the midquel, that is a continuation created later. The events depicted in it are chronologically related to the period of the original story. The series share a common theme, genre, and characters.

Other on-screen sequels include a retake (a re-shoot with characters who had success in a different narrative), a remake (a re-told story), and a spin-off where minor characters become the main actors. The division of films by the criterion of completeness/incompleteness (prolonged/non-prolonged) such as "closed end" / "open end" was also approved.

The principle of seriality is used both when creating videos and computer games. They are also characterized by potential incompleteness and endlessness. The concept of "product" as a complete and closed system is replaced by the concepts of "process" ("accumulating processes", "additive process"). Seriality has become one of the fundamental principles of virtual space design.

Development of the simulacrum phenomenon. Another design principle characteristic of the virtual space is simulacrum. A simulacrum is a compiled artistic image that is perceived by the human senses: visually, audibly, and kinestatically [14]. It is created by combining certain physical traits or other characteristic qualities that are idealized in a given culture (Chinese, African, European, etc.), taken from different sources. This can be a person, an image of nature, or other products, for example, that appeared in musical culture. Relatively speaking, this is a copy that is then mass produced. Plato defined a simulacrum as "a copy of a copy which original never existed."

In postmodern aesthetics, the simulacrum takes the place of the classic "artistic image". The French philosopher Jean Deleuze stated: "A simulacrum is not a degraded copy. It contains a positive charge that denies both the original and the reproduction" [15]. Other researchers, on the contrary, see the spread of simulacra as negative.

J. Baudrillard believed: "The relationship between the simulacrum and mass culture is obvious. Any connection with reality has been lost, meaning has been completely lost, and art has been turned into design. The result is an absolutely empty world of simulacra, in other words, the world of advertising" [13]. In his book "Simulacra and simulation", he identified three orders of simulacra: 1) simulacra natural, naturalistic, based on the image, imitation and fake; 2) simulacra productive, aimed at increasing productivity, based on energy, force, its material embodiment in the machine or in the entire production system; 3) simulacra of simulations based on information, modeling, and cybernetic play [13].

The imagination of science fiction writers anticipated the appearance of new mechanisms and machines. Scientific and technical thought of the twentieth century created the possibility for the appearance of a large number of simulacra of the second order. The computer is one of them.

Currently, the computer attracts people's attention more than others. With the development of information and computer technologies, "simulacra of simulations" with their hyperreality began to be created. [13]. And now, according to J. Deleuze: "Any model is lost in the dizzying abyss of simulacrum" [16].

The inclusion in the virtual space of computer games created exclusively for entertainment with a greater share of fantasy stories will help people to believe in the existence of other worlds, the main images and objects of which are simulacra. Users of the virtual world are put in the world of simulacra.

The impact of sacred myths on human psychology. The possibility of the impact of sacred myths on human psychology has been recognized by many prominent scientists: Paul Janet, Sigmund Freud, Carl Gustav Jung, Johan Huizinga, Mircho Eliade, and others. A number of studies and publications are devoted to this important topic of the cultural life of society. Work on the search and study of the heritage of humanity does not stop at the present time. This is not just honour to the past or an abstract interest.

In the process of the formation of Christianity, some of the mythological beliefs were included in its religious and cultural paradigm in a modified state. Thus, the Scandinavian "Saga of the Niflungs" turned into a medieval chivalric epic "The death of Nibelungs" [17]. Other stories were banned, but later some of them became fairy tales, which lost the ritual part of sacred myths.

The world of fabulous wealth and other norms of behavior that differ from Christian morals, full of mysticism and rituals, perfectly removes the psychological stress of gamers and brings them unexpected satisfaction. Carl Gustav Jung wrote about this effect of rituals on people in his book "The soul and myth: six archetypes of man" [18]. This proved to be a successful counterbalance to the settled understanding of the sublime essence of God in the Christian society. In the minds of most people, the idea has been formed that God, who stays in the transcendental sphere, cannot be known. This led to an increase in skepticism and disbelief. This helped to increase the distance between a person and his spiritual ideal.

Mythological images in screen culture. Social upheavals and rapid development of science in Europe (during the XIX – XX centuries) contributed to scientific and technological progress. This raised the cultural level of people in a short time. This has improved the material life of people. This significantly weakened the position of religious teachings. The increased cognitive and creative activity of people turned to science their expectations in explaining all the secrets of the universe.

The gap in knowledge was filled by writers and myth-makers. They widely used folklore sources in their works. Skilfully using people's curiosity and thirst for new experiences, they quickly created works that became bestsellers. The world they created was recreated in movies and video games. This marked the appearance of new trends in screen culture. According to the Belarusian scientist L. P. Saenkova: "All series and films that have become an example of mass adoration are created on the principle of restoring mythological plots and archetypal schemes" [19].

An arbitrary interpretation of mythological images and unconscious myth-making gave rise to archaic patterns of character behavior in movie and video game scenarios. Such scenarios described a dark world of mythological entities. In the countries of Eastern Europe, in a society raised in the spirit of atheism, an incredible number of psychics, fortune tellers and other representatives of the occultism appeared. Most of them have been considered witches and sorcerers by Christianity for centuries [20].

Ethnologists say that antiquity and the wild state are in our modern life. Their existence is proved by studies of sociologists [21, 22]. Scientists are studying the effect of presence experienced by a person in the virtual space. In the process of perception of events unfolding on the screen, the line between the fictional world and reality is blurred [23]. In some cases, the gamer may feel like not only an actor, but even a person with the story of the hero. Often, the gamer associates himself in games with the hero and his actions, which, as it seems to the gamer, ensure the omnipotence and death of others at his desire.

Virtual image in the gamer's psyche. We conducted research among students studying technical specialties at a university in Minsk (151 people). The results showed that 60% of respondents construct new worlds with a fairy-tale-mystical plot and characters like "orc" or "vampire" [24, 25]. The desire to gain all-power over the situation for some gamers becomes dominant. The role of a God or a demon in a computer game is preferred by a fifth of respondents (32 people). In the role-playing game (RPG), playing from the first person, they manage global processes with actions corresponding to their character.

It is significant that in half of the cases of respondents-gamers (17 people) who manage such entities, after exiting the game, a vision appears that is an autonomous virtual image, AVI [25]. AVI takes place in a real environment after exiting the game and/or shutting down the computer. The AVI generated by the gamer's internal representations appears as a visual image. Sometimes the AVI appears in the auditory sphere of perception: "the image from the game is sitting, walking, talking." The AVI of four students at the age of 18 acquired a higher hierarchy. Respondents said: "The image from the game controls me."

The images of the lower demonistic. It is known that primitive man spiritualized the objects surrounding him, the natural power, and his actions. He correlated them with the possibility of interacting with the invisible power.

Elves (Alves in Scandinavian mythology) and fairies were created by representations of stone age people. Therefore, elves and fairies are afraid of one type of metal, and immediately disappear from a metal clink, lose their magical power. According to Irish legends, they have empty bodies. These creatures are small, and their children have frightening appearance and monstrous appetite.

Elves and fairies are no strangers to theft. These creatures need human help for procreation. However, for such a person, who got into that world and came into contact with them, there is a threat to stay forever in their otherworldly dark world [26].

In computer games, dark mythological entities are portrayed as powerful associates of gamers. These associates are ready to oblige the master's will like fairy-tale servants. Fortunately, Microsoft canceled the release of the game *Scalebound* using a similar image. The developers said on Twitter that canceling the game would be useful primarily for gamers.

Pagan and occult rituals. In folk sagas and treatises of travelers, telling about pagan rituals of human sacrifice, terrible scenes of murder, bloodlessness of bodies, and sprinkling of sacrificial blood with brooms on a banquet table are described. People who already professed a monotheistic religion (Christianity or Islam) at that time were shocked by such feasts [27]. At the same time, the bearers of rites in the tribal system firmly believed in the need of such actions.

The plots of computer games and movies (along with images of archaic entities) have the similarity of ancient occult rituals. In Scandinavian myths, there is the use of organs from the bodies of people sacrificed to the god of war. These organs were used to predict the future. This ritual of mutilation was most widely carried out on prisoners.

The extant mythology of pagan beliefs was written in the last period of the tribal system. It preserves descriptions of traditions that have remained in the memory of generations. These traditions were passed on and followed. This allowed many peoples to survive and maintain their integrity and community in that barbaric era.

Conclusion

It becomes obvious that in the artistic culture of mass media, represented by the means of information and computer technologies, such general patterns that are characteristic of postmodern art as the principle of seriality and the principle of simulation are being updated. One of the key characteristics of the principle of seriality is repetition. Repeatable structures of mass art have naturally gained a place in the virtual space since social and humanitarian knowledge has been successfully processed on computers and transmitted through a network.

Just as technical capacities are already having a devastating effect on natural processes, the impact of humanitarian information transformed with the help of technical means will have a similar effect on their mental processes, with the aim of sophisticated influence on the human imagination.

The humanistic ideals of Christianity gave everyone, the weakest person and even the sinner, a chance for life and a better future. The revival of forgotten beliefs in the minds of people, the imitation of bloody scenes in computer games, can have a significant impact on the psyche and worldview of people. Science has no evidence that moral norms and the obligation to follow them are inherited. The degree of human civilization is determined by the social context: education and environment [28]. The virtual world has also become a habitat for many people. A significant number of users spend 40 or more hours a week in it for entertainment purposes.

Manipulation of the gamer's emotional experiences in a game with a mythological plot may cause him to experience a state of ecstasy similar to that experienced by people of the pre-Christian era and the early middle ages when performing certain rites. Devotion to bright, dynamic images from myths inevitably activates users' interest in the subject of ritual actions. Erich Fromm defined the danger of such devotion as "... readiness to accept any ideology and any culture as a promise of an exciting life" [29].

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