Virtual World

Virtual World:

Creators, Residents, and Tourists

By

Kira N. Mezianaya,
Konstantin M. Karaneuski
and Konstantin D. Yashin

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The book acquaints the reader with the computer virtual world, which has become a part of the contemporary entertainment industry, an environment for professional activity and a means of people's communication. You will find the results of computer addiction studies conducted by the authors in recent years, and you will also be able to pass the dependence test. The book is intended for a wide audience interested in interaction in the virtual world.

TABLE OF CONTENTS

Foreword viii

Preface x

Introduction 1

Chapter One 4
Virtualization Process Drivers
1.1. The Scientific and Technological Revolution and its Impact on People's Lives 4
1.2. Virtualization Drivers 13
1.3. Information and Transformation 36

Chapter Two 69
Gamer's Dreams and Anticipation of Happiness
2.1. Oda to Games 69
2.2. The Problem of Moral Choice and Moral Character 85
2.3. Simulacra of Social Media 107

Chapter Three 122
Battle with Virtual Life
3.1. Computer Addiction as a Multitude of States 122
3.2. Flow Experience and the Physiological Dominant 139
3.3. The Virtual World in the Life of Students 147

Chapter Four 183
The Realm of Virtual Life
4.1. Pagan Motifs in the Realm of Virtual World 183
4.2. Who is Who in the Virtual World? 198
4.3. Vampires and Their Incarnations in Various Games 206

Afterword 214

Annex 217

Glossary 234

FOREWORD

Readers have an unusual book before them: it would seem to be about the known things, but it is only apparent clarity and plainness of the new reality that has entered the life of people over the past decades. The book is addressed to a wide range of readers who would like to know how a technical device, an electronic computer intended for a narrow circle of specialists, has become an integral part of the lives of millions. This book is about the unknown in the known; about the humanitarian in cybernetics, about the emergence of information technologies, the result of which was the creation of a virtual reality, a new alternative.

The authors of the monograph are doctors: a psychiatrist, a neurologist, and an engineer. They have covered a number of pressing contemporary problems in close creative cooperation. The book is full of humanism, sincere anxiety about mental and physical health of children and youth—the future of this country, and indeed of all countries.

People, including young ones, related to the global network, will discover unexpected truths and nuances in the book. Those fond of computer games will get useful knowledge about their creation, use of myths and especially subconscious mechanisms forming attraction to them. Often it does not matter for scriptwriters whether the mythological logic is perverted, or even narration of mythology adopted by science is fundamentally distorted. It is only important for them to involve the user in "bloody events" and to deceive them into the belief that this is the human prehistory, that we are all animals dressed in clothes, etc.

The book focuses on negation of the social role of rites and rituals in the plots of computer games, on disregard for the process, well traced in the culture and history of communities, of limiting and gradually ousting sacrifices. As a result of the long struggle against demons, human existence in European countries has changed, an era of spirituality has come, and understanding of the contents of the myths themselves has become more objective and rational, first in Hellenic culture, and then throughout Europe.

Computer games developers exploit the cultural heritage of the peoples of Europe, myths and legends, ignoring their meaning and purpose. An inexperienced user plunges into the world often spawned by

a painful fantasy, and sometimes a perverted imagination. The authors defend the truth and the future of our children.

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PREFACE

I spent a long time working as a psychiatrist; first, in the inpatient facility of a large psychiatric clinic, later—in the outpatient department of a health centre. During that time, I became interested in schizophrenia—the most mysterious of mental diseases. At first, I was only interested in symptoms and diagnosis. Later, when talking to patients in the process of accompanying them during remission, I was struck by the mosaic pattern of personality changes in persons who had their first bouts of psychosis: from subtle to pronounced defects. I literally could not recognize many of them; in their homeliness, the patients looked so adequate and intact. I later realized that many people maintained their marital status and social activity for decades, both after the first bout of the disease and after the subsequent ones. It was possible due to treatment and preventive measures, support from relatives and individual ability of the body to recover vital force. I have established trusting and respectful relationships (compliance) with many of my patients and members of their families. During this period, I started discussing possible causes of schizophrenia with one of my patients, E. Z. He never tried to hide his health issues, even though he developed the disease in his youth. The disease did not prevent him from creating a family, having two wonderful children, defending a thesis and maintaining his labour status. It is easy to understand why he kept asking himself: "What was the cause of my disease?" Even though one of his close relatives suffered from severe schizophrenia, the hereditary factor was not an answer to all questions, as there were many healthy people in their family, and there was hope for the good mental health of his children. For many years he had kept a diary, writing about his affairs and state of health and relating them to external factors. He was the one who got me involved in the search for factors contributing to the occurrence of the disease. I collected information about people with already established schizophrenia: dates of their births, dates of first and following bouts, educational status of the patients and their parents as well as about fifteen related environmental indicators. In 1998, the search for data analysis methods brought me to the Department of Intellectual Information Technologies of the Belarusian State University of Informatics and Radioelectronics (BSUIR). Several years of collaboration with Tatiana Lemesheva, a student of the university at that period, helped process the accumulated information and come to first conclusions about

the importance of certain factors and the level of their influence on human mental health. The results were presented in Berlin in 2001 at the 7th World Congress of Biological Psychiatry, in which we took part.

Further study of the materials based on the results of the study of this subject demonstrated that external factors, including social ones, play an important role in mental health. In the process of tracking the information, I came across the monograph by Lyudmila Yurieva and Tatiana Bolbot "Computer addiction: diagnosis, treatment, prevention." It had a stunning effect on me. Until then, while constantly communicating with programmers in the educational environment of the university, I had no idea about their interests in the virtual world, their hidden private life. I had a desire to perform independent analysis of the problem from the points of view of both psychology and psychiatry. With the support of the staff of the department of intellectual information technologies of the BSUIR I designed a special questionnaire to identify qualitative characteristics of interest in computer games and their influence on the user's personality. The first survey was performed by continuous reading among seventy-four university students. It became clear how serious and deeply hidden the problem of using the computer for entertainment is among youth. Ignorance of the true extent of this problem in society and its seriousness, and the substitution of this by ideas about the exceptional usefulness of the computer as a new technical device, gave rise to misconceptions about the role of the Internet and computer games in the lives of many people.

Soon after that, I received strong support thanks to the progressive views of Konstantin Yashin, Head of the Department of Human Engineering and Ergonomics at the BSUIR and PhD in computer science. Extensive studies of computer addiction were performed among students, which proved the seriousness of the problem. Based on the results of these studies, in 2014, with the support of the BSUIR administration, the Ministry of Education of the Republic of Belarus approved the topic of research of "the risk of violation of information security of students in the process of communicative, recreational and educational activities under the effect of aggressive media environment factors." Many teachers and employees of the BSUIR departments joined the study; neurologist Konstantin Karaneuski took an active part in it and currently continues searching for ways to diagnose changes in the emotional-volitional sphere of a person under the effect of computer media environment.

Over a period of two years our team developed several questionnaires to study the problem of computer addiction and the consequences of its influence on the mental health of students—these were used to perform surveys among students. A number of articles on the results of the study

were published in many science journals. The materials published drew attention of scientists; in particular, I received an offer to write a book about the influence of the virtual world on the psycho-emotional sphere and behaviour. The collected material has been accumulated and is presented in this book in concentrated form.

Credits

The authors would like to thank Yuri Prikhodko, PhD in Computer Science, who helped me establish contact and collaboration with lecturers of the Department of Intellectual Information Technologies of the BSUIR. The authors also express their gratitude to the head of this department, Professor Vladimir Golencov, PhD in Technical Sciences, Margarita Stepanova, PhD in Physical and Mathematical Sciences, and all members of the department for mathematical formulations of the task, development of software and analysis of the poll results. We thank the Principal of the University Sergey Dzick, PhD in Physical and Mathematical Sciences, Anatoliy Davidovski, PhD in Biological Sciences, and the entire academic staff of the BSUIR who provided their all-round support during the research. We would also like to thank E. K. Doroshevich, Doctor of Philosophy, for his advice in the field of ethnography and mythology.

The authors express their gratitude to Artsiom Dydyshka, director of the Virtualnye Radosti newspaper, who provided us with letters from correspondents received by the newspaper's office. We are grateful to Alexander Meleschenko, the Head of the IT House of Minsk, for his cooperation and support in contacts with the media. And, of course, we thank the students who took part in the surveys, whose sincere answers helped us to clarify the situation and bring us closer to understanding the problem of computer addiction.

On behalf of the authors: Kira Mezianaya.

INTRODUCTION

In lieu of an epigraph

> The emergence of robotic engineering in the middle of the twentieth century caused fears in the American psychologist Lewis Mumford that scientific and technical progress could lead to the creation of a robotic machine that would be able to "think" in the absence of many vital functions. According to L. Mumford, this new machine's function, "thinking," can enter into a partnership with the "id" of a person, with its content rising from the depths of the unconscious. ("id" is an unconscious sphere in which instinctive desires are accumulated, reflecting the brute of the human body: propagation and self-preservation.) The power of "id," according to L. Mumford, detached from a holistic personality, may be more unbridled than the wildest beasts. A man-made automaton is immune to human emotions and anxieties. It is only intended to respond to a limited number of tasks originally embedded in it. Ultimately, according to the scientist, "the machine does not have enough saving consciousness to disable its own, forcibly acting mechanism, which is capable of pushing to death both science and civilization." [1]

How boring is to live without something new! The most interesting new thing in a person's life is the birth of a child. So the appearance of everything new is also called birth, or origination. The birth of a new era! The origination of a new society! Pathetic it may sound, but it has not happened once in history. Today the influence of any new thing on the development of humanity and nature can be felt just within one human generation.

The world around us is constantly changing, and we are changing with it. Today a new generation has entered an active social life and was brought up at the beginning of the information technologies era. Parents have tried to provide young people with access to such technical novelties as a personal computer, and then to all other gadgets: smartphones, tablets, and iPads. There is no doubt that the virtual world generated by means of information and computer technologies delivers a lot of pleasures to every taste. Like sweets, it creates a pleasant feeling of emotional satisfaction and satiety, and, as is the case with excessive sweets, despite the negative consequences, continues to be desired.

The world of new ideas precedes the emergence of new things and new relationships. Today, the generator of ideas is the virtual world, a joint creation of people. In this world, each person can find for themselves something new and interesting, and if they wish, they can offer their own creation to others. This process carries them away, it turns into a call to the person's spiritual life. Attraction to it intrudes into mental activity, it is organically included in all the person's mental processes and ultimately can turn into a computer addiction. Such dependence is formed in the process of excessive computer use for the purpose of entertainment and communication in the virtual space generated by software and hardware. The most important indicator reflecting this process in the society is the ever-increasing number of personal computer users. In European countries, this figure is close to 80% of the population. With this growth, the number of people with computer addiction is growing, ranging from 9 to 15%, and in countries such as South Korea and China, according to the latest data, has reached 25 to 30% among some categories of the population. [2, 3]

The study of Internet addiction as a pathological impulse began with the work of American clinical psychologists Kimberley Young and Maresca Orzak. From their point of view, Internet addiction should be considered as a real clinical phenomenon, a type of health disorder, which is based on impaired impulse control. Behavioural addictions, such as workaholism, gambling and sex, are known to be forms of psychological dependence. The propensity to use substances such as drugs and alcohol are forms of both psychological and physical dependence. Computer addiction is recognized as a non-chemical type of addiction. This is still a new topic in the field of psychology, and from a medical point of view, only the first steps have been taken to recognize it as a serious disease. Such a cautious attitude of scientists is due to the lack of research that would establish its cause and effect. This type of non-chemical dependence is not yet approved in official medical reference books, the main one of which is currently ICD-10 "International Classification of Diseases (10th revision)." According to the latest information on the official website of the World Health Organization (WHO), dependence on Internet video games is included as a disease in the ICD-11 preliminary version. [4]

Dependence is formed in the process of excessive use of a computer for the purposes of entertainment and communication. The scientists who study the problem of computer addiction identify several types of virtual world in accordance with the type of activity. The most common in the Commonwealth of Independent States countries is the classification of six

types: computer games; web surfing; social networks and dating; films, television series, videos; exchange trades; gambling; cybersex. [5]

By the number of users, the top place is occupied by computer games. The emotional richness of the game activity, the possibility of escape to a higher level of other reality and self-affirmation in it, as well as the sacral nature inherent in the game, studied by Johan Huizinga, [6] are an important part of this entertainment, which greatly surpasses the others in its fascination. However, our three-year dynamic study of involvement of students in the virtual world shows that watching movies and videos has become as popular as games. A significant increase in the audience is due to the fact that many gamers with great gaming experience feel the need at some stage for new stimuli of imagination and emotions. An already known plot of a popular game is developed in the scenarios of some films, or vice versa, a series of games is created based on the idea first embodied in a film.

New kinds of entertainment have come into our lives as a result of scientific and technological progress, the foundations of which had been laid in the nineteenth century. Of key importance were discoveries in the field of physics and mechanics which contributed to the onset of two technical revolutions that radically changed the lives of people.

CHAPTER ONE

VIRTUALIZATION PROCESS DRIVERS

1.1. The Scientific and Technological Revolution and Its Impact on People's Lives

The last one hundred and fifty years have been marked by three great discoveries in the field of physics, each inaugurating a new era in the history of civilization.

1) Discoveries in the field of electromagnetism: M. Faraday, D. Maxwell.
2) Discovery of atomic energy: M. Skłodowska-Curie and P. Curie.
3) Discoveries in the field of telecommunication and information technology: invention of computer, digital devices and the creation of the Internet.

Electricity

Michael Faraday, having discovered the flow of energy invisible to humans in a magnetic field, developed a technical solution for the generation of electric energy. James Maxwell laid the foundations of modern electrodynamics. The discovery of electricity marked the beginning of a new era in the development of civilization. Since then, inventors, experimenting with this new type of energy, have created and are creating devices that allow it to be used in various fields of human activity, which are constantly expanding with the advent of new discoveries and inventions. Today, all humankind uses electricity. As is well known, business is engaged in introducing the discoveries of scientists into production, promoting and improving new technologies.

Atomic energy

The discovery of the powerful energy of radioactive radiation, which is used in atomic energy industry, ensured the development of this industry

in countries that did not possess natural sources for alternative energy generation. At the end of the nineteenth century, the Curie couple began work on the separation of radium. In 1902, having received decigram of pure substance and measured its atomic weight (225), they touched upon the secret of the structure of matter. The knowledge that they had discovered about the effects of radium on living matter was almost immediately included in the system of medical care for cancer patients. However, the ignorance of radium properties led to the fact that Henri Becquerel bore radium salts in a glass ampoule in the inner pocket of his jacket and received radiation burns.

In 1921, Marie Curie visited America, where she was presented with one gram of radium (out of twenty grams available at the time in the country). This gift was brought to France in the safe of a steamship on which she was returning home. At that time, various medications and "radium" cosmetics were widely advertised. [7] Simultaneous with the discovery of this element, both Pierre Curie himself and other prominent scientists expressed concerns about the possibility of using it for evil purposes. As we know now, it was not without reason.

In 1939, five years after the death of Marie Skłodowska-Curie, the discovery of Yakov Zeldovich and Yuli Khariton, who worked at the Institute of Physical Chemistry of the USSR Academy of Sciences in Leningrad (St. Petersburg) on the theory of explosion and the chain reaction of uranium fission, initiated the creation of both an atomic bomb and the atomic energy industry. On the other hand, in the fifties and the sixties of the twentieth century radioactive irradiation of children with ringworm was widely used in dermatological clinics in order to epilate the hair on the head for better access to the lesion. Now it seems incredible and many readers would hardly believe it, but then it was called the use of the peaceful atom and such clinics were equipped with cobalt guns.

The history of the creation of electronic data processing machines and personal computers

The invention of the computer has a long history and it began in antiquity, when a person started to use abacuses and beads for calculations. In the Middle Ages, the quantity of money increased as a result of population growth and the development of crafts, raising the need for economic calculations. Educated people with outstanding abilities and inquisitive minds invented mechanical devices capable of performing simple arithmetic operations: addition and subtraction of numbers. Scientist W. Schickard designed such a machine at the beginning of the

seventeenth century. However, the first arithmometer capable of performing four arithmetic operations was created by famous French scientist and philosopher Blaise Pascal. The main element in his device was a gear wheel. This invention was a key event in the history of the computing technology development.

The next stage of development in this area began only in the nineteenth century, thanks to the talent of the English mathematician Charles Babbage. He designed a computing machine in which he implemented the idea of printing on a negative photo printing plate and storing the results of the calculation on an additional device external to the processor. This will be a very fruitful technique in the future. In 1834, Babbage embodied the progressive principles of work in his other machine, which he called "Analytical," and that has become the driver in the development of this trend. Countess Ada Augusta Lovelace, who is considered to be the first programmer in the world, took part in the creation of this machine.

In the following years, Babbage's ideas have been developed and used by H. Hollerith and Babbage's son Henry, who contributed to this trend. In 1930, Konrad Zuse in Germany created a machine that worked not with decimal numbers, but with binary ones. In 1941, he designed an electromechanical machine, the arithmetic unit of which worked on the relay base. Information for calculations was entered by symbols using combinations of 0 and 1.

The history of the binary code goes back to Frenchman Louis Braille, who lost his sight in his childhood. He studied and worked at the Paris Institute for the Blind where, by 1824 at the age of fifteen, he created the basis of his alphabet: a small "cell" consisting of two numbered vertical rows. The placement of dots in the cells created sixty-three combinations with which it was possible to write letters of any alphabet, musical notes, numbers and mathematical symbols. Louis Braille worked on the system for many years and the principle of "significant points" used in his alphabet became the basis for modern computer technologies. In the nineteenth century, Boolean algebra was invented on the basis of a binary code (working on the switch principle), but a new meaning and the value of this discovery was understood only after one hundred years.

Engineering science developed a way of converting a computer to electrical power and reduced mechanical parts. In general, during the development of computers, a large number of previous inventions were used, which had been considered of little value before. Such an invention was that of American inventor Lee de Forest (1906), a three-electrode vacuum tube (triode), which replaced the relay.

The first mainframe computer, the ENIAC, was created in 1946 in the USA, at the University of Pennsylvania. It contained eighteen thousand lamps, weighed thirty tons, occupied an area of about two hundred square meters and consumed enormous amounts of power. It still used decimal operations, and programming was carried out as at a telephone exchange in the early twentieth century, with switching contacts. Mathematician John von Neumann, one of the key figures in the history of computing, worked on the ENIAC project. He was the first to propose writing the program and its data in the machine memory so that it can be changed in the process if necessary. It is this design that was called the "Von Neumann architecture."

The use of logical elements at the molecular and atomic levels became an important achievement in semiconductor physics and created the conditions for the development of the elemental base of modern computers. As a result, since 1955, the lamps in a computer have been replaced by miniature transistors created on the basis of silicon compounds, an innovative technical solution. These were the machines of the so-called second generation, in which punch cards were still used to ensure the recording, storage and reproduction of information, but the first operating systems (OS) for controlling the resources of the machine appeared. However, originally computers were used only in large companies and for government programs because of their high cost and large size.

It is believed that five generations of electronic computing equipment have been created to date in the process of development.

Continuous development of scientific and technological progress contributes to the creation of more and more efficient software and powerful information carriers. As a result, information and computer technologies (ICT) have been introduced in to all spheres of life: industry, business, administration, mass media, science, etc. The technical equipment of human cognitive activity has increased significantly. Against this background, household personal computers (PCs) purchased by the population are widely used, mostly as a means of entertainment, a reference book, and a typewriter. Due to their relatively small cost, they are willingly bought for children as a new interactive toy.

Unfortunately, the understanding that a PC is a complex set of software and hardware tools that have been developed by thousands of scientists through intense research for decades has not been established in society. In fact, it is a tool with many capabilities. On the one hand, it is intended for a large number of calculations and information processing, data transmission, payments, etc., which have made important changes in

people's lives. On the other hand, it can instantly turn into a means of communication or immerse us in the magical world of entertainment with a wave of the user's hand. Many people perceive the computer at the domestic level as an improvised tool that saves them from both idleness and routine duties, attribute to it the functions that are not characteristic of it, and in some cases even tend to endow it with mystical properties. A PC is a tool that performs a specific set of tasks, so the cultivation of mythical virtual creatures in computer games can in no way be a function of computing technology.

Much emphasis is on artificially created computer intelligent systems. The experts understand this concept as any information systems that manifest the ability of purposeful behaviour. The following three functions of the intellectual system are currently considered as basic ones: representation and processing of knowledge, reasoning function and the function of communication. Artificial intelligence can solve complex problems based on existing algorithms and rules and synthesize original, new information. However, it cannot generate fundamentally new knowledge, since it operates within the framework of the existing rules and programming flowcharts created on the basis of already known information.

English mathematician Alan Turing did not refer all types of engineering equipment to the category of machines involved in the imitation of mental activity. He considered intellectual only those digital computers that worked on a program created on the basis of mathematical algorithms to perform certain tasks on a pattern. For this purpose, variants of answers on a specific topic are worked out, systematized and laid into the program. Efficiency depended on the matching of keywords (tags) in the text and marker words embedded in the robot program to search for the most appropriate options in response to a query. In any socially significant industry, an electronic computer is used as a tool to facilitate the solution of application tasks. This is defined by the rules of operation incorporated in the programs. Many people are misled by the information about extraordinary properties of computers.

In a simplified form, the work of a computer can be represented as follows: a digital processing device encodes each letter, number, sign, colour square on the screen or sound as a chain of 0 and 1, then stores it in a memory device and sends it to the receiver. Another processor decodes this chain to turn it into a picture, sound or sensation that will be accessible to sensory receptors. [8]

The use of the Internet, due to the high speed of searching and processing information, has led to the fact that some people began to

perceive the computer as something supernatural, whereas it is just a technical device. Being an instrument, it does not think logically, for it is intrinsically linked to humans. Human thinking and logic based on the knowledge of aspects of the problem can shorten the search path to a minimum, but the speed of calculations in the traditional way is limited by the possibilities of human mental activity. Using the technical capabilities of a computer has meant that important results in many areas of science have been obtained. These results involved mathematical problems that were known to be solvable in principle but were inaccessible to humans because of the large amount of operations required. Many such solutions were obtained on the basis of the generalization of great amount of information and the calculations made, but they are based on mathematical models built by experts. This allowed scientists to make discoveries in many areas of knowledge, including virology and genetics.

Creation of the Internet

The emergence of computers predetermined the search for ways to use them. The priority in the development of computer technologies and systems belonged primarily to the military. After the Soviet Union launched an artificial Earth satellite in 1957, the US Department of Defense decided that their country needed a reliable information transfer system in case of war. For this purpose, it was decided to develop a computer network so that even if more than one computer was destroyed, the network, with many other connections, could continue to function.

In the 70s of the twentieth century, a team of American scientists, by order of the military and driven by patriotic feelings, invented a router (network data transmission device) to decentralize the transfer of commands from the National Communication Center. Through this network device information was transmitted from computer to computer, including over a distance. The first ARPANET server was installed on September 1, 1969 at the University of California, Los Angeles. By 1971, the first program was developed to send email over the network to a remote computer, which has immediately made the program very popular. In 1973, the first organizations from Great Britain and Norway were connected to the network via a transatlantic telephone cable, which ensured its international status.

However, the ARPANET network, being an advanced one, could not yet interact with other networks built on other technical standards. By the end of the 1970s, data transfer protocols began to boom. The first were TCP/IP created by Vinton Gray Cerf. They represented a network model

for transmitting data in digital form. The model described a method of transferring data from the source of information to the recipient. These were the agreements on digital coding of transmitted information, which were standardized in 1982–1983. Mathematician Jonathan Postel from the USA played an active role in the development and standardization of network protocols. In 1984, the Domain Name System (DNS) was developed—the coding of stored information like numbers in a catalogue. Later, in 1988, the Internet Relay Chat (IRC) protocol was invented, thanks to which real- time communication (chat) became possible on the Internet. In Europe, the World Wide Web concept was born in 1989 within the walls of the Conseil Européen pour la Recherche Nucleaire (CERN). It was suggested by British scientist Tim Berners-Lee. Within two years he developed the HTTP protocol, URI identifiers and the HTML language, in which modern hypertext is recorded—that is, such documents distributed over the network, which can be viewed by context thanks to hyperlinks. In 1990, the first dial-up Internet connection (Dialup access) was recorded.

Since 1991, the World Wide Web has become publicly available, and in 1993, the NCSA Mosaic web browser appeared, which contributed to its promotion. Subsequently, it has become the main information provider, which led to the formation of the World Wide Web Consortium (W3C). We can say that the World Wide Web has transformed the Internet, creating its modern look. Since 1996, it has almost completely replaced the old concept of "Internet," and by this time the World Wide Web was firmly established in people's minds.

In the 1990s, the Internet united most of the existing networks of that time. Such unification looked attractive, both because of the absence of a single management and due to the openness of its technical standards. All this made the network independent from governments, businesses and specific companies. In 1995, the virtual social network Classmates appeared, created by Randy Conrad. Tens of thousands of users, many of whom were talented programmers, joined in the development of Internet programs for free. This contributed to the rapid progress in this area and the creation of programs to simplify the network use. Currently, if you need to press more than two buttons when searching for the necessary information, the resource is considered ineffective. The popularity of the Internet as a means of exchanging various types of information is currently unmatched. In 1998, Pope John Paul II established the World Internet Day (September 30). [9]

Outstanding contributions to the development of information and computer technology (ICT) were made by Bill Gates and Steve Jobs, whose names are known throughout the world. Initially, Bill Gates showed

his talent by searching for weak spots in security programs, like all hackers during the birth of ICT. Later, together with Paul Allen, he created his own Basic language interpreter, and then, within his Microsoft company, adapted the operating system to MS DOS, which was a great success. During the period of personal computer development, in intense competition with Xerox and Apple, the first mass operating system Windows 95 was created under the direction of Bill Gates, which conquered the global software market. Microsoft was ahead of its competitors, which has ensured Bill Gates's commercial success for several decades. Representatives of this product line are still leading to this day.

The way of Steve Jobs was somewhat different: this entrepreneur, inventor and industrial designer placed himself on record in the information technology (IT) industry. His engineering talent, free-thinking and a wide range of interests had already been apparent in his youth. After voluntary withdrawal from college he lived with his own mind and at that time got close with the Krishnaites. From 1974 he began working at Atari, a company that produced video games, but his cherished dream was to visit India. In the late 70s, Steve Jobs, together with Stephen G. Woznyak, designed one of the first PCs , Apple II. It became the first mass product created by Apple. By this time, Douglas Engelbart presented an interactive device called a computer mouse, for which he received a patent in 1970, at a show in California (December 9, 1968). And although Xerox included a mouse, along with a graphical interface, in the first computer Xerox 8010 Star Information System (1981) created by its specialists, this development could not take on a market because of its high cost (the mouse cost USD 400). In 1983, Apple created its own one-button mouse (valued at USD 25), with which it has become possible to perform a large number of operations on the graphical interface of Apple Lisa and Macintosh (Mac) PCs. It was a great success: Apple, headed by Steve Jobs, has led the production of PCs . However, at a certain stage, it became clear that PCs created on the basis of new technical solutions remained in their functions the same computing machine combined with a typewriter. The main requirement of the business is that the product being created should be needed by the maximum number of consumers, but PCs as mini-computing machines were not a necessity for the public. At that time Steve Jobs made a brilliant invention as a marketer of a new business trend. Realizing that using a binary code, you can transfer any information through a computer, he found a solution: to transmit it in the form of symbols that carry aesthetic content. It was the way to unite humanitarian knowledge and stories accumulated in society with the technical

capabilities of a personal computer. Steve Jobs introduced aesthetic symbolism in the products of his company. Aesthetic needs are the subject's desire to satisfy the thirst for the original and in a certain sense the beautiful. The diversity of talents and originality of knowledge of Steve Jobs have fully manifested in his work as a marketer: he added accumulated humanitarian knowledge to technical solutions. By virtue of his inner needs and searching, he studied calligraphy, learned from Indian yogis, practiced meditative techniques, and was inclined to flight of fancy. Acquired knowledge gave him an understanding of the meaning of symbols in the human perception of the world. Contemporary humans think by words displayed in graphic symbols. Hieroglyphs, sometimes meaning whole phrases, have had the greatest importance in the development of culture, as well as letters as the characters for writing words, and numbers. The hieroglyphs in Chinese and Japanese culture are of exceptional interest, since several strokes in them convey developed content.

The use of symbols has become one of the main directions in the development of programs for the IT industry. A person reads from the technical device display the information, which can have both aesthetic and emotional impact on them through symbols. Satisfying aesthetic needs plays a key role in people's mass attraction to the virtual world. Steve Jobs has made full use of his knowledge in this area after his forced departure from Apple. Initially, he created a new company NeXT to develop computer platforms for the business sphere. He acquired a division of Lucas Film company, which was engaged in computer graphics. He promptly turned a small division into a large Pixar studio, where under his leadership the movies "Toy Story" and "Monsters, Inc." were created. He later returned to direct Apple corporation. During this period, thanks to his efforts, the iPod digital audio player was developed: all music switched to digital format, which predetermined the possibility of its distribution on the Internet. [10]

The aesthetic content of Internet resources has become comprehensive. The virtual space created by technical means is filled with a gallery of beautiful faces with a clearly standard look and a string of various stories with different display quality. This is especially characteristic of advertising, computer games and the widespread fancy for selfies. The desire to get new and extraordinary photographs leads to paradoxical results. A computer gamer, satisfying his aesthetic needs through the perception of graphics and heroes, sooner or later feels the need for new variants and models. Hence the flow of new products and neglect of the quality: the competition of companies in this race for profit plays a

decisive role. Since 1998, the era of information computer technology (ICT) has begun. Today you can connect to the Internet via communication satellites, radio channels, cable television, telephone, cellular communications, special fibre-optic lines or electrical wires. Work is under way on the transmission of a signal by means of light, as well as on quantum computers. The global network has become an integral part of people's lives in almost all countries. The Internet has reached an audience of over fifty million users within five years. If we compare it with the period required for the same for other media, it took thirty-eight years for radio, thirteen years for television, and ten years for cable TV. Cyberspace has entered our lives. Today this word means the space created by the world telecommunication network and other computer communication systems. Writer William Gibson, who first introduced this concept, used the metaphor of the "consistent hallucination that most operators around the planet experience every day." [11]

1.2. Virtualization Drivers

ICT priests: who are they?

Initially, computers were used exclusively for production needs and were installed in special rooms. With the creation of PCs , as well as a variety of programs for them, they became an instrument of intellectual activity, which greatly accelerated decision making. Revolutionary changes in the minds of people have occurred under this influence. Hacker subculture played a great role in this process. Hackers were the users who quickly mastered the world of computer technology, they are successful explorers of virtuality. Today, when the concept of a hacker is associated with crimes, so-called white hackers are singled out. Why is this happening?

Virtuality has always been a gaming space, long before game programs became a mass product. Famous hacker Kavin Mitnick describes in his book "The Art of Intrusion" typical cases of hacking computer networks without any sordid motives, solely for the sake of interest and self-affirmation. [12] Such specialists are now called white hackers. Trying to break through the protection of an intellectual product, they help to test its effectiveness, and some companies willingly give them such orders. Linus Torvalds, the creator of the Linux operating system, published the autobiographical book "Just for Fun": the title fully characterizes the motive for creating programs that millions of people are now using. [13] The principle "just for fun" has spread to all intellectual activity in the virtual space: computer graphics, music, education. Everything that can be

created without financing is created for the pleasure derived from the process of creation itself and, perhaps, "I want to become famous!" The growing capabilities of computers and networks allow amateurs to create more high-quality products. Inevitably, hackers have got into mass culture: the cyberpunk genre appeared. Such movies like "The Matrix," "The Lawnmower Man," and "Johnny Mnemonic" appeared on screen. From now on, a hacker who has managed to gain access to secret information of corporations or governments becomes not just a successful person—he becomes a superhero: who has not heard about Julian Assange and Edward Snowden? The era began when lone geniuses challenge the power structures of superpowers and gain fantastic victories.

Who is the usual hacker of the late twentieth century? He is about twenty-five years old; young people quickly master new technologies. A hacker, as a rule, has an excellent technical education (some of them are called "computer genius" from adolescence). Perhaps he/she is even connected with the scientific environment, because it was the easiest way to access an expensive computer at that time. A hacker often has to work at night, he/she does not care much of his/her appearance, in which the connection with the hippies played a significant role. The hackers consider white-collar workers as their antagonists: corporate employees working on patterns and schedules. Hackers have their own ideologues. In 1996, John Barlow published the "Declaration of Independence of Cyberspace," which, *inter alia*, states: "Governments of the Industrial World, you weary giants of flesh and steel, I come from Cyberspace, the new home of Mind. On behalf of the future, I ask you of the past to leave us alone. You are not welcome among us. You have no sovereignty where we gather. We have no elected government, nor are we likely to have one, so I address you with no greater authority than that with which liberty itself always speaks. I declare the global social space we are building to be naturally independent of the tyrannies you seek to impose on us . . . You do not know our culture, our ethics, or the unwritten codes that already provide our society more order than could be obtained by any of your impositions." [14]

At that time, Eric Raymond, Richard Stallman, and Linus Torvalds promoted the idea of free open source software, allowing everyone to participate in program improvement. They believed in Utopia, where any person will have access to all the knowledge of the world and the achievements of scientific thought, because programs can be copied almost without any material costs.

The significance and role of individuality, and possibility of independent activity with the prospect of high incomes in the field of ICT,

perfectly correspond to the provisions of positive psychology which pays great attention to the strength and dignity of the individual, and not to its shortcomings and diseases. The behaviour of a person who excessively uses the Internet corresponds to the description of the subject who is carried away by the process of cognition, which means that he is quite adequate psychologically. Perceiving their activities in the virtual space as a game, many hackers do not aim at a commercial result. What matters for them is involvement in this gameplay, from their point of view, and victory, of course. The degree of involvement is even more important than winning, because you have to be an "insider" among the same hacker players. An attacker who deceives the defence system will be the winner, while the network administrator who caught the attacker is not a "player," and therefore will not deserve the admiration of other players. As in any game, in the first place, people are involved in the general secret of the game, the language of the community, their dress code and behaviour, and most importantly, the desire to spend time and energy on the game. Victory in the game called hacking is reached by the solution of complicated mathematical problems and the search for vulnerabilities in other programs. For example, Donald Knut, a well-known programmer, created the TeX computer typesetting system and announced a reward for each error found in the program, and the amount of the reward doubled every year after the program had been released. Some errors were found, but not a single check with a reward was cashed. People chose to keep the checks for memory as documentary evidence of their victory over an outstanding scientist and programmer. However, over time, a kind of "gold rush" has started; many people are only looking for easy money in the virtual space. Now the word hacker, thanks to the media, is associated in law-abiding citizens with a burglar of bank accounts and crime. A similar metamorphosis occurred with the ancient Greek name "cynics," which literally means "dogs." It stuck with a group of philosophers, to whom Diogenes joined: following his own convictions, he lived in a clay barrel. The teaching of cynics expressed the protest of the poor against unequal distribution of wealth in the society. Subsequently, this word turned into a curse: in today's language cynics are overcritical and judgmental people.

Computer games have always been an integral part of the virtual world. And if the virtual world is a kingdom, then a game program is one of its provinces. The creative nature of hacking manifests itself in the emergence of a variety of programming languages, viruses and computer games. In a computer game, its creator establishes and announces the conditions for victory. Initially, these conditions are associated with the

search for weak points of artificial intelligence or the optimal balance of character qualities: both of them represent a logical task. Some computer games are just versions of well-known board games, where artificial intelligence (AI) stands for one of the characters.

It is generally accepted that both the developers of computer games and their users are gamers who are equally attracted to the game. Many users combine the use of three or four types of virtual world, of which the most popular are games, movies, video reels and social networks. [15] The coordinate system "gamer to a normal person" is deeply alien to them. They are enthusiastic people and are even convinced that time is not wasted in games but is used exclusively for a useful purpose. Thus, one of the students who participated in our survey on the subject of computer dependence, indignantly noted in the questionnaire to the question "How much time do you spend on the game?" "Why spend!!!" For millions of ICT users, dedication to their cause is undoubtedly a blessing, to provide the possibility of a detailed knowledge of the world and further increase of their knowledge in different spheres of life. The most motivated and gifted people with an analytical mindset even alone can achieve high professional levels in the field of programming. They have the opportunity to promptly create a product with the desired properties, useful to many people. If earlier the introduction of science into production required a lot of time and considerable material costs, and the ability to accurately predict the economic effect was accessible to few organizations and companies, now an individual having programming skills can quickly create a product with desired properties that is useful to many people. The physical, material world has been quickly transforming under the influence of the virtual world.

The ability to solve problems using computer programs at a speed inaccessible to human thinking, has led to the fetishism of computers and to the fact that it is now being considered and analysed as having the function of thinking. However, the mental action of a person is not only object-specific, but also social by origin: it is always directed at another person. The main feature of human intelligence is the ability to be creative, while the computer only solves problems in a "computerized" way, because it uses the information provided by specialists in the programs they create.

Managing the flow of information has become important, if not paramount: special arrangements are being made to streamline them. The quality of a resource is determined by how simple it is to provide, by one or two clicks of a button, access to the required information: text, picture, link, etc. One of the main forms of organizing databases on any topic is a

website known to Internet users. The programmer, as a rule, does not take part in filling this site with information and is not formally responsible for its content. They simply earn money by the technical work on its creation, based on the profitability of the order. Providers now say that everything that fills the virtual world is "impersonal." It has become the technical part. The programmer receives information from the customer "for uploading" to the site, but their communication can be purely virtual. The programmer is not obliged to study the content of all that is posted on the site, the more so as changes and additions are possible in the future at the will of its owner. However, the programmer knows the general idea for which the site is being created. In this case, we can talk about moral responsibility for participating in the seduction by something or the spread of what can afterwards harm both personal and public health.

But not only programmers are the "priests" of ICT today. These "priests" include all those who fill Internet resources with specific information, manipulate the interests of people, including such public figures as bloggers. The notoriously democratic nature of the Internet provides the ability to place virtually any text or image there. So far, only special agencies are concerned about the appearance of information of aggressive content or encouraging suicide. Administrators and providers are not indifferent witnesses either, but they earn money and are guided only by instructions that prohibit dissemination of information that violates specific laws adopted by the country of residence: arms trafficking, drugs, and paedophilia.

In this new environment of communication and inhabitation it is necessary to create rules to be widely discussed in society. The conditions for compliance must also be specified. When creating a new technical tool, a special instruction is always developed on the conditions for its safe operation. The absence of such rules, as well as their ignoring, is fraught with accidents. One of the products created beyond the control of society, in the development of which the leading role belongs to the game mechanics (principles of control in the game), is computer games.

Like everything in the field of ICT , the gameplay of computer games is created by software engineers. By the nature of the action, the game programs were divided into genres: arcade, fighting, action, shooter, strategy, etc. which has become widely known. The earliest product was arcades, which could be played on a console, regardless of the technical requirements of the game program. Arcade games have their prototype in the form of the famous Tetris and Pinball. There are certain levels on the site like a maze, and to win, you need to go through them, collecting maximum points or bonuses. There are no scenarios with role-playing in

this genre, but such games have had their devotees for many years. Scientific studies on the nature of their impact on the health of players have proved the usefulness of such games in the development of spatial-logical thinking. [16]

The next product was the fighting game (battle). Gamers are invited to choose a character that they will control in the game. The list of such characters in various the games varies from ten to seventy. This is usually a humanoid creature or a robot with a set of mechanical movements and a set of facial expressions. As soon as the hero is selected, the game program automatically enters the opponent in the playing area: a character under AI control with a preset program of movements. Each of the fighting characters has a hit points (HP) strip. In the end, one of the characters must die in a virtual battle: the HP strip fades. Such games, as a rule, are not role-playing.

Action games are more diverse. The scenario is built on maps of a locality: new territories, lands or premises are offered. They need to be fitted out, which adds a taste of epic with a lot of events and the need for vigorous activity. In the games of this genre, the developers have included the ability to take on the role of a hero based on the RPG principle. The shooter genre is also closely related to the action genre: usually a game from the first person. More and more games like arcade shooters based on mixing genres are appearing on the market.

Role-playing games RPGs are a way of presenting a picture of the playing area depending on the location of the video camera in relation to the main character: from the first person—from the eyes of the hero, when the player sees only the weapon in their hands; from the second person—looks ahead from behind and sideways of the character; from the third person—looks from above and behind the character the player controls. Within a game, a combination of control from the first and third person, etc. is also used. The main interest is not the image of the hero, but the wide possibility of controlling it. Gameplay is game dynamics, which is expressed in a variety of movements, actions and interactions with other characters. Technical capabilities are widely used in the genre of action and fighting games and horrors. In an RPG game, the user plays mostly alone, but cooperative modes are also possible: with friends, via the Internet connection through voice programs (TeamSpeak), if they are far away. In the overwhelming majority of cases, the scenario of such games is built on the creation of a team of several characters, which must be chosen from the offered image gallery. The hero can also be used: a loner, which can be controlled, as in the famous The Witcher game. In other