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The Voice Interface as the Future of Information Technology

For a long time people have been trying to invent a technology that would make communication between users and new devices easy. The result of one of the branches studying this technology is *Speech Interpretation and Recognition Interface* (or *Siri*).

Siri is a personal and knowledge navigator which works as an application for Apple Inc.'s iOS (iPhone Operation System). The application uses a natural language user interface to answer questions, make recommendations, and perform actions by delegating requests to a set of Web services. Apple claims that the software adapts to the user's individual preferences over time and personalizes results.

The system *Siri* is a result of work of the research groups from Carnegie-Mellon University, University of Massachusetts, University of Rochester, Florida Institute of Human & Machine Cognition, Oregon State University, Miskatonic University, the University of Southern California and Stanford University. This technology has evolved with the dialogue and natural language understanding, machine learning, the obvious probable reasoning ontology and knowledge representation, and planning.

The original American voice for Siri was provided by American actress Susan Bennett.

Since the appearance of the voice assistant in *iOS5*, many users have been waiting for the Russian language support. First steps in this direction were made with the release of the beta-version of *iOS7*. So, *Siri* voice could pronounce names written in the Cyrillic. However, they sounded quite unclear. Thereby, *Apple* company started testing its service in Russia.

First, *Siri*'s functionality in most countries was limited, so maps and search engine Yelp were only available within the U.S. For example, in the UK at the request to find some local company, get directions, or give information about the movement *Siri* responds, "I can only look for businesses, maps and traffic in the United States, and when you are using U.S. English. Sorry about that." With the *iOS6* being available outside the United States, *Siri*'s functionality has significantly expanded.

In its new version Siri:

- can recommend restaurants, movies, and book tickets and tables;
- provide information about sports (score, matches, teams etc.);
- open applications;
- write in *Twitter*, *Facebook*;
- give routes on maps;
- use the application *Apple Store* (for example, command *«Buy iPhone5»*) [1].

Siri is a technology of the future which is gradually merging into our lives. Perhaps, some input devices like a keyboard or a mouse will disappear because of their uselessness and the user will communicate with the machine on the language which it understands. Many of my friends and I use google voice (the analogue of Siri technology implemented by Google Inc.). The technology works at a high level, but requires some improvements.

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Women in Business

Traditionally, men dominate in business and management. But my story is about women in business. To many people it will seem strange. Most people think that woman should be a wife, mother and housekeeper. And it was so some years ago. It is considered to be a norm which exists over the centuries.

The history of women's struggle for their rights, that of feminism as a part of mankind's social history, is quite known to everyone. In recent decades, feminism has become a subject of scientific researches.

But things have changed. The 21st century turned this stereotype. The example is a famous actress of the 20th century Mary Pickford, the first businesswoman in Hollywood, a co-founder of the film company United Artists. In 1938, she founded her own cosmetics company Mary Pickford Cosmetics. The first Russian business lady is Yekaterina Dashkova, commonly nicknamed "Little Catherine." She has organised and headed the Russian Academy of Sciences. Talking about businesswomen, we cannot forget about Coco Chanel, a French fashion designer, perhaps the most important figure in the history of fashion in the XX century. Chanel brought a fitted jacket and a little black dress in women's fashion. Coco's influence on high fashion was so great that – and it was the only example in the history of fashion – she was included in the list of the hundred most influential people in the XX century made by the "Time" magazine [1]. These are just a few examples of business-women in different countries. To be a business woman you need to have certain qualities of character such as firmness, communicability, determination, and many others. That's why, it is believed that it is better to deal with men in business, but it is not so. Women can also have all these qualities. So the chances of men and women here are equal. A number of women in business is rather small in comparison with men. Most women prefer to be a wife and a mother in the first turn. Career does not take the first place in their lives. But a number of women in business is quickly growing nowadays.

In my opinion, every woman should choose her way in life but not live in stereotypes. Some women devote themselves to their families, some – to work, and some of them can combine both family and work.

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Your computer is slow! How to upgrade your PC?

Installing any program, the system tells you that this computer has not sufficient system requirements for work of this application program. There are cases when the program has been successfully installed, but works very slowly. If your software is serviceable most often it means that it is necessary to carry out the upgrade of the computer system.

Computer upgrade is one of the methods of supporting necessary productivity of system which gives the chance to you not to lag behind technical progress. Modern games and programs with each new version consume more and more computer resources. To exercise modernization of the computer, for a start it is necessary to define the purposes for which it is necessary or select the parts which don't suit you in the present personal computer.

In 2007 the average price of the personal computer made about \$800. Within the next two years it fell to \$580. Since 2010 the personal computer began to rise in price and cost about \$700. Such price policy remained and at present. It means that it is impossible for everybody in Russia to buy an absolutely new computer.

In this article we would like to pay special attention to the personal computer and to tell about ways of their upgrade, relying on hardware updating.

At the beginning it is necessary to consider the main computer hardware:

The **power supply** converts alternating current electric power to low-voltage DC power for the internal components of the computer.

The **motherboard** is the main component of the computer system. It is a rectangular board with integrated circuitry that connects the other parts of the computer. Components directly attached to the motherboard include: Central Processing Unit, Random-Access Memory, storage, video controller, sound controller, network interface and expansion slots.

Before carrying out a computer upgrade, it is necessary to allocate the purpose of its use and then it is important to choose characteristics which need to be improved. Most often devices on the motherboard which directly are responsible for operability of the computer are exposed to updating.

Purpose and characteristics.

CPU (**Central Processing Unit**) performs most of the calculations which enable a computer to function and it is sometimes referred to as the "brain" of the computer.

When choosing a CPU should pay attention to the following characteristics:

Number of cores. Multi-core processors allow to share the load between processors. Most operating systems allow to perform multiple applications simultaneously.

Clock rate is the number of cycles (operations) per second of the processor. As a rule, the higher the CPU clock rate, the higher the performance is.

Cache capacity (L1, L2, L3). The cache memory of the first level is a block of high-speed memory. It is located directly on a processor kernel. Preservation of the basic commands can improve processor performance due to the higher processing speed. The cache of L2 carries out the same functions, but has lower speed and the bigger size. L3 integrated a cache memory in combination with the fast system tire forms the high-speed channel of data exchange with system memory.

Support of various technologies: Turbo Boost, 3DNow, AMD64/EM64T, HT, Intel vPro, NX Bit, SSE2, SSE3, SSE4, Virtualization Technology. Each technology has the features that increase the possibility of conventional processors.

It should be remembered that when you replace the processor is necessary to consider the compatibility of the processor and motherboard.

Random-Access Memory (RAM) stores the code and data that are being actively accessed by the CPU. There are several types of RAM. Basic and important of them: SDRAM, DDR SDRAM, DDR2 SDRAM, DDR3 SDRAM, DDR4 SDRAM, RIMM. It should be noted that these types of

memory are incompatible with each other but there are slots that support multiple types of memory. The more RAM you have, the more computer processes can execute simultaneously. Installing additional memory can solve many problems associated with the "freezing" of the computer.

Storage devices retain digital data. Data storage is a core function and fundamental component of computers. The more hard disk space you have, the more data you can store on your computer. There are two main types of storage devices: HDD (Hard Disk Drive) and SSD (Solid State Drive).

Video Controller (built-in or as a separate board) sends the signal to the monitor. The main connection socket is PCI-Express. All modern motherboards support this type of video controllers.

When choosing a GPU should pay attention to the following characteristics:

Memory type. There are few types of memory such as GDDR, GDDR2, GDDR3, GDDR4. GDDR5.

Memory frequency. When the frequency of video memory increases, the general productivity of the video card increases. For video memory of the GDDR-GDDR4 type the doubled frequency for GDDR5 - quadruple is specified.

DirectX version. Support of a certain DirectX version designates ability of the card at hardware level to carry out a certain set of functions. The later DirectX version is supported by the videocard.

Maximum resolution. The higher the resolution, the more detailed and informative picture is obtained on the monitor.

Memory capacity. Image is stored in video memory (screen shot) and the elements needed to build a three-dimensional images. Large amount of graphics memory is required for new computer games.

Sound Controller facilitates the input and output of audio signals to and from a computer under control of computer programs. Sound cards have many characteristics but mainly for professional work with music. Average user rather integrates sound card or an inexpensive HD Audio card.

Network interface allows the computer to interact with other devices of a network. The main characteristic is the maximum data transfer rate. Maximum data transfer rate indicates the possible modes of operation (10, 100, 1000 Mbit/s). When selecting a network card with certain characteristics, make sure that all other network equipment supports this speed.

It is necessary to remember that before modernization of the computer it is important to make productivity analysis to identify weak places in your computer. Before work you have to solve in accuracy what you want to improve in the computer.

Modernization is a good way to increase computer productivity several times but to apply it you can spend spare cash where you want to save. All depends on possibility of improvement, at each separate taken personal computer they are limited and it is more expedient to reflect on assembly of the new computer in certain cases. As a rule, the upgrade of the computer is most effective when replacing separate accessories, weak links in a chain. As an example if there is a good processor and the video card in the personal computer but only 1024 MB of RAM, installation of additional levels of memory, worth \$50, gives an essential gain of speed, in difference from replacement of the processor by more powerful for \$300.

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Actual programming languages

Now, the role of information technologies in life of people raises every year. The modern digital technique and household appliances were included in daily use of each person. It is known that electronic devices are supplied with the software which allows to execute different functions.

The software is an integral part of computer system. It is logical continuation of technical means. Scope of the specific computer is defined by the software created for it. Computer itself doesn't possess knowledge in one scope. All this knowledge is concentrated in programs executed on computers. The software of the modern computers includes million programs — from game to scientific.

For software development the special branch called programming was created. In narrow sense, programming is understood as writing of instructions (programs) in a specific programming language. Currently there are more than 150 different programming languages. They are divided into two big categories: low-level and high-level languages. Now, high-level languages are more actual. Different constructions, procedures and functions represent the text, most often, in English.

Due to the evolution of the computer equipment, such as the PC (notebooks, netbooks), smartphones, tablets, the most actual became programming languages which allow to create software for different operating systems (families Windows, Linux, Mac OS, Android) and languages for programming of web sites.

Statistically for 2013, in Russia of 85% of home PCs have Windows family OS, 10% use Mac OS and only about 5% of OS on the basis of Linux. Popularity of OS on tablets and smartphones: Android use about 75% of devices, IOS about 15%, and for a share of other OS there are 10%. Thus, it is necessary to consider programming languages which allow to create applications under the most actual OS. Today it is Windows and Android systems. Certainly, special attention should be paid to web programming because with growth of popularity of the Internet need for web developers increases.

Programming for OS Windows.

Since 1995 the Microsoft corporation regularly develops and supports the Visual Studio programming environment. The last version – Microsoft Visual Studio 2013. This environment supports all modern languages of programming for Windows, such as C ++, C# and others.

C++ is widely used for software development, being one of the most popular programming languages. The area of its application includes creation of operating systems, various application programs, drivers of devices, applications for embeddable systems, high-end servers, and also entertaining applications (games).

C++ supports such programming paradigms as procedural programming, the object-oriented programming, the generalized programming, provides a modularity, separate compilation, exception handling, a data abstraction, declaration of types (classes) of the objects, the virtual functions. C++ combines properties both high level, and low-level languages.

 $\it C\#$ is based on languages C++ and Java. Relying on practice of their use, excludes some models which have proved as problematic and not used by development of program systems. For example, C# unlike C ++ doesn't support multiple inheritance of classes and pointers.

C# has simple syntax in comparison with C++. Developers of language wanted to reduce time for applications creation considerably. This language finds the application in the most different spheres of computer systems.

Programming for OS Android.

As it is known from documentation, Android OS was developed in the *Java* programming language. Therefore, the majority of used applications are developed in the same language. Certainly,

there are the development environments, allowing to create Android-applications and in other languages, such as C ++ and C#, but they require installation of additional extensions.

Until recently, Android-applications were developed by means of Eclipse development environment in the Java language. In 2013 of Google developed a new development environment - Android Studio. In it the Java programming language is used. As Google is the Android developer, the majority of programmers transferred to a "specialized" programming environment - Android Studio.

Why *Java*? First, the speed of execution of the programs written in the Java language is much higher, than written on C/C ++. Secondly, these programs can be executed on any device as after compilation the code doesn't depend on OS. Thirdly, the Java language is permanently supported by developers, regularly adding new features. The release of the last version (Java 8) took place on March 19, 2014. Thus, Java is one of the most perspective programming languages.

Web-Development.

It is the section oriented on development of web applications (the programs providing functioning of dynamic sites of the Internet). In case of creation of web sites most often use the *JavaScript* and *PHP* programming languages.

JavaScript allows to lower considerably load of a Web server because the main scenarios for operation with the page will be executed on user's side. Such scripts apply to creation of interactive pages, to writing of programs, for example, easy browser game or the calculator. The majority of services and sites apply JavaScript to determination of the browser, an operating system and so on in order that it is more correct to display the page on the specific device.

At present *PHP* is the most widespread language of Web programming. Unlike JavaScript, PHP is executed on server side. From the moment of creation in PHP opportunity to insert into a command HTML code in the PHP language for change of appearance of the page was its main feature. Thus, PHP, first of all, provides creation of dynamic web pages. Also in the PHP language important elements of a site are created:

- form of feedback;
- possibility of commenting;
- registration of users;
- search in a site;
- storage of the information entered by the user.

Certainly, creation of sites isn't restricted to use of these programming languages. Knowledge is necessary for creation of the elementary site (at least) HTML (HyperText Markup Language) and CSS (Cascading Style Sheets) which provide fundamental features.

It is important to know in order to become a programmer it is not enough to know one or two programming languages. The more programming languages the programmer knows and is able to apply, the better he can select the most suitable language for the solution of this or that task taking into account all requirements facing it and restrictions. But creation of big software products requires from the programmer of ability to work in a command that superimposes additional restrictions which need to be considered in case of decision-making. It is necessary to consider the need of training in a modern language of all command, and it significantly changes a situation in case of which use of an exotic programming language will be justified.

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Development of business in Russia

In Russia, business as an independent socio-economic phenomenon exists for more than 10 years. Development of entrepreneurship in our country started in 1985 when the Individual Labour Activity Act was passed.

Cooperatives became the first stage of business development in Russia .The number of active cooperatives was constantly growing. Cooperation, starting almost from scratch, gave about four per cent of the total national product by the end of 1989. By 1991, cooperatives covered about twenty types of goods and service production such as construction, manufacturing products for industrial purposes, agriculture, transportation. Cooperative sector was significantly dependent on the state and developed on its basis. Development of the cooperative movement was complicated. Some cooperatives were transformed into private enterprises.

Small business activities expanded during the second phase (the years 1987 – 1988). Small businesses mainly developed in the form of cooperatives. At the same time, material support of cooperatives was reduced. That made entrepreneurs start such forms of business that required large costs. At the beginning of 1991, there were about 135,000 cooperatives in Russia. They produced goods and services for more than 42 million rubles [1]. Later, many specialized cooperatives turned out to be the most competitive, and some of them have become big business structures. Partnerships and corporations were created on their basis. Cooperatives performed an important function, creating the foundation for development of industries producing consumer goods and services. However, some forms of such business were banned and the access to raw materials and equipment was limited.

The third stage may be referred to the years 1989 - 1990. This stage is characterized by passing laws regulating small business activities. The spheres and range of organizational forms of business significantly expanded. It was also a period of intensive development of leasing and preparation for so-called small-scale privatization. The development of leasing was of particular importance at that time because of the transition of all state-owned enterprises to self-sufficiency on January 1^{st} , 1989 [2].

Commercialization of medium and large enterprises characterized the fourth stage of business development (the years 1991-1992). At that time the number of small businesses increased. Price liberalization, fiscal pressure, inflation, devaluation of people's savings, bank credit interest rates increase led to investment stagnation, which resulted in agency business.

The fifth stage of small business development in Russia refers to the years 1993 – 1994, the period of large-scale privatization and development of all types of business. There was a lot of owners and intensive participation of small businesses in the service sector, trade, food and consumer goods industries. The background of market relations is also referred to this period. Formed capitals gave reasons to believe in their ability to invest in business and develop entrepreneurship. In 1993, the first steps to the legal and organization support of small business as a particular sector of Russian economy were made.

Nowadays, business in Russia requires state support of small firms at all levels, especially in the field of credit and insurance and investment promotion. According to the Federal Law of 24 July 2007 «On the development of small and medium enterprises in the Russian Federation», small enterprises have special terms of taxation, a simplified system of accounting and some kind of financial support from the government [3].

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Types of network threats and Internet attacks. Methods of protection of a site

Nowadays such big companies as Google and Yandex pay more attention to network safety. For providing network safety open competitions in finding vulnerabilities are held. The purpose of such competition is to provide safety of their products, web applications and network infrastructures. A lot of existing web systems contain vulnerabilities of different characters.

For those who think of network safety and protection of the web applications the main groups of network vulnerabilities which developers shall remove are considered in this article.

What is the network vulnerability?

WASC (Web Application Security Consortium) selects some base classes of widespread vulnerabilities. Their use can cause damage of the company.

Main groups of security risks of sites.

Insufficient authentication in case of access to resources. This group of threats includes attacks on the basis of brute force, abuse of functionality and predictable resource location. The main difference from insufficient authorization consists in insufficient check of the rights already the authorized user.

Effectively it is possible to counteract such attacks only at the level of logic of application. The part of attacks can be disabled at the level of network infrastructure.

Insufficient authorization. Here it is possible to refer the attacks directed on search of attributes of access or use of errors in case of check of access to system. This group includes technicians of brute force, credential and session prediction and session fixation.

Protection against attacks of this group assumes a complex of requirements to reliable system of authorization of users.

Contents substitution (attacks to clients). All techniques of change of contents of the web site belong to this class without interaction with the server servicing requests. In other words, threat is implemented at the expense of the browser of the user or the intermediate a cache server. This group contains the following types of attacks: substitution of contents, abuse of redirections, HTTP response decomposition, bypass of routing and others.

The considerable part of the specified threats can be locked at level of setup of a server surrounding. However web applications shall filter also carefully both arriving data, and responses of the user.

Code execution. Attacks to execution of a code are classical examples of cracking of a site through vulnerabilities. The malefactor can execute the code and get access to a hosting where the site is located, having sent definitely prepared request for the server. This class includes the following attacks: buffer overflow, formatting of a line, integer overflow, mail implementation, implementation of SQL, implementation of XML, implementation of XQuery and others.

Attacks of this class are correctly locked only at the level of WAF (Web Application Firewall) or data filtering in the web application.

Information disclosure. Attacks of this group aren't explicit threat for the site. But they can be used for carrying out other types of attacks. The following types belong to this group: fingerprints and bypass of directories.

The correct setup of a server surrounding will allow to be protected from such attacks completely. It is also necessary to pay attention to pages of errors of the web application and operation with file system.

Logical attacks. The attacks which entity consists in limitation of server resources belong to this group. For example, a failure in service, abuse of SOAP, overflowing of the XML attributes and extension of XML entities.

Protection against them only at the level of web applications, or lock of suspicious requests (network equipment or a web proxy).

DDoS attacks. The concept DDoS attacks is an exhaustion of resources of the server by different methods. Methods of detection of DDoS attacks are based on qualitative and quantitative analysis of traffic.

In conclusion it is necessary to underline that main types of network vulnerabilities are considered in this article. Measures for their eliminations are presented as well. The offered material will be useful for developers of sites and web applications.

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The smart house

Modern people use many devices, which simplify vital processes, do them more comfortable and save time. For example, the mobile phone, helps people to be always in touch, a cooler for water provides us with a hot and cold water and so on. People are going to automate everything, including the house. The house is a complex a set of devices which is necessary to control: gas equipment, electric equipment, water supply. The house needs to be protected and security system helps us with it.

The house is a vacation place full of all possible conveniences and therefore right now the control system of the dwelling (Smart house) will be interesting to modern people.

Today there is a large number of control systems of the house including security systems or control systems of light, multimedia etc.

However there is no system possessing all functions. Besides, similar systems are very expansive and in many cases their cost is measured by hundred thousands of rubles. In the European countries the system of automation of building was known long ago; it is not the innovation, today such technologies actively are developed in our country too. People show the increasing interest to improvement of conditions of accommodation. Today people are short of time and it seems irrational to spend life monotonous routine operations. About 2 hours a day people spend on performance of everyday household operations, such as making a bed, cooking, clearing a flat and so on. The system of the house automation will allow to save this time. Leading suppliers of information system and equipment for automation of the house are AMX, C-Bus, Comfort, CommandFusion and others. Now leading producers of electronics, such as, Microsoft, Nokia, Samsung, Toshiba and others only enter the market of the house automation. Generally all these companies are foreign ones and there aren't any domestic-owned firms at present which are engaged not simply in installation, but also production of operating modules and the software for such system. The foreign equipment is rather costly and not everyone can buy it. As for, cheaper components, it, as a rule, means poor functionality. Today you can hardly meet both inexpensive and dependable control systems for the house. Existing decisions allow to establish only part of demanded functionality therefore all components of the house can't be united in uniform system.

Besides, the smart house system can be used for production processes monitoring; it will allow to automate routine operations, such as turning on the light and equipment shutdown, monitoring of the operation process, etc. It will allow to increase productivity and efficiency of the decisions made, to raise the quality of goods.

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Crypto-anarchism and anonymity in the Internet

Philosophy of Crypto-anarchism was created in light of recent trends to tighten state control of cyberspace. Crypto-anarchism is used to save a guaranteed privacy. Now there are several tools to promote Crypto-anarchism. These funds also provide anonymity in the Internet.

The main concept of Crypto-anarchism is:

— protection of privacy from the state;	
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- use of encryption algorithms, which are beyond the state;
- fighting against censorship in the web;
- anonymous communication;

Crypto-anarchists exist in the normal Internet. For example, many large Internet resources have registered the user with login, which is cypherpunks01, and with password, which is cypherpunks01. This account is intended either for general use or for a single-use access to a resource.

The main objective of Crypto-anarchists is building an independent and uncontrolled communication structure. To implement this objective, Crypto-anarchists use several tools.

First tool is I2P. This is an anonymous, decentralized and overlay network, based on users' computers. This network of VPN-tunnels is existing over a common Internet. Six different algorithms encrypt traffic within the network. It ensures a high level of anonymity and security. I2P provides the users with a variety of resources, such as forums, chats, and anonymous trading platforms, as well as supports network file sharing, but at a low rate.

In addition, there are other hidden networks. They differ from each other in implementation of encryption methods, but the meaning remains the same. These are secrecy and anonymity. Here is a list of some of these networks: TOR, Perfect Dark, Freenet, Bitmessage and others.

Second tool is bitcoin. Crypto-currency that has very disputed status in the world. Some countries have officially recognized it, while the other countries have equated its using to terrorism. Designed to make anonymous purchases over the Internet, in anonymous networks it is the main crypto-currency, has no specific issuer, but has a high purchasing power. Some of the countries, such as Germany, Croatia, the USA, have recognized the bitcoin as means of payment. In other countries, such as China, Thailand, Russia, operations with crypto-currency are considered as terrorism. Current exchange rate of the dollar to Bitcoin is 1 to 600.

Third tool is software encryption of all data on your hard disk. It provides application of TrueCript, an open-source, which provides strong encryption of user data and hiding it from prying without entering a special password, which is known only to the owner of the computer. Without the password, the data is simply a collection of bytes, useless for those to whom it may potentially be interested.

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Google Glass

Google Glass is a mini-computer, mounted on the frame behind the user's glasses, that allows him to wear it on head.

Task of the project is to create a companion for the user who will be constantly with him, making it easier to process life. For example, such an assistant can remind you of unfinished business, turn on the light in the garage when you arrived home and open the door.

Design Build Quality. The main part of the device is the computer itself, directly mounted on the arc, made of titanium.

Glasses are very light and do not fall down. At the same time, they are very comfortable and no heavier than normal glasses. All this is thanks to the choice of titanium as the material for the glasses frame.

The standard set of the device includes: spare nose pads, micro USB cable, manual, power supply and wear glasses (transparent and sunglasses).

Interface. Glass interface does not have a huge number of functions. Easy access to installed applications, photos, videos, settings is provided. Some applications of social networking are displayed on the screen. In general, all functions of the device are easy to perform.

The device is operated by means of the touchpad. For example, to switch between the menu items, arranged in sequential order, it is sufficient to slide on the touchpad forward or backward.

Start Google Glass. First, you should put sunglasses on the head and turn them.

Now you can start using the device and you can choose one of the options using the touchpad or voice commands.

To do this you are to say the phrase «Ok, Glass» and display a list of available commands.

To start the search, you give the voice command, and then utter a search term. For maximum efficiency the phrases are to be expressed very clearly in English.

Video recording time is limited to 10 seconds, but after clicking on the touchpad, you can select «Continue», then the restriction disappears.

Google Glass is a novelty which will make the world better and raise our life standards to new level.