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INTERNET - FROM ARPANET TO THREE BILLION USERS

Mini review

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ABSTRACT
The Internet has moved all the boundaries or rather erased, and made the most important step in the process of globalization. Today, computer, the Internet and mobile phone component, almost inseparable part of modern man in the workplace and in private. From propagating through the network to book airline tickets, hotel reservations, scheduling urgent to any adjustment of hairstyles - all is possible through the Internet, and now use your mobile phone. We tried to focus on the development of the Internet consider how these innovations gradually occupy their place in business systems and our lives.

Keywords: Internet, Arpanet, protocol, computer.

Foreword
Experts in marketing, are still at an early stage of development of the Internet recognized the possibilities of networked computers, and quickly, online business becomes the standard model of doing business. The Internet has made revolutionary change their advertising opportunities in communication. Simply put, the company never had the possibility of such rapid and direct communication with customers, advertise their products or services and monitor user behavior. The Internet has erased geographic boundaries, time differences, and made the first big step in a process that is now known as globalization. The development of mobile telephony provides additional impetus, small pocket devices have the possibility of great personal computers, and it always handy.

It is calculated that in the world today there are nearly three billion computers connected to the Internet, while the number of mobile phones in 2016, most likely exceed the number of inhabitants of the planet.

Arpanet
At an early stage in the development of computers and industrial computer applications, there is a great advantage of connecting and networking of these machines. At the height of the Cold War, started operating a computer system ARPA /Advanced Research Project Agency/. Designed as a computer version of the fallout shelter system protected the flow of information between military installations by building an information network using a newly developed protocol - a way of networking and interacting computers called NCP - Computer Network Protocol. Former Director ARPAnet Charles M. Herzfeld persistently denies this conception of a global network, claiming that the network originally formed, not by military necessity, but as a requirement of a certain number of powerful geographically distant research computers, to connect to a system that will allow

faster and more facilitate the exchange of information. The first data exchange took place between computers at UCLA - University of California, Los Angeles, and the Stanford Research Institute. Try to not much success in fact, the first step in accessing the network, typing login, the system UCLA SDS Sigma 7 computer fell apart with the letter g. An hour later, after reinstalling, professor Leonard Kleinrock and his team were able to send a message using the IMP Protocol - Internet Message Processor. It was the 29th of October 1969, and the rest is recorded as the first message is sent from one computer to another. **(1)**

Indeed, there was another attempt, and success conducted a few years earlier. Leonard Kleinrock is still July 1964 published a paper that explains the possibilities of transfer messages between remote computers. Kleinrock convinced Roberts G. Lawrence of researchers from MIT /Masachusetts Institute of Technology/ it is theoretically possible to make a connection between the remote computer, which was a crucial step in the development of computer networks. To examine the theory, Roberts in 1965, in collaboration with Thomas Merrill connect TX - 2 computer in Massachusetts with Q - 2 computers in California. The connection went slow dial-up telephone line, and thus achieved the first computer connection ever been worked. **(2)**

It should be noted that it was a slow connection, without any protocol, so there was no possibility of additional involvement in the relationship, but it is of great importance as evidence of the correctness of the theory, which is by Kleinrock.

By the end of 1969, using IMP four networked computers. Based on the network consisted of computers; UCLA Honeywell DDO 516 Computer, Stanford Research Institute with SDS - 940 Computer, UC Santa Barbara equipped IBM 360/75 and the Univerity of Utah with its DCC PDP - 10 As the network grew and expanded compatibility problem with the networking of different types of computers. The problem was solved by setting a better protocol, TCP/IP, Transmision Central Protocol/Internet Protocol, designed in 1982.

Rapidly expanding the network, and through the next two years, they worked on completing and bringing the functionality of the Host-to-Host protocol and other network software. In December 1970, Network Working Group, which ARPANET Host-to-Host protocol, called the Network Control Protocol - NCP. Thus, the ARPANET site completed a full implementation of NCP during 1971-72. year. network users could finally begin its implementation. In October 1972, Robert E. Kahn organized a large, very successful demonstration of the ARPANET network, during ICCC - International Computer Communication Conference. This was the first public demonstration of new network technologies. The World in the same year introduced the E-mail application - e-mail, and it was the beginning of a new kind of activity that we see today through the World Wide Web, the fastest growing of all forms of electronic people-to-people traffic. **(3)**

(1) Mark Prig, ***The room where the internet was born: UCLA opens up the office where the first message was sent - and reveal it crashed after sending just TWO letters***, http://www.dailymail.co.uk/sciencetech/article-2575070/The-room-internet-born-UCLA-opens-office-message-sent-from.html Retrieved, Aug.11, 2014.

(2) Barry M. Leiner, Vinton G. Cerf, David D. Clark, Robert E. Kahn, Leonard Kleinrock, Daniel C. Lynch, John Postel, Larry G. Roberts, Stephen Wolf, ***Brief History of Internet*** Retrieved, Aug. 11, 2014. http://www.internetsociety.org/internet/what-internet/history-internet/brief-history-internet

(3) Barry M. Leiner, Vinton G. Cerf, David D. Clark, Robert E. Kahn, Leonard Kleinrock, Daniel C. Lynch, John Postel, Larry G. Roberts, Stephen Wolf, ***Brief History of Internet*** Retrieved, Aug. 11, 2014. http://www.internetsociety.org/internet/what-internet/history-internet/brief-history-internet

The idea was conceived back in July 1945 when Vannevar Bush, in his essay ***As We May Think***, published in The Monthly Atlantic visionary Memex device introduced, through which individuals will be able to store data, whole books, videos and movies, but also to achieve mutual communication, and it will all be stored in one's memory. **(4)**

The paper is a shortened version of this was published in September of the same year after the United States dropped an atomic bomb on Japan. Bush has expressed concern in relation to the direction of science, directed towards the destruction, not to understand. He expressed a desire for some kind of machine - the collective memory, and the concept of Memex machine, which will allow better access to knowledge, he believed that such a device has helped in solving the problem. Through this machine, he hoped Bush would allow the transformation of the information explosion in the explosion of knowledge. **(5)**

Actually essay As We May Think, prophetically predicted a number of new technologies, was found after the release, including hypertext, personal computers, the Internet, World Wide Web, on-line encyclopedia. Sam Bush says: "Many of the new forms of encyclopedias will appear, ready to enter the social network of Memex and to reinforce it." **(6)** n May 1974, IEEE - Institute of Electrical and Electronic Engineers, published a paper entitled: A Protocol for Packet Network Interconnection, copyright pairs Vinton Cerf and Robert Kahn that describes a protocol called TCP, which involves the simultaneous connection and access to the database. Au-

thors soon became clear that the design must be divided into two separate protocols. Session management is not easy. In practice, the application is sometimes able to work more efficiently or to be easier to implement when the network management either through the automatic connection. TCP becomes the Internet protocol, in support of the database as the Central Transmission Protocol - TCP / IP. [7]

It is important to understand that before using the TCP / IP protocol, a very small number of computers at all could be connected to the network. NPC protocol could facilitate the work of the network only for certain types of computers. What to ask himself-in mean? That's the situation, as if someone is still logged in to the global network, and can communicate only with computers type Apple or Sony! It was the primary problem ARPANET network in the early seventies. The new protocol, TCP / IP network gave univezalnost. Unlimited expanded network capabilities, not only in the variety of types of computers, but also their number. The creators of the new protocols were dreamers, lovers of electronics and visionaries who are at the time realized the potential and importance of the global network. Another important element in the development of the Internet is launching a satellite SATNET, allowing the abandonment of fixed lines, the transition to the use of satellite radios for data transmission. ARPANET goes beyond America, as the first satellite link connected the United States and Europe, as the network for the first time gave an international dimension. [8]

(4) Manovich Lev, ***As We May Think*, *The New Media Reader***, The MIT Press, 2003. str. 35.
(5) Wardrip-Fruin Noah and Nick Montfort, ***The New Media Reader*** Cambridge:The MIT Press, 2003. str. 3-5
(6) Bush Vannevar, ***As We May Think***, *The Atlantic*, July 1945.
(7) Bradley Mitchell, ***Inventors of the Internet Protocol***, Retrieved, Aug. 12, 2014.
(8) ***History of the Internet***, http://www.historyofthings.com/history-of-the-internet Retrieved,Aug. 14, 2014.

It would be incorrect in this review of the development of the Internet to bypass a man named Raymond Ray Tomlison, makers of e-mail communications. Tomlison was in 1972 laid the foundation for reading and sending e-mails via the ARPANET network. Although the basic variant was quite unfit for use, later e-mail perfected, so that is one of most using forms of communication. Ray Tomlison chose the famous @ sign in the creation of email address, the user name to connect to the destination address. He also co-wrote the first standard format for Internet email messages / RFC - 561 /. [9]

While the ARPANET and SATNET wider connectivity of computers on the network was pretty chaotic and disorganized. This led to the creation of an Ethernet cable. This connection is used today, actually still a large number of computers still used landline and modem connection device via ISP - Internet Service Provider. In addition to the ETHERNET developed another great innovation was to UUCP - Unix to Unix Copy. The man who developed this innovation was Steve Bellovin. It was a protocol developed for computers that use the Unix platform. At that time there was no Windows, as a synonym of a single platform, we already know about the issue discussed, but there have been numerous systems - often mutually incompatible. UUCP over time evolved, and today is known as USNET, networking groups, through which millions of people share information, news, files and e-mail messages using the Internet. [10]

The eighties of last century drastically changing computer network. Numerous technical innovations allow computer hardware to be smaller, faster and significantly cheaper. The computer, once the privilege of the powerful corporations, it becomes cost effective for home use, and for a dozen years, at the end of 1989, the network consists of more than 200 000 connected computers. In addition to the ARPANET, forms and other networking groups, and the National Science Foundation designs network called CSNET - Computer Science Network, specially created for scientific research. This network has enabled easier and faster communication between research institutions that are able to connect to both networks, but also to establish communication between networks. Soon, Paul Mockapetris and Jon Postel created DNS - Domain Name System, an innovation that is backing up an easier connection to the network. Prior to the implementation of DNS, it was necessary to enter complicated codes, bulky composed of numbers, not just heavy for storage, but it also took quite some time to dock cheats, introduce systems to recognize and realize connections. [11]

In addition, from January 01, 1983 all computers users ARPANET and CSNET network, they stopped using the NCP protocol, moved into a TCP / IP connection. Beginning of the nineties was marked by intensive expansion of the Internet. Number of networked computers exceeds 300,000 units, so that this segment of the electronics obeyed Moore's Law - Moore's Law. Almost incredible that Gordon Moore, co-founder of Intel Corporation, in 1965 correctly predicted the trends of development of semiconductor technology. Even then, he said that every 12 months the process will be twice as fast and the price will drop by half.

(9) ***Raymond Tomilson***, http://www.internethalloffame.org/inductees/raymond-tomlinson Ret. Aug.14, 2014.
(10) ***History of Internet***, http://www.historyofthings.com/history-of-the-internet Ret. Aug.14, 2014.

(11) Paul Mockapetris, ***Domain Names - Concepts and Facilities***, The Internet Society, November 1987.
It is also very accurately predicted the development of the capacity of memory, digital cameras, image quality is expressed in pixels and so on. **(12)**

Mosaic

The Internet is the new T - 3 line, with the then whopping 45Mb / sec, much faster than its predecessor T - 1 line with only 1.5 Mb / sec. Network group CSNET is off, and instead creates a new named SERN - National Research and Education Network. The segment is completed the Internet and probably the most important innovation in the development of a global network to develop WWW -World Wide Web platform. The web has made access to information much easier, using hypertext links in fact, pieces of code that connect one site to the other. WWW was created in 1989 by Sir Tim Berners-Lee, Sir Sam Walker and Robert Caillau working for CERN - European Organization for Nuclear Research, have developed a platform to proceed to the data, and the public is familiar with this achievement August 06 1991 and that is the date that marked the boom of the Internet as we known. Web browser, soon widely accepted, mainly as a complication relieved that others have hypertext links, could directly be linked, and the other was free - there was no need for licensing or other restrictions. No less important - he could have used the existing hardware. **(13)**

In 1993, he realized the top MOSAIC, a revolutionary way to access information and data on the Web site. It was a very easy way to search Web pages created by the NCSA. Using this search engine can immediately see the Web page, including the various steps in the data or the media. Previously, access to information, a through every step had to open a new file or window. As Mosaic grew in popularity, slowly grew into a project called NETSCAPE browser. The leader of the project was Marc Anderson, and today it is clear that this approach is search the internet, actually beginning Dot.com boom that followed, and forever changed the global network. While Mozaic and Netscape dominated the mid-nineties, the more the user entered the homes of Microsoft WINDOWS software. Microsoft has been extremely effective in promoting of his own IE - Internet Explorer browsers, in particular the development of Windows 98 at the time NETSCAPE covers about 85% of the global network, but for a few years, falling to 1% and then just shut down, while Internet Explorer remains the dominant global net the search engines. **(14)**

Dot. com revolution

Enabled simple and easy access to web pages, but other components of the navigation to move through the web, they are necessary. Amount of data on the network grew is fascinating, and it was harder and slower search so bulky files. What was needed, they were directories, to facilitate and simplify access to information. The problem of fast and easy search quality is decided browser Yahoo - Yet Another Hierarchical officious Oracle.

(12) Moore Gordon, ***Cramming More Components onto Integrated Circuits***,
Electronics Magazine, April 19. 1965. Vol. 38, No. 8
(13) Tim Berners-Lee, ***The World Wide Web Browser***, Retrieved, Aug.17, 2014.
http://www.w3.org/People/Berners-Lee/WorldWideWeb.html
(14)***History of Internet***, http://www.historyofthings.com/history-of-the-internet Retrieved, Aug. 18, 2014

This search was launched at Stanford University, January 1994. Jerry Yang and David Filo created a new approach to search files and named your browser Jerry and David's Guide to the World Wide Web. It was actually a directory for other website pages, which can organize the info in the hierarchy of data, as opposed to prior art indexing the pages. In April of the same year, the authors of its instructions renamed in Yahoo. Yahoo.com domain designed on the 18th of January in 1995, and it's beginning mentioned Dot.com boom of the information revolution. **(15)**

Like the Yahoo search engine, another great creation developed at the university - the Google search engine, in order to effectively search the web content. Developed an algorithm based on-relevant and important parts of the content, which will lead to the correct page - the requested content / Page Rank /. So, the design of the algorithm is based on non relevance of the content, designed to more web pages are ranked by the search criteria, and the importance and the amount of content they offer, which is correlated with a topic that is being sought. Google is becoming very popular search engine, which made one of Google.com najprofitabilnih company in the history of the world!

Clearly, the Internet certainly has forever changed the way access, exchange of information and on-line services. In today's world there are nearly three billion users of the global network, which is daily expanding rapidly!

REFERENCES

(1) Mark Prig, ***The room where the internet was born: UCLA opens up the office where the first message was sent - and reveal it crashed after sending just TWO letters***, http://www.dailymail.co.uk/sciencetech/article-2575070/The-room-internet-born-UCLA-opens-office-message-sent-from.html

(2) Barry M. Leiner, Vinton G. Cerf, David D. Clark, Robert E. Kahn, Leonard Kleinrock, Daniel C. Lynch, John Postel, Larry G. Roberts, Stephen Wolf, ***Brief History of Internet*** http://www.internetsociety.org/internet/what-internet/history-internet/brief-history-internet

(3) Barry M. Leiner, Vinton G. Cerf, David D. Clark, Robert E. Kahn, Leonard Kleinrock, Daniel C. Lynch, John Postel, Larry G. Roberts, Stephen Wolf, ***Brief History of Internet*** http://www.internetsociety.org/internet/what-internet/history-internet/brief-history-internet

(4) Manovich Lev, ***As We May Think*, *The New Media Reader***, The MIT Press, 2003. str. 35.

(5) Wardrip-Fruin Noah and Nick Montfort, ***The New Media Reader*** Cambridge:The MIT Press, 2003. str. 3-5

(6) Bush Vannevar, ***As We May Think***, *The Atlantic*, July 1945.

(7) Bradley Mitchell, ***Inventors of the Internet Protocol***, http://compnetworking.about.com/od/networkprotocolsip/l/bl_ipinvent.htm

(8) ***History of the Internet***, http://www.historyofthings.com/history-of-the-internet

(9) ***Raymond Tomilson***, http://www.internethalloffame.org/inductees/raymond-tomlinson

(10) ***History of Internet***, http://www.historyofthings.com/history-of-the-internet

(11) Paul Mockapetris, ***Domain Names - Concepts and Facilities***, The Internet Society, November 1987.

(12) Moore Gordon, ***Cramming More Components onto Integrated Circuits***, Electronics Magazine, April 19. 1965. Vol. 38, No. 8

(13) Tim Berners-Lee, ***The World Wide Web Browser***, http://www.w3.org/People/Berners-Lee/WorldWideWeb.html

(14) ***History of Internet***, http://www.historyofthings.com/history-of-the-internet

(15) David G. Thomson, ***Blueprint to a Billion***. John Wiley & Sons, Inc. Hoboken, New Jersey, 2006. str. 155

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