

Formation of Global Village: Evolution of Digital Media - A Historical Perspective

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ABSTRACT

Current research work deals with evaluation, development and historical perspectives of digital media. Aim of the study was to explore the historical background of the evolution and development of digital media. Digital media is foundation of global media. Using the archival methodology, data was collected from various books, research journals online achieve to explore the origin and development of digital media. The study found that since the birth of digital media in 1940s, and rapidly invention of technological devices enforces digital media to improve to make journey parallel. Passing from different phases, digital media gave birth to social media in the dawn of 21st century. Today digital media has captured almost all the lives of humanity. So current research study expresses all dramatic phases that lead digital media from single device media to network connected global media.

Keywords: Digital Media, History, Origin, Development, 21st Century.

Evolution and Development of Digital Media

Defining Digital Media

Digital media includes software and other form of software such as images, videos, games, web pages usually called web sites that include social media, databases, e-books, audio etc. In present days digital media contrasts with traditional media such as print media, printed books, magazines and images etc. Digital media is mixture of software and digital devices that provides any kind of information and facilitates to make traditional form of work that includes publishing, education, commerce, politics, journalism and entertainment. Digital media has posed new challenges by promoting open content movement in which contents may be created, modified and destroyed according to the mood of users. It is estimated that till 1986 there was less than 1% digital media storage capacity in the world that progressed rapidly that in 2007 it was almost 94%. It was assumed that in 2002, people prefer more digital storage than analog media (Hilbert, 2011)

Digital media refer to use of computer technology that combines with different forms of media. This term sometimes used with multimedia more closely to electronic media that work with digital code known machine code or binary code rather than analog signals. Digital media use digital codes to create digital contents, audio, video, text and graphics. Digital media work with discrete values rather than continuous signals (Lee, 2018).

Digital media refer to the media programmed in machine readable format. Digital media can be preserved on digital device and can be created, viewed, customized and distributed. Other Medias like print and traditional media is frequently contrasted with digital media in present days. Focus of digital contents is short and quick consume. Digital media based on computer based digital devices and work with combination of hardware and software. There are glut of formats in which digital media is produced,

ranging from web, news, short films, gaming and social interaction. Over the last decade, TV is also shifted to smaller screen (smart phones) for pleased utilization by viewers. The trend of watching TV with family is changing as each member consumes contents on their personal gadget according to their own interest, will and time. This change of shifting contents in digital arena has increased content consumption as well as type of content consumed (Briggs & Burke, 2009).

Historical research about digital media goes back in the late 1940s. The first invented computer was based on vacuum tube and magnetic drums technology. It was the time when era of digital computer started (Clavert & Noret, 2009).

Origin of Digital Media

Digital media came into survival with the invention of digital computer (Lee, 2018). Digital media cannot keep its identification without hardware devices. Digital computers are hardware that uses binary code and Boolean logic to store and process the data to make information. Digital computer is a device that is designed to perform different tasks. The first digital computer was designed in 1942 and fully programmable digital computer was “Manchester Mark 1” and “EDSAC” that was invented in 1948 and 1949 (Copland et al., 1999). These computers were based on software to perform logical operations. They were binary encoded (0 and 1) that are also called binary digits. These binary digits are foundation of digital media.

Defining Network

Network is connection of two or more computer devices that connected together to share information and resources. Network can be made physically or logically. Physically network established by using wires whereas logical network is wireless network that uses radio signal through air waves to transmit data and information. Computer network architecture is designs plan that how components parts work together. It identifies how the program or system is built and how its elements fit together and protocols used for communication and cooperation among modules of system. Network architecture defines function of data formats and procedures used for data communication among nodes. It combines standards and protocols to provide desire functioning network. (Durr et.al., 1989).

Computer network is set of connected computers called nodes through cable usually sued Ethernet cable, coaxial cable or fibber optic or wireless connection through radio waves. Connected nodes share information and resources access to internet, hardware resources like CR-ROM, printer etc. Network is multipurpose connections that allow single computer do more rather than single computer (Study, 2018).

Communication Network Standards

Communication can be successful only when both sender and receiver have equal power. If sender is powerful and receiver is poor then there is chance of data loss. So, to overcome this problem the concept of standard took birth. Standards are rules that must be adopted everywhere so that communication could be successful and errors free (Forouzan, 2007). Every communication network requires standards.

Standards are essential for communication over network. Standard enable equipment's of various vendors' different operating capabilities to become components of same network. Due to standards different networks geographically away enables to communicate with each other's. Standard enable users to access variety of network and services using same device (Hekmat, 2005). Structure of hardware and software of communication system has become similar due communication standards and trouble-free communication among users has become possible (Samson, 2018).

Different vendors design different products that may use for communication. It is important for products developed by different vendors able to communicate with each other's. Standards provide vendors a measure to follow in order to ensure compatibility between products in multi-vendor network. As a result, these standards provide equal opportunity to all manufacturers to produce compatible and complementary equipment's to reduce the possibility of monopoly of few industries. Every organization produces

compatible equipment where standard exists, emphasize quality and value-added services rather than particular protocol difference. This leads to competition and lower price of product for consumers (Madron, 1990).

Adaptation of standards resulted economic self-interest. Users want more independence rather than specific vendors and government may encourage standards for cheaper solution and increase efficiency. These standards adopted only when there are sufficient economic incentives (Miller, 1991).

Luckily, organizations have been set to help create standards protocols for network devices to ensure communication between them even users are using products of different vendors. Most popular organizations that set standards for communication are “*International Standard Organization (ISO)*” and “*Institute of Electrical and Electronic Engineers (IEEE)*”. ISO created standards for network equipment’s. This organization created model for data communication. This model was designed with the goal to able different vendors to confirm this model to become able to conned and share information (Durr et.al., 1989).

Start of Network

The start of network goes back to second cold war in 1960s. The world’s first network consisted on four computers was made by America for military purpose to keep in touch with their widely spread army to know the conditions of enemies military movements. USSR started space race and launched sputnik satellite in 1957 that warn United States to boost scientific research. American military department Advance Research Project Agency (ARPA) later named Defence Advance Research Project Agency (DARPA) established computer network consisted on four computers. It was totally military network aimed to keep in touch with widely spread army (Grovmov, 2018). In 1969, Advance Research Project Agency, American defence organization designed network project to make able computers to talk with each other over distance of national defence computer network. Actually, it was the beginning of internet (Screen, 2011).

LAN, MAN, WAN

Local Area Network (LAN) is network that is designed to meet the requirements of automating short distance communication at high speeds of operations and comparatively low fault rates. It is meticulous form of data communication that optimizes hardware and software to support sharing of information and devices (Espiritue, 1991). Interconnected computers within limited geographical area such as home, school, college or business organization is called local area network (Gray, 2007). LAN is simply interconnection of computers within single organization at single site (Franklin, 2010).

Computer network consist on number of computers linked together via server or directly to share information. Local Area Network (LAN) commonly used in business, laboratories, education institutes or even in homes for sharing of information among users (Braine, Yorozu, 1998).

Expansion of local area network goes back to 1980s when various institutes adopted IP protocols and joined with each other’s. Thus, they were able to communicate with each other’s. In this way, significantly creation of network of networks received the name internet.

The aim of intention of NSFnet was to prolong education and research in US institutes. The policy of NSFnet was to use network for limited purposes and some activities were banned on the portion of network. Banned activities where network could not be used for revenue deeds unless fulfil the general principles or particularly adequate use and general use for personal or private business. Furthermore, behaviour to be avoided at that integrated; extreme ill-conceived use, excessive game playing, anti-social, harassing or hateful behaviour, intentionally interference and damaging others and accessing other’s private files (Krol, 1992). Network is name of expansion and never remain static that rapidly extending it region (Gregory, 1995).

Local area network is also presented as wireless local area network (WLAN). With the development of technology, the use of cables reduced as data communication at low distance made possible without using cables with the help of air waves signals usually called radio signals (Rappaport, 2002; Negus et al., 2000). Wireless technology provides capability to create network without wires (Zacharias, 2004). As the name shows wireless local area network, it provides all the benefits and features of traditional local area network without use of wires or cables (Cisco Systems, 2000). It is a data communication network, naturally packet communication network but on limited geographical area (Clark et al. 1978).

The combination of two or more local area network is called Metropolitan area network (MAN). MAN usually consists on a large city. As the name metropolitan shows, a city consisted on large population. MAN is a network longer than LAN but smaller than WAN (Sharma et al., 2004). It may also be called middle area network. After the successful experiment of LAN, the developer tried to connect multiple LAN's to share data and information among different branches of same organization geographically away or various organizations to share data to work in collaborative environment (Rigney et al., 1997; Goldsmith, 2004).

Wide Area Network (WAN) is communication two or more metropolitan area networks. Multiple LANs and MANs make WAN (Trepanier, 1995). This network usually referred as global area network as it cover large geographical area than LAN and MAN. Wide area network is called internet. With the development of technologies, network expand its growth even covered the entire world (Mogel, 1985; Lynch, 1993).

Start of Internet

The actual concept of development and start of internet relatively differ among different authors and historical data. But the concept of communication goes back to the development of digital devices in 1940s. Basically the concept of internet in the present age is the worldwide network of communication but the origin of network start from small level. The first on the record report of communication through networking was series of memos written by Licklider in August 1962. In this memo, he discussed the concept of "Galactic Network" (Licklider, 1962).

Another major step was to make computer able to talk with each other's. To explore this, practically, Thomas Merrill and Roberts connected computers at long distances with low speeddialup telephone connection. In fact, it was small but first Wide Area Network (WAN) ever built (Robert & Merrill, 1966). Roberts presented this concept of packet switching in conference where another paper was also presented by Donald Davies and Roger Scantlebury from UK on packet switching. The work of Dvaies and Scantlebury was as well as Paul Baran was proposed the concept of data communication at distance. A paper on packet switching network was also written by RAND group for source voice in military in 1964 (Baran, 1964). Simultaneously, MIT, RAND and NPL work parallel on packet switching network without knowing about others work.

Growth of Internet

Internet is assortment of communities and its achievement is greatly attributable to fulfilling community needs as well as engaging community in an efficient way to drive the infrastructure forward. It is recognized that in the late 1970s, expansion of internet was accompanied due to enlargement in size of paying attention research community and coordination among them. Vint Cerf of DARPA formed various coordination bodies to work together for expansion of internet and work on satellite communication including European countries. In 1983, it was recognized that continuous expansion of internet community demanded reformation of mechanisms to expend the network. Growth in demand of internet, upgrade standard process itself. Since 1980s to day today, internet grew further than it's mainly research roots to include widely spread user community and enlarged business-related activities (Leiner, 2009).

Increased concentration paid to make process open and fair. This renowned concept of join to internet is needed to support community needs and ultimately internet led to the formation of internet society in

1991. Communication with the use of optical fiber was initially developed for telephone system but experienced to connect computers through fiber technology caused primarily rapidly rising demand of internet connectivity in late 1990s. Since that time, internet has been rising at extraordinary rates.

Over next several years, his work from suggestion to verifiable prototype to fully fledged system was on its way. But the cover was finally blown off the comparatively satisfied growth of internet when in the mid-1990s; the World Wide Web (WWW) became available to millions of people round the globe.

It was Mosaic (a user-friendly web browser) recently name “Netscape” created in March 1994 by team members of university of Illinois with the leadership of Marc Andreessen. At the moment, all previous working style about proper use of internet reserve concerning its commercialisation become debatable issue because existing setups of governments and academics efforts were compressed by incoming rush of interest from every sector. Till November 2000, internet user calculations were reached to 407.1 million and from them 113.14 million were estimated from Europe. Apparently, usage and size figures increased quickly and internet offer users to visit more sites for latest data (Cerf, 1993).

World Wide Web (WWW)

The World Wide Web merely Web is worldwide information medium which allows users to read, write, upload and download using computers linked to internet. Sometimes the term web is used for internet itself but it is facility that operates over the internet just as shopping, email or online reservation etc. Web is global information system and history of internet goes back further than WWW (Berners, 2000).

The history of World Wide Web goes back to development of hypertext or computer aided reading of electronic documents and secondly development of internet protocols made possible of large global network (Cailliau, 1995). Hypertexts are linked pages to access information of different kinds of websites in which users can browse at their own will.

The first web page was uploaded on December 25, 1990. It was the start of World Wide Web (Oxford, 2002). In early 1990s web is born and proved killer app for internet eventually break down the walls (Bratt, 2009). Recent development of worldwide consumption of World Wide Web has brought with it a new community (Gromov, 2013).

World Wide Web is faculty to publish or access data on widely connected computer like devices around the world. The concept of WWW was developed in 1989-90 (Andrew et al., 1996; Kappe, 1993; Fountain et al., 1990). The credit of development of World Wide Web goes to Tim Berners Lee and his team who were working in CERN laboratory, Switzerland (Andrew et al., 1996; Hall, 2011). World Wide Web is open hypermedia that allows using and process data by the system to other system without any limit and implies the opportunity to access them using any browser (Davis et al., 1992). To access any web page, browser is its entry point, so after the developments of web, several browsers were made that was free of charge, easy to use and have simple user interface (Ehmayer et al., 1997). In 1993, after Mosaic’s development, internet explorer and Netscape were developed to access web pages (Andrew et al, 1996; Berner-Lee et al., 1994)

Due to World Wide Web as open source, browsers are available that have ability to talk with servers and display all type of documents including text, graphics, audio and videos consisting on simple and easy interface to perform functions in different platforms. There were no entry barriers on Web as in other types of networks such as Hyper-G and Microcosm (Andrew et al., 1994; Ehmayer et al., 1997; Berner-Lee &Cailliau, 1992). Berners’s simple idea of 404 errors allowed web to grow by not having to ensure that each server has valid end point and allow others servers to participate and publish data more freely (Davis, 1999; Lawrence et al., 2001).

On the web people have freedom to upload whatever they want to see on web without any restriction or writing documents of best quality or scientific valuation of their work before publishing (Donato, 2005). Linked web pages takes very less amount of space due to best coding language. Hyperlinks are achievable

that help in resulting to know about how related documents are linked together which contribute to build a website (Carr et al., 1999; Gronback et al., 2000). From start to till now, web is free to access using browsing software that is also available free of charge. Due to free and wide level of access, web is more valuable among users and has caused increased in volume of data created in this network. As the popularity grow, more people started to contribute and take benefit of resources accessible on the web. For using web, user not requires to take training course or do much attempt in order to learn its basics (Berners-Lee, 1994; Bouvin, 1999).

Availability of browser allows people to view contents published on web. Browser is gateway to enter the web. Due to web and the use of browser, people have become able to access and become part of web in its growing. Not only this, but also interoperability of web contributed in its success by allowing client server talk with various platforms flawlessly. It is easier to access web page by naming its address rather than its location. Due to common addressing system, web structure has become stronger and more made public able to provide address of any web that he wishes to visit (Berners-Lee, 1994).

Current Scenario of Internet

In present day, internet is world's largest network through this facility billions of people are connected round the globe. Now, not only computers but also computer like devices is available in variety of shapes and connected with through internet. The facility of World Wide Web has made internet more fruitful due freedom of downloading and uploading data of user's interests (Safdar & Khan, 2018). Before 1990's internet was limited scope and was in the ownership of some dominant companies to get access limited data in limited way. But the development of WWW by Burners-Lee created revolution in networking by giving freedom to users to upload and download information from anywhere in the world.

Information technologies, internet and computers have extraordinarily influential tools. These tools have powerful potential both to benefit and harm societies that hug them. In beneficial, internet has been used improve business, education and create meeting places even participants are away from each other's. But in negatively, these technologies have also been produced new avenue for theft, fraud, distribution of pornography, hate speech and invasion of privacy (Toor, 2003; Shabir et al., 2015; Shabir et al., 2014).

In recent decade life without information communication technologies seems as profound and picturesque as an era before sliced bread. Now youth of today have instant access to human knowledge and information just through click of mouse or tough of finger. This facility sometimes, provides unparalleled opportunities for global connection, learning and innovation as never before. Along with threats, internet also best showed numerous benefits as it is potential for persistent and presenting new ideas but also unpredictable challenges for young people (Swanbrow, 2010; Rallings, 2015).

Now internet is huge collection of concepts that provide data and information from societies to individuals round the clock. From email to video conferencing, print media electronic media, advertising to e-commerce, and increasing friend's list from all over the world is facility provided by the internet. Here are some mostly use services among every age group of individuals.

Summery

Digital media is an ocean. It is everywhere and in any form. No matter it is cell phone or PC, digital media is present there. Now digital media is ocean which has no banks. Digital media is huge elephant that have ability to digest any kind of data upload on it. No matter uploaded data is in the form of text, graphics, audio or video, internet welcome it being part of worldwide information. Digital media could be further hieratically sub divided into various categories such as social media, online TV, online lectures, encyclopaedia, search engines, e-newspapers, shopping, business, e-commerce, video conferencing, online text, audio and video chatting, online books, email, newsgroups, advertisements, buying and selling goods, online reservation, data transfer, entertainment, education, religion, music, drama, movies, chatting, culture, politics, languages, fashion, dressing, personal look, ethically moral material etc. Simply

digital media is collection of all kind of information that can be accessed by one click and has made this world a global village is every kind of data is available to you just on one click.

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