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Emerging Internet Services Vis-à-Vis Development: A Theoretical Overview

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Abstract—

The Network of Networks i.e. the internet is now a leading global system. This is the interconnected systems and machines and consists of the millions of computers and similar devices, tools, and machines. Millions of computers normally connected in this system from the wider and diverse field which includes the private, public, academic, business and also governmental and healthcare segment. Initially, internet was mainly used for the communicating each and sharing of files, documents and for email. Gradually with the advancement of the internet service providers and healthy innovations, many new internet services have emerged. This is a conceptual paper which is talks about the internet; its foundation, its characteristics and mainly about the emerging services. Among these services, few important are VoIP, Internet TV, Internet Fax, Instant Messaging and so on.

Keywords—

Information Science, Internet, Computing, Informatics, Internet Services, Emerging Services, IT Management, Network of Networks, Online Systems, VoIP, Internet Fax, Instant Messaging.

Introduction—

The internet is an information resource and service system contents millions of documents, files, applications, email, telephony and so on. The beginning of the internet was by the project ARPANET in 1960's. This was governed and financed by the Government of United States (i.e. the US Federal Government). During the initial was the internet was mainly (ARPANET) used for the area of academic and military networks [01], [14]. The National Science Foundation Networks started more efforts for the improvement of the internet since 1980's. Thereafter the communication was started. In the late of 1980's several newer networking technology has been developed and thus internet services had emerged rapidly [02], [03], [15]. The commercialization of networks and also enterprises was the main pillar of the transition to the today's internet

system. Today many internet and network services have been developed and affecting around the world [04].

Objectives—

The core and main aim and objective of this conceptual paper is includes but not limited to as follows—

- To know about the internet and its basic foundation in a brief manner.
- To learn about the history and foundation of the internet and networking technology.
- To know about the internet services during the initial days and also its gradual development.
- To learn about the emerging services of the internet and web systems.
- To draw the information and documentation on latest internet and also their challenges and opportunities.
- To draw future potentialities of information infrastructure powered by the internet systems.

Internet: Fundamentals—

Internet is a connection of network of networks; which store and carry millions of files, documents in different formats. Internet initially used only for the private and personal purposes but gradually it has become an important tool on information sharing since 1990's. Many services and applications such as www, email, telephony, peer-to-peer networks for file sharing etc are possible with the introduction of internet systems [06], [07], [26].

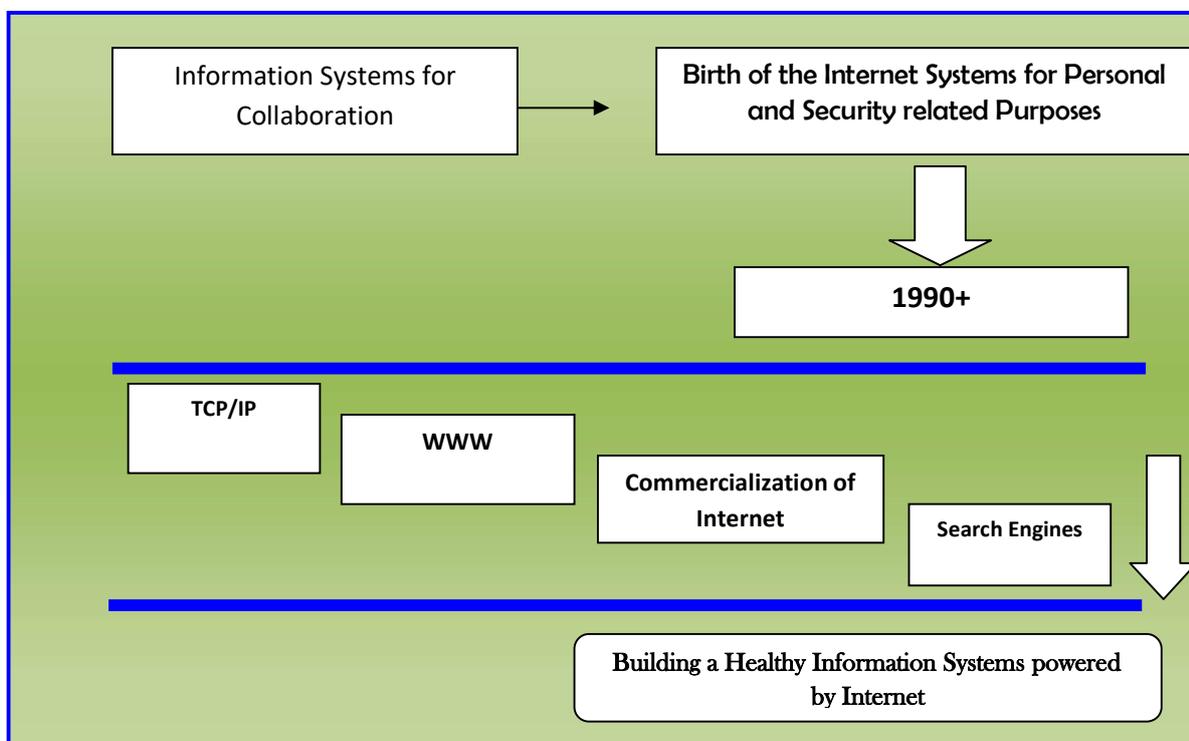


Fig: 1 Depicted the overall role of the Internet from its beginning.

During the late of 1990's internet become important systems for information solutions (*Several descriptions on Internet has been provided on Fig: 1*).

The collection and sharing of information mostly depend on internet. Instant messaging, internet forum, social networking, online banking and shopping today play an important and valuable role for complete and healthy internet services. Many organizations and associations such as INANN, IETF, RIR, ITIA play a great role for solid development of the internet and network systems; many ways [08], [09], [15], [24].

Basic Internet Services—

Initially the internet service was mainly offered with the services such as email, for sending letters, documents etc anywhere and anytime in the world. Participation in the offline discussion by the email and other news group and also by the conferencing in the real time mode by the internet video phone (popular one is Skype). Online chatting or relay chat (IRC) is also another important feature of the internet. Using computers from the remote place; it is most valuable and important task and services of the internet and this is called telnet [25]. Taking file from any computers from the remote place is also important and fall under the activities of the internet and here FTP play an important task. Use of search engine to get information is also most useful task of today's internet services. Moreover the internet banking, online banking, online shopping have increased recent time and growing rapidly [10], [11], [25]. The online education, e-governance are also most valuable name in today's internet and in all these areas internet is the key player and with the formats of text, graphics and sound etc depending upon need.

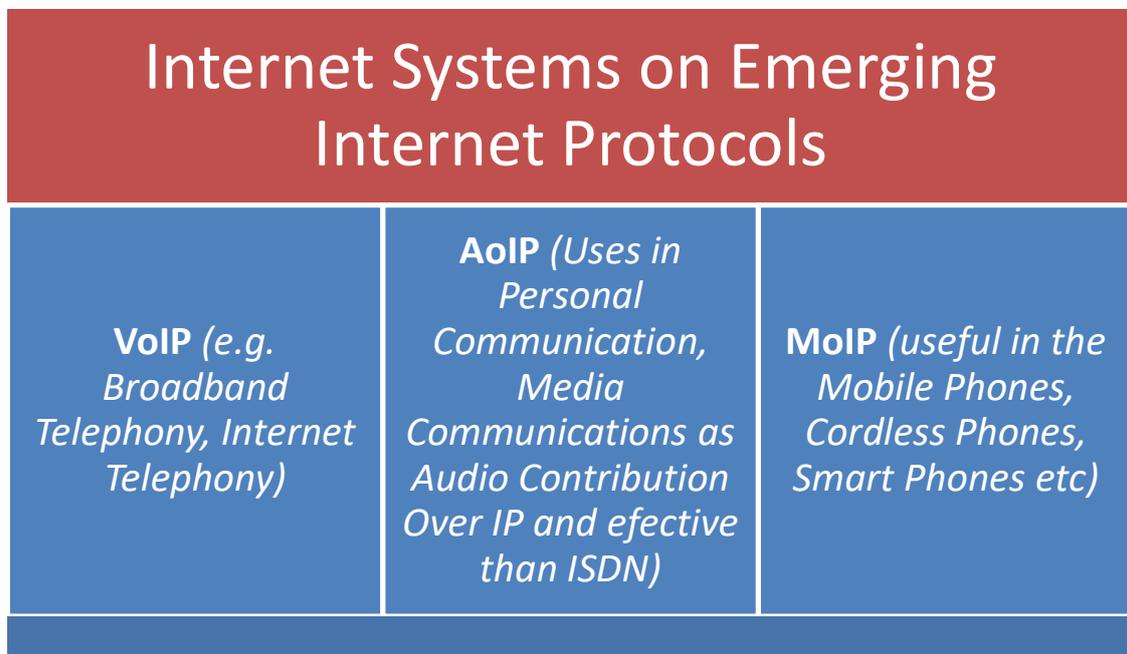


Fig: 2-Showing the Basic aspects of Emerging IP based Audio & Video Communications etc.

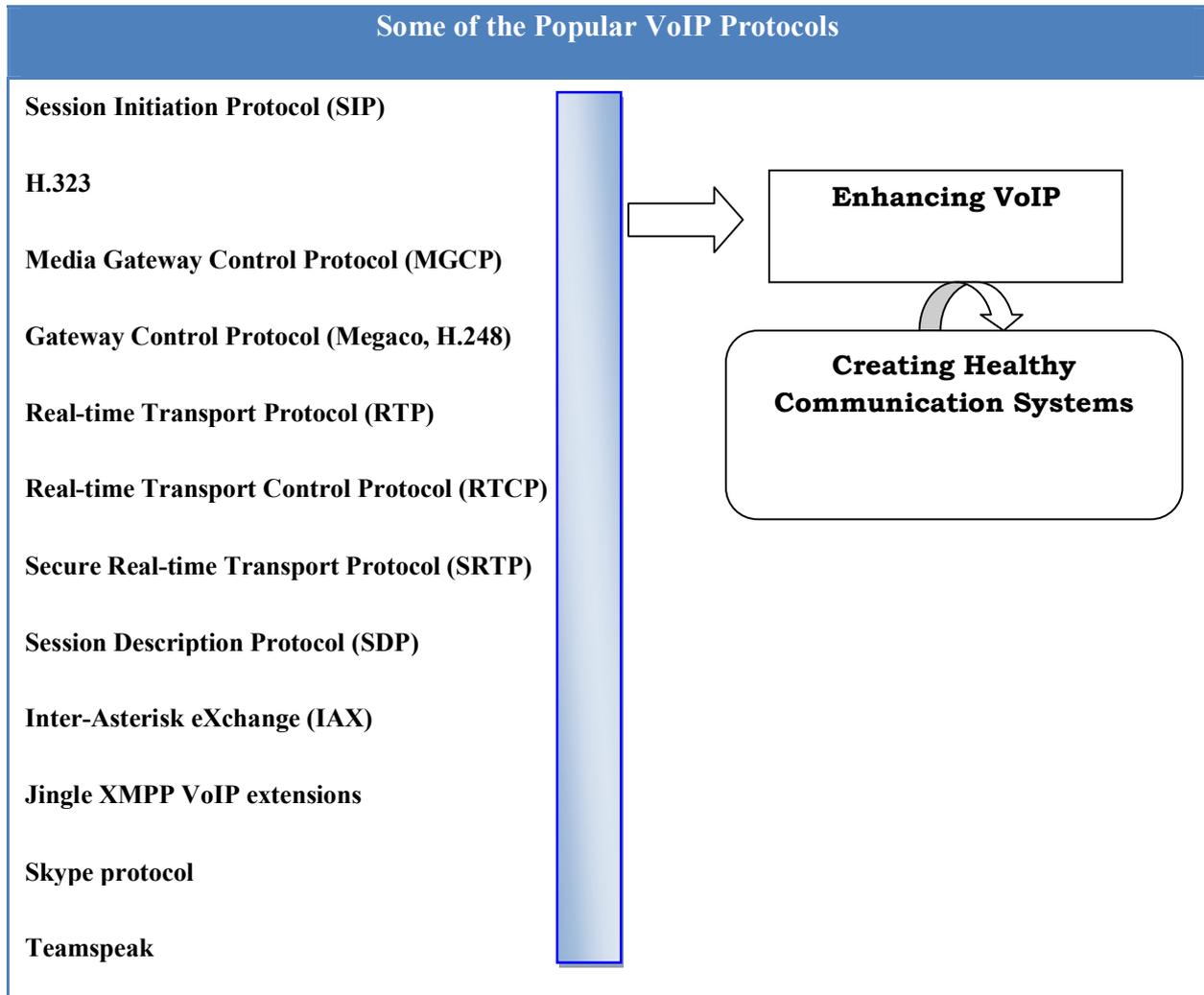
Emerging Services and Systems—

Today many new internet services have emerged and using rapidly by many people and organizations. Instant messaging, internet forum, online shopping, internet telephony, peer to peer are also rising in almost all the areas and sectors. The VoIP, AoIP, MoIP etc are also emerging rapidly [12], [13], [27]. Similarly, the video phone and similar services such as video chat, video call, picture phone, visiophone are also using rapidly (*See Fig: 2 for more clarifications*). After the emergence of video conferencing these are rapidly using in the business, government and also in the individual and personal use segment.

Internet Telephony Service Provider is a service of the modern digital communication service which is used the internet and various types of protocol such as session initiation protocol, media gateway protocol, H 323 protocol and so on. This is kind of VoIP. The internet telephony basically provided by the internet telephony service provider and here services are directly offered to the end users. The services started during the late of 1990's and in the US the services started in 1995 by the net2phone [15], [15], [20].

Audio over IP (AoIP) is a kind of distribution of the digital audio by the internet protocol network. This is used for long distance conversations and also called Audio contribution Over Protocol. Today many organizations have started the use of the technology, for example, the BBC, they are using this technology as a part of the Pacific quarry development in Glasgow. In India also in the commonwealth games, AoIP had used [27]. In Olympic Game, 2004 the same has also been used. This has transformed of using ISDN to other protocols such as TCP, UDP, RTP. The rapid growth of IPv6 now needs to shift for the IPv6 due to the requirement and future demand. Similar to the AoIP the Voice over Internet Protocol is also important and most valuable for video communications and also other multimedia sessions over the IP networks. Earlier the VoIP mainly used for the business models and technical solutions but the Skype was started as individual services too and offering mainly for free calls. The most emerging VoIP is the Google Talk based on the enhanced federated VoIP. The VoIP normally allow the dynamic connections between the users or two domains [17], [18], [27]. The VoIP normally carry the audio stream over IP Networks by the use of special media delivery as the voice codes, audio codes, video and audio codes and also the digital audio by the streaming media. Today smart phone, PC and other internet devices and many digital devices are using the VoIP systems by the appropriate apps. List of VoIP protocols have been shown in the Table: 1 (*as mentioned in the Wikipedia* [26]). Due to several reasons, the VoIP is using rapidly over the PSTN (Packet Switched Telephonic Network). The security matters of this technology are more or less same of this technology is more or less same like any other internet based systems.

Table: 1-Depicted the Major protocols related to the Voice Over Internet (VoIP).



In India, VoIP to VoIP based phone calls are allowed but VoIP to POTS or vice versa not allowed. From the last few years, the VoIP seekers and manufacturers have emerged [19], [28]. Mobile VoIP is another important valuable services and a kind of extension of mobility to a voice over IP. For short campus based communication and long or wide area communication. It allows the mobile users to use the VoIP on mobile handsets. Mobile VoIP ultimately helps the mobility, proper information and communication and indirectly helps in building smart and healthy digital economy. The newer protocols and standards are rising (and also improving) for the mobile VoIP.

The Internet based Fax, called Internet Fax or eFax or Online-Fax is also emerging tools and services of the internet and that is based on the internet protocols. This is different from the IP Fax [20], [21], [24]. It is easy to use and cost saving tool and may be used frequently without any telephone connections. The both sender and receiver need a proper and healthy internet fax systems. Here the hardcopy is normally formed into the TIFF or JPEG or PDF and then allowed with an email (with the formal of MIME) and data is sent by the TCP/IP to another internet fax.

Video Phone is another important emerging phone service which allows video calls, video chat and uses the VoIP. This is capable in communication between the receiver and sender with audio and video material. The video telegraphy was the first form of video phone and gradually other was emerged such as video conferencing, web cams, high definition tele-presence. Video Conferencing is the kind of visual collaboration and similar of groupware. In this system, some common devices are Video input, Audio-Input, data transfer and computer. Normally the video conferencing is done by the three popular methods—dedicated systems, desktop systems, WebRTC platforms [22], [23].

Similarly, the Video Telephony is also very much important and popular aspects in today's age. In this system, the audio-video signals basically transfer between the sender and receiver. The tele-presence becomes most important and valuable contribution. Mobile phones, computer webcams are common devices for Video Telephony. The social networks, social forums, online banking, online-shopping are also rising rapidly around the world.

Findings—

- Though the internet had developed in 1960's but become available in academic and research settings since 1980's.
- Internet become an individual device and system since the late 1990's when the www has been developed.
- Internet is the most important tool for online systems these days which include the online banking, online shopping.
- Internet TV, internet telephony, internet fax, internet connections have become most common.

Suggestion—

- Government needs proper steps and policy for the overall development of the internet systems.
- Digital divide and information divide are most important and vital uses and these can be solved in many contexts by the initiation of IT and internet spreading.
- Governmental and Private tie-up and collaborations are very much important and valuable for solid information infrastructure building powered by the internet.

Conclusions—

'Google' become synonymous with the internet. Today people are very much associated with the internet. The advancement of networking technologies have changed the entire world of the internet and today many new technologies keep the internet into a new height; these include the cloud computing, Internet of Things, Human Computer Interaction, Human Centered Computing etc. the emerging services and new offering no doubt would help of the rise of the internet and improving the digital economy in many context.

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