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Growth of Internet Users with Special Emphasis on the Impact of New Coronary Pneumonia

Jean Baptiste Hategekimana

Librarian, K N College, Berhampore, Murshidabad
hategekimana24@gmail.com

Abstract: ***In the atmosphere of COVID-19 pandemic, life has drastically changed. Many of us now work from home, turn to telemedicine to see a doctor, watch more Netflix to stay entertained, and use online communication tools to talk with friends. This resulted in a significant increase in internet data usage over the first few months of the outbreak. Today nearly around 4.57 billion people are active internet users as of July 2020, encompassing roughly 60 per cent of the global population. The paper aims to analyze the growth of internet use in the post COVID-19 pandemic. The paper makes use of secondary data from several online sources such as IAMAI, Internet Live Stats, TRAI, Our world data, statista, and applies a number of quantitative and cartographic techniques using QGIS to examine the spatial growth of internet use. Study shows that there is a great leap forward in the use of the internet worldwide and post globalization in India. Pandemic has caused great enhancement in the use of the internet, though all may not be productive.***

Keywords: Internet user, Internet penetration, ARPANET, ISP, New Normal, Pandemic

1. Introduction

On October 29, 1969 at 10: 30 PM, internet history was made, as it was born with the transfer of one simple message. Though in the late 1980s electronic transfer of mail through private computer network started happening, it is in 1989 that the first commercial Internet service provider (ISP) in the United States was launched. Since then several rounds of improvement have taken place and the technology has witnessed sea change.

Since its inception, the internet in any form is going to complete nearly half a century of its existence. Since then a short history of development of internet goes as follows: in 1969 ARPANET is born, in 1972 the first form of email is created, by 1974 ARPANET goes commercial, in 1983 website addresses become much easier to remember, in 1989 commercial dial-up is introduced, in 1991 the first live webcam feed was introduced, in 1993 the Internet becomes browsable, and by 1998 with inception of Google, there is a beginning of world domination by Google. Today the internet has enabled almost literally to bring the whole world on to your palm top.

During the last decade of the previous century the internet used to be considered something of the elite society. By the end of the first decade of the present century it has become a necessity of common and as we reach the end of the second decade of present century it has become nearly a necessity of all. Moreover, the ambience of COVID-19 internet has become essential to the additional group of users such students for online class and the people engaged in ‘work from home’.

Since the advent of the internet, it has spread slowly to every corner of the world and today you will not find any part of the Ecumene having no internet. Throughout the history of internet expansion, it has witnessed ups and downs but generally nothing has deterred growth till date. Like many other aspects of technology, this ICT based service is also tagged with positives and negatives since its initial days. Today the internet has become an inseparable part of life. Major boost to the use of the internet was the phenomenon of globalization and integration of world affairs, particularly of economy in the early 1990s. The more recent pandemic due to COVID-19 has set out many ‘New Normals’, under such an ambience, the growth of the internet is pre-eminent.

Though the Internet initially evolved over time as the worldwide interconnection of an individual's computer or individual’s networks operated by government, industry, academia, and private parties to a limited extent, it has become truly worldwide in expansion today. Originally, at the initial stage, the Internet served to interconnect laboratories and organizations engaged in government research, but since 1995 it has been expanded manifolds to serve millions and billions of users and a multiple of purposes in all parts of the world.

2. Relevance of the Study

The internet has immense popularity nowadays and hence almost anyone uses it. It is accessible by nearly any person having a minimum gadget and who tries to connect to one of its core, main networks. Moreover, it can be accessed by users of any age and condition. But like many other outputs of sciences and technology it also has certain positive and negative aspects. The following aspect gives some great positive effects and hence it becomes relevant to study particularly in the ambience of pandemic.

1) Internet search engines are the best and easiest information retrieval systems available so far. Within a fraction of second they are capable of bringing all information for internet users, from ordinary local events to international news of global significance.
2) The Internet provides the most effective means of communication among users in the contemporary period irrespective of distance and terrain and often even political units. Online mailing and instant messaging are now inseparable parts of communication today.
3) The Internet opened up avenues for business houses and companies to do quick transactions with their even

remotely stationed production units, outlets, clients and customers.

4) Due to availability of internet, inhabitants can take precaution and avoid adverse circumstances. Calamitous and disastrous phenomenon such as hurricane, Cyclone, storms, flood and other natural events and other accidents can be tracked through the internet and can be escaped.
5) The internet has proved to be a bliss facilitating the interchange of ideas and materials among scientists, university professors, researchers and students, in addition to provide servers, resource centers and online tools for their research and scholarly activities. Moreover, millions of books, journals and other digital materials are easily available through the internet because of the digitization of public domains material from libraries and archives.

In spite of having such great advantages, it also tagged with a number of disadvantages too. Breaching of privacy, security threat, money fraud, viruses and malwares, unsafe for children, online threat and blackmailing and wastage of time are some of the disadvantages of using the internet. However, the internet being a nearly inseparable part of life today plays a very crucial role in communication worldwide. It has successfully dismantled almost all the barriers of distance, topography and time. Now information can flow within fraction of second anywhere in the world thus enabling individuals to communicate as per wish of individual but the barrier of cost of getting gadgets and reliable network i. e. the accessibility as well as availability of funds to purchase data is still a big deal. Therefore, the internet penetration is not uniform; rather there is a large regional gap in terms of internet users. Beside accessibility and capacity to pay, there may be several other factors also playing an important role. Income, literacy/educational attainment, gender ratio and level of development measured by HDI are some of the factors that have been taken into consideration while examining growth of internet users in India. Thus the study has significance and relevance as it will reveal much of geography, economy and sociology as well as culture of the countries as at least partially reflected through use of the internet. Thus the study is a relevant one to assess use of the internet and its determinants.

3. Literature Review

There are a number of works available on the area under consideration but very few of them appeared in the highly acclaimed academic journals. Most of the work is done by different corporate houses and their research organizations in the form of reports etc. Meeker (2019) attempted to document the trend of internet users since 1995. She identifies many limitations and problems associated with the internet, and opines that 'The Internet Is Growing, and So Are the Problems That Come With It'. She further says 'while the Internet is growing, slowly, technology is taking up a large slice of our time and money' (Meeker, 2019). The study of Yip (2000) shows that use of the internet has a differential impact on industries and it supports five types of global strategy: market participation, products and services, activity location, marketing, and competitive moves. He examined the joint effort of the internet and globalization. Berisha-Shaqiri (2015) in his study attempted to assess the impact of use of ICT and internet on business. Kraut *et. al*. (1998) have in their study that greater use of the internet has association with decreased communication within family, community and even a decreased social network in the local level and also may cause loneliness and depression. Wellman *et. al.* (2010) conducted a survey and found that use of the internet helps to increase interpersonal connectivity and organizational involvement but at the same time it builds more connections with reducing commitment to community. Wellman & Frank (2001) attempted to define Network Capital as relations with friends, neighbours, relatives, and workmates who noticeably provide companionship, emotional aid, goods and services, information, and a sense of belonging. Rajani and Chandio (2004) studied use of the internet and its effect on society where they found that IT has brought advancement in the society in the two decades of IT existence in Pakistan. Truzoli R, Viganò C, Galmozzi PG, Reed P. (2019) showed the relationship between Problematic Internet User (PIU) and learning strategy and test anxiety and identified that with high PIU implies lower motivation to study. Stephanie Laconi, et al. (2018) also studied PIU and highlighted that the relationships between PIU and psychopathology brings out specific risk factors for PIU across the respective European countries. On the other hand Mujgan Hacioglu Deniz and Seda Karakas Geyik (2015) wanted to state a profile of students representing their practices towards the use of Internet and they concluded that the use of ICT and Internet make students not just to consume technology but also lead them to produce it. Grant Blank & Darja Groselj (2014) identified and explained all possible dimensions with which use of the Internet may vary from the digital inequalities perspective. Shelley Boulianne (2009) examined whether civic life matters on the use of the Internet. In order to ascertain the negative impact of internet use of the internet a meta-analysis approach was used. The meta-data provides strong evidence against the Internet having a negative effect on engagement. Zizi Papacharissi & Alan M. Rubin (2000) identified the distinctions between instrumental and ritualized Internet uses. Prevalence of Internet addictive behavior (IAB) is the area of investigation by Artemis Tsitsika, *et al*. (2014). They also investigated related psycho-social characteristics among adolescents in the participating countries. In the study, there was a distinction between problematic groups: adolescents having IAB, with loss of control over Internet use, and adolescents 'at risk for IAB, ' showing either fewer or weaker symptoms of IAB. Jiaping Zhang, Mingwang Cheng, Ran Mei and Feng Wanga (2020) attempted to explore the links between Internet use and Chinese residents' environmental quality evaluation. Their study showed that Internet use is related to a greater negative impact on environmental quality evaluation for older people and rural residents. It is further exhibited that it has greater effects on risk perception of environmental issues that are closely related to residents' lives.

Objectives

The study is designed in accordance with the paper title and to fulfill the following objectives as mentioned below:

1) To find out the spatial pattern of growth of internet users in the world.

2) To identify the determinants of growth of internet users.
3) To examine the impact of Covid-19 on growth of internet users in the world.
4) To find out the impact of Covid-19 on different sectors using the internet.

4. Methods and Materials

Data collected from the above sources have been checked and verified, wherever possible, using multiple sources. Several rounds of screening and pruning have been done to filter the most appropriate data to be used for the purpose. A number of quantitative techniques (simple statistics, correlation and regression analysis between the variables) have been applied to analyse data. Suitable cartographic techniques such as cartograms (graphical representation using line and bar graph) and Choropleth techniques to show concentration and ratios have been applied to illustrate the phenomena in this study. QGIS (QGIS 3.14.1 version) is used as mapping tool for the present paper. The study is primarily based on secondary data accessed from different published sources available in their websites. Some of the leading sources used for the purpose of this study are:

a) The Internet & Mobile Association of India (IAMAI) [https://www.iamai.in/],
b) Internet Live Stats (InternetLiveStats) [https://www.internetlivestats.com/],
c) Statista-an online portal for statistics (Statista) [https://www.statista.com/],
d) Our World in Data (Ourworlddata) [https://ourworldindata.org/],
e) Telecom Regulatory Authority of India (TRAI) [https://www.trai.gov.in/],
f) Bond Internet Trend 2019 [https://www.bondcap.com/report/itr19/],
g) Pew Research Center on Internet & Technology [https://www.pewresearch.org/], and
h) Internet World Stats [https://www.internetworldstats.com/].

5. Result and Discussion

The result of the study and discussion on it has been divided in different sections and arranged according to the chronological order as produced below.

Evolution-Early stage

From a maiden journey that started on October 29, 1969 at 10: 30 pm, internet history was made; as it was born with the transfer of one simple message a long path has already been crossed. Meanwhile in the late 1980s electronic transfer of mail through private computer network started happening, it is in 1989 that the first commercial Internet service provider (ISP) in the United States was launched. Since then several rounds of improvement have taken place and the technology has witnessed sea change over a few decades.

Up to the year 2000 one can consider the early stage of development of the internet. With 1995 as the proper beginning of the internet, 16 million people were using, counting only 0.04 per cent of the world population for the period. Slowly it started picking up and by mid-1998 the number crossed approximately 100 million and by December 1998 the number reached to a very high of 147 million comprising only 3.6 per cent of total world population. Within a passage of 15 months (March 2000) the number of internet users went up to 304 million counting 5.0 per cent of world population registering over 100 per cent increment within little over one year duration.

Growth of internet

Growth of the internet during the 1990s and following decades has been remarkable, bearing the footprint of initially computerization and subsequent use of the internet in terms of societal change that has happened. During the early years of the first decade of the new millennium, globalization and computerization have redefined every aspect of the industry, politics, culture, and also social order. Globalization as a process ultimately integrates economic and cultural institutions. It is this information technology that helps in integration of the entities. Global computerized network is the prerequisite for free movement of information, and peoples across national boundaries. Global computer network equipped with the internet paved the easy way to the global economy by providing technological infrastructure. The components of computerized networks, satellite communication systems, software and hardware link together facilitated the global economy in the last decade of the previous century and in the last two decades of the present millennium.

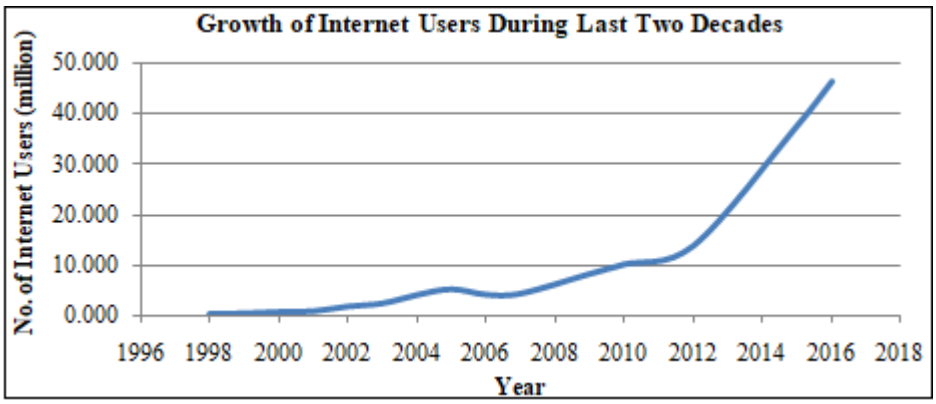

Figure 1: Growth of Internet Users
Data source: https://www.internetworldstats.com/emarketing.htm

Steady increase of internet users can be noticed during the post 2000 period. The number of users crossed 400 million mark (458 million) by March 2001 with a share of 7.6 percent mark and further crossed 500 million (513 million) mark by August same year (2001) registering a share of 8.6 per cent of world population (Fig-1). A landmark in the history of internet users was made when every 10th person (10.06 per cent) registered using the internet by September 2003 with a total number of internet users arriving approximately 677 million.

The number of internet users registered a billion marks (1008 million) by the month of December 2005 with a share of world population of 15.7 per cent. The next five year period witnessed some sort of slowing down of internet penetration. This might have been caused by the economic recession in the last half of the first decade of this century. By the end of the year 2010 the number of users reached approximately 2 billion mark (1971 million by September 2010 and by March 2011 reached to 2095 million mark) thus by the end year 2010 approximately 30 per cent of the world population were using the internet. This much internet penetration is certainly a large development.

Table 1: Share of Individual Internet Users by Country (2000)

Internet Users per 100 People	No. of Countries	Per cent
≥ 35	17	8.02
25-35	10	4.72
15-25	14	6.60
5 to 15	39	18.40
< 5	120	56.60
0	11	5.19
DNA	1	0.47
Total	212	100.00

Source: Calculated by the author based on data source: https://ourworldindiadata.org/technology-adoption (13/07/2020).

It has been observed that at the beginning of the present millennium i. e. in the year 2000 there were only 200 countries where there was presence of internet users. The situation was so poor that even within 200 countries with the presence of internet users there were as many as 120 countries (56 % of all countries) reporting only below 5 per cent of their total population using any kind of internet (Table-1). While the highest proportion of internet users were found to be 52 per cent in the year 2000 in Norway with only another country having more than half of her population i. e.51.3 per cent in Canada, only 8 per cent countries numbering only 17 have recorded good internet penetration (≥ 35 per cent) in that year.

Table 2: Share of Individual Internet Users by Country (2010)

Internet Users per 100 People	No. of Countries	Per cent
≥ 80	16	7.55
60-80	32	15.09
40-60	35	16.51
20-40	44	20.75
< 20	80	37.74
0	4	1.89
DNA	1	0.47
Total	212	100.00

Source: Calculated by the author based on data source: https://ourworldindiadata.org/technology-adoption (13/07/2020).

By the year 2010 i. e. during the last one decade there has been considerable increase in the internet penetration. Whereas only four countries reported having no internet users, only one country reported 'Data Not Available'. The highest internet penetration is found at the tune of 93.39 per cent of its residents using the internet in Norway, whereas the lowest value is just 0.25 per cent in Myanmar. Besides Norway, Luxembourg, Netherlands and Iceland also have recorded more than 90 per cent of their residents using the internet (Table-2).

It's seen that as many as 16 countries (7.55 per cent of all countries) had 80 per cent or more of their residents using the internet in 2010. It's also noteworthy that more than 50 per cent (58.50 %) of the countries have less than 40 per cent of the population using any type of internet.

Table 3: Share of Individual Internet Users by Country (2016-2017)

Internet Users per 100 People	No. of Countries	Per cent
≥ 80	45	21.23
60-80	56	26.42
40-60	33	15.57
20-40	39	18.40
< 20	36	16.98
0	1	0.47
DNA	2	0.94
Total	212	100.00

Source: Calculated by the author based on data source: https://ourworldindiadata.org/technology-adoption (13/07/2020).

By the time it's another half decade (6-7) years, further improvement has taken place. The highest figure has climbed to a staggering 98.24 per cent in Iceland (Table-3). But the number of countries having more than 90 per cent of their population using the internet has increased from a mere four in 2010 to 23 in 2016-17 spread over Asia, Europe, South America and North America. Little over one-fifth of the countries now have internet penetration 80 per cent or more than that. At the same time little over 63 per cent of the countries have recorded internet penetration rate more than 40 per cent of their population. It is remarkable that the lowest penetration rate has gone up to 1.1 per cent in 2016-17 from the previous 0.25 per cent in 2010. Moreover, the number of countries having zero internet users has come down to only one out of 212 countries and only two countries have recorded 'Data Not Available'.

Phases of spread of internet

The first phase of spread of internet users may be up to the year 2000 where the internet penetration was inconspicuous**,** particularly in much of the Asian, African and Latin American countries. Relatively deeper penetration of the internet till the year 2000 was witnessed in some of the European and North American countries. Australia also, to some extent, witnessed deeper penetration of internet use.

By the time the existence of the internet has reached little over one decade (1989-2000), many N-W European countries, USA, Canada and Australia achieved a penetration rate over 35 per cent of their total population. These are the countries that are rich, industrialised and technologically advanced and people are highly educated. On the other hand there were a few countries in Asia such as Afghanistan and in Africa such as South Sudan and Benin Republic having no existence of the internet. Vast majority of the countries of Asia, Africa, Latin America and few countries even from North America had a very low share of population who were internet users at the tune of less than 15 per cent of their population. There were as many as 120 countries in 2020 having as little as less than 5 per cent of their population using the internet (Fig-2). General poverty, illiteracy and technological backwardness have contributed to having such a poor internet penetration rate in these countries.

By the time we have reached the end of the first decade of the present century, the internet has made its presence throughout the world. By June 2010 the number of internet users in the world reached to nearly 2000 million (1966 million) that comprised roughly 28.70 per cent of the world population with very high penetration rate in the North-Western European and North American countries (Fig-3).

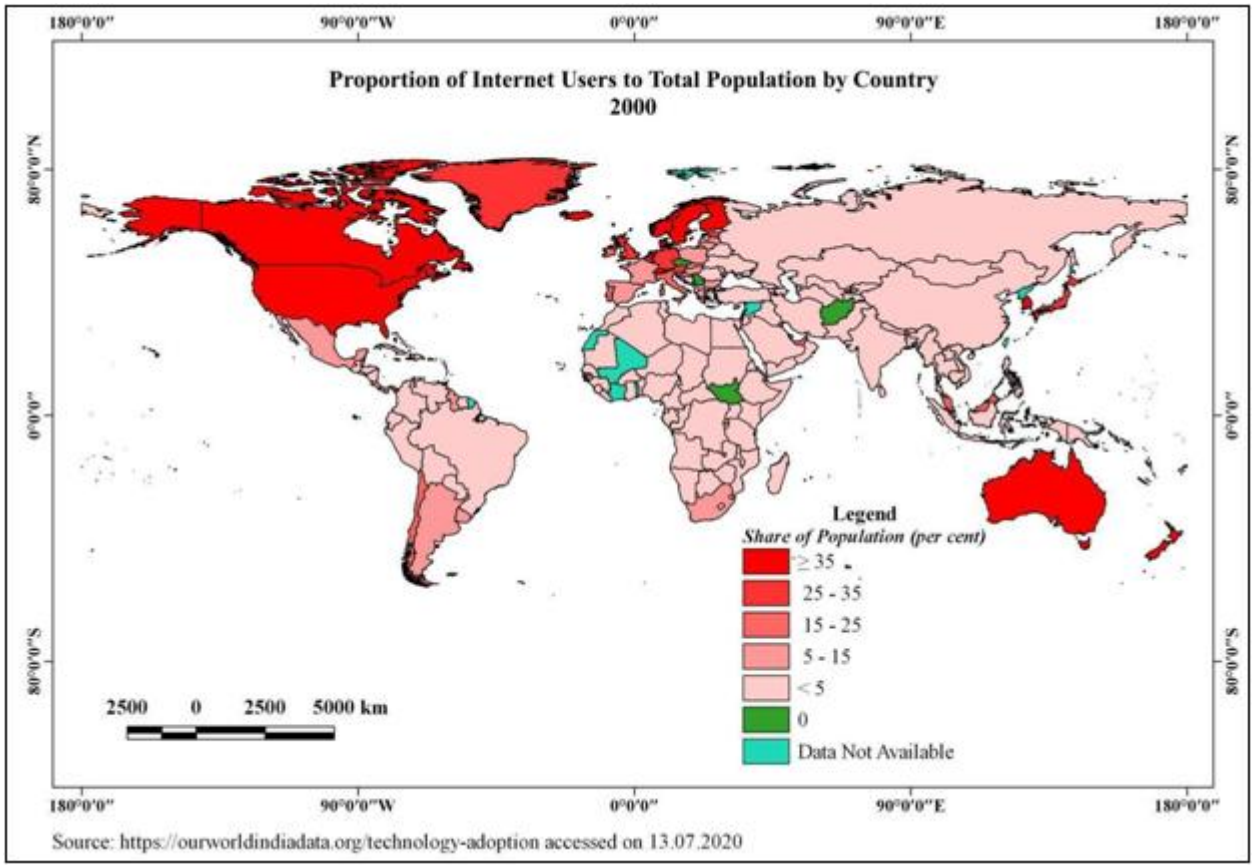

Figure 2: Share of Internet Users to Population (2000)

It has been found that only four countries (American Samoa Curacao, Nauru and South Sudan didn't report any internet users whereas the lowest level of internet users was found in Mayangar with a meager 0.25% of that country's population using the internet in 2010. But as many as six countries, all Asian and African countries (Mayanmar, Sierra Leone, Eritrea, Democratic Republic of Congo, Ethiopia and Niger) recorded less than one per cent of their population using the internet in 2010. As many as 80 countries recorded internet penetration rate as low as below 20 per cent. On the other hand Norway and Iceland topped the list with 93.39 per cent of their population using the internet (there are some multiple users too). However, Sweden, Luxembourg, Netherlands, Iceland and Norway all N-W European countries recorded 90 or more than 90 per cent of their population using the internet in 2010.

As per the latest data available for the year 2016/17 there was only one country (American Samoa) that reported no use of the internet. There were as many as 15 countries (mostly African, some Asian and Latin American countries) having below 10 per cent, 36 countries below 20 per cent, 56 countries having 60-80 per cent and 45 countries greater than or equal 80 per cent penetration rate (Fig-4). The highest penetration rate (98.24 per cent) is found in Iceland with another 21 countries witnessing over 90 per cent penetration rate. The countries having high penetration rate are found in the advanced regions of Europe, America and Australia where people are rich, technologically advanced and highly educated.

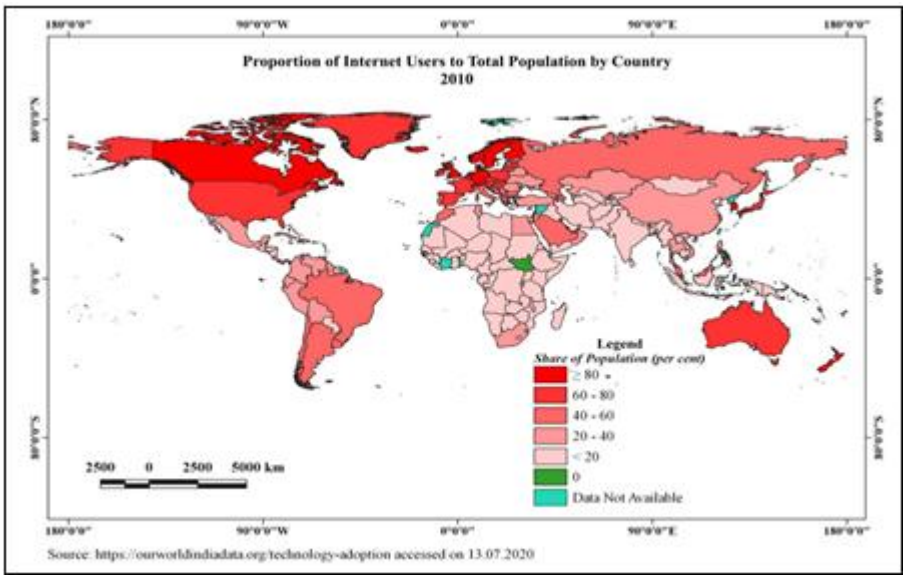

Figure 3: Share of Internet Users to Population (2010)

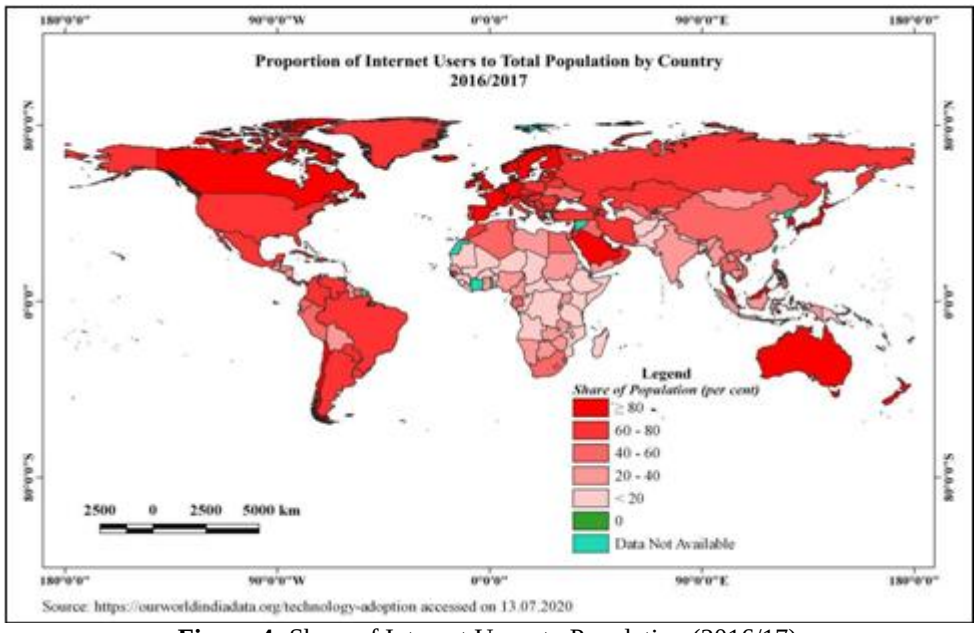

Figure 4: Share of Internet Users to Population (2016/17)

COVID-19 Phase

The length of period since the first case of COVID-19 was reported in China is little over one year but since it took the shape of pandemic over six months have elapsed. The impact of COVID-19 pandemic on internet use has been observed remarkably within six months of pandemic. Even in the developed and industrialized society such as in the US the impact is going to be severe and is likely to 'widen the digital'.

The pandemic period for around a six month period has created a situation studied by the Pew Research Centre (Internet and Technology) found that Americans with lower incomes are particularly likely to have concerns related to the digital divide and the digital "homework gap". "A new Pew Research Center survey conducted in early April finds that roughly half of U. S. adults (53%) say the internet has been essential for them personally during the pandemic and another 34% describe it as "important, but not essential. " The new national survey of 4, 917 U. S. adults conducted April 7 to 12 using the Center's American Trends Panel explores public attitudes about the role of government in addressing these issues and finds that a majority of Americans (62%) do *not* think it is the federal government's responsibility to ensure that all Americans have a high-speed internet connection at home during the COVID-19 outbreak. And a similar share (65%) don't think the federal government should be responsible for ensuring cell phone services to all" (VOGELS, PERRIN, RAINIE AND ANDERSON, 2020).

It's quite obvious that apart from direct impact on internet use, the impact of other sectors of economy and activities will have indirect impact on internet use. The cascading effect will certainly be on internet use too. In order to examine indirect impact COVID-19 on internet uses, the following aspects have been examined, namely,

a) Activities People will avoid when COVID-19 restrictions are lifted,

b) Coronavirus impact on online traffic of selected industries worldwide as of October 2020,
c) In-home media consumption due to the Coronavirus outbreak among internet users worldwide as of March 2020, by country when nearly worldwide lockdown was in effect, and
d) Sudden shot up of internet use during pandemic period in the year 2020.

There has been an attempt to assess the impact of COVID-19 through activities that the user/consumers will try to avoid. As per Statista estimates with respect to Germany, UK and USA, it is found that the highest impact is found in Germany in Music festivals, Music concerts and Sports of total 13 events as 57, 55 and 53 per cent interviewed responded said that they will avoid (Fig-5) these activities even after COVID-19 restrictions are lifted. But Cinema / theatre, Pubs / bars / clubs, Gym / sports centers, Restaurants / café's and Holidays will have no less impact as over 40 per cent responded to avoid such activities even after COVID-19 restrictions are lifted. Other activities studied are Large retail shops / shopping centers, Museums / galleries, Shopping downtown / high-street, Hairdressers / beauty salons and Supermarket / grocery shops are likely to be less impacted as less than 40 per cent users/consumer responded to avoid these activities after COVID-19 restrictions are lifted.

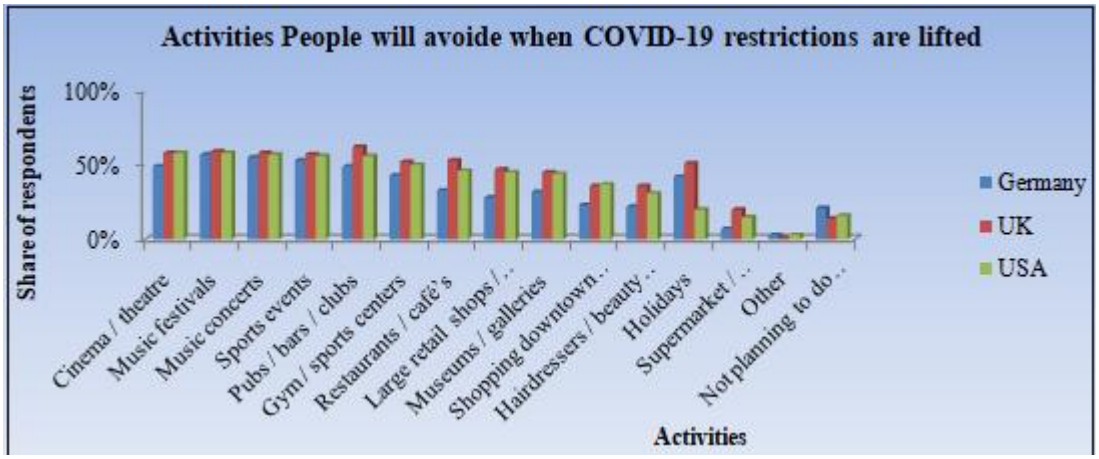

Figure 5: Activities apprehended to be avoided
Source: https://www.statista. com (18/11/2020)

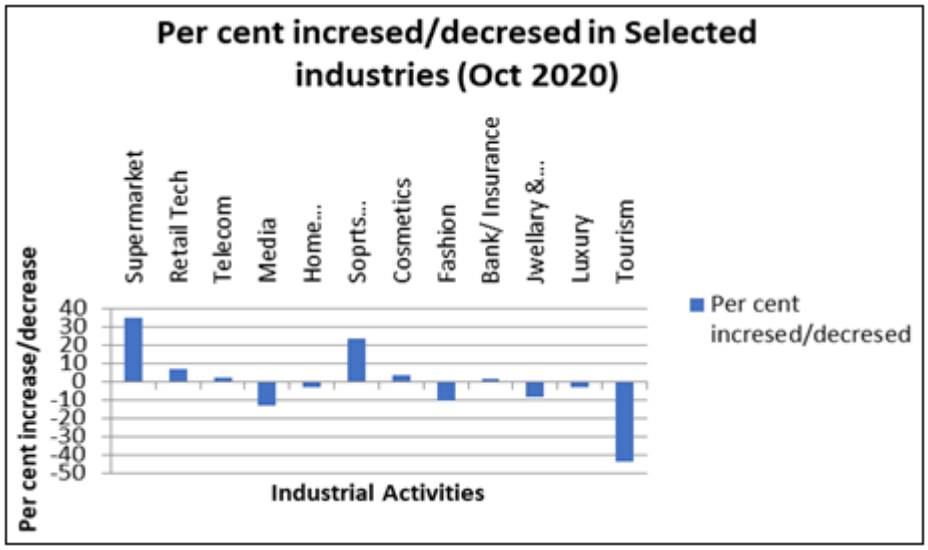

Figure 6: Change recorded in selected industries
Based on data from https://www.statista. com/statistics/1105486/coronavirus-traffic-impact-industry/ (15/11/2020)

In case of UK over 50 per cent of the users/consumers opined to avoid Holidays Gym / sports centers, Restaurants / café's, Sports events, Cinema / theatre, Music concerts, Music festivals and Pubs / bars / clubs (Fig-5) and only two activities namely Museums / galleries Large retail shops / shopping centers will be avoided by users and consumers under the above mentioned ambience. The USA case is somewhat different from the other two countries discussed above. It is found that as many as six activities such as Gym / sports centers, Sports events, Pubs / bars / clubs, Music concerts, Cinema / theatre and Music festivals reported to be avoided by users and consumers even after the Covid-19 restrictions are lifted.

There are a number of industries for which there has been a record of negative growth in online traffic that have negatively impacted use of the internet during the pandemic period. October 2020 report of Statista on Coronavirus impact on online traffic of selected industries worldwide shows that as many as six out of out of 12 sectors witnessed negative growth. The highest negative impact can be observed in the case of Tourism with 43.7 per cent decline

(-43.7 % growth) with some other sectors such as Media, Home, Furnishings/DIY, Fashion, Jewelry & Watch, Luxury and Tourism also witnessing heavy toll (Fig-6). But half of the sectors namely Supermarket, Retail Tech, Telecom, Sports Equipments, Cosmetics and Bank/ Insurance witnessed positive growth with varying degrees during this period.

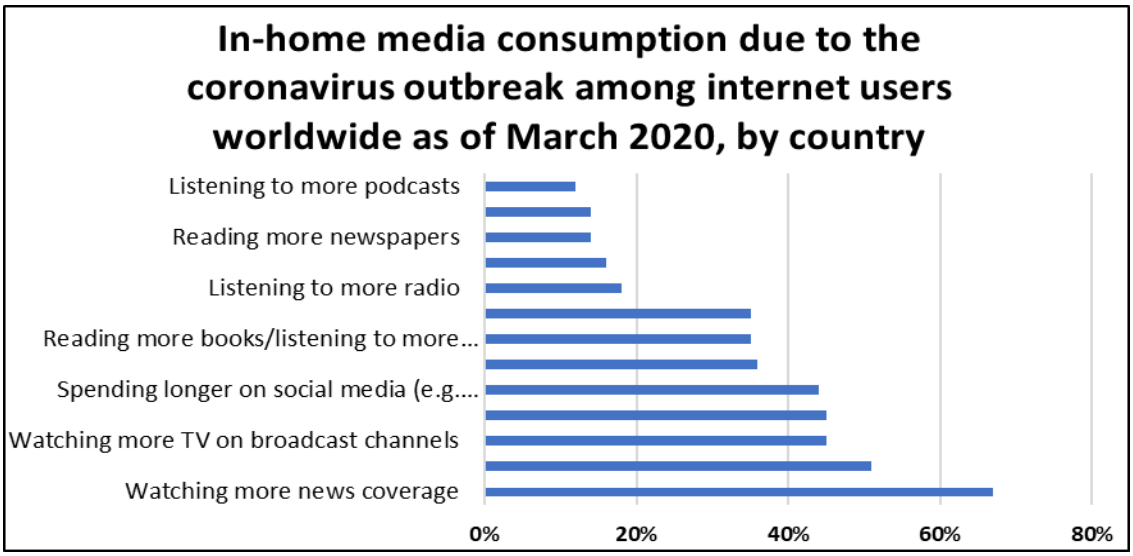

Figure 7: Increase in-home media consumption

Data Source-https://www.statista. com/statistics/1106498/home-media-consumption-coronavirus-worldwide-by-country/ (15/11/2020)

Another way to assess impact of COVID-19 on internet use may be by analyzing In-home media consumption due to the coronavirus outbreak among internet users worldwide. During the period March 16 to 20, 2020, through online survey method, with the respondents in the age group 16-64 were asked the question "Which of the following have you been doing at home, because of the coronavirus / COVID-19 outbreak?" As many as 12845 sample respondents from the countries 1, 004 (Australia), 1, 001 (Brazil), 1, 003 (China), 1, 016 (France), 1, 010 (Germany), 1, 010 (Italy), 1, 079 (Japan), 1, 008 (Philippines), 1, 008 (Singapore), 573 (South Africa), 1, 005 (Spain), 1, 040 (UK) and 1, 088 (USA) were surveyed. As many as 67 per cent reported 'Watching more news coverage' during March 2020 followed by 'Watching more shows/films on streaming services (e. g. Netflix) ' by 51 per cent. 'Watching more TV on broadcast channels', 'Spending longer on messaging services (e. g. WhatApp, Facebook Messenger, etc.) ' and 'Spending longer on social media (e. g. Facebook, Instagram, Twitter etc.) ' were found to be substantially high proportion of respondents using such in-home media consumption to the extent 45 %, 45% and 44% respectively (Fig-7). 'Spending more time on computer/video games', 'Reading more books/listening to more audio books', 'Listening to more streaming services (e. g. Apple Music, Spotify etc.) ', 'Listening to more radio', 'Reading more magazines', 'Reading more newspapers', 'Creating/uploading videos (e. g. on TikTok, YouTube etc.) ' and 'Listening to more podcasts' are among the top 13 in-home media consumption sectors found in the above mentioned countries when nearly worldwide lockdown was in effect.

Table 4: World Internet Usage and Population Statistics in 2020 (Q3 Estimates)

World Regions	Population (2020 Est.)	Population % of World	Internet Users 30-Sep-20	Penetration Rate (% Pop.)	Growth 2000-2020	Internet Users World %
Africa	1, 340, 598, 447	17.20%	631, 940, 772	47.10%	13898%	12.80%
Asia	4, 294, 516, 659	55.10%	2, 555, 636, 255	59.50%	2136%	51.80%
Europe	834, 995, 197	10.70%	727, 848, 547	87.20%	593%	14.80%
Latin America / Caribbean	654, 287, 232	8.40%	467, 817, 332	71.50%	2489%	9.50%
Middle East	260, 991, 690	3.30%	184, 856, 813	70.80%	5527%	3.70%
North America	368, 869, 647	4.70%	332, 908, 868	90.30%	208%	6.80%
Oceania / Australia	42, 690, 838	0.50%	28, 917, 600	67.70%	279%	0.60%
WORLD TOTAL	7, 796, 949, 710	100.00%	4, 929, 926, 187	63.20%	1266%	100.00%

Source: https://www.internetworldstats. com/stats. htm? (15/12/2020)

Internet users as on 30 Sept 2020 in the world is 4, 929, 926, 187 of which the highest share of 51.80 per cent are in Asia with nearly 55.10 per cent population whereas with 10.70 per cent population Europe contribute 14.80 per cent of the internet users. Similarly, North America with 4.70 per cent population share 6.80 per cent of the internet users (Table-4). With as high 1266 per cent growth in internet users during 20 year period of 2000-2020, the highest growth is recorded in Africa 13898 per cent growth and the least is found in North America during the same period as the country has achieved deep internet penetration much early as compared to other regions. The penetration rate has been continuously growing during the last few years as one can see from the data of 62 % in June 2020 and the same being

58.80 % and 55.10 % respectively in June 2019 and June 2018. A jump of nearly 4 per cent from a Jan 2020 figure of 59% to a September figure of 63.20 per cent is certainly propelled at least partially by pandemics.

6. Major Findings

The early stage of internet growth may be termed up to the year 2000 where a very poor internet penetration, five per cent, was observed. Thus the period may also be termed as a stagnant period. The year 2000 onward a slow but steady growth period may be found during 2000-2005 with a slow but fluctuating growth period from 2005 to 2010 is recorded. A real jump in internet use was observed during the period starting 2010. A phenomenal growth witnessed in this period arriving at a staggering 63 per cent penetration rate by June 2020. Globalization coupled with the ICT revolution caused such tremendous growth.

The regional scenario of spread of internet users is mostly concentrated in industrially and educationally developed and rich countries of NW European countries and North American countries. It is found that by the year 2000 only 17 countries recorded a 35 per cent or more penetration rate with as many as 11 countries having no use of the internet. The progress made by the year 2016-17 is so high that as many as 45 countries from the same region recorded an 80 per cent or over penetration rate. Rich NW European countries remained with very high penetration rate and the lag behind countries remained in Africa, Latin America and some countries of Central and South East Asian region.

The COVID-19 pandemic period has witnessed declining in number of industrial and trade activities as a result use of the internet also has been severely affected. Data from UK, USA and Germany shows that over 50 per cent of the respondents in the age group 16-64 will avoid Holidays Gym / sports centers, Restaurants / café's, Sports events, Cinema / theatre, Music concerts, Music festivals and Pubs / bars / clubs etc. even after restriction due to COVID-19 is withdrawn. Similarly, Media (-13.2 per cent) and Tourism (-43.7 percent) are severely affected with negative growth among many other sectors. Watching more news coverage, Watching more shows/films on streaming services (e. g. Netflix), Watching more TV on broadcast channels, Spending longer on messaging services (e. g. WhatsApp, Facebook Messenger, etc.), Spending longer on social media (e. g. Facebook, Instagram, Twitter etc.) etc. in the form of in-home media consumption has increased during pandemic periods that obviously lead to increase in internet use. The result can be seen from the growth during 2020.

An interesting aspect of growth of internet use is that during 2000-2020 period a global growth of 1266 per cent has been witnessed of which the least is in North America (208 per cent) and the highest in Africa with 13898 per cent indicating a phenomenon where North American countries have intensive penetration rate till 2000 and African countries were with only a few users till 2000 and hence this apparently asymmetric growth rate of internet users during 2000-2020.

7. Conclusion

Tremendous growth of the internet has been witnessed during the last few decades with an unusual surge during the pandemic period. The Internet has undoubtedly offered a new avenue of communication through social media, email and video conferencing. It has helped to find old friends with whom you may not be in contact for many years. It has opened up an opportunity to make video call, participate in a video conference. The world virtually reduced to your palm top or mobile phone. Growth of internet use has opened up new opportunities of employment and income using social media platforms. In spite of several positive and productive dimensions of fast growing internet users, there are a few negative aspects also. Many of them have developed "Zoom fatigue" and as many as 40% of those who have ever talked with others via video calls since the beginning of the pandemic say they have felt worn out or fatigued often or sometimes by the time they spend on them (Pew Research Centre, 2021). Still a considerable number of internet users face 'Cyberbullying', Fear of Missing Out (FOMO), Unrealistic Expectations, Unhealthy Sleep Patterns, General Addiction, Cyber Theft and other Cyber Crimes. However, growth of internet users is inevitable and 21st century man can't survive without the internet.

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