Correlates of the Digital Diversity in the Information Age: A Bird's Eye View

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ABSTRACT
The digital diversity generally refers to differences between individuals in likelihood of accessing and using the information technologies, specifically the Internet resources. The thrust of this attempt is to provide an overview of digital diversity. Several factors influence diversity. Digital diversity exists not only in underdeveloped and developing nations but also in the so called rich and developed nations. It reflects differences among nations. The phrase of digital diversity is seen as well as due to demographical, socio-cultural, psychological and political characteristics. The crucial variables highlighted in the present work include income, education, gender, age, race/ethnicity, caste, infrastructure indicators, pricing regulatory quality etc. The need for further research that identifies new correlates is also called for.

Keywords
Access; broadband; computer literacy; culture; digitally connected community; digitally disadvantaged communities; India; ICT; information gap; infrastructure; low-income level; network; policy; psychosocial barriers.

1. INTRODUCTION

1.1 Background
Ordinarily, diversity refers to differences. It means substantial collective differences, which are differences which mark off one group of people from another. The diversity can arise from many different sources. Some of the more common ones include nationality, ethnicity, social class, religion, and gender characteristics. Urban, suburban and even rural areas are becoming culturally diverse. So, divisions in broader sense are seen in countries and in the social structure of a society. Obviously people are sometimes categorized as either haves or have-nots. In almost every society, there are broadly two groups of people. One group has the easy and best access to computer, technology sources and the Internet services. Another group does not have reach to such technologies, excluding them from enjoying the fruits of such technologies. However, some people fall in moderately haves category. With the increased globalization this diversification is also being witnessed at a greater extent in societies at international and national arena. The difference between these groups of people is simply termed as "Digital Diversity" Or "digital Divide".

2. FACTORS CONTRIBUTING TO DIGITAL DIVERSITY
Digital diversity is embedded in race, caste, gender, social class, language, religious affiliations and cultural tapestry. These diverse characteristics and associated life experiences contribute significantly in digital divide. Encompassing a vast literature canvas succinctly and incisively, the present review of contemporary research studies here takes a closer look at the multiple crucial sources of digital diversity at the same time.

2.1 Global Local
Digital diversity exists between countries (Norris, 2001), so called global divide. The disparities between the developed and developing countries are tremendous. Developed countries as compared to developing ones have higher per capita income, per capita grain consumption and per capita energy consumption and have higher education level, better technological innovations, better communication, better health care delivery and improved quality of life. Developing and underdeveloped countries are dependent on more developed countries for capital, technology and access to information which in-sequel perpetuate various forms of inequality at the global level (Norris, 2001).The reach to science and technology in general and sufficient access to information and communication technology in particular is hardly available to all inhabitants of the world. The Internet has developed unequally throughout the world, creating global digital divide (Castells, 2000; 2001; Looker and Thiessen, 2003; MacLaren and Zappala, 2002; Martin, 2003; Norris, 2001). Estimates indicate that nearly 11% of world population is online. Most of these-90%- Internet users are in the affluent developed World (UNESCO, 2005). About 63% of the world's Internet users come from the US, Canada and Europe. The Asia-Pacific's share is about 30%, Africa and Middle East combined account for less than 2% of the universe of Internet users. Scandinavia, North America and Western Europe are leaders in Internet penetration followed by Eastern Europe, Asia, Middle East and South America, with minimum diffusion in Sub-Saharan Africa. However, there are millions of people in this world who do not have access to telephone, mobile and Internet. Most of them reside in developing countries (UN, 2006). Current estimates (as of ITU, July 1st, 2014,) revealed that nearly 75% (2.1 billion) of all Internet users in world (2.8 billion) reside in the top 20 countries; remaining 25% (0.7%) is scattered among 178 countries. China has the maximum internet users 642 million in 2014, more than the composite population of United States, India and Japan. India has the lowest penetration, but highest yearly growth. Advance countries (United States, Germany, France, U.K., and Canada) have the highest penetration. Approximately over 80% of population in these countries has an Internet connection.

The digital diversity is not only visible at global level, but rather different geographical region of a given country. The diversity exists in the form of a wider segregation between rural and urban inhabitants. Usually, citizens who live in the urban centers/metropolitan areas are more likely to own computers and connected to the Internet (Donnermeyer and Hollifield, 2003; looker and Thiessen, 2003). Urban population has historically enjoyed greater Internet access than rural strata. This is delicate, because infrastructure facility, opportunity, education, income and efficiency scale

differ decisively in rural/tribal locations and urban areas (Cuneo, 2002) and as a result access to digital ICT. Internet access is also difficult in mountainous, desert and rainforest areas which are usually named as tribal areas. These areas lack basic ICTs and other infrastructures. Only wireless technology can be used. Singh (2004) suggested that urban people are rich in concepts; competence and connections and thus, they are privileged and have greater power to use telephone, computer and Internet technologies. Most of the rural poor can't afford computer and broadband connection. They do not have access to various means of Internet and continue to be "information poor" while rich and powerful in the urban locations elsewhere become "information rich".

In the United State, 27% urban households had access to Internet, as compared to 22.2% of rural households in 1998. In 2000, 42.3% of urban and 38.9% of rural households was online (NTIA, 2000). Further, a survey based on the period between 1994 and 2000 reveals that computer ownership was slightly higher among urban households than rural households (NTIA, 2000). According to Pew Internet and American life Survey (2010) majority of non -Internet users tend to live in small cities, towns, and rural areas, while Internet users live in larger cities and suburbs (47.0%). About 19 million U.S. citizens in rural areas or about 6% of the population had no access to sufficiently fast broadband (FCC, 2012). Such dichotomy also exists in Canada, Australia, New Zealand and Western world. The digital divides exist in rural and urban centers and are more pronounced in the underdeveloped and developing countries (Norris, 2001; Singh, 2010b). Disparity among rural and urban Internet users is very high in India (Dasgupta, lall and Wheeler, 2002; Mahajan, 2003). Approximately 70% population lives in villages in India, 75% of the poor are in rural areas and computer and Internet use correlate with poverty (Singh, 2010b). In rural locations only 1.2% citizens have Internet access whereas it is 12% in urban areas. Almost 70% users come from big cities and 30% from all other cities. There are only 5PCs per 1000, 37 fixed lines per 1000 and 9 mobiles per 1000 in India (Singh, 2010b) and about 10% of villages have no electricity. India is known for advanced IT industry, but can't avoid the problem of digital diversity among urban, rural and tribal areas

3. SOCIO-DEMOGRAPHIC CHARACTERISTICS

Literature suggests that this is a composite variable than a single one, summarization of some variables is presented here.

3.1 Age-life Cycle

Human life span is classified into different stages. It is also obvious that the opportunities and problems changes from one development phase to the next. The digital divide obviously holds an age related division (Millward, 2003; Rice and Katz, 2003). The literature shows that elderly citizens being over-represented among the lesser users of the Internet (Sangmoon, 2011) and the pendulum swings to the youth in terms the of Internet use. Old age often implies a disengagement from different societal areas, such as income generating activities, community engagements, responsibilities political participation and withdrawal from the field of technology. The biological, cognitive, psychological, social and economic reasons associated with advanced age and contact with environments that feature new technology (e.g. workplace, house) may form a barrier to the adoption of Internet. Adler (1996) suggests that children, teenagers, and senior citizens as often seen as the 'digital have-nots', while middle-aged persons are seen as the 'digital haves'. According to Wills and Tanter (2006) in Australia those in the under-30s age category are five times more likely users of the Internet than those of over 50 years age. Rasanen (2008) revealed that in the Scandinavia under 30 years of age than 60 are ten-to-thirteen times more likely uses of Internet. Similarly, Ono and Zavodny (2007) and Sangmoon (2011) showed that early adopter of the Internet technologies were predominantly younger. Looking for reasons, elderly people show low level of confidence and proficiency in using computer and Internet. Seniors manifest elevated levels of technophobia and psychological computer anxiety and they also lack of formal training and experience at their past employment. They prefer to do work manually. Digital gerontological divide also interact with other dimensions of digital disparities such as interest, needs, gender, resources, location of use etc.

3.2 Gender

Digital diversity due to gender is inconclusive and less predictable. The differences between the sexes were put up as evidence of the socialization or cultural conditioning and thus, were used to expect/justify differences in social status, power and technology use (Fallon, 1998; Herring, 2000). The use of technology has been dominated by man. But the origin of computer owes to the achievements of women, with women pioneering information processing systems during the1940s (Fallon, 1998), even in the post-war period (second world war) women were assigned the work of computer programming, word processing and data entry in the armed forces. Later the work on computer was conceived as more complex, technical and cognitive skills demanding than it was reconstructed as "men's work"(Fallon, 1998), that in-sequel caused a substantial drop in the number of jobs for women in IT related complex activities. By 1995, the use of Internet has dramatically increased and few women have access to internet or the broadband technology (Kennedy, Wellman and Klement, 2003). They are latecomers to the digital age. Generally men use this new technology and hence, it is portrayed as a male domain. Women are seen as being more likely to be techno phobic and ascribed a certain computer anxiety. They are considered to be less tech-savvy. However, gender became an insignificant variable in the US and Australia by 2003 (Sangmoon, 2011; Willis and Tanger, 2006), narrowing the gender divide in UK, Japan, Korea, China and Mexico. The marked differences were noted in Germany and Italy. Akiyoshi and Ono (2008) revealed that females are much less likely than males in Japan to use computer-based Internet, but gender is insignificant in relation to mobile Internet use. Denny-Brown and Thomas (2013) highlighted gender gap in Internet access in the developing countries. Parul (2014) investigated the Internet usage by college students of Bhiwani city in India. Findings of the study revealed that males more than females use Internet for social communication, educational and recreational purposes. However, there is a lack of evidences from various regions in India.

3.3 Race/Ethnicity

Race and ethnic minority may influence the participation in information and communication technology, particularly in Internet use and also contribute to digital divide (Jackson, Barbabtsis, von Eye, Biocca, Zhao and Fitzgeraid, 2003; Pew Internet and American Life Project, 2010). Research literature has shown that ethnic minority groups are less likely to access and utilize the Internet (Dupagne and Swalden, 2005; Fairlie, 2003) For example, Mesch (2012) reported that Israeli Jews were the greater user of computer at home, at work and Internet users followed by immigrants from the former Soviet

Union (FSU). Israeli Arabs are the least frequent users in every category. In their study on the US sample, Witte and Mannon (2010) found that, without controlling for measure of class (education and income), race had a statistically significant association with going online the previous day. Black and Asian American were less likely to go online. However, when measures of social class were included, the effects of race become statistically non-significant. This indicates that negative effects of race on Internet utilization are the impact of social class.

3.4 Caste System

Caste system has stratified Indian society. Caste plays out in India just as race plays out in United States and the social class in Britain. Caste is a social construct without genetic basis. Caste is inextricably linked to and is a proxy for socio-economic status. Certain castes have traditionally been rich at the expense of others (Singh, 2010a). People belonging to upper caste, more or less, have accumulated land, capital resources, power resources and control of technology. Upper castes are generally having higher socio-economic status and relatively better educational positions in society. Dalits (Schedule Castes), tribes (Schedule Tribes) and other lower/backward castes (OBC) continue to face social discrimination and excluded from education, economic outcomes and development. Generally, persons belonging to SC/ST/OBCs are who have lower social, economic and educational statuses. Thus, Sudheendra Kulkarni opined that "the biggest factor that made India a land of knowledge into a land of illiteracy and backwardness is our social caste system"(http://www.expressindia.Com/news/daily). Lower income increases poverty that in turn reduces the participation in remarkable technology like ICT. The toxic combination of exclusion of Dalits/ST/OBC from knowledge and intervening in the thought process practiced by the society deprived them from digital opportunity (Prasad. 2000). In a survey of 132 tele-centres in south India by Kumar and Best (2006) observed that the usage of ICT by SC/ST is relatively lower. Further, they noted that locating tele-centres in SC/STs neighborhood appears to be an important factor in increasing the usage. Mohanty (2006) documented the lower levels of ICT use among SC/ST population. The participation of SC/STs is either low or absent in the IT industry workforce (Ilavarasan, 2007; 2008). In a sample of 100 ICT workers, Oommen and Sundararajan (2005) did not find a single SC/ST worker. Upadhya and Vasavi (2006) revealed that out of 132 people surveyed there was only one SC/ST worker in the force. The representation of OBC is also very thin in IT workforce (Ilavarasan, 2007; Oommen and Sundararajan, 2005). The majority of the software worker in India hails from forward strata (upper caste) of the society. Fuller and Narasimhan (2008) reasoned that majority of the workforce in IT industry is of forward castes, particularly of Brahmins. The problems in accessing the Internet technology are higher among SC/STs due to lower educational and socio-economic statuses.

3.5 Literacy

Literacy is conceived as core element in the development of a human being as well as of the society. It aims at improving people's skills and liberties in all life dimensions. Literacy is one of the most powerful factor that has vital influences on the digital diversity (Pew Internet and American Life Survey, 2010; Robinson, DiMaggio and Hargittai, 2003). Illiteracy divides the connected and non- connected. Rasanen (2008) carried an investigation comparing Sweden, Finland, Norway and Denmark where education, alongside age, was observed to be the most statistically significant factor in predicting likelihood of ICT use. In these countries highly educated category is 27 times more likely to use the Internet than the least educated. Similarly, Gutierrez and Gamboa (2010) conducted a study of ICT access in Latin American countries, specifically Mexico, Peru and Colombia. This study revealed that the level of education is the most important factor that determines most likely access to ICT. In other investigation comparing the US, Sweden, Japan, South Korea and Singapore, documented that more educated individuals were more likely to use the Internet regardless of location. All these show that educated elites have the more privilege to use the technology (Sangmoon, 2011) and uneducated or less education have less or negligible reach to ICT, some of them have never seen even how a computer looks like (Singh, 2004). Schools, college and universities located in rich geographical areas are more likely to have Internet access than in poor location or neighborhoods or regions of world (Cuneo, 2002). The majority of government run/grant-in-aid schools and other institutions in India have poor ICT infrastructures that in turn reduce the chances of using the technology (Singh, 2010 a; b). Such institutions are named as digital 'have-nots' (Cuneo, 2002; Singh, 2010 a; b).

3.6 Economic Inequalities

Since times immemorial societies have been cleavage into rich and poor, strong and weak and upper and lower classes. In the present time 20% of the world population earns about 75% of world income. On the contrary, 25% population earns less than two percent of the global earning. More than 40% of global population is living in the unsatisfactory or substandard conditions. One billion of the world population lives on less than $1 per day, whereas two billion live on less than $3 per day. India has great disparity in income, a very small minority is affluent, but the vast majority is poor. The economic disparities create barriers to enter into the tech-savvy world (Hilbert, 2010; Norris, 2001; NTIA, 2002; 2004; OECD, 2001; Rice and Katz, 2003). There is evidence in the literature that wealth is significant predictor of computer ownership and the Internet use at the international or national level (Pew Internet and American Life Survey, 2010). OECD (2000) report echoed that affluent states have the greater ownership of computer and ICT use, poor countries in Sub-Saharan Africa, Latin America or South East Asia lagging behind in the race. For example, in US, Singapore, Sweden, south Korea and Japan computer ownership and the Internet use are found to be positively correlated with wealth (Ono and Zavodny, 2007; Norris, 2001). All can't afford the computer hardware, software and monthly charges of Internet. The apparent gap in ownership and Internet access vary according to income and wealth of individuals and households (MacLaren and Zappala, 2002; Martin, 2003). As income rises, do the ownership of computer machine and access to Internet and as income declines, so do computer ownership and Internet use (Cuneo, 2002). Small (1997) described this association as the association between economic stratification and computer stratification. Willis and Tanter (2006) observed in Australia that those households that earn more than $78,000 a year were four times more likely than those earn less to use the Internet. In this line, Rasanen(2008) revealed a statistically significant and positive relationship between income and Internet use, but the correlation was lower as compared to other variables.

3.7 Occupations Employment

There are about 3000 occupations in the modern economic society. The number of occupations/jobs has increased manifold from agrarian economic to new digital economic.

Occupations are generally found to be associated with prestige, status/position and power in the social life. The status of occupation is positively linked to the increasing likelihood of the Internet use (Sangmoon, 2011). Jobs that consider ICT use more necessary are the ones that see the highest rate of ICT use by employees. The occupations that utilize computer and the Internet more are managerial and professionals in higher education, information processing, software and IT industry, telecommunications, publishing, government, the scientific, financial, and health sectors. Conversely, jobs that use the Internet least are semi-skilled and unskilled urban, manual labour, agricultural labourers, workers in mining, utilities, homemaking, other collar work and clerks (Cuneo, 2002; Sangmoon, 2011). A study based on Australian and US employees revealed that professionals and managers were much more likely than working class individuals to be Internet users (Willis and Tanter, 2006). Unemployed are more likely to use the Internet than the employed for job searches and for taking courses, while employed more likely use it for information searches (NTIA, 2000).

3.8 Status Power

All over the world certain groups are denied equal opportunities for personal growth, education, employment, and participation in political life due to structural characteristic of societies. They are deprived of status and power in the society. They are ascribed to be sub-ordination or powerlessness in multiple domains. Status is a social position one occupies in a society. It is a quality of social honour, prestige and power. Power has been interpreted in a variety of ways; it may refer to autonomy, influence, power to decide for others, ability to manipulate and institutionalized position in the authority structure of a community. The levels of access to digital technology depend upon the good position and status in the life of society. The allocation of resources is positively associated with position and power, those with lower/lesser status and power in the societal ladders are least users of digital technologies (Castells, 2001; Fox, 2005). The work of several authors (Durkheim, 1984; Marx, 1976; Weber, 1922) highlights the relationships of social status and power position with inequality of resources.

3.9 Family Characteristics

A vital aspect if the digital diversity is the connection between family structure and ownership of computer and Internet access. The family structure can include the size of the family, the presence or absence of children and whether there are one or two parents living in the family. The size of family is found highly correlated with larger Internet use (OECD, 2001). Families with children have more computer and Internet access than family without (Cooper, 2000). The Falling Through the Net study (NTIA, 2000) concluded that family with dual- parent more likely to use Internet (61%), compared to male-headed families with children less than 18 years of age (36%) and for female-headed families with children less 18 years of age (30%). Female-headed families in central cities have low Internet access rate (23%) and male-headed families in rural areas 30% access rate. Married couples without children are far less likely to access Internet. Non-family households consisting of single or unmarried persons are least likely to have Internet access (28%). The account in literature illustrates that the presence of children in family, however, does not have similar effects for men and women in two-parent families (Lebo, 2000). Women in such families with children have more access to the Internet (70%) than women in families without children. The presence of children has little or no impact on the likelihood that men will have differing levels of Internet accesses. Computer ownership is high among rich dual-parent families with children as compared to lowest income families (NTIA, 2000). Further, analyses (Fong, Wellman, Kew, and Wilke, 2001; NTIA, 2000; 2002) noted that married people have the highest rates of the Internet use (55%) as compared to those who are never married (50%). These two categories contrast strongly with those in the category (divorced, separated and widowed), merely 32% of those in this category have used the Internet.

3.10 Homelessness

The digital diversity and homelessness as an area of investigation has received little systematic attention. Housing status is not involved in various exploratory analyses of digital division and inclusion (Grogan, 2003). Information of this type is needed given the large rate of growth of the homeless population. There is handful of evidence on the extent of communication exclusion among homeless. Homelessness is exposed to multiple forms of social exclusion and particular circumstances and difficulties it entails are likely to reduce the ownership of and access to a range of information communication technologies (Hersberger, 2003). A qualitative study of homeless people's uptake of information communication technologies suggested that digital inclusion, in the sense of access to ICTs, does not necessarily lead to social integration of homeless people into mainstream society, as they used the ICTs 'in ways that reinforce the patterns and practices of their sub-culture'. Mobile phones and email allow homeless people to be contacted regardless of their physical location, and are commonly used maintain to social networks among individuals with transient or nomadic lifestyles (Bure, 2005).

3.11 Disabilities

Disability is an umbrella term, covering impairments, activity limitations and participation restriction. It may be physical, cognitive, sensory, emotional, developmental, or sometimes combination of these. According to American Association of Disabilities "a person with a disability as one who has a physical or mental impairment that substantially limits one or more major life activities" (NITA, 2000). The proportion of disabled people is rising. It is about 15% of the global population. It confirms that disabled people are the world's largest minority. Often disability has been ignored in discussing the digital inequalities. According to Kaye (2000) in United State, about 23.9% of persons with a disability have a computer in the household, as compared to normal national population and 10% of disabled have access to the Internet as compared to 38.1% adult national population. According to Cuneo (2002) disabled are independently part of digital have-nots and they are unable to cope physically, mentally and emotionally complex computer and Internet technologies. Disabled come from various classes, castes and urban and rural settings. Disabled belonging to black race, lower castes, lower income groups and rural locations are less likely have their reach to the Internet. According to current Pew Internet and American Life Project (2012) showed that people with disability are become victims of digital inequality. About 27% of them were far less likely to use the Internet than were people without a disability. There are no reliable estimates in India that can establish the association between disability and digital inequalities, but it is believed that disabled have lesser reach to the Internet.

3.12 Health Status

Health is closely related to the sense of well-being. Health psychologists viewed "health" as a multifaceted notion consisted of biological, social, cognitive, and behvioural aspects rather than the mere absence of disease. Disease is often associated with ailment both in body and mind. Internet has both negative and positive social and psychological consequences. Higher level of Internet use linked to relationship breakdown, neglect of domestic or work responsibilities, decreased physical/psychological well-being etc. Online activities are also associated with social connection, friendship, romance, support, health care benefits etc. People with severely poor physical, mental and emotional health –paralytic, terminally ill, severely depressed and schizophrenic – generally do not or rarely use internet (Suraj Mal, 2008), but their friends, family members, caregivers and significant others use the Internet for information or support of a doctor or other health professionals (Pew Internet Project's Report, 2013). It is not an exaggeration to say that persons being afflicted with these ailments exacerbate the digital disparity, but there is lack of empirical studies that provide firm conclusions. Virtual community support groups use Internet to a greater extent for people with conditions limiting their mobility such as multiple sclerosis and chronic fatigue syndrome (Davison, Pennebaker and Dickerson, 2000). The data indicate that 74% US adults got information from a doctor and health professional, 64% got information from friends and family, and 24% from others who have the same condition (Pew Internet Projects Report, 2014). However, the majority the information and care or conversation took place offline. People living with chronic conditions and their caregivers are more likely to track health information online in a formal way (Pew Internet Project's Report, 2014).

3.13 Social Relationships

Social relationships are a ubiquitous part of life, serving important social, psychological, and behavioral functions across the lifespan. More important, both the quantity and quality of social relationships have been reliably related to ICTs use. For instance, Granovetter (1973) disclosed that people have different patterns of relationships to others in terms of size of their circle, strength of their ties, the average of geographical distance over which they maintain relationships and their tendency to enter in new relationships. Internet can be a fertile ground for the formation of closer and meaningful relationships in the safer environment **(**Hatfield and Sprecher, 1986) based on shared interests, values, beliefs and perception of similarity as opposed to attractive and physical appearance as in the form in the off-line world. Internet, mainly through e-mail offers the opportunities to maintain relationships with friends and family members over a longer distance at a cheap cost than telephone and faster to postal mail (Guillen, 2005). Wellman, Quan-Haase, Witte and Hampton (2001) maintained also that individuals who continue closer ties with acquaintances too far away to visit in person on a regular basis are more likely to use the Internet People, who have longer distance and wider relationships, want to explore new contact beyond the existing ones, desirous to strengthen or improve the local and distance weak ties and increase and enhance more active-meaningful social lives are more inclined to use the Internet technology (Bargh and McKenna, 2004). Online tools are very helpful in making talking with strangers and new acquaintances more easy (Kang, 2000).

3.14 Information Rich and Information Poor

The 21st century has been described as the "Information Age". The phrase "information age" was coined by Castells (1996) to describe a period in which the movement of information through network would overtake the circulation of goods as the primary source of value in society The impressions 'information rich' and 'information poor' explicitly describe the existence of serious imbalance among various countries, and within a given country. It is quite obvious that information play important role in international relations. And information can be an instrument of understanding and sharing knowledge (Drucker, 1994). Appropriate skill is needed to accumulate knowledge. Knowledge workers with skills tend to use digital technology to turn information into knowledge and knowledge into action (Castells, 2001; 2010). There is a glaring disparity in the way information is generated, distributed and acquired. Information poor do not have requisite skill, abilities, or material means to obtain efficient access information, interpret it, and apply it appropriately (Himma, 2007). Information rich people are those who belong to economically and educationally advanced strata. The information rich has greater opportunities to adopt, own and use Internet technology, while the information poor who are also often economically poor, women and ethnic minorities lack in ownership of instruments and proper access to the Internet which is vital for empowerment, development and survival (Zillien and Hargittai, 2009). Higher utilization of Internet by information rich tend to get them richer ("Rich get Richer", Kraut, Kiesler, Boneva, Cummings, Helgeson and Crawford, 2002) and lower use or non-use of Internet by information poor tend to make them digitally illiterate ("Digibetism", Carpentier, 2003,) At international level also developing countries are dependent on more advanced countries for capital, information and technology leading to profound digital inequalities.

4. CULTURAL CHARACTERSTICS

Cultural digital diversity has received far too little attention. Cultural differences affect nearly all areas of the world. About 90% of nations are culturally diverse. There is close connection between technology use and culture. According to some social anthropologists cultural facts include mythology, religious practices, arts, institutions, values, norms, customs, attitudes, scientific theories and symbols (Gee and Green, 1998; Lee and Smagorinsky; 2000). These features characterize a culture. A combination of cultural factors determines individuals' access to capital, technology and skill development (Friedman, 2001; Hooper, 1998). Cultural patterns influence the way people perceive, understand, and interpret technology (Hooper, 1998; Lee And Smagorinsky, 2000; Suraj Mal, 2008). In fact, the technologies are created with the cultural biases and constitute automatically technology restrictive attitudes and practices or liberal attitudes for adoption, acceptance and use (Porter and Donthu, 2006; Shaw, 1995). The technology acceptance model (TAM) suggests that the perceived attributes of the technology such as perception about the benefits or devastating effects of the technology influence attitudes toward and use of technology (Porter and Donthu, 2006). For example, in Britain the locomotive in the early days of rail road was called a "Hell on Wheels and the "Devil Wagon". Fear about ICT and its negative impact on time- honored values and traditions and repercussion on the social structure, met with resistance to acceptance and likelihood of usage of the Internet (Meuter, Ostrom, Bitner and Roundtree, 2003). Positive attitudes are

associated with a greater likelihood of ICTs use and negative attitudes toward ICTs are linked with lesser use of computer and of the Internet (Jackson, Barbatsis, Alexander, Biocca, Zhao and Fitzgerald, 2003). Negative attitudes toward computer and the Internet were more frequently in low income and minority groups, this cultural attitudes perspective has its roots in the work of Max Weber's (1922) distinction between class and status.

Additionally, it is observed that societies that follow rigid hierarchical structure are less likely to go online than liberal societies with a flatter hierarchy. Liberal, flexible and lenient societies encourage curiosity; provide equal chances for all citizens to acquire capabilities in the context of ICTs and give ample opportunities for ICTs utilization that in turn increase a greater likelihood of access to the Internet. Turkish people have settled in Germany about 40 years ago. The culture of their homeland mostly shaped by an agrarian and patriarchal structure, many Turkish immigrants in Germany experience some distinct cultural conflicts and they are usually described as marginal people. Marginal people are labeled with negative stereotypes such as "apple", "banana", or "oreo". Turkish has below average command of the German language. Most of the computer programs of computer are in German or English language. Thus, they perceive computer systems as culturally different, belonging to a so -called outer sphere and causing a delayed adoption and use of Internet technology (Nohl, 2001). Moreover, other asserted that language barriers are important which implies the involvement of culture and linguistic paradigms. ShuhoOtani (2003) illustrated a distinct 'information gap' in Japan due to language that is viewed as core element of a culture. Japanese cultural factor, especially, the Japanese users' face difficulty with the English language and non- alphabet typing culture has led active avoidance of computer and the Internet. In a similar vein, France, Belgium, Spain and Portugal share the disadvantage in terms of language. These countries show the information restrictive practices and also exhibit 20% less usage rate of Internet. Greece marks with 12%, the least connected member state of European Union.

4.1 Linguistic Diversity

Language-oral or written- is the primary vessel in which learning, information gathering, information storage, information transmission are carried forward. 10,000 years ago, there may have been as many as 15,000 languages worldwide, 2.5 times as many as today (Krauss, 1992). On a global level, there are less than 6000 languages, and of those, up to 3000 are on the red list of endangered languages. By 2050 there may remain English, Spanish, Arabic, Chinese and Hindi/Urdu (Cunningham, 2001). There are several reasons of language disappearance. Globalization and ICT (specifically Internet) are posing threat to linguistic diversity, damaging the purity and health of any language other than English and creating the so called digital divide and other inequalities. The dominant obstacle to enter into the Internet world and much of computer technology is that they require the use of English and fairly sophisticated level of English at that. According to the Internet Society's Survey (1996), about 82% web sites are in English, followed by German (4%), Japanese (1.6%), French (1.5%) and Spanish (1.1%). Other experts have found that 90% of Internet sites are in English (Cuneo, 2002). Today, it is estimated that approximately 87% of the material posted on Internet is in English. In e-commerce, English is even more dominant, with over 94% of links to pages on secure servers in English. Most people prefer to interact with web sites in their own language, prefer to get local information in their own language and in many cases simply can't function in a non- native language. Language becomes a barrier to use the Internet. And whose primary language is not English, they are often left out of the benefits the Internet offers (Friedman, 2001; Twist, 2000). This may be the reason that non-English speaking people use the Internet less. The dominance of English on Internet serves to reinforce and maintain the digital divide. Most English speaking countries, groups and classes are "Digital Haves; and non-English speaking are likely found among the "Digital Have -Nots". There are currently fewer sites for non-English users. The World Wide Web is indicating the signs of breaking away the dominance of English and increasing the sites in local languages.

4.2 Religion

Across the globe the major agent of social control is religion. Various Religions differ on different dimensions such as tight and flexible behaviour, restrictive doctrine, expressiveness, fundamentalism, ways of worship of God, etc. Religious beliefs are written into the mental map of the individual and therefore construct the unconscious filter in which choices are made. Thus, religion is associated with the life styles, values, attitudes, habits and mental pictures or images. Directly the religion has no bearing on the technology innovation, revolution, adoption and use. However, it provides unique environment for the understanding, interpreting and evaluating the technologies. Several investigations have reported that Hinduism was the dominant religion among ICT workers in India (Ilavarasan, 2007; Oommen and Sundararajan, 2005; Upadhya and Vasavi, 2006) and Muslims, who form about 13.4% of the population are lesser in the ICT work force (Basant, 2007) and lagging in Internet use. Middle East society sees Internet with skepticism (Norris, 2002). Fundamentally authoritative Muslim regimes such as Egypt, Libya and Syria have lower Internet connectivity. On the contrary, states like UAE, Saudi Arabia and Qatar have higher Internet connectivity. Women constitute one-third of all Facebook users, a finding that respondents attribute to general regional cultural constraints (Arab Social Media Report, 2012). Young Muslim generation who believe in democratic, secular, individualistic and neo-spirituality values clearly utilize more Internet services for various purposes like religious practices, religious communication, religious lifestyles, welfare, therapy, self-help, pilgrimage sites than orthodoxy (Turner, 2012), now more young Muslim people have access to religious sites of communication that in result has changed their religious lives, beliefs and practice.

4.3 Immigrants

Migration is ordinarily defined as the relatively permanent movement of persons over a significant distance from their place of residence--- usually place of birth, while a stay for a shorter period is termed as a visit. The cities across the world are facing an explosion of population over the years. The majority the population consists of migrated educated youth, skilled, unskilled workers and minority groups, adding a shanty township each year. Immigrants are disproportionately unskilled, have limited English skills, and are in lower socioeconomic status groups (Quian and Lichter 2007). Immigrant resides in segregation (Cutler, Glaeser, and Vigdor, 2005). This concentration in segregated communities limits immigrants' interaction with natives and magnifies their social distance from mainstream society (Quian and Lichter 2007). Given all of these disadvantages, lack of IT access and skills may be one of many barriers to socioeconomic advancement. There are results indicate that there is a large

gap in computer and Internet access and use between immigrants and natives. The digital divides tend to mirror preexisting patterns of inequality (Korupp and Szydlik 2005; Ono and Zavodny 2007; Warschauer 2003). Immigrant households tend to be disadvantaged along many dimensions usually associated with lower rates of IT usage, such as race, income, and education. In particular, immigrant households tend to be poorer and less educated than households headed by a U.S. native. Since there are pronounced disparities in IT ownership and use by income and education (Warschauer 2003), this alone suggests that immigrants have lower rates of IT ownership and use. In addition, immigrant households have lower literacy rates and less wealth, on average, creating additional barriers to IT usage. Limited English proficiency may be an important obstacle to IT use, particularly of the Internet, for the many immigrants who lack English fluency. Immigrant households may lack social networks that would enhance their opportunities to acquire IT access and skills. The literature on the digital divide emphasizes the importance of being able to draw on social support for IT help (Hargittai 2003). Given the low average rates of IT use among immigrants due to low rates of social interactions, many immigrants' social networks probably have relatively low rates of IT use.

5. PSYCHOLOGICAL CHARATERSTICS

Psychological characteristics can have powerful influence upon individual's patterns of behavior in a variety of situations. Psychological traits are generalizable and allow one to predict behavior even in normal circumstances. Various psychological factors and elements are necessary for adoption and use of technology. Research in the past provides an illustration that there is a psychological digital divide (Eastin and LaRose, 2000; Frideres, Goldenberg, Disanto and Fleising, 2006). The psychological dispositions of an individual determine adoption, access and use of technology. The work of Cuneo (2002) suggests that, on one hand, some individuals are most intense users of computer and Internet because of high degree of self-confidence and efficacy and low anxiety about utilizing computer technologies. On the other hand individuals have low confidence and less proficient in their use and high anxieties, are least users or fall behind and increasingly at a disadvantage (Rasanen, 2008). High anxiety and deficiency in confidence form strong psychological blocks to computer and the Internet use. Lack of confidence in the Internet use is observed among low-income earners, females and elderly persons. Technophobia inflicts more to older generation and females (Igbaria and Chakrabarti, 1990). It has been argued that some students suffer from computer-anxiety. Marcoulidies, Marcoulidies and Stocker (2004) reported that students studying in America and Chinese students studying in China showed similar degree of computer phobia. The study suggests the universality of some degree of computer phobia among students and their lesser digital participation. Another study (Glass, Knight and Baggett, 1985) suggests that one-quarter to one-third of the population suffer some form of computer anxiety. Extraversion trait has the inclination to approach to computer and the use of the Internet (Hudiburg, 1999) and alleviate computer related phobia and stress.

Attitude is also an important factor. Attitude can be formed about many things and represents evaluation and preferences towards various things. Those who have negative attitude towards Internet are less likely to use Internet. Therefore, they differ significantly in their ability towards their technological efficiency and as consequences remain excluded from technologies (Rice and Katz, 2003).

Several psychological characteristics have been listed above. There are other dispositions like intelligence, ability to grasp, interest, motivation, perception, memory and others can affect the utilization of the Internet technology (Haddon, 2000; Stanley, 2003; Tu and McIsaac, 2002). It seems that digital inequality is related to want- nots (no need or no desire). Ownership of computer and the Internet use both are reported to be associated to motivation (NTIA, 2000) and people of lower income and education groups show lesser appeal for Internet or they do not see any good reason to use (Katz and Rice, 2002). Dependent proneness- a promoter of an inhibitory work culture, influences the ability to access, adapt and create knowledge using the information technology and this blocker or barrier traits is found to be more prevalent among poor strata of the world. Stereotype refers to certain physical and psychological aspects of some people/group. Social cognitive theorists speculate that the stereotyped group tends to adopt the stereotype as standard for their own self-comparison, lowering their self-efficacy and imposing further psychological block to use Internet efficiently (Cuneo, 2002).

6. BUSINESS/INDUSTRY/INVESTMENT

Indisputably, the business and industry definitely have a considerable impact on accessing and using ICTs (OECD, 2001). The usage of ICTs in business increases productivity. The use of ICTs differs a lot among business, industries, and firms. The literature indicates that factors such as size of the firm, location, type of industry, external environment and IT investment determine the level of ICTs use (Taylor and Murphy, 2004; UNCTAD, 2009). The variables mostly used to examine the diffusion of ICTs among firms are Internet access, existence of a web site, number of computers per employee, employee's skills, use of e-mail, browsing, enterprise resource planning, online sales, online purchases, etc. The size of firm depends on number of employee and huge investment in IT (Forman, 2005). Firms of big size are more likely to invest in IT and to utilize ICTs more and increase their reach to local, national an international market (Dewan and Riggins, 2005). Smaller business units are less likely to have invested in new technologies and to use the internet External environment pushes firms to invest more in IT in order to remain in competition (Iacovou, Benbasat and Dexter, 1995). Firms/industries located in urban location are more likely to use ICTs than firms located in rural geographical area. Business institutions/industries provide information-intensive services such as communication and finance and the public sector (education, public administration, health care) often have higher penetration rates. Transport and storage, retail, accommodation and food services have the lowest penetration rates with manufacturing approximately at the middle ladder of Internet use.

7. POLITICAL PERSPECTIVES

Technology is not complete, nor is it ever likely to be final or static. Its nature is dynamic. The technological evolution or revolution is affected by social conditions and demands. Internet is a new technology came into existence approximately five decades ago. Many factors have promoted and retarded the faster surge of Internet across the globe. Scholars have turned their attention to political factors (Milner, 2003). Mass media communications are often utilize by masters in various ways including to organize campaigns, to employ it to more efficiently deliver administrative services, to project their own power globally and impose restriction on certain activities (Cuneo, 2002). Some scholars

argue that political elites or political regimes in a given society can shape various aspects of mass communication or Internet such as content, autonomy, and availabilities of the media output (O'Sullivan, Hartley and Fiske 1983). Authors now claim that democratic political regimes are more open to thoughts, beliefs and innovation, so are more likely to adopt and spread the Internet technology at a faster pace than authoritarian regimes (Friedman, 2001). Democracy offers greater autonomy or discretion to access information and users may retrieve information 24 hours and easily engage in exchange of information's with other individual or groups. Wilson (2004) opined that countries that have stable environment and respect for law and democratic rights, there are chances of rapid development of ICT. Authoritarian political regimes prefer centralized mass communication. They regulate the use of Internet in a number of ways such restricting access by controlling networks and instituting registration requirement, restricting content by means of filtering or blocking of forbidden sites etc. and threat of arrest for using unauthorized information or use Internet for political mobilization (Friedman, 2001). Autocratic ruling groups see more disadvantages of Internet than its advantages. They have greater desire and more ability to hinder or retard the adoption and use of internet

Government policy toward the telecommunication can affect the Internet spread. Policies regarding licensing, taxation, subsidization investment and standard setting also determine the rates of adoption. Liberal taxation, investment and privatization policies of the governments lead to flourish the Internet growth and access too. Unfavorable policies to investment, lower taxation and privatization slow down the speed of adoption of ICTs and in turn increase the likelihood of higher cost of Internet and digital diversities. Political institutions can manipulate governments or ruling elites to foster technological change or enable them to slow it down or derail it completely. If institutions see that their motives are not going to be fulfilled they try to use governments to enact policies that block the spread of Internet and create digital political divide.

8. SOCIAL OBLIGATIONS

Philanthropy and Obligation have a long history as an important aspect of social life. The very concept of philanthropy and obligation are deep-rooted in the religious philosophy or ethical theory. Across the world it has been regarded as an integral part of the society. Moral obligation aimed at helping the individuals, social groups and creating a society of equality and equity (Saha, 2014). It can adopt problem solving way. Many problems like poverty, poor nutrition, illiteracy, unemployment etc. can be solved by philanthropy, social/moral obligations. There is a comparative lack of meaningful access to ICTs due to inequitable distribution of resources which should bother any conscientious person. The concern here is not that the problem of digital gap with many dimensions is extremely difficult to solve. But the moral importance of the digital diversity that needs to be taken care of is linked to variety of inequalities. There may be a case for thinking that such disparities are inherently unjust and against the social justice. It is beyond controversial that it is morally good for resourceful persons to help the digital have-nots by addressing the problems of absence of schools, arranging training and providing necessary infrastructures and economic assistance (Himma, 2007). To give assistance digitally disadvantaged is conceived as charity. Several studies cast doubts on the thesis of bridging the gaps by means of obligation. Those who are wishing to help bridge the gap, are suspect and the have-nots do not see them in the positive way. Instead of praising the obligatory acts and extending gratitude, benefactors can say that they are helping us only to help themselves in the long run (Guillen, 2005) such to get tax benefit, to receive prestige and status in the society and for securing the dignified life heaven. Donors are also perceived as having superior attitude, hence recipients resent to the advice, external technological help and even encouragement to enter into the mainstream of digital haves. It would refrain from the morally obligated help to eliminate the digital diversity and alleviating its effects. In a way the divergent perception of helper and benefactors provides a fertile ground to continue the prevailing gaps and hamper the bridging efforts.

9. OTHER SIGNIFICANT CORRELATES

Digital diversity is a complicated construct, but variables mostly used as determinants have been presented above, can't mirror a comprehensive picture of digital diversity. There are other factors that may correlates with access and use of ICTs. Some of the correlates are: Technical means, computer skills, autonomy of use, cost of access, location of access; social support, purpose of use, local content etc. Many studies have found that the cost of equipment (hardware machine) and internet access charges are highly associated with ICT penetration (NTIA, 2000; OECD, 2004). Higher cost of computer and ICT use negatively affects ICT adoption. People in many European countries do not have computer and the internet connection at home (Demunter, 2005). OECD (2004) report shows that the cost of ICTs tend to be higher in rural locations and keeps many people disconnected. Cuervo and Menendez (2006) documented that Greece has the higher cost of the Internet access for residential users among the member of EU and in turn comparatively lower the connectivity to EU-average. Kabati (1999) reveals that access charges are much higher in Argentina, the Dominican Republic, India, Armenia, Kenya, and Ghana than in Finland and the US. The costs or charges present immediate barriers for many non-users.

ICT infrastructure is clearly related to ICT diffusion and its use (OECD, 2004). Poor infrastructures in terms of physical lines, communication channels, server security etc. dramatically decrease the development and innovation in the Internet technologies (Menkova, 2004). The development can be assessed by means of number of host, secure servers' density and access lines. Studies (Cuervo and Menendez, 2006; OECD, 2004) have highlighted that poor or lack of ICT infrastructure among regions and countries reflects gaps. People who have no access to the quality of the connection or powerful means such as broadband connection (high-bandwidth Internet access, either DSL or Cable modem), can't exploit the full range of Internet content. Developed countries and rich individuals clearly have the best Internet connections (Wellman, 2000). Local content can contribute to the creation, dissemination or preservation of a community's or county's knowledge or tradition and help disseminate important information about security, education or political situations. Local content increase the likelihood of Internet use (OECD, 2004).

To use computer or Internet some sort of skill/ competence is required to locate content online effectively and efficiently (Hargittai, 2002). This skill may be termed as computer skill, computer literacy, Internet use skill or information skill. Research literature indicates that those who have adequate computer skills are called the digital generation and vital for

computer and network sources use for particular goals. People who do not have adequate computer skills are less likely to use Internet. There exist still skills based usage gap. These vary due to age, experience, gender and educational standard. In nutshell, it was observed that age was negatively associated with skills of use and Internet experience and formal educational attainment had positive correlations with operational, formal, information and strategic Internet competence (van Deursen and van Dijk, 2010).

The autonomy of the Internet use is another factor that contributes in digital diversity. The autonomy on Internet may be restricted by the constraints of the geographical area or the exact location where the access is feasible. Such constraints might concern the access time (e.g. public libraries), the content itself (e.g. work places, religious grounds, criticism of government policies) and the quality of the connection. Survey accounts (NTIA, 2000) advocated that the use of the Internet at home implies an individual typically has more opportunity to use the technology and for longer periods of time than if he or she uses it only at a school, library or community center. Persons who use Internet at home for various services more frequently and for a longer duration than who access the Internet from others locations (Dickinson and Ellison, 2000). Newcomers to the Internet spend less time online and engage in fewer online activities than those users who have more experience using the Internet (Spooner and Rainie, 2000). Lebo (2000) described that newbies or those less than one year of experience spent approximately 6 hours a week online in comparison to those with Internet experience of 4 years or more who spent 16 hours online a week. Internet utilization, thus, correlates with experience using the Internet.

The support on the part of government, institutions, NGOs, family and friends is helpful in facilitation of the Internet use. For example, persons whose families or friends are more familiar with the new technologies are often highly motivated to adopt and use ICTs too. Lack of support can be discouraging for "Newbies". The digital disparities are also visible due to the purpose of the ICTs use. The higher the purpose of the Internet use, more the accumulation of knowledge and fruits giving in the societal life. If the technology is utilized merely for entertainment, social-networking, videos and games rather than education, then users usually have limited information, knowledge and poor academicals achievements. It would serve only to widen what some called “the time waste gap", "money wastage" and "lost opportunity" for advancement. It has been emphasized that lack of information of local web-sites and content in the local language or useful online community content creates obstacles for the Internet users (Lazarus, 2000)

10. FUTURE DIRECTIONS

Majority of studies reported here are unquestionably based on Western and other developed countries. These have direct bearing on literature creation, production and utilization. Present attempt has limitations to review the body of literature in short period, an exhaustive exercise is needed. Future efforts may involve generating indigenous updating data base. Additional research should point out the missing links and gaps with respect to the digital diversities**.** It would be a fertile territory to study interactions between different factors and their causal relationships with digital inequalities. The research has underplayed the importance of dynamic interactions between cultures within a culture and isolated regions or physical settings. It is also imperative to obtain better and coordinated data on remedies or strategic efforts to tackle the gaps. Future pursuit should also concentrate on to develop mechanisms that prevent from negative psycho-socio-economic consequences to those who are already deprived and whose voices remain unheard. This particular issue certainly would spark enthusiasm among galaxy of investigators in the orbit for flourishing researches.

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