IMPACT OF ICT IN EDUCATION, ENTERTAINMENT, DEVELOPMENT, GOVERNANCE/POLITICS & INDUSTRY

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Abstract—

Purpose – The purpose of this paper is to explore impact of ICT, in Education, Entertainment, Development, Governance/politics, and Industry

Design/methodology/approach – This is a term paper for ICT Impact on Society (MDC 6402).The methodology used is literature review from scientific research papers.

Findings – ICT has impacted every sector either positive or negatively but positive impact supersedes negative impacts.

Keywords:

Paper type - Research paper

Keywords— Education, Entertainment, Development, Governance/politics and, Industry

1. Introduction

The acronym ICT stands for Information Communication Technology. Oxford dictionary defines each word in the acronym as; Information -[1]"what is conveyed or represented by a particular arrangement or sequence of things", communications- "means of sending or receiving information, such as telephone lines or computers" and Technology- "the application of scientific knowledge for practical purposes, especially in industry" (Oxford 2012). United Nations Educational, Scientific and Cultural Organization (UNESCO) further define ICT [2] "as the combination of informatics technology with other, related technologies, specifically communication technology." Organization for Economic Co-operation and Development (OECD) define ICT as, [3] "A combination of manufacturing and services industries that capture, transmit and display data and information electronically." (OECD 2002).

We can therefore conclude that ICT as technologies used for sending and receiving information using technology in a work/industrial environment.

It is very hard to quantify the impact of ICT in society, this is because**,** [4] "These technologies do not create the transformations in society by themselves; they are designed and implemented by people in their social, economic and technological contexts",(Pruulman 2006), in order to understand the impact of ICT, [5] "We must go beyond measurements of the diffusion of pieces of hardware and even increases of information in stocks or flows and investigate the social context within which these developments are taking place." (Pruulman 2006).

The impact inspired by the use of ICT can be either positive or negative. There is also ethical issue that arises and affects different life aspects. World is changing rapidly leading to paradigm shift of how things used to be done to new ways which have been enabled by the use of ICT.

There is no technology that is bad, but how the technology will be used and the impact it will have on the environment determines its goodness or badness. This paper seeks to identify the impact of ICT in Education, Entertainment, Development, Governance/politics and Industry.

2. ICT Impact in Education

[6] "It is difficult and maybe even impossible to imagine future learning environments that are not supported, in one way or another, by Information and Communication Technologies (ICT). When looking at the current widespread diffusion and use of ICT in modern societies, especially by the young – the so-called digital generation – then it should be clear that ICT will affect the complete learning process today and in the future." (Yves Punie, Dieter Zinnbauer and Marcelino Cabrera)

ICT has contributed immensely in the development of education in very many ways. Education is considered as one

[1] Oxford dictionary (2012), "Define: 'Information' 'Communication' 'Technology'", available at: http: // oxford dictionaries. com/ definition/ English/ (Accessed November, 15, 2012)

[2] UNESCO (2002),"INFORMATION AND COMMUNICATION TECHNOLOGY IN EDUCATION: A CURRICULUM FOR SCHOOLS AND PROGRAMME OF TEACHER DEVELOPMENT.UNESCO, Available At: http :/ / unesdoc .unesco. org /images /0012 /001295 /129538e.pdf. (Accessed on November 2, 2012)

[3] OECD 2002,"Measuring the Information Economy",OECD,(20), Available at:http : // www.oecd.org /internet /internet economy / 1835738. pdf.(Accessed on: November 12, 2012)

[4] Pruulmann-Vengerfeldt, Pille (2006). "Exploring Social Theory as a Framework for Social and Cultural Measurements of the Information Society." Information Society, 22(5), 303.Available at: http://intramis.net/old/tis_articles/Exploring_Social_Theory.pdf. (Accessed on: November 19, 2012)

[5] Prof. Richard Taylor & Prof. Bin Zhang (2007), "MEASURING THE IMPACT OF ICT: THEORIES OF INFORMATION AND DEVELOPMENT", Available at: http://www.intramis.net/TPRC_files/TPRC%2008%20Taylor-Zhang%20Final.pdf. (Accessed on: November 19, 2012)

[6] Yves Punie, Dieter Zinnbauer and Marcelino Cabrera (October 2006), "A Review of the Impact of ICT on Learning". Available at: http://ftp.jrc.es/EURdoc/JRC47246.TN.pdf. (Accessed on: November 19, 2012)

of the key pillars for the growth of an economy in a country. In this ICT era called [7]"the Global ICT Society – a global society supported by a universal technology." (Krystyna Górniak-Kocikowska 2007), education system is changing rapidly due to the new innovations in ICT which has led to "Knowledge society also called the "knowledge and information society" (Krystyna Górniak-Kocikowska 2007). Knowledge society will be understood here as [8]"a society endowed with the ability and capacity to generate and capture new knowledge and to access, absorb and use effectively information and ICTs". (D'Orville, 2000)

Knowledge society also has transformed the economy to Knowledge economy. Knowledge economy is understood as one "in which the generation and exploitation of knowledge play the predominant part in the creation of wealth" (Krystyna Górniak-Kocikowska 2007) new kind of economy driven by information has created job opportunities driven by the knowledge known as the knowledge economy. The knowledge economy is the key driver of growth of economy. The key driver of the growth of this economy is information accessibility, processing power and modern education systems.

The Knowledge economy requires schooling system to generate graduates who have prerequisite IT skills. The old education system is not able to cater for the growing demand, [9]"Even with increasing enrollments, the number of graduates in computer science and information systems has been inadequate to meet worldwide industry demand" (West & Bogumil, 2001), and [10] "our teaching methods have not evolved to meet the needs of students and employers in these rapidly changing technical fields." (Laurillard, 2002).

2.1 Positive impact of ICT in education

The knowledge economy has created new job opportunities. More and more people are graduating through the education system and employed in the key sectors in the country leading to the growth of the economy.

ICT has enabled more information to be readily available and shared through the use of the internet. The information now is readily accessible and cheap. This has led reduced load of books that students had to carry. For example a flash disk can carry hundreds of book; if the student had to buy the books and carried them it would be so bulky.

The amounts of information students are have access is vast. This has led to more knowledgeable students who can adapt to rapidly changing technological environment; [11] "Information literacy provides students with the opportunity to explore how information and knowledge shapes their lives, their community, and the world. Students become critical users of information, learning how to situate information and knowledge in a diverse global environment." (Ezziane). The kind of graduates modeled to the job market are versatile technological savvy and able to work in diverse environments.

The internet has enabled the sharing and easier accessibility of books and scientific journals which in some few years was scarce and very expensive. This has contributed immensely to the high standards of research papers and higher standards of education.

New modes of teaching formats has also been developed which has lead to higher quality in education system. The digital electronic boards are replacing the traditional blackboards which were dusty and unkempt. The digital boards comes in with new interactive features has improved learning experience like the touch screen to navigate, presentation formats and easier access to reference materials through touch screen.

Teachers are scarce human resource s here in Kenya. The teacher to student ratio is very high compared to internationally recommended standards. This has led to the poor education standards and learning standards. With ICT, this is envisaged to reduce the ration to internationally standards due to the new modes of teaching. I online learning, one teacher can be used to teach many students over wide geographical area and remote areas through the use of teleconferencing.

ICT also has changed the experience of learning whereby more interactive learning software is being developed to teach sciences in an easier and understandable mode. Students need to access the learning software and start learning without the intervention of teachers. Example is virtual reality, [12] "The visual nature of VR and the intuitive manner in which users (students) can control and manipulate virtual objects are thought to be the two main ingredients that support learning in virtual environments." (Win & Jackson, 1999). The VR is used in teaching sciences and aviation. This is because students get first-hand experience leading to better understanding.

The cost of the educational materials has greatly reduced due to the use of ICT. Students can now access them readily in digital format. Personal digital assistants can be used to carry the learning materials and also download the reading materials. This has reduced cost of education materials.

Student learning environment has become friendlier in that the professions which required specialized training like engineering, "ICT offers tremendous possibilities in enhancing students' learning, developing teachers' professional capability, and strengthening institutional capacity". This is by use of computer applications like computer-aided applications and virtual environment for training of pilots.

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[7] Krystyna Górniak-Kocikowska, (2007),"From computer ethics to the ethics of global ICT society", Library Hi Tech, Vol. 25 Iss: 1 pp. 47 - 57

[8] D'Orville, H. (2000), "Towards the global knowledge and information society – the challenges for development cooperation", available at: http://ncsi-net.ncsi.iisc.ernet.in/cyberspace/societal-issues/131/info21.htm. (Accessed on: November 19, 2012)

[9] West, L., & Bogumil, W. (2001). Immigration and the global IT work force. Communications of the ACM, 44(7), 34–38.

[10] Laurillard, D. (2002). Rethinking teaching for the knowledge society. Educause Review, 37(1), 16–25.

[11] Ezziane, Z. (2007). Information Technology Literacy: Implications on Teaching and Learning. Educational Technology & Society, 10 (3), 175-191.

[12] Winn, W., & Jackson, R. (1999). Fourteen propositions about educational uses of virtual reality. Educational Technology, 39, 5–14.

2.2 Negative impact of ICT in education

Infringement of intellectual property due to the illegal download and sharing of unlicensed learning software. The software are freely accessible from the net, and due to difference in application of intellectual property laws in different countries, it has become had to deter the practice.

The internet and easy accessibility of information through illegal downloads has led to rapid increase in plagiarism leading to poor education standards. Students are not able to produce quality research due to lack of knowledge to undertake research. Plagiarism also has led to led to degrading of education standards from certain countries and institutions.

[13]"Another hurdle in coping with computer literacy is the constant state of flux of IT today" (Ezziane). The reading materials are becoming irrelevant with in a very short duration of time due to technological advancements which lead to change in the training curricular. For example training of web development using static pages has become irrelevant; students need to be trained now on how to code dynamic websites. The dynamic websites developed also are very complex to comprehend and require training.

There are inadequate instructors trained to use the new ICT gadgets due to obstacles they face in using the technology. The obstacles are caused by poor infrastructure or outdated ICT gadgets.

ICT has led to loss of revenue, jobs and closure of many publishing companies. This is because more and more students are shifting to the digital learning materials leading to lack of market for books.

3. ICT impact in Entertainment

Entertainment has been a part of all cultures since time in memorial. But what is entertainment? Zillmann is defines Entertainment as [14]"the action of providing or being provided with amusement or enjoyment" (Online Oxford dictionary). [15]"Will define, more than ever before, the civilizations to come" (Zillmann)

Entertainment is viewed as an elite culture, "elite culture is whatever cultural critics give their seal of approval" (Stephen Bates and Anthony J. Ferri). The culture has made people to try and adapt new trends so that to feel fashionable. This is viewed in the society classes, these classes have different taste of the kind of entertainment they want. The key determinant of kind of gadget to use for entertainment is the amount of money available to finance." The upper classes are more likely to embrace what is defined as elite culture than the working class. Another approach emphasizes self-improvement, even at the cost of pleasure." (Zillmann).

Leisure also has similarities with entertainment, this is because, [16]''The individual must perceive the activity as (a) freely chosen, (b) intrinsically satisfying, (c) optimally arousing, and (d) requiring a sense of commitment.'' (Tinsley et al). To have entertainment the above characteristics of leisure must be fulfilled.

ICT has changed entertainment making it much more popular, easy, convenient and enjoyable. Almost every area of entertainment has been affected by digital technology enabling more entertainment options. ICT has revolutionized entertainment whereby it has been dramatically enhanced in the accessibility of music, movies, and games and gambling. Music and movies can now be purchased online free of charge or at a low cost. There are also online gambling sites.

The video game is an area in multimedia that is famed and common in Kenya and internationally. [17]"The US market for home video games in now larger than that for films or music, and is a major force in the development of technology and public use of multimedia" (Fame 2010). This is because video games are a youth phenomenon.

Another form of entertainment gaining popularity is gambling. "Gambling is a multi-billion pound industry worldwide ($40bn alone in the US, WIRED 6/ 95), and is highly regulated, both on moral grounds, and to ensure government revenue." (Fame 2010). Gambling relies mostly in technology for publicity and relaying results. Mobile phones currently are being used by betting and lotteries companies and to client to potential clients.

The government of Kenya is currently undertaking migration of the analogue to digital transmission. This will bring new experience in TV industry in Kenya whereby Kenyans will be spoilt of choice in the channels to watch. ICT is the enabler of this and has led to cheaper access of entertainment which was out of reach by millions of citizens.

3.1 Positive impact of ICT in Entertainment Industry

ICT has created new jobs for the programmers who develop games, software's that operate multimedia equipment's.

The use of ICT has greatly improved the production standards in the entertainment industry bringing new experience in the industry like 3D movies, and televisions.

There is no need to have a TV so as to access entertainment; smartphone technology has made it easier to access entertainment from anywhere.

The internet has made the entertainment materials more readily accessible. There is no need to go to a movie or a music store to buy the movies since you can and download (video on demand). For example the iPod comes with huge internal memory to store music and one can access more and

This has increased revenue and profits for the entertainment industry due to Internet that has enabled to reach new markets readily accessible from any corner of the globe.

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[13] Ezziane, Z. (2007). Information Technology Literacy: Implications on Teaching and Learning. Educational Technology & Society, 10 (3), 175-191.

[14] Oxford dictionary (2012), "Define: Entertainment", available at http: / / oxford dictionaries . com / definition / english / entertainment ?q= entertainment (Accessed November, 15, 2012)

[15] Zillmann, Dolf. "The Coming of Media Entertainment." Media Entertainment: The Psychology of its Appeal. Eds. Peter Vorderer and Dolf Zillmann. Mahwah, NJ: Erlbaum, 2000. 1-20.

[16] Tinsley HEA, Hinson JA, Tinsley DJ & Holt MS (1993) Attributes of leisure and work experiences.
Journal of Counseling Psychology 40(4): 447–455.

[17] Fame 2010, "Forecasting the Future of Multimedia to the Year 2010 and beyond" available at http://www.rcss.ed.ac.uk/fame/WP/entertainment.pdf (Accessed November, 15, 2012)

The entertainment materials which seemed very bulky to carry in form of cassettes and jockey discs, nowadays, you don't have to carry the baggage. "New ways of distributing existing entertainment formats are enabling access to a wider range of media than was possible in the past" (Fame 2010) with a flash disk, you can carry many movies in ease. Once a selection of music has been downloaded it can be put onto a range of things that make it portable such as iPods, MP3 players and even CD's this means that ICT had advanced entertainment because it can now be accessible both in the comfort of your own home and while on the move.

3.2 Negative impact of ICT in Entertainment

There are psychological problems associated with video games as highlighted Fame 2010, [18]"Video games have raised public issues such as addiction, isolation and health issues, as children's entertainment they are compared unfavorably to entertainment activities of the past."(Fame 2010). People are also now spending more time online and getting less fresh air and exercise, this can lead to likelihood of various diseases, particularly heart disease and type 2 diabetes. Internet is very addictive; many people do find themselves spending a lot of their time on it. Example is online social sites which when obsessively can lead to lack visual social skills. This leads to psychological problems or techno stress

The development of these technologies has meant that many people stay inside, watch TV, play online games etc. Therefore the amount of leisure activities that people do have decreased, with respect to the wide range of entertainment technologies. This has led to diseases caused by lack of exercise like obesity and diabetes which are one of the leading killer diseases in the world.

The internet has enabled people to freely share files. This has lead to infringement of copyright laws and intellectual property. It is a norm nowadays for a movie or music to be released and with a spiral of minutes; millions of people have accessed a free copy. This has led to loss of revenue leading to fall of entertainment companies. This has been experienced locally whereby artists are losing revenue due to pirated materials. This has led to closure of music production companies and poor returns for artists.

The easier access of entertainment at home or anywhere has led to closure of stores traditionally used to provide the services. Locally, cinema halls are shutting down and Video libraries are also following the queue due to loss of clientele base.

.The biggest problem which has been brought about by ICT is the moral decay of Kenya society. Traditional cultures are being eroded and society adapting to immoral behavior's propagated by entertainment industry. For example, pornography materials are easily accessible to underage, child pornography is not adequately regulated, and youths exposed to drug abuse as they try to fit to new fashion trends.. The new foreign lifestyles are also replicated leading to breakage of marriages and family foundation is more shaken than ever before.

4. ICT Impact on Development

Development is defined as [19]"the process of developing or being developed" (Oxford online dictionary). In this case I will consider development as economic growth of a country. ICT has been identified by United Nations as one of the key drivers of economic growth. Kenya has identified ICT as one of the drivers of attaining vision 2030 as a stated by Kenya economic report [20] "ICT has been the main driver of Kenya's economic growth over the last decade since 2000; Kenya's economy grew at an average of 3.7 percent. Without ICT, growth would have been a lackluster 2.8 percent—similar to the population growth rate—and income per capita would have stagnated". (Poverty Reduction and Economic Management Unit Africa Region (2010).

ICT is multifaceted in development as it across many sectors, according to The International Institute for Sustainable Development (August 2012), identified ICT as [21]"enablers of sustainable development, including sectorial inclusions in farming, forestry, fishing, energy efficiency and education." This clearly shows that you can't divorce ICT with development, to achieve desired developments; countries have to realize the potential impact of ICT in economic development. The journal continues to state that "Many governments, private sector and civil society members are beginning to recognize the potential offered by ICTs in overcoming structural and historical weaknesses affecting emerging economies."

United Nations ICT Task Force (2003) had identified ICT as one of the tools to enable economic growth in developing countries, [22]"ICTs offer the developing world the opportunity to 'leapfrog' several stages of development by use of "frontier" technologies that are more practical, environmentally sound and less expensive than undergoing the traditional stages and cycles of progress to the Information Society." This has come to as evidenced in Asian tigers like Singapore that has exploited the power of ICT for economic growth and development.

4.1 Positive impact of ICT in Development

ICT has created job opportunities in different sectors of economy. These numerous opportunities that can be exploited

[18] Fame 2010, "Forecasting the Future of Multimedia to the Year 2010 and beyond" available at http://www.rcss.ed.ac.uk/fame/WP/entertainment.pdf (Accessed November, 15, 2012)

[19] Oxford dictionary (2012), "Define: Development", available at: http: // oxford dictionaries. com/ definition/ English/ method ?q=method (Accessed November, 15, 2012)

[20] Poverty Reduction and Economic Management Unit Africa Region (2010), "Kenya Economic Report". World Bank

[21] International Institute of Sustainable development 2012,"Moving Beyond the Tool: ICTs in the Sustainable Development Discussion at Rio+20 , Available at: http://www.iisd.org/pdf/2012/com_icts_discussion_at_rio.pdf. (Accessed on November 19, 2012)

[22] United Nations ICT Task Force (2003), "Tools for Development Using Information and Communications Technology to Achieve the Millennium Development Goals" Available at: http://www.ceprc.ca/docs/ICT_e.pdf. (Accessed on November 19, 2012)

with use of ICT and can play a critical role in economic development as United Nations ICT Task Force further states "Major advances in ICTs combined with rapid growth of global networks such as the Internet offer enormous opportunities to narrow social and economic inequalities and support sustainable local wealth creation, and thus help to achieve broader development objectives." (United Nations ICT Task Force (2003). Kenya where the job market is flooded with fresh graduates who don't have jobs. The graduates now can get well-paying jobs in outsourcing industry, there are also cheap loans advanced by the government and international investors to set up local ICT companies by the initiative of Kenya CT board entitled "Incubation centers"

Timely and accurate decision making for development decisions which require processing and vast research to understand the effects of policies to be implemented. ICT has been utilized to conduct research and conduct simulations of the benefits of the policies,

The use of ICT by government (e-Government) leads to easier access of government services and information which spurs economic growth and development. The benefits brought about by e-Government and improved governance leads to increased number of foreign investor in different sectors of economy leading to development. Due to good governance, Kenya is strategically placing itself to harness the power of ICT for development by starting mega projects in ICT like the "Konza ICT Park" which is envisioned to be the "Sahara Valley" an equivalent of US "Silicon valley".

4.2 Negative impact of ICT in Development

Digital divide between those who can access and those who can't access ICT is growing wider. These impacts negatively to the development of a country whereby it creates a big gap between rich and poor. This might lead to political instability.

The exposure to foreign habits and lifestyle like the drug abuse which leads to low productivity and death between the youth and working class.

5. ICT Impact on Industry

[23]"The demand for qualified IT workers rose steadily over the last decade and is likely to become strong again as the global economy recovers from the current recession. Two specific areas where demand for talent has been consistently growing are those of networking/telecommunications and e-commerce (Minch & Tabor, 2003)

Current University graduates are IT savvy, [24] "students focus on the role of technology as an integration tool and how it can be utilized to solve real-world problems, such as how to improve the way a company keeps its customers satisfied, the way decisions are made, how raw materials become finished products, or how products are distributed." (Ezziane), therefore, they can readily be absorbed in the industry. The outcome is rapid industrialization leading to increased levels of production, efficiency and low cost of production." Knowledge-based industries require an educated labor force of computer-literate individuals who themselves understand and can harness the power of ICT", (Ezziene)

Internet banking gives you access to banking 24 hours a day, seven days a week. Online banking also eliminates time and distance as barriers to banking. Today in banking, ICT is used to support commercial activity in branches and the development of new distribution channels with the Internet. But the Internet is not only a new distribution channel; it influences the evolution of banking, and promotes the separation of production from distribution of financial products. The result was the emergence of non-bank competitors. These new entrants are positioned to a key point of bank's chain value, at the stage of customer contact. Thus, they require banks to rethink their distribution method, and overall strategy.

5.1 Positive ICT Impact on Industry

Industrial processes are fast and efficient. This has led to increased productivity.

Improved working conditions as machines are used in extreme working conditions which are not conducive to life.

ICT has enabled manufacturers to monitor the goods sales online and therefore able to plan their production schedule. This has greatly helped in reducing shortages of products in the market.

ICT has also enabled industries to improve their products to suits different tastes of consumers due to one on one interaction of consumers through social sites and internet.

ICT has helped industries in reducing environmental pollution by which it is used to detect harmful toxins and byproducts which might be released to the environment.

5.2 Negative ICT Impact on Industry

ICT has crippled traditional industries which relied on human labor for production of goods and loss of jobs due to computerization of industrial processes which depended on human labor.

Industries are facing stiff competitions from external companies as customers are able to access information about other company products online. External industries don't need to establish industries in the country as they can access the market online.

6. ICT impact on Governance

[25] Ubiquitous and pervasive nature of information and communications technologies (ICTs) can support global community interaction, commerce and learning, resulting in higher standards of living and improved social welfare (Dewan & Riggins, 2005). This is further reinforced by King

[23] Minch, R. P., & Tabor, S. W. (2003). Networking education for the new economy. Journal of Information Technology Education, 2(1), 51–60.

[24] Ezziane, Z. (2007). Information Technology Literacy: Implications on Teaching and Learning. Educational Technology & Society, 10 (3), 175-191.

[25] Dewan, S., & Riggins, F. J. (2005): The Digital Divide: Current and Future Research Directions, Journal of Association for Information Systems, Vol. 6, No.12, pp. 298-337.

stating that [26]"Use of ICTs in government and governance can significantly improve the relationship between policy making and service delivery and has implications for such key values as social equality and inclusiveness."(King, 2007) The use of ICT to empowered citizens to participate in governance; [27]"online mapping tools facilitate participatory governance by allowing anyone to submit geo-located information on incidents such as natural disasters, government services, crime and corruption." (IISD).

The power of social media was experienced during the last two (2) years in which political uprising hit many Arab countries. This social applications, internet and websites were used to air grievances and displeasure of poor governance in these countries by organizing rallies and mobilization of support which led to toppling of dictatorial leadership in these countries.

Kenya rural communities who were marginalized are now empowered. [28]"Rural communities are those people living in farms or agricultural service Centre's including those in mining towns and coastal holiday and retirement communities" (Black et al, 2004). The communities did not have access to the government services, "Rural communities are characterized by limited availability of services such as telecommunications, banking services, transport systems, public housing, shops, civic associations and community networks. [29]"(Black et al, 2004). The rural folks can now access internet access from information kiosks also called Digital villages. The kiosks offer myriad of services and information empowering them to participate in national decisions. "The services they offer include telephone calls, email, facsimile, photocopying, web browsing, information retrieval assistance, general purpose computing, and computer training (Rathore & Alhabashi, 2005)

6.1 Positive ICT Impact on Governance

ICT has increased transparency in governance. Through the use of ICT citizens can be able to air their views freely.[30] "E-Government ensures efficiency and democracy in a more economical way than it was forecasted before, and the application of ICT creates opportunities for government to modify the traditional compromise between these two objectives." (Rimantas, 2008). Through the e-Government, citizens can also access information and government services online.

The decisions that used to consume long time to make a decision due to vast amount of data or slow communication process can be made fast and accurately.

The change of political governance structure has opened countries to foreign investors as information to make decisions and government processes is transparent leading to greater economic growth.

6.2 Negative ICT Impact on Governance

The cost of ICT is still beyond reach of very many people in rural areas. This has created divide between the elite (urban dwellers) and rural folks. [31] "Rural communities are characterized by limited availability of services such as telecommunications, banking services, transport systems, public housing, shops, civic associations and community networks" (Black et al, 2004).

7. Conclusions

ICT has transformed the way things are done in so many ways. The positive impact of ICT eclipses the negative impact. Imagine the world with no ICT, how would it be? Though to my opinion, ICT has made world to a "small village and better living standards.

The human quest for knowledge has greatly improved more than ever before. This can be attested by amount of information available and shared over the internet. In the human history there have been episodes of castatreophies that threated to wipe existence of human beings. For example the environmental calamities, diseases, and conflicts. ICT has greatly helped in governance to reduce human to human conflict through the use of internet to exchange information research, interact and present views. Due to the improved learning conditions, more knowledge is generated and discoveries in many fields are discovered specially medicine for killer diseases. The industries are also ready to produce in mass vaccines and medicine before they disease cause havoc. Diseases like "bird flu or H5N1" which hit the headlines worldwide in 2007 is an example of how ICT helped to counter the spread of the virus by provision of information by internet and social sites. Educating users about the symptoms, prevention which helped bring infection under control by identifying potential targets and to conduct disease mapping surveillance using global positioning systems. The data generated was stored in a database of the reported infections and pattern, and lastly in developing the vaccine.

The power of ICT in geological calamities was evidence during the hurricane sandy which hit the Northeastern US in October 2012. The early warning systems and accurate weather forecasting helped to safe millions of life Florida.

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[26] King, S. (2007): Citizens as customers: exploring the future of CRM in UK local government, Government Information Quarterly, Vol. 24, pp. 47-63.

[27] Internation Institute of Sustainable development 2012,"Moving Beyond the Tool: ICTs in the Sustainable Development Discussion at Rio+20 , Available at: http://www.iisd.org/pdf/2012/com_icts_discussion_at_rio.pdf. (Acessed on November 19, 2012)

[28] Black, A. (2004): Rural communities and sustainability, In "Sustainability and change in rural Australia", C. Cocklin & J. Dibden (Eds.), Sydney, University of New South Wales Press.

[29] Rathore, A. S., & Alhabshi, S. M. (2005): A Case of Urban Cyber Cafés in Malaysia, IFIP WG9.4 Newsletter, Vol. 15, No. 5, Available at:http://www.iimahd.ernet.in/egov/ifip/apr2005/article3.htm (Acessed on November 20, 2012)

[30] Rimantas Gatautis (2004),"The Impact of ICT on Public and Private Sectors in Lithuania" SSN 1392 – 2785 ENGINEERING ECONOMICS. 2008. No 4 (59). Available at:http://www.ktu.lt/lt/mokslas/zurnalai/inzeko/59/1392-2758-2008-4-59-18.pdf (Accessed on November 20, 2012)

[31] Black, A. (2004): Rural communities and sustainability, In "Sustainability and change in rural Australia", C. Cocklin & J. Dibden (Eds.), Sydney, University of New South Wales Press.

The ICT gadgets are becoming smaller with high processing speed, as Moore's law states [32] "the number of transistors on a chip roughly doubles every two years." Intel Corporation (2005). The gadgets now are becoming smaller, powerful in processing power and are able to communicate with other applications, gadgets using the same network infrastructure. This ability is called IT convergence. ICT convergence is defined as the ability of networks to carry similar kinds of services, Rajendra Singh and Siddhartha Raja (2008) further defines as [33] "convergence is the erosion of boundaries among previously separate services, networks, and business practices in the ICT sector." Services like voice over Internet Protocol (IP) or over circuit switched networks, video over cable television and Asynchronous Digital Subscriber Line (ADSL) are carried on a single network.

There are different types of ICT convergence, this are; convergence of using one single network to support different services, "the common standard that allows network to connect to each other" Rajendra Singh and Siddhartha Raja (2008), and "a communication service can travel over any combination of networks" Rajendra Singh and Siddhartha Raja (2008). But what is the impetus of convergence?

Cloud computing is one technology pushing towards ICT convergence. Because each sector (Education, Entertainment, Development, Governance/politics and, Industry) has exploited the power of ICT. [34] "The IT and telecommunications industries will converge for cloud services. In addition to providing bandwidths for cloud services, telecommunications carriers will gradually move their IT systems, value-added services, and Internet data centers into the cloud to provide services to a variety of industries." Ivan Huang, Roc Guo, Harry Xie, Zhengxiang Wu (2012).

Green computing is another stimulus of ICT convergence. Green computing is environmentally friendly computing and the goal is to reduce the cost of power consumption used by computing hardware and software, computing is sustainable for long period and uses best alternative source of energy. San Murugesan defines the field of green computing as [35] "the study and practice of designing, manufacturing, using, and disposing of computers, servers, and associated subsystems such as monitors, printers, storage devices, and networking and communications systems efficiently and effectively with minimal or no impact on the environment." All the ICT equipment's manufactured in all sectors discussed are geared towards green computing.

ICT is now gearing to centralized computing due to ICT convergence. The end product will be computing tools that have no boundaries in all the spheres of life.

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