ADOPTION OF GREEN INFORMATION TECHNOLOGY (GIT) IN INDIA-A CURRENT SCENERIO

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Abstract- "Green IT" refers to the set of technologies, policies, and practices that meet the information technology needs of an organization while minimizing the impact on the natural environment. Many developed countries have already taken move towards this by following some principles, now it is the time for the developing countries to follow some rules of thumb to achieve partly the benefit of "Green Technology". In India, the implement-ability of principle of "Green technology" is facing a dilemma due to many socio-economic matters .This paper is about the adoption of green IT practices in INDIA that can reduce electronic waste and associated costs by conservation of energy and other natural resources. Recommendations drawn from this study should provide effective strategies for balancing cost and energy efficiencies require-ments in organizations and for reducing impact on the natural environment.
Keywords - Green IT, e-waste, WEEE, EPR

Introduction

Green IT to attain a sustainable impact, in Indian IT industry needs to change their approach of Green IT from 'obligation' to 'Opportunity' in order to pro-actively take chance in "Green" business rather than only focusing on making IT infrastructure, services and products "Green".

Green IT also includes the goals of controlling and reducing the environmental footprints of computing by minimizing the use and discharge of hazardous materials, and other scarce resources and reducing waste throughout the value chain. Green computing considers IT product use over its lifecycle, and the recycling, reuse, and biodegradability of obsolete products. These objectives help IT products and services for companies and their customers.

Globalization & Impact of Information Technology (IT) on the Environment

In this era of globalization and flat world, organizations have managed to thrive and grow, throwing away the limitations of social, economic & cultural boundaries. Technological advancements in Information Technology (IT) are often credited for this growth. Fu-

ture technological advancements are aimed at leveraging the global skills for producing some of the best results in every sphere of life, making IT an inseparable component of our personal & professional life. The very global nature of today's businesses is resulting into larger IT facilities. Their demand, including PC's & server space is growing exponentially. Technologies like internet, wireless broadband, virtualization and 3G/4G have become significant part of the corporate world.

While IT, also mentioned as Information & Communications Technology (ICT) sometimes, is credited for making life easier and making exponential growth possible, the darker side of this is the adverse impact it leaves on the environment by producing enormous amount of electronic waste. It is therefore time for everyone to wake up to this challenge and start utilizing resources judiciously and managing businesses in a more environment friendly manner.

A glance through some of the findings by the United Nations Environmental Program (UNEP) is really shocking.

- Global e-waste generation is growing annually at 40 million tons
- US is the unchallenged leader, with China as distant second
- Developing economies like China & India are catching up fast
- China will overtake the US by 2020, as principal e-waste producer
- Next 10 years, India's e-waste (notably cell phones), is likely to grow by 18 times

Green IT initiatives in India
It is good to know that many initiatives have been taken by the India government in tackling climate change but effective implementation is still a concern. India is more vulnerable to the climate change than the United States and China. Specifically poor communities in India, who contribute least to the climate change, are the most affected ones. There need to be a sense of urgency with proper perspective to include them while implementing these initiatives.

The Indian industry bodies are also not behind in taking concrete initiatives in the area of Green Business. The Confederation of Indian Industries (CII) Sohrabji Godrej Green Business Center (CII-Godrej GBC) has outlined initiatives like "Mission on Sustainable Growth (MSG)". As a part of this mission, CII Code for Ecologically Sustainable Business Growth has been developed. This program aims to involve top management of companies seeking voluntary commitments to reduce resource consumption & emission intensity.

NASSCOM, India's premier trade body and chamber of commerce for IT-BPO industry, has also started its "Green IT" initiative. NASSCOM has partnered with TERI-Business Council for a new initiative called, "Corporate Action Plan on Climate Change: ICT as a Game Changer". This initiative aims to identify the sectors where ICT can play a game-changing role in carbon emission reduction thereby significantly contributing towards India's action on climate change

Since 2000, India has been effectively using Special Economic Zones (SEZ) as engine for economic growth. This has attracted large flow of foreign and domestic investments. So far about 144

SEZs are operation across India and many more are about to come. The Ministry of Commerce and Industry is therefore, developing guidelines for establishment of 'Green SEZs". All new and existing SEZs are supposed to implement these guidelines and go for green certification.

Factors Driving the Adoption of Green IT Practices in India
The rapid growth in technology, expected shortages of electric power in country, huge maintenance of data centers, WEEE (Waste of electrical and electronics equipments) of IT hardware products are driving the adoption of Green IT practices in India.

The rapid growth rate of Internet usage
According to Hindustan Times write-up, says that India is now the third largest Internet user- base in the world. As claimed by Google India's Head of Products Vinay Goel. The first one in the list is China with 300 million users, then U.S. at 207 million. India comes in third with 100 million people entangled in the digital web (Rohan Naravane, 2010). Based on the Internet World Stats (International Telecommunication Union, 2010) the below table 1, shows the internet usage and population statistics of India. The GDP per capta is US$ 1,124 according to I.W.F (Internet Watch Foundation) and India's broadband subscribers 5,280,000 broadband subscribers as of June, 2009 per ITU (International Telecommunication Union, 2010).

Table 1: Internet Usage and Population Statistics of India

YEAR	Users	Population	% Pen.	Usage Source
1998	1,400,000	1,094,870,677	0.1 %	ITU
1999	2,800,000	1,094,870,677	0.3 %	ITU
2000	5,500,000	1,094,870,677	0.5 %	ITU
2001	7,000,000	1,094,870,677	0.7 %	ITU
2002	16,500,000	1,094,870,677	1.6 %	ITU
2003	22,500,000	1,094,870,677	2.1 %	ITU
2004	39,200,000	1,094,870,677	3.6 %	C.I. Almanac
2005	50,600,000	1,112,225,812	4.5 %	C.I. Almanac
2006	40,000,000	1,112,225,812	3.6 %	IAMAI
2007	42,000,000	1,129,667,528	3.7 %	IWS
2009	81,000,000	1,156,897,766	7.0 %	ITU
2010	81,000,000	1,173,108,018	6.9 %	ITU

Source: Internet World Stats (International Telecommunication Union, 2010)

Corporate Social Responsibility (CSR)
The industry has significantly contributed to empowering the diverse human assets and raising aspirations. IT-BPO sector has enabled an environment for innovation and provided necessary impetus to IP creation. The industry has enhanced India's credibility as a business destination and put India on the global map. The industry has facilitated social development, contributing over US$50 million towards Corporate Social Responsibility (CSR) activities in 2008-2009 (Ministry of Communications and Information Technology, 2009-10).

Low Server Utilization rates
Data center efficiency is a major problem in terms of energy use.

The server utilization rates average 5-10 percent for large data centers (Forrest at al, 2008). Low server utilization means that companies are overpaying for energy, maintenance, operations support, while only using a small percentage of computing capacity (Tohmatsu, 2009).

Growing Awareness of IT's Impact on the Environment
Carbon emissions are proportional to energy usage. In 2007 there were approximately 44 million servers worldwide consuming 0.5% of all electricity. Data centers in the server dense U.S use more than 1% of all electricity (Dietrich and Schmidt, 2007).Their collective annual carbon emissions of 80 metric megatons of CO_2 are approaching the carbon footprint of the Netherlands and Argentina (Forrest et al., 2008) Carbon emissions from operations are expected to grow at more than 11% per year to 340 metric megatons by 2020. In addition, the carbon footprint of manufacturing the IT product is largely unaccounted for by IT organizations (Forrest at al, 2008).

Increasing Energy Cost and Restrictions on Energy Supply and Access
As per the report of business week 2010, the power prices for households are increased by 2 percent, while those for industrial users raised by 5.8 percent, and the overnight delivery climbed up to 8 percent. It was also known that electricity prices were raised by an average 3.9 percent in India (Eunkyung and Shinhye, 2010). Keeping all in view it can be predicted that there will be power shortage in future. The Energy and Resources Institute (TERI) of India says, even today 18,000 Indian Villages are operated without electricity for next 10 years.

E-wastage
According to a UN report, India is the second largest e-waste generator in Asia. In the year 2009, India generated 5.9 mn tonnes of hazardous waste, posing serious health issues. The UN study says that by 2020, e-wastes from old computers would jump by 500% from the 2007 levels in India, and by 200% to 400% in South Africa and China (Paul Budde, 2010). A recent report by the Delhi based Center for Science and Environment (CSE) says that apart from generating about 3, 50,000 tonnes of electronic waste every year, India imports another 50,000 tonnes. The study alleges that the unorganized sector recycles more than 90% of this; and instead of organizing this
sector, government chooses to ignore it. The organization also says that Attero Recycling which has the only license in India to import e-waste is reselling e-waste instead of recycling it. As per the data, India generated 3, 30,000 tonnes of e-waste in 2007 which is equal to 110 mn laptops (Paul Budde, 2010).The goal should be to have zero impact on the environment in the disposal of assets.Strategies include product take back programs, waste management and recapture of critical materials and secure disposal (Hanselman and Pegah, 2007).

Conclusion
Green IT is a very vast subject extending far beyond data centers and IT departments, therefore needing urgent comprehensive actions. Going by the current level of industry preparedness and lack of uniform government regulations, there is far more urgency that needs to be demonstrated. Failing this the true potential of IT as an enabler in reducing the global emission levels significantly by 2020 cannot be achieved. Everyone, including governments, industries and individuals need to bring in significant changes in their policy making & implementation, business models and behaviors, respectively. There are a few organizations worldwide which have taken up the role of spreading the awareness and providing assistance in adopting Green IT practices. This will assist in realizing the true potential of Green IT. Large organizations have already adopted Green IT practices and have started reaping benefits through direct savings and achieving their corporate sustainability goals. It is time for everyone to take steps in adopting Green IT practices, if not already done, because Green IT is going to be the main stay for the future green economy.

References
[1] Annual Report (2009-10) *Ministry of Communications & Information Technology, Government of India*.
[2] http://www.mit.gov.in/documentpublications
[3] Chang K.F., Chou P.C., Chiang C.M. and Chen I.C. (2005) *world sustainable building conference Tokyo*, pp: 1792-7.
[4] Deloitte Touch Tohmatsu (2009) *CFO Research Services*, 32 pages.
[5] Dietrich J. and Schmidt R. (2007) *IBM Global Services, white paper,* 21 pages.
[6] Eunkyung Seo and Shinhye Kang (2010) *Korea Joins India, Malaysia in Raising Power Costs*.
[7] Forrest, Kaplan W.J.M. and Kindler N. (2008) *The McKinsey Quarterly*, No 14.
[8] Jacquelyn A. Ottman, Edwin R. Stafford, Cathy (2006) *Green Marketing Issues of environment,* vol 48, no 5, pages 22-36.
[9] Luis Neves (2008) *The Climate Group for the Global e-Sustainability Initiative*.
[10] Madhavan Srinivasan, Pohle G., Hittner J. (2010) *Nasscom Articles. IBM Institute for Business Value, White paper*, 20 pages.
[11] Robert Harmon and Haluk Demirkan (2010) 43*rd Hawaii International Conference on System Sciences, IEEE*.
[12] Rohan Naravane (2010) *A majority of those users are accessing the net via cell-phones*.
[13] Saaty T.L. (1980) 1*st edition*, *McGraw-Hill, New York*, ISBN: 0070543712, Alibris ID: 9503413947.