Green Computing: A Secure Future

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Abstract: *Green computing is the study and practice of designing, manufacturing, using,. 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. Green computing whose goals are to reduce the use of hazardous materials, maximize energy efficiency during the product's lifetime, and promote the recyclability or biodegradability of defunct products and factory waste. During the last two decades has led to generation of a huge amount of electronic wastes resulting in soil, water and environmental pollutions. Thus pollution control and environmental safety has become the greatest concern of environmental scientists and activists worldwide. Dumping of electronic wastes, one of the by-products of this urbanization process has become a major problem in our society. Because these wastes are not biodegradable, gradual deposition of these e-wastes leads to accumulation of various toxic metals like lead, cadmium etc. and contaminates the soil and the ground water. Ground water contamination in turn, affects the plant animal and the living system as a whole causing severe health hazards and disorders. This paper presents at various sources of e-wastes, their effects, E-waste, Health Risks, Recycling and several green initiatives.*

Keywords: Green Computing, Literature Review, Electronic-waste, Energy Star, recycling,

I. INTRODUCTION

Study of designing, manufacturing/engineering, using and disposing of computing devices in a way that reduces their environmental impact and disposing of computers. Green computing is also known as green information technology (green IT).Green computing is the environmentally responsible and eco-friendly use of computers and their resources. Green technology encompasses a broad range of subjects, from new energy-generation techniques to the study of advanced materials to be used in our daily life. Green technology focuses on reducing the environmental impact of industrial processes and innovative technologies caused by the Earth's growing population. It has taken upon itself the goal to provide society's needs in ways that do not damage the natural resources. This means creating fully recyclable products, reducing pollution, proposing alternative technologies in various fields, and creating a center of economic activity around technologies that benefit the environment.

II. LITERATURE REVIEW

When it comes to PC disposal you need to know everything there is to know in order to be involved in green computing. Basically, the whole green aspect came about quite a few years back when the news that the environment was not a renewable resource really hit home and people started realizing that they had to do their part to protect the environment.[3] Many governments worldwide have initiated energy-management programs, such as Energy Star, an international standard for energy-efficient electronic equipment that was created by the United States Environmental Protection Agency in 1992 and has now been adopted by several other countries. Energy Star reduces the amount of energy consumed by a product by automatically switching it into ―sleep mode when not in use or reducing the amount of power used by a product when in ―standby mode. Surprisingly, standby ―leaking, the electricity consumed by appliances when they are switched off, can represent as much as 12 percent of a typical household's electricity consumption. Basically, the efficient use of computers and computing is what green computing is all about. The triple bottom line is what is important when it comes to anything green and the same goes for green computing. This considers social responsibility, economic viability and the impact on the environment. Many business simply focus on a bottom line, rather than a green triple bottom line, of economic viability when it comes to computers. The idea is to make the wholeprocess surrounding computers more friendly to the environment, economy, and society. This means manufacturers create computers in a way that reflects the triple bottom line positively. Once computers are sold businesses or people use them in a green way by reducing

power usage and disposing of them properly or recycling them. The idea is to make computers from beginning to end a green product. The solution to green computing is to create an efficient system that implements these factors in an environmentally friendly way. A good example would be IT managers purchasing hardware that has been EPEAT approved meaning that maintenance is reduced, the hardware's life is extended, and makes recycling the computer easy once it is no longer necessary. Mobile phones are better than computers – green computing. What do you use your computer for? Surfing Internet, chat, gaming, social networking, downloading, desktop computing including documents, spreadsheets or presentation making or just watching your photos and videos ? Today's mobile phones are capable of doing it all, rather sometimes more than the traditional phones. They have faster processors, more ram, faster wireless Internet connectivity and larger memories. Mobile Phones consume very low power. VIA Technologies, a Taiwanese company that manufactures motherboard chipsets, CPUs, and other computer hardware, introduced its initiative for "green computing. If everyone takes into account green computing then our world of computers will have as little a negative impact on our physical world as possible and that is what green computing is all about.

III. EXISTING SYSTEMS

E-waste is one of the fastest growing waste streams in the world. In developed countries it, on an average, equals 1% of the total solid waste. The increasing "market penetration" in developing countries, "replacement market" in developed countries and "high obsolescence rate", make e-waste one of the fastest waste streams. It includes items such as televisions (TV), computers, Liquid Crystal Display (LCD), plasma E-waste Management: A Step towards Green Computing 419panels, printing-scanning devices, mobile phones as well as a wide range of household, medical and industrial equipments which are simply discarded as new technologies become available. Huge quantities of these wastes are discarded every year and since these wastes contain toxic and carcinogenic compounds can pose high risk to the environment. In computer lead and cadmium are used in circuit boards, lead oxide and cadmium in cathode ray tube monitors, mercury in switches and flat screen monitors, cadmium in computer, polychlorinated biphenyls in older capacitors, transformers and batteries. At present, Indians use about 14 million PCs, 16 million mobile phones and 80 million televisions. So, there is a pressing need to address e-waste management particularly in developing countries like ours. The presence of valuable recyclable components, in electronic wastes, attracts informal and unorganized sectors towards it but the unsafe and environmentally risky practices adopted by them pose great risks to health and environment.

Recycling of waste carries health risks if proper precautions are not taken. Workers working with waste containing chemical and metals may experience exposure to toxic substances and have sever health issues at the range of physical disorders, disabilities etc. Toxic exposure even sometimes may become fatal. Therefore, disposal of health care wastes and toxic metal wastes require special attention in order to avoid major health hazards.

Recycling 3R (reduce, recycle and reuse) process as an alternative to the present e-waste management practice. For a developing society like ours, reduced use of electronics equipments being not a feasible option, we, therefore, have to emphasize on reuse and recycling processes. Besides this, different companies nowadays are looking for other eco-friendly alternatives for industrialisation and sustainable development. We feel that, an integrated approach with scientific techniques can minimize the e-waste generation at the base level. Segregation of toxic substances at the root level with systematic planning can eliminate the pollution load and develop a green society. Used or unwanted electronic equipment should be discarded in a convenient and environmentally responsible manner. Computers have toxin metals and pollutants that can emit harmful emissions into the environment. Computers should never be discarded in a landfill. Computers should be recycled through manufacturer programs such as HP's Planet Partners recycling service or recycling facilities in the community. Still-working computers may be donated to non-profit agencies.

Based on the Gartner estimations over 133,000 PCs are discarded by U.S. homes and businesses every day and less than 10 percent of all electronics are currently recycled. Majority of countries around the world require electronic companies to finance and manage recycling programs for their products especially under-developed Countries. Green Computing must take the product life cycle into consideration; from production to operation to recycling. E-Waste is a manageable piece of the waste stream and recycling e-Waste is easy to adopt. Recycling computing equipment such as lead and mercury enables to replace equipment that otherwise would have been manufactured. The reuse of such equipments

allows saving energy and reducing impact on environment, which can be due to electronic wastes [2].

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V. CONCLUSION

The Proper methods of waste disposal have to be undertaken to ensure that it does not affect the environment around the area or cause health hazards to the people living there. Current challenges to achieve Green Computing are enormous and the impact is on computing performance. Efforts of Governments and Non-Government Organizations are also appreciate-able. Government regulations are pushing Vendors to act green; behave green; do green; go green; think green; use green and no doubt to reduce energy consumptions as well. All these efforts are still in limited areas and currently efforts are mainly to reduce energy consumption, e-Waste but the future of Green Computing will be depending on efficiency and Green products. but designing new products in this way to reduce energy consumption. Green computing in future will also help in recycling E-waste and scrap computers.

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