



REVIEW ARTICLE

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GREEN COMPUTING

Mavinder Singh
Assistant Professor
Department of Computer Science
Miri Piri Khalsa College, Bhadaur (Barnala)

Anup Singh Sidhu
Department of Computer Science
Guru Nanak College,
Budhlada (Mansa)

Abstract- Green computing is an effective approach towards designing, manufacturing, using and disposing of computers and its resources with minimal or no impact on environment. The goals of Green computing is to manage the power and energy efficiency, choice of eco friendly hardware and software, and recycling the material to increase the product's life. The term Green computing came into existence with the launch of Energy Star program in 1992 by U.S environmental protection agency. It aims towards electricity saving and less amount of heat generated by the computers. Widespread use of computers and related IT products has a very bad effect on the environment. Personal Computers are bad for environment because they are not biodegradable and the parts and pieces will be around forever and are rarely recyclable. Environment pollution could be because of the defects in manufacturing techniques, disposal techniques for computers and components. There are toxic chemicals used in the manufacturing of computers and when we use informal disposing they put harmful impacts on our environment. So to save our environment and to reduce the harmful impacts of computers we have to aware about it. Green computing can also develop solutions that offer benefits by aligning all IT processes and practices with the core principles of sustainability, which are to reduce, reuse, and recycle. The concept of Green computing has begun to spread in the past few years, gaining increasing popularity. This research paper describes that today computer is an essential part of our life, No one can not to do any work without computer, but we have to be aware about the harmful effects of computer on our environment. We discuss about the various efforts to improve the green computing.

Keywords: - Green computing, energy saving, environment, carbon dioxide (CO₂).

1. INTRODUCTION

Green computing is the study and practice of minimizing the environmental impact of computer system and related resources effectively and eco-friendly. It is an emerging concept towards reducing the hazardous material and save our environment from the harmful impacts of the computer, CPU, servers and other electronic devices.

Green computing is basically concerned with the Computers when they are manufactured, used and disposed with no side effect on environment. Use of computer plays a vital role in our environment pollution. In this era 70 percent of energy is consumed by our computers which are not in properly used and is still turned on and that consumed energy is main reason of CO₂ emission. So now there is a big need to save our environment and live a healthy life.

2. WHAT IS THE GREEN COMPUTING?

Green computing is an application of environmental science which offers economically possible solutions that conserve natural environment and its resources. Green computing is designing, manufacturing, using and disposing of computers and its resources efficiently with minimal or no impact on environment. The goals of Green computing is to manage the power and energy efficiency, choice of eco friendly hardware and software, and recycling the material to increase the product's life. Go for Green computer reduced your electricity bill and give a full rest to your mind. Now in these days, we use the star management strategies and technologies that reduce energy consumption waste.

3. HISTORY OF GREEN COMPUTING

Green computing is started in the 90's when US environment protection energy launched the Energy Star Program. Energy star is a program of label awarded to computers and other electronic devices. It is basically used to minimize the use of the energy and maximize the efficiency of the product/device.

This labeling program is basically designed to promote and recognize the energy efficiency in monitors, climate control equipment and other technologies. This technique basically increases the adoption of "sleep mode" among consumer's electronics.

According to Wikipedia "The low magnetic and electrical emission program was first launched by the Swedish

organization TCO. It issues the certification from cathode ray tube (CRT) based computer displays. This program was later extends to include criteria on energy consumption and use of hazardous material in construction.”

4. NEED OF GREEN COMPUTING

Green computing is popular now days. By using the computer we save our lot of time and efforts of humans. But the use of the computers also increases the power consumption and also generates the more amount of heat. Great heat generation means greater emission of CO₂.

The major causes for Green computing are:-

- **lot of electricity is used-**
Most of the natural resources are being used to get the electricity that all have some impact on the environment. To save the electricity we have to use the green computing.
- **Creates more toxic waste:-**
Most of us are updating our computers, throwing our outdated computer resources, peripherals and other hardware devices etc, these are the hazardless toxic waste We are producing that really damaging the environment now a days. For that reason we have to use the Green Computing.

5. EFFORTS FOR GREEN COMPUTING

- **Buy energy star labeled products:** - Energy star products are manufactured keeping in mind the term of green computing and its features. These products are manufactured on the idea of use less power consumption. These devices are programmed power down to low power state when they are not in use. In fig.1 the logo which is displayed are used in the Products for energy save. So we should buy more energy star labeled products to save our environment.



Fig. 1 for Energy Star Logo.

- **Shut down your computer:** - when we are not using computer, we should switch off it because computer and its devices consume more power and the result is more CO₂ emission. Fig.2 explains the Shut down process of PC.

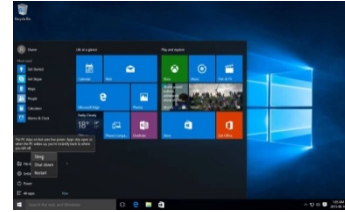


Fig.2 Shut Down PC

- **Sleep mode:** - we should put our pc on sleep mode when it's not in use because in sleep mode pc consumes low power. Fig. 3 explains the Sleep mode process.



Fig.3 for Sleep mode

- **Hibernate your computer:** - It does shut down everything when we don't use computer for short period of time. We should hibernate our computer.

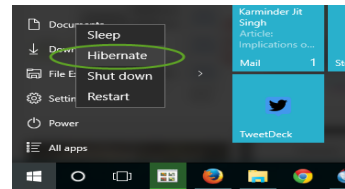


Fig. 4. For Hibernate Computer.

- **Stop screensavers:** - keep your screensaver off because it also use's electricity even when computer is not in use. Fig.5 explains the screensaver process.

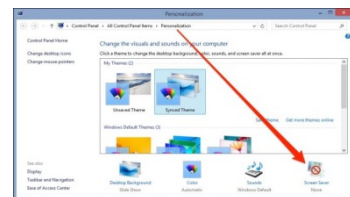


Fig. 5 Screensaver

- **Set up your Power Plan for Pc:** - You have to set up an effective power plan for your PC. It can save lot of

electricity for you. If computer consume more electricity then it is more harmful for our environment. Fig. 6 explains the power saving.

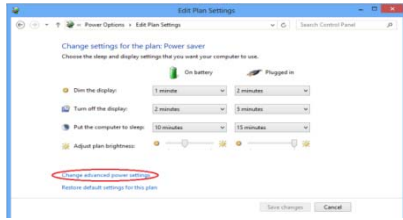


Fig. 6 Power saving

- **Recycling of old devices:** - Manufacturing of new computer devices from the old ones by using the recycling techniques. Formal recycling technique is being used by many companies. It is being performed in a special laboratory. By using these Recycling techniques we save our environment.



Fig. 7 Recycling Lab

6. ADVANTAGES OF GREEN COMPUTING

- 1) The major advantage of Green Computing is it reduces energy usage through green computing techniques that controls the carbon dioxide.
- 2) Green Computing uses less energy for electronic products during their produce, use and dispose.
- 3) By using this technique it saves energy and money too.
- 4) Green computing even includes environment policy to encourage recycling and lowering energy use by individuals and business.
- 5) It is a powerful approach to utilize resources such as computers, office space, heat, light, electrical power in an environmental friendly way.

7. DISADVANTAGE OF GREEN COMPUTING

Some people think that there are more disadvantages of green computing than its advantages. Some disadvantages are following:-

- 1) The major disadvantages of Green computing could be actually quite costly.
- 2) Some computers that are green may be considered underpowered.
- 3) Rapid technology change.

8. CONCLUSION

Thus Green computing aims to reduce the unwanted and harmful effects of computers on the environment by reducing air, water and soil pollution. Though the challenges are many but with the ever increasing research in the fields of science and technology, we can overcome the hindrances. Through the small steps that each one of us takes towards adopting green computing measures, we can make our environment congenial for healthy growth.

REFERENCE

- [1] <http://energystar.gov/>.
- [2] <http://thefutureofthings.com/articles/1003/green-computing.html>.
- [3] <http://searchdatacenter.techtarget.com/definition/green-computing>.
- [4] <http://www.greencomputing.co.in/>.
- [5] <http://www.wikipedia.org/>.
- [6] Green computing and green IT best practices.
- [7] <http://citi.umass.edu/ghpc/GHPCC-green-computing-v3.pdf>.
- [8] <http://www.brighthub.com/environment/green-computing/articles/62742.aspx>.
- [9] <https://www.primeinspiration.com/green-computing-need-for-green-computing-a-how-to-use-your-pc-the-green-way.html>.
- [10] http://www.academia.edu/7109888/Study_and_Approaches_to_Green_Environment_through_Eco-Friendly_Devices.
- [11] http://www.researchgate.net/publication/263016871_Study_andApproaches_to_Green_Environment_through_Eco_Friendly_Devices.
- [12] IJARCET-VOL-2-ISSUE-3-1200-1203.pdf.
- [13] Green computing.pdf.
- [14] Green Computing and Green IT Best Practices.pdf.