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GREEN IT AND GREEN COMPUTING

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Abstract - This paper describes Green computing and its uses. Green computing secures the Earth and its environment. It describes Carbon Footprint i.e. It provides the carbon dioxide measures; with the help of it we can work on how to reduce emission of it. The paper also takes a look at renewable sources. It takes a long time to replenish conventional sources of energy. The purpose of this paper is to raise awareness about Green Computing and the related factors amongst common people through the findings of the survey that was conducted.

Keywords: Green Computing, Eco-Friendly, Green Design, Green Manufacturing, Green Use: Sustainable Computing

Introduction

Global temperatures have risen about 1.2°C over the last century. As a result, ice caps are melting, causing sea levels to rise about 20 centimeters and increasing the number and severity of extreme weather events. The rising use of energy is one of the causes of global warming. The concept of Green IT, or Green Computing, has emerged as a response to this concern, seeking to mitigate the environmental footprint of information technology.

Green Computing, also called Sustainable Computing, aims at maximizing energy efficiency and minimizing environmental impact in the ways computer chips, systems, and software are designed and used. Green IT and Green computing are significant tools used to combat climate change, the existential threat of our time.

Literature Review

The principle of intra-generational equity since sustainable development meets the present generation's needs without compromising future generations' ability to meet their needs (United Nations General Assembly, 1987). Eco-efficiency is a crucial concept encompassing economic and environmental aspects to promote more efficient use of resources and lower emissions.

Within the eco-efficiency construct, cleaner production is a preventive conservational management strategy based on a social-technical approach to minimise hazard in work environments, optimise environmental management performance, and streamline sustainability in corporate and manufacturing operations. Glavič and Lukman (2007, page 1879) defined cleaner production as "a systematically organised approach to production activities, which has positive effects on the environment". As the central construct of continuous environmental improvement, 'innovative manoeuvre' is encouraged to promote cleaner production throughout the industry.

The Evolution of Green Computing

In a world increasingly reliant on technology, the environmental impact of our digital activities has become a pressing concern. The evolution of Green Computing is a story of progress and adaptation, rooted in the realization that technology, while transformative, can also have detrimental ecological consequences.

Green Computing traces its origins to the early 1990s when the energy consumption of computers first started gaining attention. As personal computers proliferated, energy efficiency became a priority for both manufacturers and users. The Energy Star program, introduced in 1992 by the

U.S. Environmental Protection Agency, marked a significant milestone in promoting energy-efficient computers and reducing power consumption.

Objectives

Energy Efficiency: Devices and data centers must be designed to consume less power. This involves optimizing hardware components, using more efficient cooling systems, and adopting low-power modes.

Renewable Energy: Transitioning to renewable energy sources, such as solar or wind, for powering data centers can significantly reduce their carbon footprint.

E-waste Management: Responsible disposal and recycling of electronic waste is crucial. This involves extending the lifespan of devices, recycling components, and safely disposing of hazardous materials.

Virtualization: Server virtualization and cloud computing can consolidate hardware resources, reducing the need for physical servers and data centers.

Research Methods:

- **Case studies:** Analyzing the green computing practices of organizations and industries.
- **Surveys and questionnaires:** Collecting data on the adoption and impact of green computing initiatives.
- **Experiments and simulations:** Testing the effectiveness of different green computing technologies and practices.
- **Literature reviews:** Analyzing existing research on green computing.
- **Systematic reviews:** Combining evidence from multiple studies to draw conclusions.

Challenges to Implementing Green Computing

Implementing Green Computing is not without its challenges:

Costs: Some green technologies can be expensive to implement, which can deter organizations from making the switch.

Lack of Awareness: Many individuals and organizations are unaware of the environmental impact of their digital activities or the steps they can take to reduce it.

Resistance to Change: Transitioning to more energy-efficient technologies can be met with resistance, especially in cases where existing infrastructure is deeply ingrained.

What manufacturers can do

Design for Sustainability: Create energy-efficient devices with longer lifespans and easily replaceable components.

Reduce Toxic Materials: Minimize the use of hazardous materials in manufacturing, making recycling and disposal safer.

Promote Recycling: Encourage consumers to return old devices for recycling and refurbishment.

What organizations can do

Enterprises and organizations can contribute to Green IT by:

Data Center Optimization: Improve data center efficiency by optimizing cooling, consolidating servers, and using renewable energy sources.

Telecommuting and Remote Work: Encourage remote work to reduce the need for physical office space and commuting.

Eco-friendly Policies: Adopt policies that prioritize energy efficiency and eco-friendly practices in IT operations.

Sustainable Cloud: Adopt Cloud services from a Sustainable Provider such as Google. Google has been a pioneer in sustainable practices from as early as 2007 when it became the first major company to become carbon neutral.

What individuals can do

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Individuals can make a difference in Green Computing by:

Energy Conservation: Turn off devices when not in use and adjust power settings to reduce energy consumption.

E-waste Recycling: Use e-waste resources to properly recycle old electronics at designated collection points.

Digital Footprint Awareness: Be conscious of the environmental impact of online activities, such as streaming and cloud storage.

Green Consulting

Green Consulting isn't just about reducing our carbon footprint; it's about creating synergies that benefit us all. It's about connecting sustainability and growth, paving the way for sustainable prosperity.

Green Computing is an evolving paradigm essential for a sustainable digital future. It requires a concerted effort from manufacturers, organizations, and individuals to reduce the environmental impact of IT. By embracing energy efficiency, renewable energy sources, responsible e-waste management, and conscious consumption, we can pave the way for a greener and more sustainable digital world, ensuring that our technological advancements do not come at the expense of the planet.

1. **Lower Energy Costs:** Every business is incentivized to lower costs. Reducing electricity usage with energy-efficient devices or alternative energy sources can lower overall energy costs for businesses when adopted on a large scale.
2. **Strengthen Your Brand:** Consumers have many choices in today's marketplace. Establishing yourself as a brand with tangible sustainability practices is a key market differentiator. Eco-conscious customers are more likely to purchase from brands that prioritize eco-friendly practices, such as ESG-backed products and services.
3. **Competitive Advantage:** Pursuing sustainability goals can lead to more profitability and interest from potential investors. Studies support that ESG is a top priority for CEOs and CIOs. In fact, 74% of CEOs agree that increasing ESG efforts will attract more investors.
4. **Inspire Innovation:** Green computing practices can drive sustainable innovation. New products, services, processes, and methods can become both sustainable and profitable.
5. **Attract and Retain Talent:** One in three Gen Z individuals turned down a job because a company lacked ESG commitments that were in line with their personal values on sustainability. Employees in today's job marketplace are demanding organizations with a proactive approach to sustainability management.

Strategies of green computing

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