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An efficient resource management through Green Computing

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Abstract: In today's world, with a very fast growing population, there is a great need of environment protection as well its conservation followed by the efficient re-utilization of the resources to support the green earth and to protect the human life from the major environment issues and challenges like protection of Ozone layer, prevention from global warming and many such threats to human beings. By adopting the green computing techniques every human being can reduce the percentage of carbon emitted from the electronic equipments and can claim for a protective shield from hazardous environmental challenges. Green Computing is making computing more sustainable to the environment with its countable role in reducing the energy costs associated with the computer, its resources and their operations. Green computing, is an upcoming area of study and practice of competent and eco-friendly computing resources, and has gained the attraction of environmentalists as well as the business organizations. Green computing and thus the green technology focuses on reducing the environmental impact of industrial processes and innovative technologies caused by the Earth's growing population and their increasing demands and usage of computing resources. In this paper, we would explore that how an efficient resource management could be achieved with the help and support of Green Computing concepts and techniques.

I. INTRODUCTION

In current scenario, looking after the growth in consumption of available resources, a greater need for conservation and protection of our environment has been felt, and the efforts in this direction has began with the contribution and cooperation of almost every discipline, including the fastest growing and leading field, i.e., the Information Technology. Over the last decade the idea of environment safety has come into life, and has challenged our responsibility morally as well legally, towards the important matter, that has been evolved from the worldwide climatic changes and natural resource protection. Challenges like Global warming, greenhouse gasses, carbon footprint etc., are forcing us to think more towards the protection of our precious resources through their optimal utilization, recycling and re-utilization without much affecting the entire system. Very often, we become too selfish, while developing and using new technologies and we don't even think and examine their impact on the environment and the world around us. For an effective resource management, there is the need of imbibing strict rules and regulations within the company policies. Resource management policies could be introduced in routine activities of almost every level. Our Scientists has already warned us to take care of the earth for a sustainable life in future. Efficient resource utilization, along with an effective resource management could really make a scope of safe and sustainable life.

II. NEED OF RESOURCE MANAGEMENT

With the change in needs of human beings, and increase in demands, trends and lifestyle, sharing of resources is reducing day-by-day, and the practice of using independent and single hand devices like, laptops, smart phones etc., is increasing day-by-day by almost every age group. Those days are nearly vanished, when one person was used to share computer, mobile phones etc. In current scenario, we are in practice of using latest models of systems personally on individually, leaving obsolete systems unused. Nowadays, we have separate electronic gadgets and systems at home or at our workplace for a more facilitated lifestyle. We being unaware about the fact that these devices incur carbon footprint, whether they are in use or left as outdated, even after knowing the facts, we are not able to put control on the increase in usage of all electronic gadgets. Similarly, the usage of gadgets and technology is accelerating in commercial world, with a greater rate, to match their pace with up gradations of technology and information access methods, demand of centralized data, system's network and connectivity requirements, to excel in the organizational advancements, to cross through their competitive edges and many more. All such current organizational needs, lead us towards the enhancement of the IT infrastructure in organizations and thus consequently increasing the energy burden on the entire system. As per the rising demand for energy, a continuous and smooth supply for energy and energy resources is also raised. But, since our earth has its own

limitations in providing resources, an efficient resource utilization and effective resource management is highly needed to come out from the problem of resource scarcity in present scenario.

III. GREEN COMPUTING FOR EFFECTIVE RESOURCE MANAGEMENT

Every organization or a person by individual is socially liable and responsible to take care of the earth, its environment and its resources. It's their as social responsibility towards saving the environment through optimal usage of energy resources and by enhancing the usage of alternate energy resources, by using renewable and recyclable energy resources or through such practices which could help in reduction of consumption of energy resources. Now, governments of few countries, various environmentalists, and social welfare organizations are really worried to estimate the approaching energy crisis.
Green in general; refer to environment upholding activities that are necessary to be followed to favor the human beings as well as every creature on this earth to have a sustainable and a healthier life. Now, as per the today's ever increasing needs, and with the increase in the usage of various computational and electronic devices like smart phones, laptops, tablets, Plasma systems etc., the promotion of environment favoring and environment protection techniques and systems are required to be promoted. Green computing, also known as Green IT, encompasses policies, procedures, and personal computing practices associated with the role of Information Technology. People employing sustainable or green computing practices strive to minimize green house gases and waste, while increasing the cost effectiveness of IT, such as computers, local area networks and data centres. More directly it means using computers in ways that save the environment, save energy and save money. A green strategy fundamentally helps an enterprise make decisions that have a positive impact on the environment. The principles that form the basis of a green strategy should lead a business to make decisions based on solid business logic and make good business sense.

IV. GREEN COMPUTING MEASURES

The organizations, whether small or large are required to look after the ways to go green and reduce their carbon footprint by implementing Green Computing practices and promotion of following rules and regulations in favor of optimal utilization of resources. Such practices include the implementation of energy-efficient central processing units, servers and peripherals as well as reduced resource consumption and proper disposal of electronic waste [1][2][3]. Green Computing measures and practices are introduced to cover almost every area of IT, where energy could be saved, recycled or reutilized for the organization resource management. An Effective Resource Management through Green Computing could be implemented by the following measures and practices:

4.1 Consolidation of Resources

Consolidation of server for storage and other services could be done by:

- Installing a single server, instead of using one computer system for each service. A consolidated server could be used for its maximum utilization of server resources.
- Using the devices like printers on sharing through networking

4.2 Virtualization of Server and other Resources

Usage of concept of virtualization of server and desktop through:

- Using Cloud Computing services could remove the need for explicit purchase of a server and other required hardware and software services. This would then, save cost, storage capacity, and electricity and other infrastructure needed for such implementations.

4.3 Fuel Saving through Travel Reduction

The organizational practices which could save reduce travel cost includes:

- Video Conferencing & teleconferencing
- Remote accessibility through Virtual Private Networking

- Online communication system between different departments
- Policies and strategies allowing or encouraging employees to work from home.

4.4 Energy Efficiency & Saving Practices

There are some of the best practices that can create a good culture of environmental awareness and supports a green strategy to save energy:

- PC power management like changing computer's power settings for power conservation, Unplugging the computer when not in use, avoiding screen savers, turning off monitor when not in use
- Reducing paper wastage by taking print on both sides, Minimize hard copies and increase the usage of pen drives, E-information availability among employees, E-mailing instead of fax, wireless billing
- Printing in toner saving mode to reduce toner usage
- Buying environment friendly and energy efficient computers like usage of LCD instead of CRT, buying small screen systems if bigger are not really required

4.5 E-waste Management

E-waste or toxic techno trash [4] management mainly includes a responsible and greener practice like:

- Not to mix the e-trash with regular trash
- Forwarding the trash for recycling

4.6 Green Infrastructure

Green Infrastructure involves the designing of an organizational or individual building in such a manner that it support the green technologies [5] like:

- Solar power systems
- Water harvesting systems
- Natural light, air and cooling systems
- Insulation materials and techniques
- High-reflectivity building materials

V. CONCLUSION

It could be seen that our future could face a great scarcity of resources, if Green Computing, technologies, green practices and an efficient as well effective resource management would be overlooked by organizations. Resource management through Green computing could results in saving and sustaining energy in every aspect. Industrialists and manufacturers are required to be supported and encouraged to opt for more energy-efficient and less hazardous electronics and disposing e-waste properly and safely. For a more sustainable and smoother lifestyle, green efforts and practices are to be honestly included in daily lifestyle by every organization and individual to gain the benefit of the technology for a more longer era. Though many drives have been initiated towards this, but still a lot more cooperation is required from every one.

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