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Impact of Green Computing Practices in Organization

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Abstract: *The continuous upsurge in demand for processing and computing power has led to a subsequent upsurge in data center carbon emissions, increased cost, unethical waste management, depletion of natural resources and high energy utilization. This increasingly increases the issue of the sustainability attainment in every data centers of Information Technology (IT) based industries and Organization. Green computing practice can be applied to facilitate sustainability attainment as IT based industries utilizes data centers to provide services to employees and end users. But it is a known fact that data center utilize huge quantity of energy and incur other expenditures in cooling operations and it is difficult to address the needs of accurateness and efficiency in every data centers while yet encouraging a green application practice alongside reducing the cost.[14] In this paper, we report the awareness towards green computing and show the summary of important areas where IT organizations can achieve savings in terms of energy and cost. The insights or Findings from the data shows that each of the life cycles strategies is significant in assisting IT based industries apply Green computing practices in their data centers. This study would be of interest to employees of companies, manager and adding knowledge to data management practitioners as well as environmental manager in deploying Green data centers in their organizations.[2]*

Keywords: Green Computing.

I. INTRODUCTION

The continuous advancement of the technology has resulted in the maximum users using it. And a single technology can only be used by A computing device. A computing device is a machine which works on instruction provided to it while programming it. Many of the device now works with the internet which has virtually connected the people around the globe. With the upsurge in usage of this computing devices this has resulted in upsurge in Carbon Emission. This rising level of Carbon is not good for Environment sustainability. This environmental instability is also known as Global Warming. To tackle the issue of Global Warming many Countries and Independent Organization has initiated action plans to reduce the carbon emission and adopt eco-friendly procedures.[7]

Here Green Computing plays the important role as this concept defines the maximum utilization of electronic device or Information Technology while no impact or minimum impact to the environment.

II. LITERATURE REVIEW

Following are the some Factor which are reasons to achieve Green Computing at Organization Levels:

1. **Environmental Issues:** Our planet has been impacted with many environmental challenges. Greenhouse gases accumulated in the atmosphere has changed weather cycle and increased the temperature. Challenges such as flood, drought, acid rain and other climate-related disaster occurring around the globe are because of Global Warming.[3]
2. **Information Technology Impact on the Environment:** A computer causes to environment damages in each stage of its life. From producing its material, to manufacture, to its overall use and to its disposal, each stage is contributing to environmental damages. The production of computers and its numerous electronic and non-electronic components uses energy, raw materials, hazardous chemicals, and water, as well as producing hazardous waste. Because of the rising number of computers and their use, as well as their regular replacements, the environmental impact of IT has become a serious worry for all of us.[3]

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3. **The Internet's Rapid Growth:** An ever increasing number of individuals are progressively depending on electronic information. Every one of these have prompted the fast development in the size and number of information centers. Disaster recuperation methodologies that underscores on keeping up with copy records builds request of server farms further.[18]
4. **Increasing requirement of cooling of data center:** The expansion in server power density has prompted a related expansion in data center heat density. Servers require around 1 to 1.5 watts of cooling for every watt of force utilized. The proportion of cooling capacity to server power prerequisites will keep on expanding as data center server densities increment.[3]
5. **Increasing cost of energy:** During the life of server the cost for data center and power utilizing can be increased. [19]

III. ADVANTAGES OF GREEN COMPUTING

1. Many customers while purchasing any product or services from a company considers companies environmental records and initiative about the environment.
2. Companies saves on Government taxes by following government policies about the environment.
3. Consumer shows interest in the companies which shows their data about carbon footprint and their achievement in the field of environment of their company.[8]

3.1 Objective

The objective of the research paper is to study about the green practices which have adopt by the organization and their overall impact on the growth of organization and sustainability of environment. Through this study I have evaluated the findings from different studies by different researchers. The study is focused on the methodology and conclusions from different studies.

IV. RESEARCH METHODOLOGY

4.1 Green Computing Life Cycle Strategies

- **Green Design:** Green Design is the first step in making a product Ecofriendly. A plan is designed here to make an environmentally sustainable product. The data center should be equipped with eco-friendly servers.[19]
- **Green Manufacturing:** Green Manufacturing involves production of only those product which does not poses threat t environment. This product should have label on it which indicate low or high effect of the product on nature.
- **Green Procurement:** Green Procurement is the purchasing practice that include reduction, recycle and reuse of the components used in making the equipment. It also ensures that raw material used in making of product does not harm environment drastically.
- **Green Operations:** This methodology expects to save energy which prompts less outflow of CO2 to the environment when data center servers are being sending or executed to work with IT based enterprises end clients, staffs, experts and the executives. Subsequently, data center chairman should know about how Green operation can be applied towards to lessening energy utilization of data centers.[14]
- **Green Use:** Using less amount of energy can lead to reduction in pollutants. User should be aware of green use to decrease the energy consumption of computers systems and other information systems as well as using them in efficient manner.

To save energy and the environment, some guidelines are as follows:

1. Turn off Monitor when idle: Allows us to turn off the monitor, if the system is idle for more minutes. For example when downloading something this option can save more energy.
2. Turn off hard disks when idle: Allows us to turn off hard disks if it is idle. Automate it upto 30 or more based on need.
3. System standby/sleep: Allows us to save much of power. It will turn off the monitor, hard drive, sound card and graphics. The current state of the system will be saved in RAM. If we want to use it again, we can move the

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mouse or touch the keyboard to make everything turn on .

4. Hibernate: Allows us to shut everything down. The difference from sleep/standby mode is how it is storing our information in the RAM; it will write all the information to the hard drive and shuts everything .

- **Green Disposal and Recycle:** Refurbishing and reusing old computers and recycling unwanted computers and other electronic equipment. If the equipment is still functional and show ability to do regular operation, the best way is to continue to be used by someone else, until a time when it fails or it is no longer is in use. Once it is not useful, the equipment can be recycled. It is necessary to ensure that data is deleted from device or any equipment before anyone else gets to use it. Many organizations and IT establishment would want to use their old equipment again. Most of the parts of any electronic equipment can be recycled. Computing parts can still be processed by using them as spares, refurbishing and recycling them, donating them or breaking them apart in order to reuse components and parts.[2]
- **Virtualization:** Virtualization is the best way to achieve Green Computing in an Organization. Virtualization is the technique by which we can minimize the hardware used for performing any task. Virtualization technique increases server utilization by pooling application on fewer server. Using Virtualization, Data center supports new application while using less space, less workforce and less physical space. It also improves level of efficiency of the server.[16]

V. FINDINGS

For researching purpose we have use research of Malaysian Study for Green IT practices application in data centers. Through the Malaysian Study our findings can be seen in the table below:

Life Cycle Strategy	Applied percent	Metric
Green Design	36.51%	Use electricity supplied by Green energy providers in our data center.
	51.61 %	Concerned about the energy consumption of cooling and lighting in our data center
Green Manufacturing	40.27 %	Analyses IT's energy bill separately from overall corporate bill in our data center.
	40.63%	Install more energy efficient lightings.
Green Procurement	37.50 %	Purchase IT equipment from vendors that offers take back option
	38.10 %	Buys recycled IT equipment.
Green Operation	44.26 %	Print data center report on both side of a paper to reduce paper wastage.
	40.98 %	Utilizes equipment that can monitor workloads and to shut down when unused.
	37.70 %	Uses free cooling in data centers to reduce incurred energy cost.
Green Dispose	44.26%	Disposes of IT equipment in an environmentally friendly manner.
	36.67 %	Carryout policy on managing electronic waste.
	35.90%	Reuse IT equipment

[14]

From the table, it is visible that a lot of individual are contributing to the cause of green IT in their Organization. During the Design stage many respondent were concern about the energy consumption of cooling and lighting data center. Maximum percentage of respondent shows interest in purchasing energy efficient equipment in manufacturing stage. In the Procurement, most of them prefer buying recycled IT equipment. Approximate half of respondent want to print data center report on both side of a paper to reduce paper wastage during Green Operation. And many of them tell that they will dispose IT equipment in an environmentally friendly manner and demand to create Policies to manage electronic waste.[14]

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VI. CONCLUSION

The aim of this research is to understand the impact of Green Computing Practices in Organization. Understanding why green IT practices need to be adopted by the Companies and how this change will save environment is our priority. Throughout this paper it is emphasizes that green computing is the need of the hour to save the Environment. There are many Practices to adapt for improving Operations in IT based Industries. The requirement of computing device are increasing day by day and to fulfill this requirement new devices are being produced. From paper we can find that always buying a new device is not an option instead we can recycle old PC or usable parts of the PC.[6]

Stakeholders are trying to implement best practices to achieve green computing in their organization.

Through this they can attract those consumers who prefer companies with achievement in natural causes.

Thus, it can be concluded that to have a healthy and clean environment in our surrounding all stake holders must work collaboratively for a healthier and greener environment for our future generations.[4]

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