GREEN IT: AN APPROACH FOR SUSTAINABLE BUSINESS DEVELOPMENT

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Abstract—

This paper focuses on the study and practice of using computing resources in an efficient, effective and economic way. It focuses on the approach of Green IT for sustainable business practices. This paper tells us what Green ways companies should adopt to move towards a sustainable tomorrow.

Keywords — Carbon Footprint , Cloud Computing, Green IT Framework, Sustainable Green IT strategy, Virtualization.

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INTRODUCTION

Green is the color of nature and it brings in a sense of purity and serenity. Nature has given life to living beings, who inturn have impacted and altered nature in a drastic way. Global weather has changed , atmospheric CO2 has increased steadily and global temperatures have increased which shows that we are heading for a disaster and life can be washed out off our planet.

Climate change is one of the major concerns of present time and issues of sustainability are linked to global warming. In lieu of climatic concerns companies are moving towards adopting green strategies in their business processes. Most enterprises relate green IT to greening of IT Infrastructure , where new and better technologies are used to save energy. The concept of Green IT means different for different people. Research says IT contributes to 2% of the overall problem of high carbon footprint. Companies are now trying to reduce their carbon footprint by promoting paperless office, transfer of data through an electronic medium, installing intelligent energy management systems and energy efficient devices.

SUSTAINABILITY : NEED AND CALL FOR ACTION

As per the Brundtland Report, sustainability is " meeting the needs of the present generation without compromising the ability of future generations to meet their needs [1]."

To cope up with the changing times , companies are gearing up to adopt green ways of doing business. Basic drivers of adopting green movement are Branding , Economics and Compliance.

DRIVERS FOR GOING GREEN

Branding: Companies are becoming conscious about their green image since customers are increasingly demanding green products. Hence going green proves to be important for businesses sustenance.

Economics: By adopting green movement companies can have cost savings which can help in building trust with the stakeholders of the company.

Compliance: For moving towards a sustainable tomorrow companies need to adopt both voluntary and mandatory regulations.

Table 1: Voluntary / Mandatory Regulations

Voluntary Regulations	Mandatory Regulations
Greenhouse Gas Protocol (GHG)	Environmental Protection Agency's GHG Mandatory Reporting Rule (EPA GHG MRR)
Global Reporting Initiatives (GRI)	United Kingdom's Carbon Reduction Commitment Energy Efficient Scheme (UK CRC Energy Efficient Scheme)
G3 Reporting Framework	California Air Resource Board's Assembly Bill 32 (CARB AB32)
	Australia's National Greenhouse and Energy Reporting Act 2007 (NGER Act)

ADOPTING AND IMPLEMENTING GREEN

The transformation from paper based information processing to paperless or digital processing of information has happened very quickly in the past. The companies globally have started using computers to such a great scale that it has posed a lot of challenges for the companies in terms of massive energy requirements to power and cool them.

Growing energy requirements result in higher emissions from power houses and increased strain on the power grid. The government has started educating the consumers about the ill effects of the growing energy requirements. Business houses too have put their foot forward and have started implementing green initiatives. Regulatory compliances have made this change the need of the hour.

Companies have started doubling their efforts not only in reducing their carbon footprint but actively engaging in adopting green IT solutions. Such solutions bring robustness in efficiently managing energy requirements of networks , data centers and servers while automating complex and energy consuming business processes. [2]

GREEN IT SOLUTIONS

There are numerous applications and options that can help companies achieve green IT goals. Companies need to identify the processes that need to be managed by green IT initiatives. They need to identify the company's total power consumption by IT assets and the cost the company can incur. This will help minimize energy wastage. Smart IT solutions that can help are:

1. Software Virtualization : It lets multiple operating system environments (typically servers) run on a single hardware platform to reduce hardware requirements, improve server utilization and overall energy costs. Since the number of physical machines and servers is reduced , the power and cooling consumption is in turn reduced. Research shows that virtualization can help to reduce the need for CPU by more than 15% on average.

2. Cloud Services : It include software-as-a-service (SaaS), platform-as-a-service (PaaS) and infrastructure-as-a-service (IaaS), and can significantly reduce your company's overall investments in storage and server equipment.

3. Energy Management Applications: Certain companies have web presence through web applications that are hosted on web servers. By implementing cache management application companies can reduce server's CPU time to reduce servers energy consumption. To cool high-end server rooms many such energy management applications are available. These applications provide a visual heat map of the data center with insights on energy and thermal information of complex and virtualized data center environments. [3]

4. Dashboard Tools: Certain dashboard tools are available to monitor, track energy consumption and estimate energy cost benefits. Microsoft's environmental dashboard helps enterprises track financial data, orders and manufacturing schedules. This application records meter readings and energy bills to create report on fuel and power consumption and CO2 emissions. Thus alarming the company at various points of time to reduce wastages.

5. Lean Software Development: During the software development life cycle, if principles of lean software development are proactively implemented then companies can eliminate waste, amplify learning, introduce fast delivery , empower teams and build integrity. Lean principles focus on identifying activities and resources that are imperative. It also helps in steadily reducing product development time by one-third and development cost by half while ensuring product quality. It cuts down on hardware and software resource consumption during product development and maintenance cycle. Hence , energy saving benefits due to overall reduced development time.

Lean approach provides productivity gains between 20% to 40% and has a considerable impact on the overall cost of developing and maintaining applications that account for about 50% of IT budget. It helps in conservation and waste reduction which directly correlates to reduced energy consumption and carbon generation.

6. High End Computing : High Performance computing technique can build smart software applications that can run on parallel computing platforms. Hardware resources can be used efficiently , thereby reducing energy consumption. When concurrent execution of multiple threads takes place it reduces the need for a faster CPU, which require high power and high cooling for the whole system. The office desktops which are mostly left idle for longer duration can be utilized for parallel computing.

7. Open Source Methodologies: Open Source Methodologies use collaborative development process which is efficient in terms of energy consumption.

CONCLUSION

Adopting green applications not only reduce energy consumption but also inculcates a sense of optimizing and developing appliactions that contribute to the green movement. Numerous applications are deployed and developed but it is the enterprises willingness to use the application that makes a difference. To ensure correct implementation of green applications for business sustenance , companies must develop a green IT team and organizational silos must be broken with teams like facilities , marketing, human resource, production and operations working together to accomplish a common goal.

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