

## GOING GREEN: A CASE STUDY OF INFORMATION TECHNOLOGY (IT) SECTOR IN INDIA

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**Abstract:** Today, it can be seen that various activities of business organizations have adversely affected the ecosystem and is considered as the major source of environmental pollution. The degradation of the environment has negatively affected the human health and societal well-being. Considering the importance of the environment, now environment problems have been recognized and discussed at various forums. Consumers are becoming sensitive to the environmental issues and have started preferring businesses that practice environmentally friendly/green initiatives. Seeing the positive response from the consumers towards eco-friendly products & services, Indian Organizations are adopting green practices like their counterparts in developed countries. The research paper attempts to study the green IT practices adopted by IT organizations in India and further analyzes their approach towards Green IT. Case study method has been adopted by the researchers. Based on the findings, implication for further research is discussed.

**Keywords:** Green Initiatives; Green IT, Information Technology organizations; India.

### 1. INTRODUCTION

The concern related to the environmental conservation has become an important issue and agenda at national as well as international level in the last three decades. Billions of dollars have been spent by governments and various international agencies for conservation programs such as protection of natural resources, pollution control etc. (Lee *et al.*, 2005). Considering the environment as an important issue, the concern for the environment has increased rapidly among the general public. The issues of environmental conservation have been brought up to the consumer level as human consumption has added lots of the environmental problems as about 40 percent of the environmental degradation arises due to the consumption pattern of household (Grunert, 1993). Further, Hertwich (2005), Hertwich & Peters (2009) have also argued that, consumption pattern and behavior of the consumers is one of the strongest contributors to carbon dioxide emissions and total energy use which further degrade the ecosystem. But the scenario has changed with the time and now the consumers are getting aware and concerned

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about the environment and adopting green practices for the environmental sustainability (Chen & Chai, 2010; Chitra, 2007). This change in the behavior of consumers has impacted the marketers of consumer products and organizations as they have to respond to the changing behavior of the consumers (Ottman, 1998; Peattie, 1992). Now the organizations are also turning eco-friendly/ green as they are offering eco-friendly products & services to the consumers (Banerjee *et al.*, 2003; Peattie & Ratanayak, 1992).

The concern for environmental conservation is not limited to developed country such as the United States and Germany (Ottman, 1988; Pierre & Prothero, 1997) but this concern is getting receptiveness in less industrialized & developing nation such as India (Tantawi *et al.*, 2009). With the time, the Indian organizations have understood the importance of environmental sustainability and implementing green practices (Yadav & Pathak, 2013). According to a report about 80 Indian organizations are providing their sustainability report on the basis of the Global Reporting Initiative framework (John, 2012) as the sustainability issues related to the environment has become an important concern for the Indian organizations (Narwal & Singh, 2013).

The present paper attempts to study the Green IT practices adopted by Information Technology (IT) organizations in India. The focus of this paper is on IT sector as this sector is considered as one of the sectors in the service industry that contributes to environmental degradation, as it contributes to 2% of global CO<sub>2</sub> emission which is equivalent to CO<sub>2</sub> emitted by airline industry (Dulabab, 2009). Murugesan (2008) also reported that at each step (from production to usage) IT sector has negatively impacted the environment and resulted in a lot of ecological issues. Due to its role in energy conservation & the environment issues, the IT sector has received attention from academicians as well as practitioners (Bose & Luo, 2011).

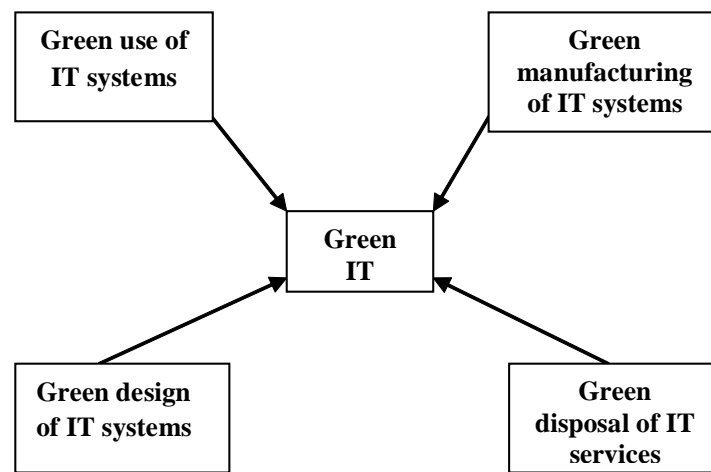
## **2. GREEN IT: DEFINITION AND CONCEPTS**

According to Murugesan (2008), Green IT refers to “environmentally sound IT”. Green IT is about the practices of designing, manufacturing, using and disposing computers and its related components in an efficient and effective way that it has minimal or no detrimental impact on the environment. Trim & Park (2013) define Green IT as “a compound noun of green (environment) & IT” having a focus on environmental protection, energy conservation, proper disposal and recycling. From the above definition, it can be concluded that Green IT is about implementing green /eco-friendly practices at all levels from designing to dispose of computers and its related components.

Green IT includes a wide range of eco-friendly practices and activities such as: energy efficiency computing, virtualization of servers, proper disposal & recycling,

adhering to regulatory compliances, green metrics and its assessment tools, eco-labeling of IT products, use of renewable energy sources, power management etc. Murugesan (2008) emphasizes on adopting a holistic approach (see Figure 1) to address the environmental issues of IT in an effective and comprehensive way. Following, the holistic approach towards Green IT will help in implementing 'green' at all possible steps (from designing to disposal) in IT firms.

Figure 1: Holistic approach to Green IT



(Source: Murugesan, 2008)

*Green design:* Green design refers to the designing of eco-friendly and energy efficient components such as desktops, servers & cooling equipments.

*Green Manufacturing:* The term green manufacturing is related to manufacturing of computer and other related components of computers and servers in a way that they have less or no negative impact on the environment.

*Green use:* Reduction in energy consumption of systems, servers & utilizing them in an ecologically conscious way.

*Green Disposal:* Green disposal is all about responsible disposal of electronic equipments. It also focuses on refurbishing the old components so they can be reused.

If all these four aspects considered in a good manner, then it will help IT organizations to achieve total environmental sustainability.

The objective of this research paper is to study the green IT practices adopted by various Information Technology (IT) organizations in India and further attempt to analyze their approach towards Green IT.

### 3. RESEARCH METHODOLOGY

Case study method has been adopted in this paper by the researchers. Yin (1989) defines a case study as “an empirical enquiry that investigate a contemporary phenomena within its real-life context; when the boundaries between phenomena and context are not clearly evident, and in which multiple sources of evident are used” (p.23). Case study method is among those research approaches which can be applied in both qualitative as well as quantitative stances (Hancock, 2000) and it is most widely used method in qualitative study (Barnes, 2001; Yin, 2003). More precisely, the multiple case study approach has been used in the paper. Multiple cases from IT industry have been considered in the present paper to study their Green IT practices.

The secondary sources were used for data collection in the study. The data and information about green practices adopted by the IT organizations have been accessed by using various secondary sources such as an organization’s official website, sustainability reports, annual reports, research reports, articles etc.

In conducting the study top performing IT organizations (Computers- Software) in India were considered in the present study as sample.

The top performing IT organizations on the basis of total revenue generated in the year 2013 are mentioned in Table 1.

**Table 1**  
**Top IT companies in India**

S. No	Ranking among ET 500 Fortune Companies (2013)	Name of the Organization	Total Revenue generated (2013) in (Rs. million)
1	18	Tata Consultancy Services	641670.71
2	26	Infosys	427170.00
3	28	Wipro	388700.50
4	42	HCL Technologies	259320.17

Source: ET Fortune 500 list, Retrieved from: <http://economictimes.indiatimes.com/marketstats/pid-50,pagano-1,sortby-CurrentYearRank,sortorder-asc,year-2013.cms>).

### 4. GREEN IT PRACTICES ADOPTED BY INFORMATION TECHNOLOGY ORGANIZATIONS IN INDIA

The Green IT practices adopted and implemented by top four organizations in India are discussed below.

**4.1. Tata Consultancy Services (TCS):** TCS is an Indian based multinational information technology company, belongs to the renowned Tata group. TCS was

founded in the year 1968, now it provides IT services, business solutions and consulting in forty six countries. TCS is largest India based IT service company on the basis of 2012 revenues. Along with its core business, TCS is also involved in community services such as education health and environmental protection. The triple line bottom approach of people, planet & profit has been adopted in TCS.

Following are the green initiatives adopted by TCS:

(a) Various renewable energy practices, such as solar lighting, solar water heater are being used in the select offices. (b) TCS follow green procurement policy for electrical and electronic appliances. For e.g. Energy star rated appliances are being used in TCS offices. (c) The organization prefers suppliers & vendors who conduct their businesses in eco-friendly way. (d) The organization is also playing a vital role in creating awareness about environmental issues among their employees and business associates. (e) Most of the TCS offices are certified by EMS (Environmental Management System) certification, ISO 14001: 2004. (f) The 3R policy of Reduce, Recycle and Reuse in followed by TCS.

Source: TCS Sustainability Report (2013).

**4.2. Infosys:** Infosys is an India based multinational IT Company, founded in the year 1981. It provides various services and products related to information technology such as: software development, business consulting, technology outsourcing, maintenance and independent validation services to other companies. Infosys is the second largest IT Company in India on the basis of 2013 revenues. The company has global presence with 94 development centers & 7 offices in India, China, Japan, Middle East, Europe, United States etc. The company is also involved in the development of society through the Infosys foundation.

Following are the Green IT initiatives adopted by Infosys Ltd.

(a) The organization plans to be carbon neutral by the year 2017. Moving towards this, the organization has already reduced its energy consumption by 50 percent by using various energy saving appliances. (b) The entire new infrastructure constructed in the past few years have been constructed using mechanism and design that helps in energy conservation. (c) Renewable energy such as wind and solar energy is used in selected offices. (d) The entire campuses of Infosys are conformable and certified with Environmental Management System (EMS) certification. (e) Several measures such as desktop power management, audio-video conferencing and virtualization have been adopted to reduce the energy consumption in IT infrastructure.

Source: Infosys (2013): Business Responsibility Report, 2012-2013

**4.3. Wipro:** Wipro is a multinational IT company in India headquartered in Bangalore, India. Wipro founded in 1945, but it enters in IT domain in 1980. Wipro is the third largest IT Company in India having its presence in sixty two countries. Wipro mainly deals in IT consulting and system integration. In the year 2010 Wipro was ranked 1<sup>st</sup> among Indian companies & 6<sup>th</sup> among Asian companies by Asian Sustainability Rating for their sustainability performance. In November 2012, Greenpeace ranked Wipro first for its sustainability performance with a score of 7.1/10.

Following are the Green IT initiatives adopted by Wipro Limited:

(a) Wipro has launched a new range of eco-friendly desktop called Greenware. These eco-friendly desktops are energy saving in nature and follow European norms for restricting hazardous substances. (b) The organization provides its sustainability report on the basis of Global Reporting Initiative (GRI) framework; which show the organization's commitment toward transparency toward ecological issues. (Business Standard, 2011). (c) The organization has initiated various e-waste disposal, collection centers for responsible disposal of the e-waste. (d) Automated power management system has been implemented in the offices. This automated system automatically identifies the power savings. (e) The organization follows virtual policy system which enables the existing hardware to be used by multiple operating systems.

**4.4 HCL Technologies:** HCL is a multinational IT company based in Noida, India. The company was founded in the year 1991 and currently it is operating in 26 countries. HCL is the fourth largest IT Company in India on the basis of year 2013 revenues. HCL mainly deals in software consulting, R&D services, business process outsourcing, remote infrastructure management, enterprise solution etc. HCL is also involved in community activities such as quality education and providing health facilities. HCL runs a multi-layered corporate program 'Go Green' to drive its sustainability initiatives.

Following are the Green IT initiatives adopted by HCL Technologies-

(a) The organization has reduced its power consumption by 1.7 per cent in the company owned facilities. (b) Received 66/100 ratings in carbon disclosure projects in the year 2012 which is higher than average industry ratings. (c) The organization has initiated ways to measure carbon footprint & water footprint in their offices. (d) The organization has managed to dispose its e-waste and printer cartridges in eco-friendly way. (e) More than 60 % waste of plastic, tiles etc. are recycled or reused.

Source: HCL (2012): Rebelance 2012, Making way for tomorrow, today.

The Green practices adopted by IT industry are shown in Table 2.

**Table 2**  
**Green Practices Adopted by the IT Organizations in India**

S.No	Organizations	Green IT practices
1	TCS	Use of renewable sources of energy at selected offices. Star raed energy saving appliances is used. Preferring suppliers who conducted their business in eco-friendly way. Creating awareness among employees & business associated about the environmental issues. Follow the policy of Reduce, Recycle and Reuse.
2	Infosys	Offices are conformable with EMS (Environmental Management System) certification. Uses energy saving appliances which has reduced its energy consumption by 50% as compared to the last year. Organization is now focusing on infrastructure that helps in energy savings.
3	Wipro	Launched a range of eco-friendly desktops. Initiated various e-waste disposal collection centers. Provide sustainability report strictly on the basis of GRI framework. Uses automated power management systems to identify power savings.
4	HCL	Proper disposal of e-waste in eco-friendly way. Follow the policy of recycling and re-use. The organization has reduced its power consumption in their company owned facilities.

Source: Compiled by authors

## 5. FINDINGS & DISCUSSION

After studying the Green IT practices adopted by the various IT organizations in India, it can be analyzed that the Indian organizations are focusing on adopting green practices like their developed counterparts. Now the green practices and strategies have been integrated and implemented in each aspect of IT sector in India. A wide range of eco-friendly activities have been adopted and implemented by Indian IT organizations as organizations are voluntarily adopting green IT practices along with conforming to the regulatory compliances.

With the help of a holistic approach to Green IT given by Murugesan (2008), the study attempts to analyze the approach of the organization towards Green IT. The important aspects of a holistic approach towards Green IT are discussed below on the basis of Green IT practices implemented by Indian IT organizations.

*Green Design:* Initiatives such as desktop power management, virtualization, automated power systems, audio-video conferencing etc. are being used by the organizations which can be categorized under the concept of green design.

*Green Manufacturing:* Under the green manufacturing policy, Wipro has launched its range of eco-friendly desktops known as Greenware.

*Green Use:* The organizations are focusing on various ways that may help to reduce their energy consumption. For this, renewable sources of energy such as solar, wind and tidal energy are used, along with this organizations are also

focusing on the green infrastructure and use of energy star rated appliances i.e. focusing on green procurement.

*Green Disposal:* The organizations have started various e-waste collection centers, 100 % environment friendly disposal of e-waste, recycling and reusing of waste material. The organizations are also following the policy of 3R i.e. Reduce, Recycle and Reuse.

The analysis shows that organizations are focusing on holistic approach towards Green IT, i.e. Now the green practices adopted by IT organizations in India are used in each aspects of IT sector (from designing to disposal).

## **6. MANAGERIAL IMPLICATIONS**

The paper will provide an insight to the marketers about the benefit of adopting green practices within the organization. As the cases of IT sector have shown that implementing green practices in organization has not only helped them to meet regulatory framework and guidelines, but it has also helped the organization in cost reduction through energy savings & green procurement. These benefits may lure marketers may to implement green practices, those who earlier considered, implementing green/eco-friendly practices as costly affairs.

## **7. CONCLUSION & SCOPE FOR THE FUTURE RESEARCH**

The term green has become a part of strategic decision making among the IT firms in India and the green practices have become the part of their day to day business activities. Like their counterparts in the developed and industrialized nations, the organizations in India have understood the importance of green marketing strategies. The green strategies adopted by the IT organizations have helped them to reduce their energy consumption and helping them to be earning carbon credit which will help them to be carbon neutral in the near future. The green initiatives implemented and adopted by the IT firms in India shows their approach toward 'Green IT' but the time demands the including the concept of 'Greening by IT' along with Green IT. The concept of 'Greening by IT' will help organizations to deal with environmental issues in a better way, as this concept emphasizes on helping the other organization in implementing green/eco-friendly practices i.e. providing green solutions to other firms.

The present study is based on secondary data, the findings from the secondary data analysis may not reflect the question of interest to others & may reflect the perspective of the initial investigator (Rew et al. 2000). Using the secondary method for analysis, limit the researcher to do what is possible from the available data and the researchers have to shape the questions to match with the existing data (Elder, 1993). In future, a better approach can be followed by interviewing the company officials regarding the green practices adopted. In the future, the



same study can be conducted to analyze the green practices adopted by other sectors in the nation.

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