

2008

# E-Readiness to G-Readiness: Developing a Green Information Technology Readiness Framework

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## Recommended Citation

Molla, Alemayehu; Cooper, Vanessa; Corbitt, Brian; Deng, Hepu; Peszynski, Konrad; Pittayachawan, Siddhi; and Teoh, Say Yen, "E-Readiness to G-Readiness: Developing a Green Information Technology Readiness Framework" (2008). *ACIS 2008 Proceedings*. 35. <http://aisel.aisnet.org/acis2008/35>

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### Abstract

*Businesses are under increasing pressure from competitors, regulators and community groups to implement sustainable business practices. Balancing economic and environmental performance to be green and competitive is therefore a key strategic issue. The increased discussion on green information technology (IT) has sparked the interest of this research. Green IT is poised to influence not only technology but also competitive strategy and even the legality of some business strategic options. Understanding and leveraging Green IT is therefore critical for businesses' continued progress. Nevertheless, the principles, practices and value of Green IT is yet to be researched. This paper introduces the concept of Green IT and describes the main pillars of a g-readiness framework to help organisations evaluate their readiness for adopting Green IT. It argues that just as e-readiness has been, and continues to be, a critical quality in the digital economy, g-readiness is an equally critical quality in the low carbon digital economy. Without a clear understanding of g-readiness, organisations would approach Green IT initiatives on an ad hoc and somewhat reactive basis which is undesirable.*

### Keywords

Green IT; Digital business; G-readiness index; IT strategy, Sustainable business

### INTRODUCTION

The advancement of information and communications technology (ICTs) based business and social practices in the last few decades has transformed many, if not most, economies into e-economy and businesses into e-business. For economies, ICTs are increasingly playing critical roles in transforming and generating economic opportunities. A number of national and international initiatives, have, therefore been undertaken to assess the e-readiness of countries in terms connectivity, access, network security, and regulatory environments (Mia and Dutta, 2007). The aim of such initiatives continues to be benchmarking and monitoring the progress of countries to capture the opportunities enabled by ICTs. For most businesses likewise, one of the key challenges of the last decade has been how to successfully migrate from traditional business models and practices to e-business models. E-readiness has been identified as one of the critical qualities, companies need to develop and continuously upgrade to operate in the digital economy (Hartman et al 2001; Molla and Licker 2005). Amidst the progress of the digital economy and business, “go green” issues are gaining momentum (Backer 2008; Chan and Yam 1995; Doherty 2002; Hendry and Vesilind 2005; Mathur and Mathur 2000; Schaper, 2005).

“Green Information Technology (IT)” is a recent addition to the Green Movement within the business sector. Although the term “Green IT” is becoming more common in discussion, there is still little common understanding of what this term actually means. Estimates indicate that ICTs account for 2% of global CO<sub>2</sub> emissions, which is equivalent to the amount generated by the aviation industry (Goasduff and Forsling 2007). In Australia, discussions are being focused on the role that ICTs have in causing and resolving green issues (Anonymous 2007, p. 18). While most consulting analysts predict that Green IT as the number one concern for IT managers (Donston 2007; Jones and Migay 2008; Winter 2007), there is, however, virtually no academic research on the topic.

The impact of a shift towards Green IT as part of the Green Movement would be global, being embedded in both the business and government context. Business and IT leaders worldwide are increasingly becoming aware of the strategic role that IT leaders can play in both greening the IT infrastructure and supporting a business's overall green initiative. What we don't know is how ready IT is to discharge such roles. Gaining a better understanding of Green IT and its business impact is a key research priority, which can give rise to a multitude of research streams. The speed with which environmental sustainability impacts IT activities and economics requires a framework that not only accounts for factors enabling the spread and usage of Green IT but that also explicitly considers the roles played by key stakeholders, such as vendors, IT professionals, business executives and the government.

This paper aims to take a client rather than a vendor perspective to discuss the concept of Green IT and describe the main pillars of a G-readiness framework for evaluating the readiness of individual organisation adopting the Green IT concept. The value of such a framework and hence the contribution of this paper to both IT theory and practice are manifold. First, the paper addresses a critical research area that has received virtually no academic research attention. This paper is, therefore, a first attempt to define a Green IT readiness (G-readiness) framework. Second, the framework offers a common platform for practitioners to assess and benchmark their g-readiness initiatives and progress. Third, researchers can use this framework to understand important issues such as the drivers, values and antecedents of Green IT principles and practices.

## BACKGROUND

The Green Movement has been identified as a significant social movement and a general reaction to the malfunctioning of the Western social formation (Galtung 1986; Mathur and Mathur 2000). It incorporates many aspects of everyday life such as politics, consumerism, technology, product purchases and consumption, marketing, manufacturing and resources (Mathur and Mathur 2000). The Green Movement differs from many other social movements in that it denies that basic social problems can be solved by addressing a single factor – a holistic approach is needed (Galtung 1986). Whether an individual joins the Green Movement or not is said to be based on whether one feels concerned enough (subjective motivation) and whether one feels that if it matters if he or she joins (subjective capability) (Galtung 1986). Individual motivation for joining the Green Movement important implications for organisations, and business considering “Green IT” and sustainable business practice.

From an organisational perspective, references to “corporate social responsibility” (CSR) and “sustainability” have become commonplace (Hendry and Vesilind 2005). The literature on sustainable business practice and corporate social responsibility indicates that organisations' capability to comply with the mounting demands of different environmental groups and government regulations and practice socially oriented moral management is a major concern and an issue that might affect competitiveness (Carroll 1991; Gartner 2008; Rao and Holt 2005). Businesses use sustainability and CSR initiatives such as green supply chain management, environmentally preferable business practices; environmentally friendly technologies, and an aggressive stance towards CO<sub>2</sub> emissions, to demonstrate their commitment to the environment (McWilliams et al. 2006). Returns from such initiatives include building positive brand image, mitigating any environmental liabilities associated with a firm's products and services and influencing the mindset of customers and investors (Rao 2004; Rao and Holt 2005; Sen et al. 2006). Consumer buying habits are increasingly driven by ethical concerns. Green issues may not only have an impact on consumer buying power, but also affect how both the public and private sector award competitive tenders (Whitby 2007).

The impact of CSR initiatives on the performance of firms is equivocal. Most of the existing evidence indicates that stakeholders tend to react positively in terms of consumption, investment and employment as a result of a firm's CSR awareness (Sen et al. 2006). Rao and Holt (2005) found a positive relationship between green supply chain management practices and market performance and competitiveness. Perceived and real market and operational benefits are among the major drivers for the adoption of green practices (Bowen et al. 2001). On the other hand, Mathur and Mathur (2000) examine the stock price reactions to corporate announcements of green marketing activities. The general results showed that investors have reservations about marketing activities, although firms with a healthier financial performance fared better, as do those whose operations are designed with environmentally sensitive issues in mind. From the CSR literature, we understand that Green IT needs to be conceptualised in the context of overall business competitiveness, sustainability and corporate social responsibility.

Although the term “Green IT” is becoming more common in discussion, there is still little common understanding of what this term actually means. In typical conversations when one mentions the term “Green IT”, the images being conjured could include (a) an economic concern (Petty 2006; Rasmussen 2006; Schmidt, et al. 2005); (b) an environmental concern (Anonymous 2007, Green et al. 1996; Jones and Mingay 2008; Messelbeck and Whaley 1999) (c) a social concern (Galtung 1986; Lewis and Gretsakis 2001; Whitby 2007; Winter 2007); (d) a strategic differentiator (Goasduff and Forsling 2007; Porter and Van der Linde 1995a); and (e) an enabler of other green initiatives (Donston 2007; Jones and Mingay 2008; Pearlman 2008).

We define Green IT as a holistic and systematic approach to address the challenges surrounding the *IT infrastructure* such as data centre space and energy efficiency; *IT's contribution* to reducing the environmental impacts of business IT activities (such as through adopting green technologies), *IT's support* for environmentally sustainable business practices (such as in enabling green supply chain management through carbon foot print monitoring through building tools for energy management options) and *IT's role* (such as supplanting high CO<sub>2</sub> emitting business practices) in the low-carbon economy. Thus conceptualised, Green IT addresses the five major concerns outlined above.

## DEFINING THE G-READINESS FRAMEWORK

In defining the g-readiness framework, we adopted the concept from e-readiness frameworks, extant literature on Green IT and on research in sustainable business practice and CSR. We have also incorporated the practices of businesses that are building Green IT brands. However, we also acknowledge that the proposed framework can be used as a generic framework for most green issues in business.

From organisational specific e-readiness frameworks, we understand that e-readiness can be a source of competitive advantage in the networked economy and the prerequisite for successful e-business (Molla and Licker 2005). Likewise, e-readiness assessment helps an organisation to pinpoint some of the hurdles that it might face in its trajectory towards e-business. It allows for the determining of an organisation's capacity for e-business and serves as a tool for guiding strategic planning processes in developing e-business. Having resources such as skilled manpower, technology, appropriate organisational culture, organisational capabilities and learning, and overall organisational commitment in the form of management and administrative support, staff involvement and championship have been identified as constructs of e-readiness (Molla 2006). The insights from e-readiness studies highlight not only some of the variables but also the importance of e-readiness as a critical quality required to execute in the e-economy successfully. We draw a parallel from e-readiness and argue that g-readiness is an equally critical quality required to execute e-business or e-government successfully in the low carbon e-economy.

Narrowly defined, greening IT implies efficient design of data centres and IT architecture to reduce both energy consumption and cost. In terms of *IT's contribution* however, Green IT goes beyond data centres and can encompass IT's adoption of environmentally friendly technologies and environmentally preferable IT management practices. IT can contribute to the reduction of carbon footprint, level of waste and pollution through practices such as PC power management, server virtualisation, recycling, socially responsible disposal of old technologies and sourcing from green vendors, (Graaf 2008). In terms of *IT support*, Green IT implies how IT can enable an organisation's sustainable business practice by providing analytical tools for carbon footprint count (Gartner 2008). In terms of *IT's role*, Green IT refers to the supplanting role of IT. For example, flexible working and services such as telephone, web or video conferencing can greatly reduce associated travel costs (Samson 2008; Whitby 2007).

The necessity for individual organisations to understand their readiness for adopting Green IT strategies and policies has been demonstrated in the existing literature. Mines and Davis (2007), for example, predicts that where current green regulations are voluntary, in the future such regulations will become mandatory. Similarly, while today there may be no specific environmentally-based taxes (e.g. carbon tax), in the future businesses may face multiple environmentally-based taxes. Further, there will be a growth in both consumer and investor consciousness on green issues. Thus while currently leading-edge executives are focusing on green issues, this will become more mainstream and we will see green business initiatives, including those within the domain of Green IT, move from niche projects to becoming a part of core business practice (Mines & Davis 2007).

One of the primary questions therefore is, what does it take for organisations using IT to succeed in this increasingly low carbon economy and global green movement? We argue that as much as e-readiness has been and still continues to be a critical attribute to succeed in the digital, web-centred and e-economy, g-readiness is a critical capability to succeed in the low carbon green e-economy. The speed with which environmental sustainability impacts IT activities and economics requires a framework that not only accounts for factors enabling the spread and usage of Green IT but that also explicitly considers the roles played by key stakeholders such as IT and business. The g-readiness framework is based on the premises, that we conceptualise g-readiness as an organisation's capacity to implement holistic Green IT, as defined above, principles and practices. It demonstrates the comparative levels of Green IT development among businesses and serves as a benchmark for measuring an enterprise's progress to participate in the global low-carbon e-economy.

Greening IT naturally starts with IT and business leaders' sentiments towards climate change, CSR and business and environment sustainability (Info~Tech 2008a; Rao and Holt 2005). Info~Tech's (2008a) global Green IT attitude and action survey of 1260 IT professionals indicates that only 50% of participants are concerned about climate change. The survey further found that attitudes towards Green IT varies from region to region where the rest of the world (Africa, South America and Oceania) leads Europe, Asia and North America in terms of

positive opinion towards climate change. The attitude of managers and business leaders towards environmental sustainability is a key factor in understanding not only the challenges of Green IT but also the opportunities associated with it (Gartner 2008). Organisations which are concerned about their social and environmental responsibilities, business sustainability and Green IT naturally start with clear policies to tackle those issues. Green IT policies can cover areas such as PC power management (Info-Tech 2007a), environmentally preferable purchasing (Info-Tech 2007b), and IT architecture and data centre design (Rasmussen 2006).

Attitudes and policies need to be translated into actions. Although, open standards such as Advanced Configuration and Power Interface (ACPI) provide PC power management capabilities, in practice, few organisations utilise these capabilities (Info-Tech 2007a). There are also variations in the practice of how aggressive an organisation can be in its power management regime and in terms of user education and user compliance (Info-Tech 2007a). In a similar fashion, despite showing concerns for the environment and having CSR policy statements, only limited numbers of businesses actually consider green issues in data centre design, sourcing IT hardware, adoption of green technologies, and end of life IT management (Info-Tech 2007c; 2008; Mitchell 2008). This implies two things – disconnect between policy and practice, and variations in the actions and practices of Green IT. There are also issues surrounding the organisational arrangement on who should lead Green IT initiatives. Existing governance arrangements vary from IT playing a role of tool provider to leading changes (Gartner 2008).

Based on the review, we argue that there are at least five important properties of success in greening IT – *attitude, policy, practice, technology* and *governance* – which together create the critical quality we call “G-readiness” (Figure 1). Thus defined, g-readiness represents a combination, unique to each organisation, of five drivers that enable enterprises to deploy environmentally sustainable IT and IT processes that are focused, accountable and measurable. It is a measure of a company’s IT preparedness to support its initiatives in the low carbon landscape.

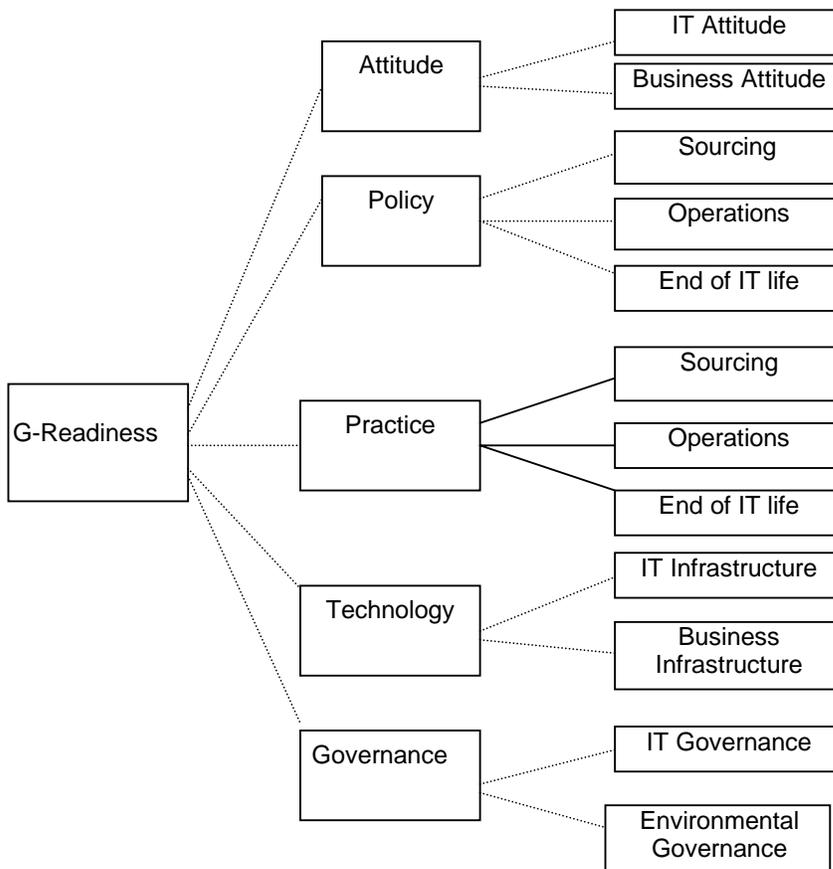


Figure 1: The G-readiness Framework

*Attitude*

Attitude refers to the affective characteristics of both business and IT leaders and professionals. It measures the extent to which both IT and business are aware and interested about the economical, strategic, regulatory, environmental and social concerns related to the use of IT. As noted earlier, whether an individual joins the green movement, is dependent on subjective motivation and subjective capability (Galtung 1986). While investigating the relationship between environmental attitudes and behaviour, Chan & Yam (1995) found that to encourage people to act environmentally, emotional appeal has a stronger impact than logical reasoning or factual description of harmful effects from environmental pollution. This is because the knowledge of an individual is only weakly related to self-reported actual environmental behaviour. On this basis, whether or not an organisation takes Green IT issues seriously will be dependent on (at least partially), IT and business leaders' sentiment to environmental concerns. Existing surveys (see Table 1) indicate that not only could opinions for Green IT might vary from organisation to organisation; they might vary from region to region.

Table 1: Survey Evidence on Green IT Attitude

Item	Europe	North America	Asia	Others	Reference
Environmental concerns in planning IT operations are: very important Somewhat important Not important	48% 45% 6%	33% 52% 15%	NA	NA	Mitchell ( 2008)
I am concerned about climate change* (strongly agree); n= 1260	59%	52%	55%	59%	Info~Tech (2008 a)
The issues of Green IT is on my company's radar (strongly agree); n=1262	16%	16%	15%	18%	Info~Tech (2008 a)
I am concerned about reducing IT's power consumption (strongly agree); n= 1264	45%	35%	39%	38%	Info~Tech (2008 a)

Measuring Green IT attitudes therefore helps to understand the subjective motivation and subjective capability of IT and business leaders.

*Policy*

Policy readiness measures the extent to which green and sustainability policies are developed throughout an organisation and permeate the value chain. For example, most IT companies do not have any policy supporting the philosophy of Green IT (Pearlman n.d.). Three value chain areas can be considered to assess the extent of policy readiness - IT sourcing, IT operations and services and IT end-of-life management.

*IT sourcing policy* – refers the extent to which an organisation has adopted an environmentally preferable purchasing policy (EPP) (Info~Tech 2007b) and articulated clear green guidelines for buying IT equipment and services. EPP is a policy choice that encourages purchasing decisions with minimum environmental impacts. Some of the negative environmental impacts of IT equipment include energy-intensive production methods, wasteful packaging, poor recycling practice and heavy use of hazardous practice (Info~Tech 2007b). EPP enables organisations to adopt a more sustainable sourcing strategy. For example, a policy that favours acquiring laptops over desktops demonstrates a commitment to Green IT. Estimates indicate that selecting an efficient laptop and operating it efficiently can reduce energy use by 98 - 99% (Commonwealth of Australia, 2001). The extent of green guidelines might cover both modern and traditional IT equipment. For instance, the Commonwealth Government of Australia published a green office guide in 2001 which covers the acquisition and use of office equipment – desktop, monitors, photocopiers, printers, fax machine, scanners, and multifunction devices.

*IT operations and services policy* – encompasses the extent to which the services provided by the IT infrastructure support issues encapsulated in business sustainability. Some of the policy considerations include PC power management (Info~Tech 2007a); policy on staff computer usage (Commonwealth Government of Australia 2001) and environmental policy (Goasduff and Forsling 2007).

*IT end of life policy* – refers to the policies and regulations related to the disposal and settlement of IT equipment/machineries in organisations. In certain regions, end-of-life recycling is required by the provisions of law (Info~Tech 2008b). For example, the Japan Ministry of Trade and Industry promotes recycling policy to

\* The percentage for the following three questions is an approximate estimation

create a sustainable society that strikes a balance between the environment and the economy (METI 2008). However, in general, there are still no mandatory policies to enforce the rules in most regions.

The g-readiness of businesses in terms of policies can be assessed on the basis of the extent to which the three areas of Green IT policies are developed. This policy reflects an organisation's commitment to technology redundancy, and to the roll-over of equipment in order to gain the benefits of each technological advance.

#### *Practice*

The policy dimension of g-readiness captures the intellectual dimension of g-readiness. However, not all policies are implemented smoothly and organisations might vary in the actual implementation of their policies. A business's green practice along its value chain from inbound to reverse logistics influences g-readiness (Rao and Holt 2005). Practice readiness measures to what extent an organisation has translated its concerns and policies into actions.

*Green IT sourcing practice* – captures the extent to which environmental considerations are factored in IT and other purchasing decisions. This practice might vary from one where there is no environmental consideration to a case where environmental considerations are given higher weight (Info~Tech 2007c). Consumer buying habits are increasingly driven by ethical concerns. Green issues may not only have an impact on consumer buying power, but also affect how both the public and private sector award competitive tenders (Whitby 2007). Generally though, green sourcing revolves around evaluating the environmental behaviour of suppliers and partnering with suppliers to improve their performance (Rao and Holt 2005). Green sourcing practices also include advocating the use of green technologies during request for proposal processes and shortening IT equipment refresh periods to gain access to energy efficient equipment (Info~Tech 2007d). The involvement of suppliers is a critical element of Green IT sourcing practice (Rao and Holt 2005).

*Green IT operations and services practices* – Green IT operation practices can range from clients through servers and people to network critical physical infrastructure (NCPI). At the client level, using Advanced Configuration and Power Interface (ACPI), IT managers not only can reduce power consumption by “slowing down processors, spinning down hard disks and shutting off monitors” but also reduce a firm's environmental footprint (Info~Tech 2007a). However, few businesses implement this. Other operational actions to reduce power consumption include retiring systems, operating existing systems in an efficient manner; and migrating to more energy efficient platforms (for example using blade servers) (Rasmussen 2006). In addition to supporting Green IT by purchasing green hardware equipment and software to reduce energy cost and consumption, companies can also cultivate Green IT practices – the way employees use IT (Baines 2007). At the NCPI level, techniques such as “right-sizing the NCPI system to load, using efficient NCPI devices and designing an energy-efficient system” can be used (Rasmussen 2006).

*Green IT end of life management practices* – this refers to the compliance of IT equipment/machinery manufactures, users, and resellers in Green IT end of life management. In terms of IT manufactures, issues concerning Green IT end of life management would be whether the IT equipment and/or packaging is reusable because to crush and/or burn these IT equipment/materials could harm the environment (Alsever 2008). For example, when a customer purchases an Apple computer or monitor, the company will provide free recycling services to handle the customer's old computer or monitor, regardless of the manufacturer (Apple 2008). IT users would refer to practices taken in handling the broken and unwanted IT equipment. For example, users are encouraged to consider selling their unwanted equipment through the CellForCash.com for recycling, whereby unwanted items will be refurbished and resold (Alsever 2008). Organisations, including the National Christian Foundation, have encouraged donation of unwanted IT equipment/machinery to non profit organisations and schools.

Overall, the extent to which IT has addressed the following issues can provide an indication of the practice dimension of g-readiness:

- Data collection on vendors' green rating
- The extent of contacts awarded to suppliers that use green technology
- Auditing the power consumption of existing systems
- IT projects implemented to reduce power consumption requirements
- IT projects implemented to maximize power utilisation (PC power management)
- The extent of enforcement of PC power management
- The energy rating of implemented technologies

- Actions taken to reduce IT's carbon footprint
- Projects implemented to monitor enterprise carbon footprint
- The extent that equipment/machinery is recycled.

#### *Technology*

Green IT is also about acquiring more environmentally effective (greener) technologies. A key driver of g-readiness success in the area of technology is to build a green technological infrastructure. This includes both NCPI, such as power supplies and IT infrastructure (Brocade 2007; Rasmussen 2006). Rossi (2007), highlights that businesses and countries spend billions of dollars each year to power computers. This creates a bad image for IT as being energy-consuming and bad for the environment. RMIT University, which claims to be leading Australian universities in green electric power consumption, is incrementally moving to buy more green power from 2% in 2007 to 15% in 2008 to 20% in 2010<sup>1</sup>. Some of the commonly adopted green technologies include server virtualisation, IT recycling, data centre energy optimisation and rightsizing IT equipment (Info~Tech, 2007c; 2007d).

To measure their g-readiness along the technology dimension, organisations can look at the following indicators:

- The extent to which an organisation has a green business infrastructure (such as green rated buildings) and green power sources
- The development of Green IT standards across the enterprise
- Server consolidation and virtualisation
- The extent that applications and technologies are retired for greener technologies
- The extent of solutions development to support enterprise wide green initiatives

#### *Governance*

Governance refers to the management infrastructure to implement Green IT. It is the operating model that defines the administration of Green IT initiatives. Gartner's (2008) case study reveals that Green IT requires "sound management infrastructure to understand impacts, prioritise actions and manage the enterprise's responses". Roles, responsibilities, accountability and control for Green IT initiatives need to be clearly established. Should a business assign the responsibility for Green IT initiatives to CIO's, or should it come under environmental managers? Should IT organisations be held responsible for electricity costs and accountable for energy efficiency? Answers to these and similar questions define the governance dimension of Green IT.

How a business as a whole manages its environmental and social responsibility influences the role of CIOs in Green IT initiatives. Existing practices vary. For example RMIT University has recently hired a facilities manager to coordinate its overall green initiatives. In the ANZ, IT leads Green IT initiatives (Gartner 2008). In others, IT's role is restricted to providing either tools or insights (Gartner 2008). In some companies in Asia, and in very few in Europe and North America, electricity costs are the responsibilities of IT (Info~Tech 2008). Governance also includes allocation of budget and other resources to Green IT initiatives and defining metrics for assessing the impacts of Green IT initiatives. For example, Info~Tech's (2008) global survey reveals that out of 1257 respondents, about "65% to 70% in Asia, Europe, Africa, South America and Oceania agree that their companies will have Green IT budget". Further, the survey reveals that only one fifth of enterprises in Europe and 15% in North America, have developed metrics for measuring IT power consumption efficiency. Businesses need to develop a standard administrative process to develop Green IT. Currently, such frameworks come in the form of six-sigma, ISO 14001; ISOI 9000 and World Business Council for Sustainable Development (WBCSD) standards (Gartner 2008; Rao and Holt 2005). In the US, data centres are beginning to get LEAD (Leadership in Energy and Environmental Design) certified, a certification from US's Green Building Council (Dunn 2008).

Overall, the governance dimension of g-readiness can be measured using the following indicators:

- Clearly defined roles, responsibilities, accountability and control for Green IT initiatives
- Existence of standard administrative processes for developing Green IT initiatives
- Establishment of metrics for assessing the impact of Green IT initiatives
- Allocation of budgetary and other resources for Green IT

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<sup>1</sup> <http://www.rmit.edu.au/browse.ID=vpusc7o147se1>

- The role of CIOs in enterprise wide green initiatives
- The responsibility of IT in electricity costs.

## SUMMARY

This paper presents perhaps an inaugural academic attempt to understand Green IT. However, as green issues continue to entice global debate, IT is expected to play a crucial role in both greening its operations and services and supporting a business's overall environmental sustainability objectives. Most CIOs and IT managers are facing two conflicting demands. On the one hand, the growth of digital business has led to increasing demands for data centres. On the other hand, the rising cost of energy, its cleanliness and its availability are limiting the supply of energy to those data centres. This requires IT to turn to Green IT solutions. In this paper, we identified five concerns of Green IT – economical, environmental, strategic, technological, and social. These concerns are not mutually exclusive and they can underline the key motivation for building Green IT. We have also identified four dimensions of greening IT – IT infrastructure efficiency, green technologies; support tools and supplanting tools. For a business to operate successfully in one or all of these dimensions it needs to demonstrate g-readiness.

The five framework concerns can relate to implementing green business practice in general. However in this paper, g-readiness is conceptualised as a measure of a company's IT preparedness to be environmentally responsible and competitive. The five dimensions that make up g-readiness can be combined in a variety of permutations to separate organisations that are successful in building Green IT from those that are less successful. Separately, the five attributes represents barriers to Green IT success. We anticipate that the components that make up g-readiness are well developed at a handful of companies, in their infancy at a few more, practically nonexistent in most.

G-readiness doesn't come easily. It might come easily for "born-green" (Backer, 2007) companies. By virtue of being created green, these companies might avoid much of the digital age inertia with which their more-established counterparts must contend with. For others, however, it requires a concerted effort from attitude to technology from policy through practice to governance. Disparities in the level of g-readiness could translate to disparities in the sustainability of businesses and hence could influence a business's performance. Understanding and leveraging Green IT is critical for businesses' continued progress. Without a clear understanding of g-readiness, companies will approach Green IT initiatives on an ad hoc, somewhat reactive basis insufficiently supported by the structural requirements to execute competently. This may lead to sinking resources into Green IT initiatives without seeing results anywhere near expected returns. As green issues continue to impact strategy, business operations and IT itself (Gartner, 2008), lack of g-readiness may translate to missed opportunities for competitiveness and success (Graaf, 2008; Porter and Linde, 1995a).

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