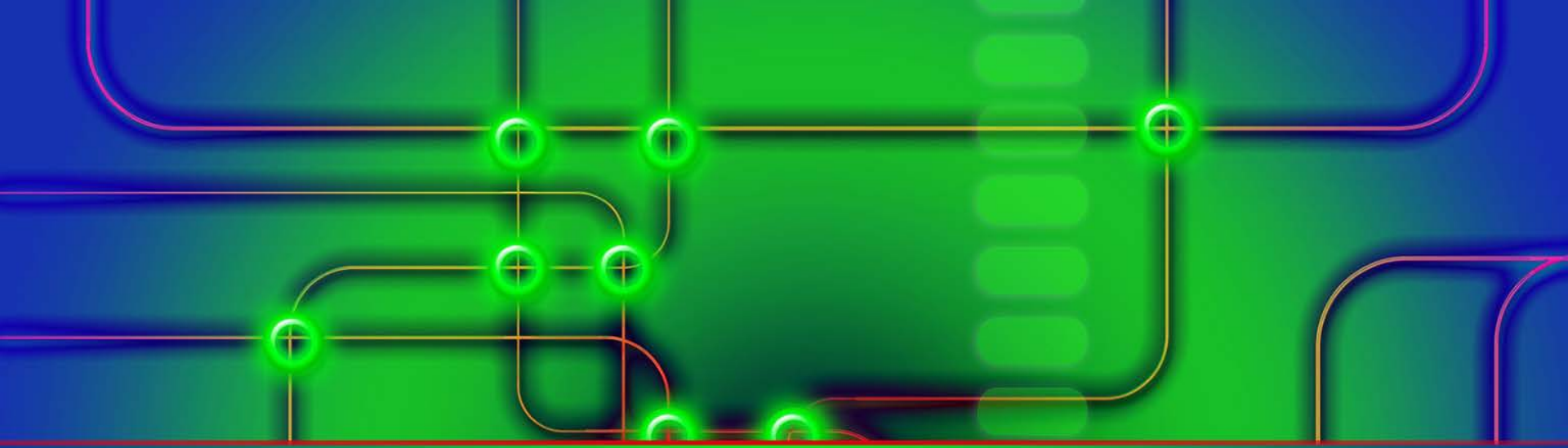

Green Information Technology (Green IT)

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AGENDA

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Introduction

- Green IT refers to the study and practice of using computers and IT resources in a more efficient and environmentally responsible way
- Green IT is a collection of strategic and tactical initiatives that directly reduces the carbon footprint of an organisation’s computing operation.
- Green IT is an umbrella term referring to environmentally sound information technologies and systems, applications and practices

Introduction

- Green IT encompasses 3 complementary IT-enabled approaches to improving environmental sustainability (Murugesan, 2008)
  - the efficient and effective design, manufacture, use and disposal of computer hardware, software and communication systems with no or minimal impact on the environment;
  - the use of IT and information systems to empower – that is, support, assist and leverage – other enterprise-wide environmental initiatives and
  - the harnessing of IT to help create awareness among stakeholders and promote the green agenda and green initiatives

Introduction



- Green IT is mainly focused on energy efficiency and equipment utilization. It addresses issues such as (Watson et al, 2008):

- Designing energy efficient chips and disk drives
- Replacing personal computers with energy efficient thin clients
- Use of virtualization software to run multiple operating systems on one server
- Reducing the energy consumption of data centers
- Using renewable energy sources to power data centers
- Reducing electronic waste from obsolete computing equipment
- Promoting telecommuting and remote computer administration to reduce transportation emissions

Why Green IT

- Rising energy demand, limited supply and soaring energy prices
- Increased consumer awareness of the danger to the environment
- Need to reduce business carbon footprint by
  - improving energy efficiency
  - improving the utilization of existing IT equipment
  - investing in new, innovative technologies

Why Green IT

- Management of hazardous waste and electronic equipment disposal (e-waste)
- Demand for more disclosures from companies regarding their carbon footprint and their environmental initiatives and achievements.

Stages in Green IT cycle

Murugesan & Gangadharan (2012) proposes that there are six stages in the Green IT cycle:

- **Green design** considers designing energy efficient equipment, computers, servers and cooling equipment.
- **Green manufacturing** refers to manufacturing electronic machinery, computers and other associated subsystems with minimal impact or having no impact on the environment.
- **Green use** focuses on reducing the energy consumption associated with the computer and other information systems and use them in an environmentally sound manner.

Stages in Green IT cycle

Murugesan & Gangadharan (2012) proposes that there are six stages in the Green IT cycle:

- **Green disposal** proposes repairing and recycling computers and electronic equipment that may be old or unwanted.
- **Green standards and metrics.** These are required for promoting, comparing and benchmarking sustainability initiatives, products, services and practices.
- **Green IT strategies and policies.** These effective and actionable strategies and policies add value and focus on both short- and long-term benefits. These are aligned with business strategies and practices, and are key components of greening IT.

Advantages of Green IT

- **Reducing carbon and other GHG emissions**
  - Proper asset disposal practices can eliminate toxic waste from entering landfill systems.
  - Recycling old equipment, when possible, decreases waste and can offer potential cost savings to organizations that reuse IT assets. It can reduce the carbon and other GHG emissions.
  - Increased legislation surrounding energy efficiency, toxic materials, and greenhouse gases (GHG) introduced in the United States, European Union, and China.

Advantages of Green IT

- **Increasing cooling efficiency in the data center**
  - By leveraging local climates and using chilled loop and free cooling strategies, IT organizations can decrease energy consumption through cooling practices.

Advantages of Green IT

- **Reducing energy costs**
  - Cloud Computing can be used to reduce the energy costs.
  - Cloud computing involves replacing regular servers with the virtual ones.
  - The different areas where cloud computing finds application includes data storage, networking, operating systems and software applications.
  - The practice of switching off computers at night helps in saving a considerable amount of energy.
  - The power supplied to scanners and printers should be cut off whenever these devices are not in use, which can also save a considerable amount of energy.

Advantages of Green IT

- **Companies are saving tons of money**
  - Green IT can save precious energy, time and money spent in manufacturing these electronic items.
  - Resources used and money spent in manufacturing an electronic item from scratch are far greater than those needed for recycling it.
  - Green IT measures can be used for improving the algorithmic efficiency of computers. An efficient algorithm makes minimum use of resources. Therefore, the productivity increases manifold and saves money.

Advantages of Green IT

- **Reducing the amount of space needed for servers**
  - Cloud computing is a green solution as cloud infrastructure embraces two critical elements of a green IT: resource efficiency and energy efficiency.
  - Virtualization is a large part of reducing the amount of space needed for servers

Advantages of Green IT

- **Helping to minimize their environmental impact**
  - Green IT is reducing the carbon and other GHG emissions.
  - Green IT focuses on purchasing computing equipment that is more energy efficient and environmentally friendly
  - It includes programs to extend equipment useful life, recycle and engage with suppliers that reduce hazardous materials in their manufacturing, packaging and factory waste management programs.
- **Green IT is a simple concept to understand and apply.**

Green IT Issues

- **Cost**
  - Much of the technology associated with green living often has a much higher cost than their traditional counterparts.
  - E.g. the use of solar panels can potentially save you money on your energy bills, but they can cost thousands of rands to install.
  - Energy-efficient appliances are designed to use less electricity and water but they often come with a high price tag.
  - The use of data centers established in cold places like North Pole region also causes in unnecessary cost due to high maintenance and high quality and high cost equipment.

Green IT Issues

- **Payback period**
  - The time factor is also an issue in terms of the payback rate of certain green living investments.
  - For example, replacing regular light bulbs with compact fluorescent light bulbs (CFLs) can help the environment and save money, but it typically takes about four months for them to pay back the difference in their cost.
  - Also producing green IT products takes up more cost while it is unable to be used for a long time.

Green IT Issues

- **Rapid technology change**
  - With the rapid change in technology, world is innovating more consumer efficient products day by day.
  - Consumers are willing to buy the same product with new features. So it causes in dumping the previous version.
  - It also affects in the green IT concept. People are inventing new environmental friendly IT products, but with the rapid technology change the products are not in use for long. It increases the cost and wastage.

Top Green IT Trends

- **Green Data Centers**
  - The move towards green data centers, which are the largest part of the power-hungry IT ecosystem, is evolving.
  - Data Centers may be contributing to over 15% of total energy usage by some organizations.
  - Better efficiencies, smarter cooling, use of alternative energy, and smarter utilization of data resources are all part of this evolution.

Top Green IT Trends

- **Create a Green ROI Formula**
  - A Green IT Return-on-Investment is a formula for both selling and justifying the need to change, and what capital or investments in people or equipment will need to deliver on for Green IT plan.
  - If invest X, what will be the ROI? Will it be in customer appreciation? Reduced costs? New business opportunities?

Top Green IT Trends

- **Green IT Innovator**
  - What are the key innovations in moving data, services, people, transactions and systems that will demonstrate the commitment to being a Green IT innovator.
  - Find clear green innovations that you can implement in how you move data, people, paper, systems, transactions and communications.

Top Green IT Trends

- **Serve Customers Smarter with Green IT**
  - Green IT is an excellent way to serve customers and grow market share by being an innovator.
  - Green will affect customer buying decisions.
  - Organizations should keep in mind, most customers are green supporters, and they expect your organization to make change.
  - Also, organizations can use Green IT to teach their customers how to become green.

Top Green IT Trends

- **Holistic Green IT Strategy & Plan**
  - Formulating a holistic Green IT strategy may be the most important exercise for every company this year
  - Green IT needs to be organization-wide, not just IT. Green IT is not just about buying more efficiently, but about a process change as well as how you think about energy, resources, waste, materials and products.
- **Transform Your Supply Chain**
  - Do an analysis of your supply chain. How green is it? Influence them to make changes with you, support efforts and award business to those that get green with you.

The State of Green Technologies in SA

- South Africa's ICT Research, Development and Innovation Road-map (DST, 2013), passed by Cabinet in 2013 makes specific mention of green technologies and provides an enabling framework for the introduction of green ICT.
- The ICT industry itself is responsible for only approximately 2% of global CO2 emissions.
- Narrowly-defined green ICT, including data centres and IT infrastructure, is being introduced in many companies.
- However, "ICT solutions have the potential to be an enabler to reduce a significant part of the remaining 98% of total CO2 emitted by non-ICT industries" (WEF, 2009).
- The ICT sector can bring together various systems, software, data and infrastructure to improve efficiencies, to reduce costs and to have positive environmental impacts, either directly or indirectly (WEF, 2009).

Examples of Green ICT business functions (adapted from Vodafone and Accenture, 2009)

Business Operations	Manufacturing and Distribution	Sales, Marketing and Support Services
➢ **Smart buildings and smart metering** – to improve energy efficiency and encourage end-users to reduce consumption ➢ **Virtual collaboration** - to minimise travel requirements, therefore reducing emissions ➢ **Dematerialisation** - introducing a paperless workplace through **e-billing and e-filing** ➢ Data centre – improving data centre efficiencies ➢ **Procurement** – ensuring procurement practices incorporate green requirements	➢ **Smart manufacturing** - optimise efficiencies and minimise raw material movement through ICT, as well as communication modules to high-value products to transmit maintenance status ➢ **Smart logistics** – use ICT to map efficient transportation networks, communicate wirelessly with vehicles to optimise speeds and loads	➢ **Sales support** – provide online and mobile sales support, minimising consumer transportation costs and emissions ➢ **Product marketing** – online advertising and mobile apps, reducing paper usage, as well as costs ➢ **Customer billing** – e-billing and payments reduce consumer needs to travel to business ➢ **Field operations** – optimise travel of support staff to increase efficiencies

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Thank you!!