

EXPLORING ALTERNATIVES TO PAPER; A CASE FOR ICTS AND E-RESOURCES

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Abstract: *The use of paper based resources have afforded many people over generations the ability to access information that they previously might not have had the means to. The increasing reliance on paper for dissemination of information has, however, had a negative effect on the environment in the way of deforestation for the purposes of manufacturing paper. This paper critically examines existing literature to determine how ever emerging technologies in the way of ICTs are enabling societies to move away from complete reliance on paper, and towards increasingly paper free environments. The paper highlights some of the opportunities and challenges experienced when looking at the possibility of using ICTs and e-resources such as e-books, as well as providing insights and recommendations in light of growing studies from around the world as they relate to the issues of environmental degradation for paper manufacturing.*

Keywords: paper, ICTs, deforestation, sustainable development, e-books

Introduction

Sustainable development has become a widely discussed and vital issue affecting countries and companies (small, medium and large) worldwide. Developing strategies to adapt to the mounting need for sustainable growth is no longer an option for many corporations and governments globally. It affects us all and must be dealt with and addressed head on. One of the most pressing issues we face today is the rapid depletion of forestland for, among other uses, the large scale production of paper. It poses a serious environmental problem and needs to be tackled with the concept of sustainable development in mind. This report will summarise research that was undertaken to answer the following questions via an in-depth study of existing literature;

1. What is sustainable development?
2. Can e-resources and ICTs be viable alternatives to paper and promote sustainable development?
3. What are the challenges of using ICTs and e-books and how can these be mitigated?

Understanding sustainable development

Sustainable development is often discussed in literature in a vague or ambiguous manner, with insufficient explanation given to define what the term really entails (Hopwood, Mellor & O'Brien, 2005). A popular definition of sustainable development offered by the Brundtland commission states that it is "...development that meets our needs today without compromising the abilities of future generations to do the same" (Redclift, 2005). This definition, while simple, is very powerful and can be used in guiding the various decisions that are made by individuals at all levels of society and industry.

Given the numerous issues affecting the environment today, it is not enough that the term be thrown around lightly. It is imperative that corporations and governments ensure that there are concrete measures for sustainable development. It is said that we measure what we value, and we in turn value what we measure (Meadows, 1998). This means that we can establish measurements or indicators to ensure that certain guidelines are followed, but we also begin to more closely follow these guidelines if we know there are certain penalties involved.

In the case of sustainable development, we generally refer to those activities that people undertake on a daily basis that may have long-term damaging effects on our planet. Such activities include; mining, agricultural practices, building/construction, vehicle transportation and deforestation among many others (Giddings, Hopwood & O'Brien, 2002). These activities have all grown tremendously globally, particularly in the 20th and 21st centuries. Rapid population growth across the planet has further exacerbated these issues as a result of growing economies and the dire need for ever more natural resources to meet the requirements of people in countries worldwide. Increasing recognition of the damage effected on the planet as a result of the exploitation of natural resources is growing as the consequences of these activities have become harder to ignore (Prisacariu, 2010). Severe soil erosion, changing weather patterns, loss of biodiversity, extinction of species and global warming are just some of the consequences of the over exploitation of natural resources globally, with some regions more greatly affected than others. Regarding the importance of having measurements/indicators in the fight for sustainable development, many industries have developed measurement scales for just this purpose (Meadows, 1998). Some companies may choose to develop their own sustainable development indicators, which regardless of government involvement, will guide their activities e.g. deciding to cut back on the amount of electricity they use as an entire company.

Sustainable development in the information age

Given that many nations and regions of the world are rapidly joining the information and knowledge society, there are new aspects of sustainable development that must be addressed to ensure that this does also not come at a detrimental cost to our planet. The information and knowledge society is often simply defined as one in which the majority of workers are involved in "brain work", and utilise information rather than manual labour in the accomplishment of tasks and for decision (Britz & Lor, 2007). It is also sometimes known as an information economy. Information has literally helped to shape economies and cultures around the globe (Esipisu & Kariithi, 2007).

Producing paper - trees as raw materials

The very high demand for information resources in the information age has led to a highly profitable business for those involved in printing and publishing. In order to guarantee the continued supply for this demand, there has been a huge reliance on sources of raw materials for the manufacture of the paper required for producing these resources. The source of these raw materials comes in the form of pulp which is harvested from trees in forests globally (Prisacariu, 2010). Trees are vital sources of raw materials for a very wide variety of products from medicines to construction materials. Their contribution to the paper industry has been invaluable. Providing what at first seemed like a never-ending source of raw materials for the paper industry, trees have enabled the production of paper and books for centuries. We now know, however, that forests and trees are indeed a resource that can be severely and rapidly depleted. Estimates put the percentage depletion of forestland in Africa and South America at 3.4 million and 3.6 million hectares between 2005 and 2010 (*United Nations*, 2013). Much of this forestland has been exploited in order to fill an ever-growing need for paper, among other reasons.

It is important, before delving into the effects of exploitation of trees, that their value be discussed briefly. Trees and forests serve extremely important purposes in the environment. In addition to providing food and serving as habitats for millions of animal species, they also help to absorb carbon dioxide and other greenhouse gases from the air through photosynthesis

(Kuhns, 2013). Added carbon dioxide and greenhouse gases trap heat from the sun making it harder for the planet to reflect, resulting in global warming. An MDG report by the United Nations (2013) estimates that global carbon dioxide emissions have risen 46% since 1990, a situation that has been made worse by intense deforestation. Forests furthermore regulate the weather by releasing moisture into the atmosphere, which results in the formation of rainfall. It is for this reason that deforested areas often face serious droughts.

Referring to the definition of sustainable development offered by the Brundtland Commission, it can clearly be seen that the importance of meeting our needs today is coming at the expense of future generations. Our need for paper resources seems to be overriding the devastation that it is causing the environment, and the very serious effects it is already having and will continue to have. Many are seeking solutions to fight the over exploitation of forests for paper manufacturing. Among the solutions available, one in particular seems to hold great promise. This solution is the utilisation of E-books and other digital resources in place of paper.

ICTs and E-books- a feasible alternative to paper?

The unprecedented proliferation of Information and Communication Technologies (ICTs) and the internet have led to a dramatic rise in the amount of information available to people globally. Information is now available, often very cheaply, at the click of a mouse. Seemingly infinite amounts of information can be accessed on diverse topics or subjects (*Deloitte, 2012*).

ICTs offer major advantages when it comes to the dissemination and sharing of information especially in terms of the speed and storage capacity they provide. Looking at the issue of sustainable development though, an important advantage that these technologies have is their ability to allow access to vast amounts of information resources, minus the resulting environment degradation as a result of deforestation (Arnfolk, 2010).

There are many reasons why ICTs and e-books can provide great alternatives to paper. The storage capacity of many of these devices means that an individual can have in their possession thousands of e-books or articles, all stored in one single device (Liu, 2005). For the same individual to accrue all these books in physical copy would mean large amounts of physical storage required. It would also mean the manufacture of copies of each of these books or articles, which represents the use of more paper resources. Multiply this effect over millions of books and the result is huge. E-books are furthermore generally significantly cheaper than hard copy books and one copy of an e-book can be made available to as many people that need it as possible. Mardis *et al* (2010) purport that the tremendously steep costs of books at educational institutions, especially at tertiary level, are a deterrent for students. Low cost digital options can enable access to more resources for more people. Furthermore, physical books are limiting in the sense that a single copy can generally only be used by one individual at a time. Digital copies allow the same book or article to be made available to a large number of people. The ease of downloading an e-book also bodes well for the environment as it reduces the need for people to travel to libraries, bookstores etc to retrieve information resources (Arnfolk, 2010; Priscariu, 2010). E-books and other digital resources differ from physical copies in the sense that digital copies are non-linear. They provide opportunities to engage users using a variety of formats and are not limited to just text. Liu (2005) and Mardis *et al* (2012) state that they can incorporate moving images, sound and links to other related resources. All these aspects certainly give e-books an advantage over physical books and resources, and should make people more inclined to consider the benefits and the immense environmental saving potential of these technologies.

Drawbacks of ICTs and E-books

E-books and the ICTs that provide access to them are not without drawbacks. A very common argument against e-books and other digital resources is that they do not offer the same aesthetic and reading comfort that is common with physical books (Luff *et al*, 2004; Prisacariu, 2010). One of the features of physical books hailed is their ease of portability. Another issue highlighted is the resolution of the screens of e-books and similar devices that make them difficult to read off of in bright locations. The dimensions of many devices such as mobile phones and PDAs are also often too small to allow for comfortable reading (Liu, 2005). It is also said that these devices are far above the price range of many people. This is mainly a concern for developing nations. If the people in these nations cannot afford access to these devices, they risk widening the digital divide and missing out on the benefits that arise from being part of the information and knowledge society (Mardis *et al*, 2010).

Specifically regarding environmental degradation, e-book access devices such as laptops, PCs, Ipads and mobile phones have contributed to the growing and severe problem that is e-waste (Widmer *et al*, 2005; Ongondo, Williams & Cherrett, 2011). E-waste around the world and especially in OECD countries has reached critical levels. E-waste refers to discarded electric and electronic devices that are no longer functional or required for use by their owners (Osibanjo & Nnorom, 2007). These include a myriad of electric home appliances as well as ICTs like computers and mobile phones. Increasing usage of these devices in countries globally has resulted in growing amounts of e-waste. Much of this waste has found its way from developed nations, which are the largest contributors of e-waste, to developing regions of Africa and Asia (Hicks, Dietmar & Eugster, 2005). Supporters of physical/hard copy books claim that given the growing e-waste problem, ICTs are not a viable solution to the deforestation problem, as e-waste has the potential to cause an even greater problem for the environment. This argument is extremely valid given the ever rising amounts of electrical waste making its way into informal disposal systems the world over, much of it from developed to developing nations (Osibanjo & Nnorom, 2007). ICTs and mobile phones are some of the fastest growing forms of e-waste produced globally. An estimated 314 million computers were discarded in the USA alone between 1995 and 2004 (Nnorom & Osibanjo, 2008). The problem of e-waste arises given the rapid obsolescence and short life span of much technology by users today. There is a culture in developed nations particularly of continually upgrading to the newest technologies that means many ICTs and mobile phones, among other technologies, are being replaced within 1-2 years compared with the 5-6 average year life spans they previously had (Osibanjo & Nnorom, 2007). Given that the cost of recycling e-waste is many times quite high, many large corporations have taken to exporting their e-waste to developing nations like China and Nigeria, where much of it ends up in landfills (Ongondo, Williams & Cherrett, 2010).

Mitigating the risks of e-books and ICTs

ICTs certainly provide their own set of unique challenges in terms of reading limitations, and especially as regards environmental degradation in the form of e-waste. Addressing reading limitations, much research is currently going into establishing ways that will make ICTs more user friendly. Luff *et al* (2004) highlight interesting research into determining how to make paper-like digital material that will allow people to download reading material but still be able read from it in a manner similar to actual paper. Many reading devices further offer ever improved features that allow for easier reading such as ability to personalisation font size, resolution and making e-readers lighter to improve portability (Mardis *et al*, 2010).

E-waste being a major issue regarding ICTs today has to be addressed as a matter of urgency. There are currently several policies in place, particularly in several developed nations seeking to ensure that e-waste is properly handled to cut back on any harmful effects it might have on the environment. Examples of these policies include the extended producer responsibility (EPR) system where corporations are now tasked with handling their products even after they have become waste (Ongondo, Williams & Cherrett, (2010). This solution has the advantage of tasking producers of ICTs to start thinking about the way their products are manufactured and what raw materials go into them so that the recycling process can eventually be made easier.

The treatment and recycling of e-waste is furthermore turning into a profitable business venture globally. The opportunities provided in the way of employment for people and companies, in the formal and informal sector, in the e-waste management field are growing. With proper training, e-waste management can be a serious income generating activity for people in developed and especially developing nations (Osibanjo & Nnorom, 2007). It is vital that governments in developing nations particularly develop and enforce strict policies concerning what second hand electronic products are allowed across their borders as much of it is e-waste masquerading as donations. Policies can also be enforced that guide recycling of e-waste produced within these countries so as to mitigate the risks arising out of increasing ICT usage rates in developed nations (Nnorom & Osibanjo, 2008). Though a significant challenge worldwide, the e-waste dilemma is one that is encouraging serious debate in order to find solutions and make the growth and proliferation of technologies a more positive aspect of development globally (Ongondo, Williams & Cherrett, 2010).

Conclusion

Sustainable development is a vital concept that should inform the decisions of individuals and corporations worldwide. It is through recognising the need for sustainable development that we can move forward with development while ensuring that generations that come after us will be able to build upon the accomplishments and innovations of the past, without having to fix the mistakes. These innovations must therefore not only be beneficial for us today but must continue being so far into the future. Deforestation is just one of many issues that must be looked into to ensure sustainable development. Tackling the issue on its own is not enough to guarantee the protection of our planet, but it is certainly a great place to start.

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