Waste of Technology

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Abstract: Mobile communication technology makes our lives easier, improves our efficiency in business and industry, improves communications in many remote and rural parts of the world, and can even save lives. So with technology having such a profound impact on our lives, what happens when it comes to the end of its own? T-Mobile has estimated that there are over 52 million redundant mobile phones in the UK, and many estimates are closer to 80 million. With legislation such as ROHS and WEEE changing how we manage this technology at the end of its life, and the fact that redundant everyday technology such as mobile phones can help bridge the digital divide and change others’ lives, consideration must be given to whether redundant equipment like mobiles is really technological waste, or a waste of technology. This question is critical for growing markets in many of the developing regions of the world. This paper will look at how Eazyfone Ltd who are based in the UK manage the transfer and redistribution of redundant mobile phones worldwide, and some of the challenges they face in doing so.

1. Production in Today’s World
A mobile phone is manufactured as many of our modern equipment, devices, toys and household items are. They require the mining, growing, or processing of various natural resources, such as oil, metals, and wood amongst others. The process by which these natural resources are obtained has traditionally been thought of in monetary costs, as opposed to environmental and social costs. Manufacturing has traditionally been based on monetary costs with various management styles developed over the years to ensure cost efficiency. Yet only recently in the last 30 to 40 years have we started looking at the other costs associated with the manufacture of our food, clothing, and electronic equipment amongst all the other day to day products we use. Our physical requirements have a number of other costs such as the pollution of our lands and waters due to the use of chemicals on crops, mining for metals leading to destruction of habitat and biodiversity, the consumption of non-renewable resources, exploitation of human life for manufacturing purposes, or the depletion of worldwide fish stocks, the list goes on.

Today’s production methods have questions surrounding them in relation to sustainability and ethics. As a result society is faced with more and more questions about sustainability, and our rights to exploit and develop in order to meet our modern needs.

2. Mobile Phones as Products: What Impacts?
There is no doubt that mobile phones bring benefits to all of us. However putting aside the economic cost of a mobile phone, what are the environmental costs associated with one of the most loved technologies of recent years?
With an estimated 3.3 billion mobiles in use worldwide [1], and anywhere from 50-80 million redundant phones alone in the UK, there is definitely a concern over how they are managed when no longer required. Heavy metals such as mercury, lead and cadmium are present in mobiles, particularly in older models [2], and can have detrimental effects on human, and animal health if they contaminate land or groundwater. The mineral Coltan is another component of mobile phones that has environmental implications. Coltan is used to regulate electricity in mobile phones and there are suggestions that it has helped fuel the war in the Democratic Republic in Congo (DRC) [3], and links between Coltan mining and the death of the DRC’s Mountain Gorillas [4].

Some legal steps towards sustainability have been taken by Europe with the development of legislation such as the Restriction of Hazardous Substances (ROHS) which aims to reduce harmful substances such as mercury and lead being used during the manufacture stage of electronic and other products [5], also key is the Waste Electric and Electronic Equipment regulations (WEEE) which aim to ensure that electronic equipment is recycled and managed appropriately at it’s life’s end [6]. However what about the other aspects in the early stages of this equipments production? What about the natural resources these products require in order to come into being, and the social and environmental impacts, and implications of their production?

It has been estimated that the average mobile phone has a lifetime of between 12 and 18 months. Over this period of time, a mobile phone being used by the average person has been calculated to emit around 105 kgs of CO₂ [7]. Considering the UK has more 68 million phone contracts [8] that would be over 7 million tonnes of CO₂ emitted every 18 months through mobiles alone.

Although many mobiles reach the end of their life before that 18 month period, the condition of the phone is less of a reason for a change in phone than perhaps the technology available on newer phones. The birth of Blackberries, I phones, and a wave of other smart phones will lead to a similar wave of mobiles that are no longer required, surplus to requirements and likely to be passed on to someone else, or kept as a spare, or back up phone.

This leads to millions of phones in the UK not being recovered for reuse or recycling. The same mentality can be seen with other products which have enough value to be kept until something triggers a need to dispose of the product, even if it still serves a purpose.

Now for every mobile phone, pair of jeans, or old personal computer we dispose of there is a finite amount of use left in that product, often without the need for refurbishment, or repair. However, putting an economic cost on these products in relation to transporting and refurbishing or repairing them for reuse often leads many of us to deem these products as beyond economical repair. A good example is that it’s easier to put a mobile in the bin than to drive to the civic amenity site to recycle it. So as a result these products are disposed of. In the case of mobile phones which often have various technological benefits to offer still, this may be seen as a waste of technology. However, if these products truly are beyond economical repair, then they are the waste of technology and must be disposed of appropriately.

A key aspect when considering disposal of technology such as mobile phones is in not looking solely at the cost of repair economically, but in looking at the environmental costs not only in producing the product, but in not reusing the product. So as a result the product’s scope for reuse should instead be expanded to consider the finite natural resources used, the suitability for reuse, development of markets for reuse, and transport and costs of shipment for reuse. These are all key factors which have led to the development of the market for used mobile phones that Eazyfone is now a part of.

3. Reuse – Ethical, Environmental, Profitable

Eazyfone have developed along with the mobile phone reuse market over the last 8 years and our model is simple. Our envirofone.com brand encourages consumers to visit our website, enter their mobile phones’ make, and model, then see how much it’s worth. Some mobiles
may have no value, while others may be worth up to £180 or more depending on the age and condition of the phone. We will ensure that phones with no value sent to us are end of life recycled at no cost to the owner.

Once the phones are recovered they are graded and where suitable refurbished for resale. We then put the phones in stock and up for auction. We sell the phones in large and small batches to buyers in the Asia, UK, Europe, and Africa. Most of our phones are sold to large buyers in Hong Kong and China, who then sell the phones to smaller buyers who in turn sell to shops and individuals for public purchase. In the UK Envirofone’s recovery model may be seen as a sustainable business and environmental model prolonging the life of mobiles, and reducing their negative impacts, but it may also be seen as a closed system as it deals only with sustainability in the UK.

4. Thinking Outside the System

It is through its model of reuse and recycling that envirofone.com is able to help contribute to the development of growing economies by providing affordable and functional mobile phones to those who need them. Nigeria is by far our largest African market (Chart 1) and has a population in excess of 120 million people, with estimates of up 80% mobile penetration. The United Nations Conference on Trade and Development (UNCTAD) found that mobile phone subscribers “…have almost tripled in developing countries over the last five years, and now make up some 58 percent of mobile subscribers worldwide.” [9] This would appear to give evidence that the digital divide is indeed closing, and that mobiles have a beneficial role in the process.

![Eazyfone's African Distribution](image)

**Chart 1**

UNCTAD goes on to say “Mobile telephony provides market information for, and improves the earnings of, various communities, such as the fishermen of Kerala, the farmers of Rajasthan, the rural communities in Uganda, and the small vendors in South Africa, Senegal and Kenya,” providing just one example of how mobile phones can have significant impacts in developing economies. Evidence that mobiles are growing in use in developing economies can be seen when comparing their growth in comparison to traditional landlines illustrated by data taken from an article by Leonard Waverman et al. [10] (Chart 2). Mobile use largely did not exist in 1995 for the countries in Chart 2, the registration of mobile users in 2003 is not only interesting because of their appearance out of seemingly nowhere but more so because in many cases they surpass the use of traditional landlines.

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5. The Challenges

Although mobiles are undoubtedly beneficial for developing economies, and organisations like Eazyfone play an essential role, there are a number of challenges associated with what we do as an industry from an environmental and social point of view.

5.1 Environmental

Chemical Hazards
The mobile phones contain small quantities of hazardous chemicals such as those identified earlier, and these must be managed appropriately at end of life. This is fine in Europe, but what about in Asia, Africa, and other developing economies and countries? As economies grow, so too hopefully will the infrastructure associated with developing economies, and the scope to manage waste in more improved manner.

Reuse and Recycling
Reuse over recycling should be a key priority, however with millions of mobiles estimated to be redundant within the UK, most of them will never be reused or recycled, but will end up in landfill. The mobile reuse and recycling industry is growing, and maturing which is allowing for a greater and more creative means to penetrate many levels of society in an effort to recover redundant mobiles.

Illegal Waste
The illegal shipment of electronic waste to foreign countries is an issue as often corrupt officials will allow these shipments to be received. The receiving countries will often dispose of this waste in unethical ways damaging the health of both workers, and the environment. The UK environmental authorities have regulations in place to prevent the shipment of electronic waste, however more enforcement is required on both sides.
5.2 Social

Clone Wars
It is believed that some Chinese manufacturers are purchasing used mobile phones to produce “Clone” phones which are illegal. This causes frustration amongst those buying the phones as clones are often indistinguishable from the real thing, and are often less reliable. As a result sellers of quality second hand mobile phones may face reduced income, and have little recourse to combat this apart from relying on high levels of customer service and quality of phones to ensure that they meet their customer’s requirements in order to compete with the sale of clone phones and keep their customers happy.

Affordability
Even though second hand mobiles are more affordable, there are still many people that cannot necessarily afford them. However, it would appear that the business of buying and selling mobiles is helping provide employment, and is helping some cities and towns develop economically while helping to provide a larger penetration of mobile ownership into developing economies. As mobile technologies improve, prices of older phones will drop making them more and more affordable.

Access
Having a mobile is one thing, but for many having access to electricity, and network coverage, as well the costs of talk time, can be issues. There is an amazing ability to find creative and innovative solutions such as using texts and phone rings without answering, as well as setting up solar powered charging stations and charging fees for use. There is also an increase of mobile networks developing worldwide. It is clear that mobiles have an integral role to play in developing economies, and that along with the many benefits they provide, there are also some challenges. However what organisations such as Eazyfone are able to do is prevent equipment from being disposed of as waste of technology, which when it is still functional would also be a waste of technology, and instead help deliver this technology into hands that benefit from what we see as items or equipment that is surplus to requirements.

6. Summary
Developing a market for reuse of mobiles often leads to their reuse in developing economies, where it has been demonstrated that mobile use has a number of benefits to these economies, although there are also some environmental and social issues that must also be considered.

The ability for organisations such as Eazyfone to develop and thrive in a market based on reuse and recycling not only helps reduce the negative impacts these redundant phones have, but also creates a sustainable business and environmental model which is able to work with legislative requirements, and reduce the likelihood of wasted technology, by managing waste arising from technology.

However, at the moment these systems have only been considered as closed systems, and more consideration must be given to what impacts both positive and negative, these models are having outside the system.

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