E-Waste

Introduction

Assume that you have been appointed to a task force of 5 or 6 computing professionals within your organization. You have been asked to examine the current issue outlined in the article below. Your team has not been asked to make specific recommendations to solve the problem. Rather, you have been asked to make recommendations that will help the Government decide what next steps they should take.

Prompts

1. What is/are the problem/problems here? Is there an underlying fundamental problem?
2. Who are the major stakeholders and what are their perspectives?
3. What are the major ethical, legal, and security aspects associated with the problem?
4. What are the intended and unintended consequences of existing computing solutions? Consider the consequences on individuals, organizations and society within local and global contexts.
5. What recommendations do you propose that may lead to potential solutions?

Meet Xiao Zhang. This forty-year-old former farmer and resident of Giuyu, a small city in south eastern China, has never used a computer, photocopier or iPhone. In spite of this, Xiao has quite possibly interacted with every single high-tech component in existence every day for the last six years. His job? Scavenging electronic parts and melting lead solder off circuit boards in what may be the largest E-waste dump on earth. In exchange, he makes less than three US dollars (less than 10 AED) a day. Xiao and about 100,000 other workers in Giuyu scavenge E-waste for recoverable materials, earning a wage five times more than they would earn as a farmer or laborer.

The Guiyu operation is not legal in China, but the venture is so profitable that it continues to thrive. E-waste is sold to processors who are the lowest bidders. In 2014, 41 million tons, 90%-of the world's E-waste, was illegally exported or dumped in Ghana, Nigeria, China, Pakistan, India or Vietnam. Exporting of E-waste to the developing world has been illegal since 2000. Despite this ban, E-waste is still shipped undercover, as "second-hand" goods.

Electric and electronic component waste, referred to in industry by the acronym WEEE and by the general public as E-waste, is composed largely of materials from computers, phones, tablets, laptops, MP3 players, televisions, monitors and printers that have been disposed of by consumers. Twenty to fifty million metric tons of E-waste are generated globally each year. Only 10-18% of E-waste is recycled and represents only 2% of trash in US landfills, but constitutes 70% of the overall toxic waste. The amount of E-waste is growing 5% annually worldwide. In 2011 alone, Americans disposed of about 130,000 computers and 300,000 cell phones every day.

There is substantial economic rationale to recover or refurbish electronic products. When a reuse opportunity is not identified, E-waste can be processed to reclaim valuable materials. When processed properly, materials are recovered, hazardous waste is treated and expensive and potentially damaging mining operations to acquire additional raw materials can be avoided.

When processed improperly, E-waste has negative environmental and health impacts. To make metal parts recoverable for re-use, plastics must be burned which, in turn, release toxic smoke. Metals are separated with an acid wash, which is then typically seeps into the ground or water. E-waste that cannot be separated is buried in the ground, allowing metals such as lead, mercury and copper, as well as other minerals and chemicals, pollute land and water.

The health effects on Giuyu residents are significant: about 88% of the E-waste workers have neurological, respiratory, or digestive abnormalities. Children have 50% more lead in their blood than typical values. Acid present in tap-water caused extreme tooth deterioration, before the city began piping in drinking water from 40km away. The land outside of the city has extremely high levels of lead, as does the breast milk of nursing women. High levels of elements such as copper, cadmium and flame-retardant chemicals can also be found in the air, water systems and land. These elements are known to attack the nervous system, kidneys and liver and increase the risk of cancer.

Recycling of E-waste in the Middle East Gulf region is well below the global average. However, governments in the region have started to develop regulations and solutions. In Saudi Arabia, where they produce the least e-waste per capita among all GCC countries, there are private companies, initiatives and Non-Profit-Organizations currently working on e-waste recycling, but there is no regulated system in place. E-waste figures for the UAE (29.28 kg per person) were below the world average (43kg per person), and the UAE has only recently began to regulate E-waste. It is unclear whether the UAE government, electronics outlets or consumers will pay to develop and sustain recycling in the country.

There are signs that consumers and companies are becoming more aware of the growing e-waste problem. Apple's decision not to include a headphone socket on the iPhone 7 was met with negative reactions and over 300,000 people signed a petition complaining that this move forces consumers to produce more e-waste as old headphones are discarded. Also, in the UAE there has been a campaign supported by the Ministry of Climate Change and Environment in which Uber and Averda had a pickup service to recycle old or unwanted electronics from consumers.

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