

Refurbished Technology: Solution to E-Waste

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Abstract— Industrial revolution followed by the advances in information technology during the last century has radically changed people's lifestyle. Although this development has helped the human race, mismanagement has led to new problems of contamination and pollution. Whenever we think of waste, we think only in terms of garbage or solid/semi-solid waste and nothing else. In the last ten years, e-waste has become a global issue. India too generates a large quantity of electronic waste i.e. e-waste every year. Unfortunately, since E-waste does not get much media coverage; people's awareness regarding e-waste is quite low. E-waste recycling is a concept barely in existing in India. As a result, the electronic waste generated is often dumped in water bodies or dumping yards without proper recycling or treatment which could be proved hazardous on various levels; for both environment and human health. The present paper highlights the scenario of e- waste by giving a solution in the form refurbishing of electronic gadgets as well as their working components by utilizing it for a better advanced projects.

Keywords: E-Waste, Refurbish

I. INTRODUCTION

The world is moving towards the technological revolution, the increased use of electrical and electronic equipment has coupled with huge population and changing consumption pattern is generating waste at an alarming rate in India. This is due to the advancement or development in technology. India is amongst the world's largest consumer of mobile phones and other electronic gadgets with over 1.8 million tonnes of e-waste generated per year. This waste is disposed at the dumping sites with all the other type of wastes. Thus affecting the ground as the e-waste contains harmful chemicals like valuable metals as well as hazardous materials and elements in it, which pollutes the ground water and air beyond repairable level.

To manage this, the government passed the first law on e-waste management in 2011, based on 'Extended Producer Responsibility' (EPR), which put on us the producer for the management of the final stages of the life of its product, in an eco-friendly way. Recycling process, which is not only expensive, but also needs specific skills and training for its operation. Therefore, Refurbished technology is the best solution for E-waste. In refurbished technology, the waste products are tested and verified, then working components are segregated and used in different electronic gadgets by sending it to the technical schools, electronic and electrical institutions, where the students can utilize these parts in their project work thus making the project economical in nature, while the others parts which cannot be used further should be disposed of in a safe manner without harming the environment.

II. LITERATURE REVIEW

In most of the cases recycling of the e-waste is possible but the waste generated from this process is also inevitable. On the other hand refurbish technology can proved to be boon for the efficient way to treat the e-waste. In refurbish, the working parts of any product can be reused. As this technology is new, the industries related to it are very few. This system is mostly adopted by the top electronic manufactures like Apple, Samsung, Dell, etc.

E-waste should be refurbished and reused as a complete product instead of dismantle as the dismantling of electronic process can incur huge monetary demands [2].

Basel Action Network (BAN) which have created a certification system for recycling, refining and refurbishing companies known as e- Stewards which can be well defined as the certification for carrying out the different e-waste management processes [5].

The article of "Exploring the Three R's of E-Waste: Refurbish, Redesign, and Repurpose" mentioned the innovative concept of Three R's management system i.e., Refurbish, Redesign, and Repurpose [4].

Implementation of framing polices for proper e-waste management in developing countries to solve environmental issues related to informal recycling practice [3].

The theory based on the literature survey and explain sources of E-waste and Modern Facilities are to be established for the collection of e-waste [6]. While, "Close the loop" practice can be implemented for proper treatment of the product [8].

Design for Environment and Life Cycle Assessment; Recycling and collection; Product Leasing; Eco- Labelling [7] and the survey to know the awareness, knowledge, perception, and attitude of college going students about existent, risk and management of E-waste [1].

III. METHODOLOGY

Refurbished electronic products are a great way for individuals and businesses to access new technology while staying within their budgets.

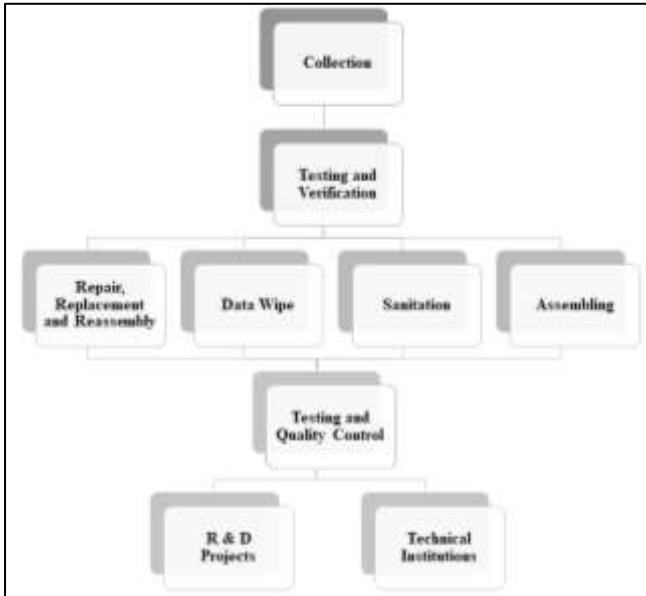


Fig. 1: Methodology

From the Fig. 1, different electronic products for refurbishing process are collected from different collection points established by the different agencies. From there, they are sent for processing units for testing and verification for knowing the damage as well as number of parts that can be refurbished.

On doing different tests, repairs, replacement of damaged parts and reassembly is done. After that if any data is present as in case of PC's, mobile phones, etc. the data is wiped. Following that proper sanitation and assembly of the device is carried out. Which will be further sent for final testing and quality assurance.

Once getting proper quality assurance from the concerned authority and after following all the prescribed norms, the refurbished product or specific component is delivered to the Technical Institutions as well as different R&D Institutes where this components can be again utilized in the their future projects thus saving great monetary consumption.

IV. PRELIMINARY SURVEY

A general survey was conducted about the awareness amongst the people of different age groups and sectors for better understanding of different e-waste management process that are known to them.

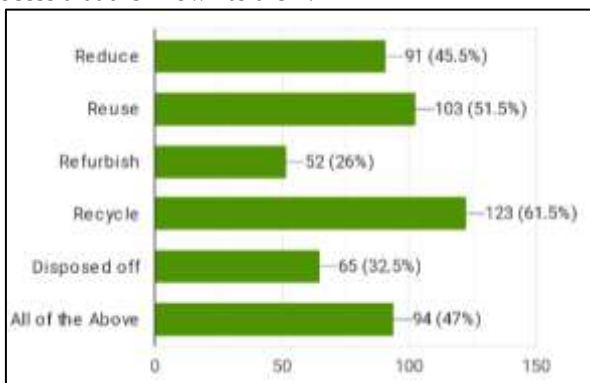


Fig. 2: Knowledge regarding different E-waste Management Technologies

From the Fig. 2, as per our survey conducted, almost all the people were having the knowledge regarding different e-waste management techniques focusing majorly on the recycling of electronics goods followed by the reuse of electronics. Majority of the responses were received from the age group of 15-30 years followed by the age group of 40-60 years.

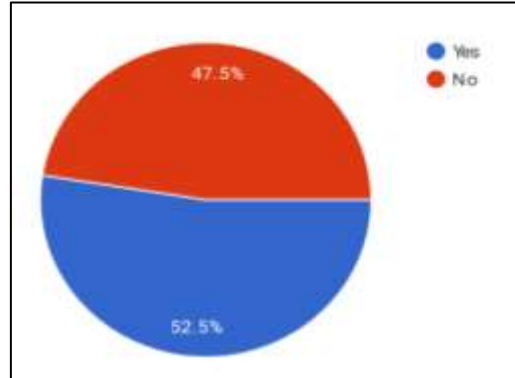


Fig. 3: Preference towards Refurbish products

Fig. 3, is showing that, as per our survey, most of the people were well known about the refurbish technology but due to extreme concerned about the quality and the warranty of the product does not prefer in buying the refurbish products. This can be due to the scarcity of the e-waste industries related to the refurbishment processes.

From this survey it is observed that, proper techniques shall be adopted for creating the awareness related to proper handling of e-waste and their respective management process in the later stage as well as the different guidelines laid by the Government. The vital role can be played by the different NGO's which are concerned with the environmental matters in establishment of e-waste collection points.

V. RECOMMENDATIONS

- Providing refurbished product to the student who cannot afford the new gadgets.
- Developing innovative and economical project with help of refurbished electronic parts.
- Encouraging and support the students for R&D projects.
- Providing refurbished products to the rural areas.
- Establishing e-waste collection points in the different parts of the city.

VI. CONCLUSION

E-waste management is a great challenge for governments of many developing countries such as India. This is becoming a huge public health issue and is exponentially increasing by the day. In order to separately collect, effectively treat, and dispose of e-waste, as well as divert it from conventional landfills and open burning, it is essential to integrate the informal sector with the formal sector. The competent authorities in developing and transition countries need to establish mechanisms for handling and treatment of e-waste in a safe and sustainable manner.

Increasing information campaigns, capacity building, and awareness is critical to promote environment friendly e-waste management programs. To support the e-

waste reduction, refurbished technology is best suitable as the e-waste management process. As there is a significant waste reduction as compared to the recycling of e-waste. The other advantage is that the old working components form the electronic gadgets can again be utilized for the repairs as well as in new production of devices.

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