

A Study on Consumer Behaviour about Remanufactured Electronic Gadgets in Indian Market

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Abstract

Remanufacturing is the process of rebuilding a damaged product, to its specifications of the original manufactured version using a combination of reused, repaired and new parts. It is the process of returning end-of-life products to original as-good-as-new condition in a manufacturing environment, with minimum waste and expenditure on materials and energy. Remanufacturing contributes to reduce the level of equipment wastes all over the world by their effective utilization. It also helps to reduce carbon emission and provide better environmental safety to the nation. In this era, when accumulated electronic waste generates environmental issues, remanufacturing of electronic gadgets and its marketing has remarkable importance.

Remanufacturing has been accepted by western world as an attractive business, but in India, it is yet to be accepted as an organized industrial sector. Electronics remanufacturing industry in India has huge potential for employment and wealth generation. But it needs a new consumer approach to the sector.

In this paper, an attempt is made to learn the extent to which consumers of electronic gadgets in Indian market are aware about remanufactured products and to learn the present consumer behavior towards remanufactured electronic gadgets. It is also tried to educate the unaware consumers about the process of remanufacturing and its benefits towards the consumers and the society as a whole.

Keywords: Remanufacturing, consumer behavior, e-waste, benefits to society.

Introduction

Remanufacturing is an industrial product recovery process, in which, the used/worn out and discarded products/components/parts of equipment or the equipment as a whole, are subjected to a sequence of activities, so as to convert them in to the same as new condition. Parts those do not worn out are reused in a rebuilt product that incorporates the technological advancements deemed necessary to ensure that repairs can be carried out in a timely manner and the item returned to functionality in an efficient manner. In remanufacturing, returned products to the company are completely disassembled to parts/components, thoroughly inspected, defective or worn-out parts are repaired or replaced by the original spare parts available and then finally reassembled to build-up the remanufactured product.

As far as quality is concerned, a remanufactured product is treated as good as new. Technological up-gradation of some parts or modules is also possible during remanufacturing process. In this method, the level of quality and performance of the remanufactured product can be improved better than its original version.

Automobile industry has the longest tradition in remanufacturing and is the most important industry in the manufacturing market. The automotive product remanufacturing accounts for two thirds of all manufacturing over the world. Locomotive industry and aircraft industry enjoy the benefits of remanufacturing at optimum level. But, electronic gadgets

industry lags much behind in the remanufacturing world. Majority of the manufactured electronics products in India ends their life in dumping yards, often most of them being underutilized.

A manufactured electronic product, moved to retailers' stores/ sold to customers may be returned to the manufacturer in the form of product recalls, commercial returns, warranty returns, service returns, end of use returns and end of life returns. And most common reasons for these returns are damage during transportation, product taken back during warranty services and returns during exchange purchases. After receiving these returns, the company has options of remanufacturing as well as discard. These discarded electronics gadgets will move to scrap handlers, and most common, will be dumped in landfills or open lands. One of the raising threats for human life in the planet earth is the fast increase in dumped e-wastes globally. In India, government has not yet initiated for any measures to control e-wastes from our markets.

Majority of the returned electronic products are well suitable for remanufacturing and companies need lesser effort for launching them back in to the market. In Western countries, it is a big business, but in India, it lags behind because of various reasons. Large manufacturing companies have not taken interest in this matter. Toner cartridges for laser monochromatic and color printers are the only remanufactured electronic product available in the Indian market. Manufacturers' Association of Information Technology (MAIT) has suggested from their study that, there is a potential for remanufacturing 2million Personal Computers per year, in India, totaling a business of Rs. 1500 Crores from Indian market. But, still no firms are attracted towards this business, which is profitable to them, as well as beneficial to the environment we live.

In this situation, it is interested to inspect the marketing elements of the remanufactured electronic gadgets in India. Consumer behavior towards the remanufactured products shall be examined in detail to understand the bottlenecks persist in developing the market, in both percepts of consumer and the manufacturer.

Scope

Global warming is a core issue addressed by the entire world today. Preventive measures have been generated and implemented by various nations to reduce the level of emission of green-house gases and other polluting agents to the atmosphere. Efficient utilization of resources is ensured all over the world for a sustainable development. Both developed countries and developing countries like India face the problem of waste management. The rapid growth of technology, up gradation of technical innovations and a high rate of obsolescence in the electronics industry have led to one of the fastest growing waste streams in the world which consists of end of life electronics equipments and products. It comprises a whole range of electronic items such as computers and printers, televisions, mobiles, iPods etc many of which contain toxic materials. Such loosely discarded, surplus, obsolete, broken electronic devices commonly termed as e-waste, occupies a noticeable portion among the total waste from the modern human society.

The countries of European Union and other developed countries to an extend have addressed the issue of e-waste by taking policy initiatives and by adopting scientific methods of recycling and re-utilization of such wastes. Indian government is far behind in addressing e-waste management and as a result, the fastest growing bulks of e-waste pollute our lands, water sources and the environment in a large scale.

Remanufacturing is one of the most proven methods to control the accumulation of e-waste all over the world. In India, major industries and business players are hesitated to enter in to the business of remanufacturing and hence the industry is still in its infancy. Studies shall be carried out to sort out the hurdles in development of this business, both from

customer's perspective as well as that of company. Huge potential of remanufacturing electronic gadgets in India shall be utilized to generate maximum revenue, as well as to tap out all the social benefits and ecological benefits emerging from this business.

This proposed study may be helpful to understand the elements of consumer behavior towards the remanufactured electronic gadgets in the Indian market. Also, this study may be useful for manufacturers for understanding about the nature of hurdles from the consumer attitude towards the newly proposing remanufactured electronic products to our market.

Unaware consumers about remanufacturing process shall use this study for understanding the process and its benefits to consumers and to society as a whole, thus to change their concept and attitude towards this market.

Electronic Gadgets and E-Waste

Human life of 21st century cannot live without electronic gadgets. The information technology has revolutionized the way we live, work and communicating methods. The creation of innovative and new technologies and the globalization of the economy have made a whole range of products available and affordable to the people changing their lifestyles significantly. New electronic products have become an integral part of our daily lives providing us with more comfort, security and entertainments. Every one of us has our own electronic gadgets. From mobile phones to television sets, from music systems to most complicated surgical equipments, from electronic watches to musical instruments, we use electronic gadgets in every moment of life. Majority of these electronic gadgets do not live long as their manufacturers promise. In India, presently the ideal life of Personal computers is not more than two years. Repairs and annual maintenance contracts do not render desired satisfaction, and finally after a struggle of one or two years, the computer moves towards the dumping hills of e-waste. Mobile phones, music systems and other electronic gadgets in India are also in the same track of the computers.

Technological up-gradation is a rapid process in the world of electronic gadgets and the outdated products turned out as a burden to users. Latest versions are being purchased and used by potential consumers. Indian markets show equal global growth rates in terms of technological up-gradation and the outdated products are being thrown away to the e-waste dump yards. Personal computers, mobile phones etc are highly vulnerable to such premature removal from service.

E-waste is the collection of discarded electrical or electronic devices. It includes computers and its accessories – monitors, printers, keyboards, central processing units, typewriters, mobile phones and chargers, remotes, compact discs, head phones, batteries etc. Used electronics which are destined for re-use, resale, salvage, recycling or disposal are also considered as e-waste. Electronic scrap components, such as CPUs contain potentially harmful components such as lead, cadmium, and beryllium or brominated flame retardants. In India, when electronics end up in landfills, toxics leach in to the soil and water. E waste is harmful to the environment and to society as a whole.

Benefits of Remanufacturing

Global consumption of electronics is increasing. Quantum of e-waste is also increasing along with the consumption. In India, situation is alarming. Every year we create more e-waste than before. This massive amount of hazardous e-waste poses a great threat to human health and environment. Government machineries do not impose restrictions towards inherent build up of e-waste, as well as no strict regulations to prevent some type of import of e-waste from other developed nations.

One of the easiest methods to control e-waste is to encourage the market for used electronic gadgets processed through remanufacturing. The technology of remanufacturing

has been successfully implemented in the world of automobile industry and aviation sector. Remanufactured electronics gadgets give people access to low-cost electronics and help them access the awesome benefits of technology. Remanufacturing process create job opportunities for skilled labor. Remanufacturing is usually more effective than domestic recycling. This process also helps to generate internal revenue in the country and an opportunity to the consumers for availing quality remanufactured products at lesser investment.

Remanufacturing facilitates less consumption of energy and materials during production, and reduce waste, thereby contributing to sound solid waste management and environmental stewardship. Remanufacturing reduces Green House Gases, Raw material use, landfill waste, energy use and water use.

Indian Context

Indian economy has witnessed significant growth in the last two decades. The IT sector has contributed significantly to the overall economic growth. In recent years, the electronics industry has been growing very rapidly along with the culture of consumerism. Coupled with the rapid pace of industrialization, Personal Computers (PCs)- Desk tops and Notebooks, Televisions and mobile phones etc have experienced high growth and even faster replacement cycle. The most commonly used PC, which earlier had a lifespan of seven years, today has an average lifespan of two to five years. The shorter lifespan of products is a marketing strategy to maintain the pace of consumption and production process. Due to the extreme rate of obsolescence, the electronic industry is producing much higher volume of waste. This has been compounded by the change in the consumption pattern in India, which has also contributed to the large volumes of e-waste being generated in the country.

Central Pollution Control Board estimated India's e-waste at 1.47 Lakhs tones per annum or 0.573 MT per day. There are 10 states that contribute to 70 per cent of the total e-waste generated in the country, while 65 cities generate more than 60 per cent of the total e-waste in India. Among the 10 largest E-Waste generating states, Maharashtra ranks first followed by Tamil Nadu, Andhra Pradesh, Uttar Pradesh, West Bengal, Delhi, Karnataka, Gujarat, Madhya Pradesh and Punjab. The main source of e-waste in India is the government, public and private (industrial) sectors, which accounts for almost 70 per cent of total e-waste generation.

While considering these facts and figures, remanufacturing of PCs and other electronic gadgets should have a great opportunity in India. Analysts aver that there would be no more than 50,000 refurbished or remanufactured Personal Computers in the country. A study done by IMRB finds out that, there is a potential for remanufacturing 2 million PCs in India totaling a business of Rs. 1000 Crores – Rs. 1500 Crores per year. But major industrial players do not show attraction towards this business.

At present, in Indian market, the main remanufactured electronic product marketed is Toner Cartridge Replacement for Printers and Photo copiers. Monoprice MPI offers the line of high quality remanufactured Color Laser/Toners designed to deliver highest performance and value possible. In their ads, MPI describes the process of remanufacturing, their product undergoes, and how the product achieves the perfection.

Remanufactured Indian Products

Remanufacturing in India is unorganized now a day. The concept of remanufacturing has been implemented in India mainly in automobile industry and locomotive sectors. EMD Locomotive Technologies Pvt Ltd is already practicing remanufacturing concept on locomotive engines. GE is using remanufacturing for engines, solar turbines, and Engineering and Track services. Indian Railway is using remanufacturing for engine blocks, Traction motor housing, Loco under frame, Bogie frame at DMW, Patiala. Still less numbers of corporate houses

involved in remanufacturing as organized business sector like Xerox Modicorp Ltd., United Van der Horst Ltd., Timkin India Ltd. and a few cartridge refilling companies.

Cartridge remanufacturing is a big business worldwide. In India also, it is the only one common remanufactured product in the market. Monoprice MPI sells a variety of remanufactured toner cartridge in Indian market. As per their ads on various media, their remanufactured cartridges are completely disassembled, worn out parts are discarded and then remanufactured like a new unit. Unused toner in old cartridge is discarded. Worn out wipers are replaced, since, snags and nicks in the wipers may lead to streaks and blotches on the printed pages. Drums are resurfaced and refinished to eliminate blemishes and give it a renewed magnetic surface and thus an excellent image quality. Finally other worn out and damaged parts are replaced. This product is under warranty protection abroad, whereas, no warranty applicable for India.

Customer Analysis

In order to analyze the consumer behavior towards the remanufactured Indian electronic products, a study was carried out among middle class customers of electronic gadgets, in order to understand the method of purchase, factors influencing their purchase, the frequency of their purchase, and to find out their awareness about the remanufacturing process of electronic gadgets and about the threat of accumulation of e-waste in the country. The sample size was 50 people, selected equally from both lower and middle level income (between Rs. 20,000/- to 60,000/-per month), selected through judgment sampling technique.

Tabulation of Collected Data and Analysis

Table 1

How often do you purchase electronic gadgets?

2 – 3 months	6 – 8 months	Once in a year	Once in 2 years
12%	30%	40%	18%
6 persons	15 persons	20 persons	persons

Among the selected people, 12% of people used to purchase electronic gadgets during 2 – 3 months period and 30% of them purchase during 6 – 8 months. 40% of them purchase once in a year and 18% purchase once in 2 years. It shows that, frequent purchasers are less in India.

Table 2

From where you prefer to shop electronic gadgets?

Ordinary shops	Exclusive Dealer	Supermarket	Internet purchase
4%	60%	16%	20%
2 person	30 persons	8 persons	persons

From the sample space, an astounding 60% of the people purchase electronic gadgets from exclusive showrooms. It is surprising that, from supermarket, 16% purchase these products, whereas, 20% purchase such items from internet. Only 4% of people purchases from ordinary shops. From this result, it may be noted that, efforts for promotion of remanufactured products shall be focused at exclusive showrooms.

Table 3

When do you replace an electronic gadget you use?

Immediately when it fails	After repeated failures and repair	When superior model launched in market	After a certain period irrespective of failure
12%	40%	32%	16%
6 persons	20 persons	16 persons	8 persons

Among the selected people, 12% of them replace their electronic gadget immediately when it fails and 40% of them replace them after repeated failures and repairs only. 32% of them replace when superior model launched in the market and 16% of them replace after a certain period irrespective of failure of gadgets. From this analysis, other than 40% of people who effectively utilize the gadgets, balance 60% are under- utilizes and contribute to fast developing e-waste bundles in our country.

Table 4

How much are you aware about remanufactured electronic gadgets available in market and are as good as new?

In detail	Up to some extent	Very little	Not at all
4%	8%	8%	80%
2 persons	4 persons	4 persons	40 persons

From the sample space, only 4% respondents are aware that, remanufactured electronic gadgets are available in market and these are as good as new. An astounding 80% of respondents do not aware this fact. 8% know this up to some extent and another 8% know this very little. This information shows the level of unawareness of the consumers about the availability of remanufactured products in the market and the quality level of such products. It also points out to the necessity of massive advertisements in this regard.

Table 5

Will you prefer to purchase remanufactured electronic gadgets over original company products, if cash discount is offered?

Yes	Sometimes	No comments	No
32%	40%	4%	24%
16 persons	20 persons	2 persons	12 persons

While purchasing the electronic gadgets, 32% of people will prefer the remanufactured products over the original company items, if cash discounts are offered, whereas, 40% of them may sometimes prefer to purchase them. 24% of the respondents are still not willing to purchase remanufactured products and 4% have no comments over this. In total, 72% of people are willing to make a purchase of remanufactured gadgets if cash discount is offered. This fact may be considered by the manufacturers.

Table 6

Will you prefer to purchase remanufactured electronic gadgets over original company products, if same warranty is offered?

Yes	Sometimes	No comments	No
60%	12%	6%	22%
30 persons	6 persons	3 persons	11 persons

From the sample space, 60% of people in detail and 20% of them up to some extent, have awareness about the accumulation of e-waste in India and about its threat to environment and society. 16% of them have very little awareness in this regard, whereas, 4% are unaware about this fact.

Table 7

Whether you believe that remanufactured products are inferior in quality?

Strongly believe	Believe	No comments	Do not believe
50%	30%	8%	12%
25 persons	15 persons	4 persons	persons

From the analysis of the sample, it is alarming that, 50% of the respondents strongly believe and another 30% of them believe that, the remanufactured products are inferior in quality. Only 12% do not believe this and 8% do not show their response. This situation needs urgent attention; so that, people may be educated about the process of remanufacturing and its benefits to the consumers as well as the society as a whole, in order to promote the same.

Table 8

How much are you aware about the accumulation of e-waste in India and its threat to environment and society?

In detail	Up to some extent	Very little	Not at all
60%	20%	16%	4%
30 persons	10 persons	8 persons	2 persons

From the sample space, 60% of people in detail and 20% of them up to some extent, have awareness about the accumulation of e-waste in India and about its threat to environment and society. 16% of them have very little awareness in this regard, whereas, 4% are unaware about this fact.

Table 9

How much are you aware about the role of remanufacturing in the control of accumulation of e-waste?

In detail	Up to some extent	Very little	Not at all
4%	8%	8%	80%
2 persons	4 persons	4 persons	40 persons

Regarding the role of remanufacturing in the control of accumulation of e-waste, only 4% of respondents are aware in detail and 8% of them are aware up to some extent. Another 8% are very little aware. But an astounding 80% people in total admit that, they are unaware about the role of remanufacturing in control of e-waste. This situation shall be addressed well and people shall be educated by government itself through various media about the threat of e-waste accumulation and various solutions for the same. Remanufacturing shall be promoted at its level best.

Table 10

Will you ready to purchase a remanufactured electronic product during the next purchase to participate in reducing accumulation of e-waste?

Yes	To a certain extend	No	No comments
40%	20%	8%	32%
20 persons	10 persons	4 persons	16 persons

Finally, admittance of the people was measured for control of e-waste. 40% of the respondents admitted that, they are ready to purchase remanufactured electronic products during their next purchase in order to participate in reducing accumulation of e-waste in India. 20% of people are ready to some extent. But, 8% are not willing for the same and 32% escaped from exposing their mind. Total 60% of people are ready for participation in e-waste reduction move, and are ready for purchase remanufactured products in this intention. It is a hopeful response.

Summary

Planet earth is facing a new threat from the waste electronic gadgets thrown away from workplaces. This waste adversely affects our ground water, pollutes our land by leaching out toxins from the metals in electronic parts. By 2017, the volume of our thrown away e-products throughout the world is expected to rise by 33 per cent from 2012. Hence the growing stream of this e-waste is a rising threat to our environment.

The most effective and proven way to control the accumulation of e-waste is utilizing it back to generate products. It is the greener option to re-utilize the thrown away electronic gadgets to produce those back as-good-as-new products through the process of remanufacturing. Remanufacturing is a big business in European countries, whereas, in India, big manufacturing companies are not focusing over this process. The business of remanufacturing electronic gadgets can afford customers better products economically, it can control the accumulation of e-waste, it can generate more job opportunities in the country, it

has potential to generate more revenue, more profits to firms, and finally, this greener and sustainable option brings advantages to environment and the planet earth.

This study was made with the intention that, bottlenecks in development of the market for remanufactured electronic gadgets shall be sorted out and the consumers shall be educated about the benefits of remanufactured products towards the consumers and towards the environment. The consumer behavior towards such products was studied and suggestions carved to develop the market for remanufactured electronic gadgets in India.

Findings

The following are the findings of this study;

1. There is no specific market for remanufactured products in India and relatively there are few customers in the market.
2. Majority of customers believe that, remanufactured electronic gadgets are inferior. Some parts of customers are willing to purchase these items if cash discounts are offered/ warranty being provided similarly as new products.
3. People are unaware of the process of remanufacturing and its benefits.
4. Most of the people are aware about the threat produced by accumulation of e-waste in India. But majority do not know that, the process of remanufacturing can effectively control the accumulation of e-waste by its effective utilization.
5. People are willing to participate in reduction activities of e-waste. They are willing to contribute by purchasing remanufactured products instead of original products for their use.
6. Low acceptability of remanufactured products due to unawareness of its quality and price.

Recommendations

The following recommendations are made in the light of the findings from this study;

1. People shall be educated about the threats generated by the accumulating waste of electronic gadgets in India. Government shall adopt effective control mechanisms through legislations and by building awareness among people.
2. Remanufacturing of electronic gadgets shall be promoted by the government itself by attracting big electronics manufacturing companies to this business. Tax rebates shall be announced for remanufactured products in Indian markets.
3. Consumers in electronic gadget markets shall be educated about the process of remanufacturing and about the quality of remanufactured products. Special advertisement campaign shall be announced by firms to promote the business. Marketing efforts shall be focused in the company exclusive showrooms.
4. Remanufactured electronics shall have cash discounts and they should have warranty as that of new products. Priority shall be given in service centers for remanufactured products.
5. Manufacturing firms should adopt remanufacturing process as part of their social responsibility. They should strengthen the reverse logistic systems to obtain their damaged products from market. Special retail showrooms shall be opened for remanufactured products.

Limitations

Although the sample consisted of people from different age groups and gender, representing both lower and middle income people, to obtain the accurate cross section of purchasers of electronic gadgets, sample size was only 50 people and a more accurate study could be drawn from a larger sample size.

References

1. <https://en.wikipedia.org/wiki/remanufacturing>
2. <http://amazon.in/remanufactured-universal-CC530A-toner>
3. Dekker,R.,Van der Laan, E. and Inderfurth,K.2000, 'A review on inventory control for joint manufacturing and remanufacturing'.
4. Steinhilper.R., 1998, Remanufacturing-The Ultimate Form of Recycling,Fraunhofer IRB Verlag,Stuttgart..
5. ISBN 978-93-82338-05-5/2012 Bonfring.
6. <http://timesofindia.indiatimes.com/Remanufacturing-PCs-A-big-opportunity>.