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  "e-Waste Management in the United Arab Emirates"

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- **Abstract**

  In 21st century, electronics have undoubtedly become an integral part of our daily lives. As a result, Electronic Waste (e-waste) or Waste Electrical and Electronic Equipment (WEEE) has the dubious distinction of becoming the fastest growing waste type in today's economy. Every year, 20 to 50 million tons of e-waste gets accumulated around the world, which is estimated to touch 73 million tons by2015.

  In UAE, there are no official statistics about e-waste collection, or how the waste is getting disposed of in landfills. This should be a huge cause for concern for not only environmentalists but also local citizens. With a revived consumer electronic durables market in UAE, valued at USD 0.85 billion (Q1 2010), the situation of e-waste looks grimmer than ever.

  UAE has around 4.8 million residents and almost double this number is mobile phone subscribers. Increasing per capita income of UAE residents has alarmingly contributed to the mindless disposal of electronic waste in this great Emirate nation. Even though the re-cycling industry is in its nascent stage in UAE, it is slowly gaining momentum. However, there is a huge awareness gap between the e-waste recycling industry and the consumers who generate the said waste.

  Our study focuses on exploring the behavior of such consumers towards e-waste management and addressing the persistent problems faced by the e-waste recycling industry in UAE. In our research project, we propose a sustainable working model to bridge the knowledge gap between consumers who generate e-waste and the industry that re-cycles the same e-waste.

- **Keywords**

  E-Waste, Waste, Electronic Waste, UAE, United Arab Emirates, Recycling

e-Waste Management in the United Arab Emirates

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Abstract

In 21st century, electronics have undoubtedly become an integral part of our daily lives. As a result, Electronic Waste (e-waste) or Waste Electrical and Electronic Equipment (WEEE) has the dubious distinction of becoming the fastest growing waste type in today's economy. Every year, 20 to 50 million tons[1] of e-waste get accumulated around the world, which is estimated to touch 73 million tons by 2015[2].

In the UAE, there are no official statistics about e-waste collection, or how the waste is getting disposed of in landfills. This should be a huge cause for concern for not only environmentalists but also local citizens. A high per capita income of the UAE residents and a revived consumer electronic durables market in the UAE, valued at USD 2.80 billion (FY 2010[3]), questions the current situation of the disposal of e-waste.

Though the re-cycling industry is in its nascent stage in UAE, it is slowly gaining momentum. However, there is a huge awareness gap between the e-waste recycling industry and the consumers who generate the said waste.

Our study focuses on exploring the behaviour of such consumers towards e-waste management and addressing the persistent problems faced by the e-waste recycling industry in the UAE and we propose a sustainable working model to bridge the knowledge gap.

Keywords: e-Waste, UAE, WEEE, Recycle, Sustainability

1 Introduction

Rapid changes in technology, low initial cost, and planned obsolescence have resulted in a fast-growing surplus of electronic waste around the globe. Only about 15% of this waste is currently being recycled[4], while a large portion is being dumped into the emerging economies.

A recent worldwide market study by ABI research for e-waste recycling (also known as e-cycling), forecasts that the market for e-waste recovery will grow from $5.7 billion in 2009 to approximately $14.7 billion by the end of 2014. This represents a Compound Annual Growth Rate (CAGR) of 20.8% over the forecasted period.

UAE has one of the highest per capita incomes in the world[5] and the current electronic sales per capita stands at USD 580. The thriving economy can only make the situation better and usage of electronics higher. Amidst all this prosperity, the disposal of electronic waste has neither been conscious nor been channelized and this in turn has resulted in improper disposal of e-Waste. All said the situation of e-waste looks grimmer than ever. There are no statistics on how much e-waste is generated in the Arab region or the UAE, or how much of it is sent to landfills, but there is definitely a cause for concern.

2 Situational Analysis of the e-Waste Industry in the UAE

a. No Government incentives for e-Waste recycling companies to set up shops.

b. The culture of re-cycling has been prevalent in the recent past in the UAE with companies operating for re-cycling papers, construction materials and tires.

c. Due to "No duty, No Tax" policy by the Government, the electronics items are available at a lesser price to the consumers.

d. With one of the most forward thinking Government in the Arab world, the UAE would be open to ideas and changes concerning the Environment[6] and that augur well for the e-waste recycling industry.

e. The behavioural patterns of the consumers towards electronics after it's useful (as perceived by them) are not completely known.

f. Though e-waste management programs are conducted by a handful of companies in the UAE, there is no complete end to end e-waste recycling plant.

g. With the internet penetration well above 75%[7], spreading messages and creating awareness for recycling would be much easier.

h. There are no laws currently governing the e-Waste re-cycling process

i. Since most of the companies do not own their manufacturing facility in the UAE, Extended Producer's Responsibility (EPR) cannot be put in place by the Government authorities.

3 Findings and Analysis

Cluster Analysis is grouping the set of observations such that each group or cluster exhibits a similar pattern of behaviour. The survey for this research questioned the respondents about the importance of certain attributes when they discard their electronic wastes. The respondents were asked to rate Money, Environment, Charity and Just getting rid of the old electronic items according to the importance these factors hold when they discard. The rating was done on a 5-point scale, with 1 being the least important and 5 being the most important.

The Reponses were coded and uploaded on SPSS to run the Cluster Analysis on these attributes. The respondents were grouped into 5 clusters.

Cluster Name	Description	Percentage
CharEn	High inclination towards Charity and Environment	25
Gerid	High inclination towards Just getting Rid of the waste	16.66
MoEnCha	Equally high inclination towards Money, Environment and Charity	14.29
GeChar	High inclination towards Charity and Getting Rid	25
EnReCha	- High inclination towards Environment, Charity and Getting Rid	19.05

Table 1: *Cluster name, Description, Percentage distribution*

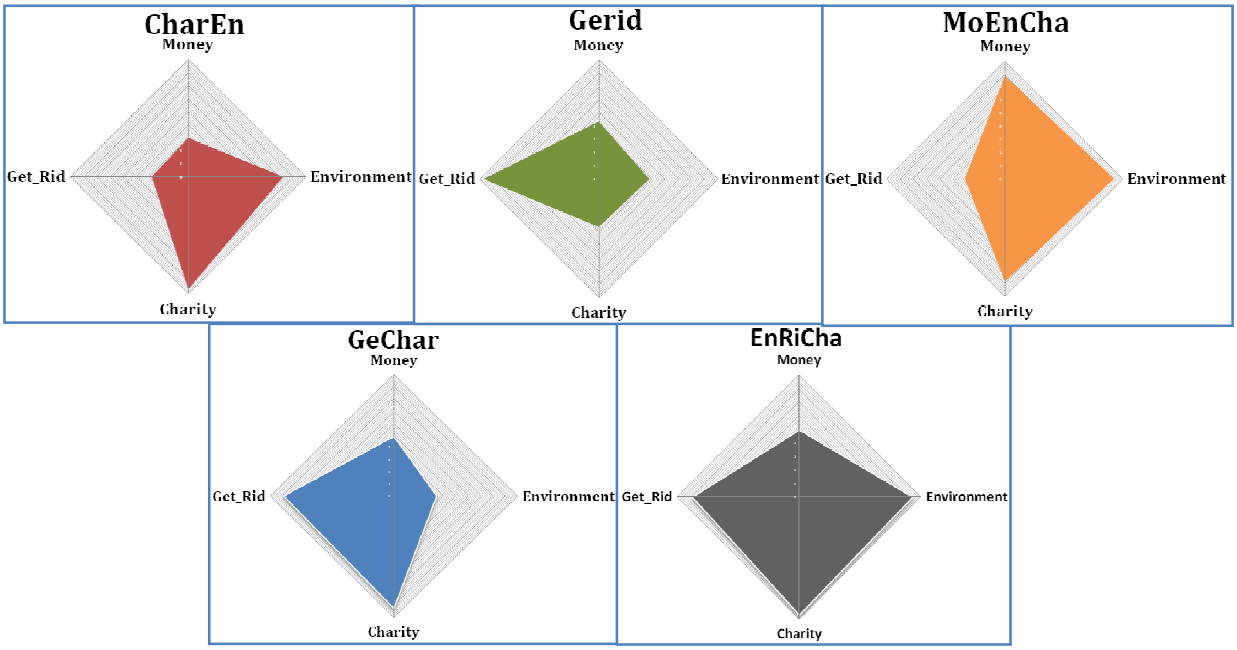

Figure 1: Cluster Analysis: Inclination towards Attributes

4 Recommendations and Conclusions

4.1 Short Term Feasible Working Model and Long term Sustainable Working Model

After the concerns of the consumers in regard to being a part of the value chain of the e-Waste re-cycling were captured, a sustainable working model in the form of "Integrated e-Waste Management Centre (IEWMC)" is suggested. This addresses the causes of concern for both the consumer and the e-waste recycling industry. The model has been divided into short term and long term to address feasibility and sustainability respectively.

4.1.1 Genesis of the Model

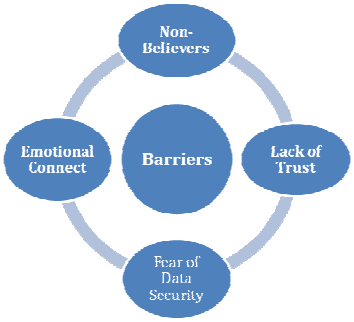

Figure 2: Barriers to donate e-Waste

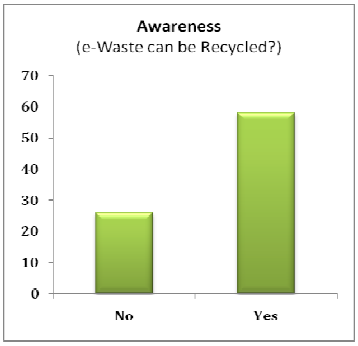

Figure 3: Awareness on e-cycling

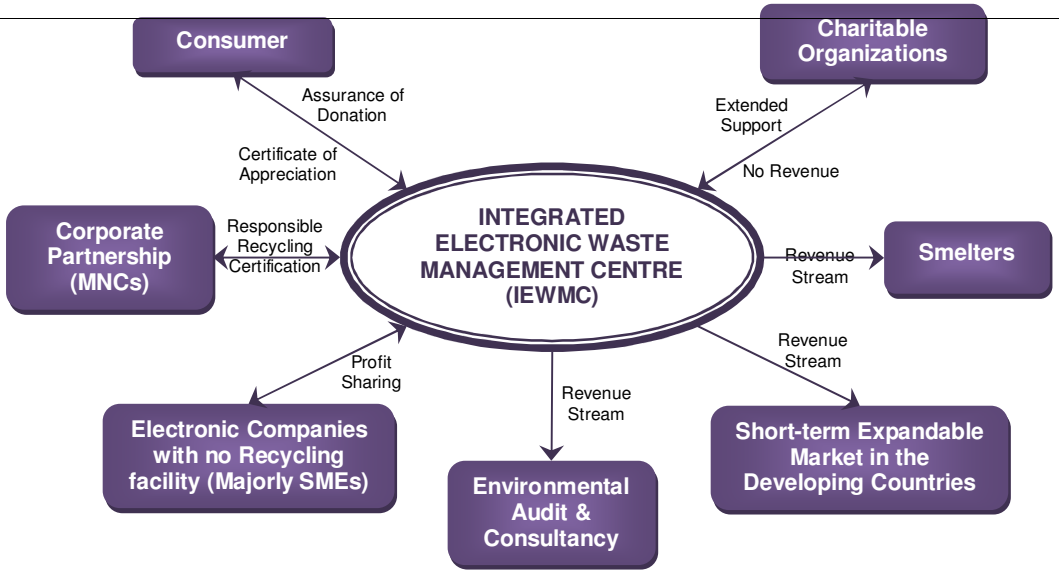

Figure 4: Short Term Feasible Working Model

4.1.2 The "Revenue" Stream consists of:

4.1.2.1 Smelters and the Global Metal Market

Short Term: IEWMC would sell the shredded metals to the smelters across the globe in order to make revenue. In the short run, this would help IEWMC analyze the trend in the quantity of equipments shredded and prepare for a higher investment in the Smelter in the long run.

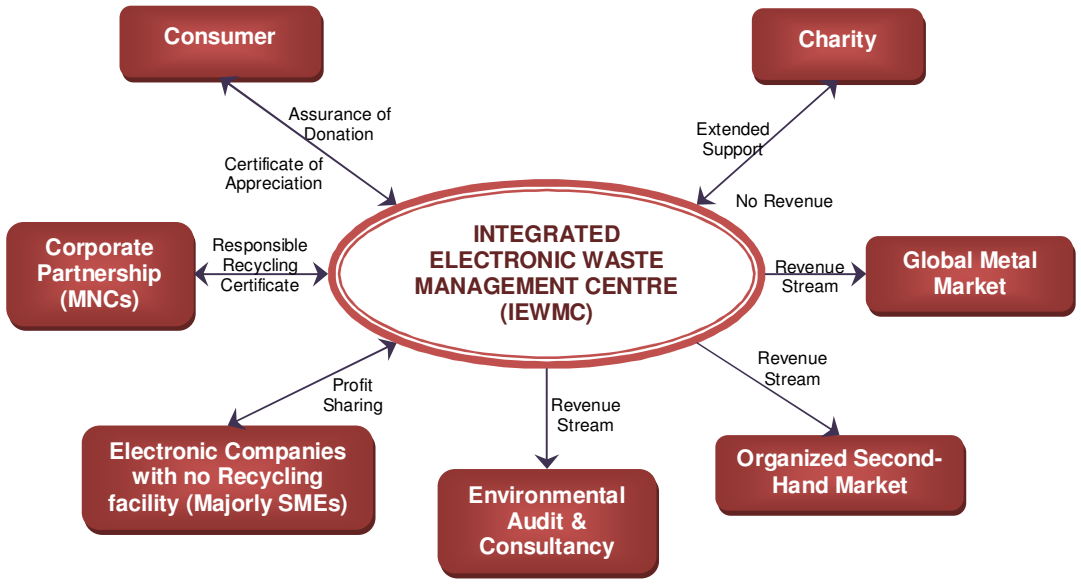

Figure 5: Long Term Sustainable Working Model

Long Term: IEWMC would setup a smelting unit to serve the UAE market and would also accept shredded metals from across the globe. This setup would ensure that the e-waste becomes useful raw material and reach the secondary metal market ensuring better margins.

4.1.2.2 Secondary Market

Short term "Expandable" Market: In the early stage, the "working condition" electronics would be sold to the unorganized secondary market in the developing countries. This would ensure IEWMC get a steady flow of revenue in the short run and would help understand the challenges and the opportunities existing in the secondary market.

Long term "Organized" Market: An organized secondary market would be created by IEWMC, where warranty and quality of service would be introduced for the second hand electronics. The market would be reached out and penetrated in a similar way as an electronic manufacturer would reach out. The extended support for electronic equipments, including spare parts from the manufacturers and a strong network of quality service engineers would help this organized secondary market grow. The "branding" effort would command better price in the market.

4.1.2.3 Environmental Audit and Consultancy

The concept of green buildings and energy efficient buildings are becoming more relevant today in the UAE and the Government is also focusing more on energy saving measures. This service would be offered by IEWMC to Government and Private Institutions on an individual contract basis or as a turnkey solution. Since this service does not require any fixed cost, the margins are higher. This initiative would yield minimal revenue in the short run until the brand and trust is established but would go on to become a major revenue generating stream in the long run.

4.1.3 The "e-Waste Input" Stream consists of:

4.1.3.1 Corporate Partnerships (MNC's)

64% of the UAE based companies are reported to have an environmental committee and 84% of the UAE based companies report they have an environmental strategy[8].

With the companies not only limiting themselves to economic profits but also considering saving the environment augurs well for the integrated e-waste management center working model.

4.1.3.2 Small and Medium Enterprises:

UAE has always supported the small and medium scale enterprises. Since the SME's are in their growth phase, we understand that economic profit takes precedence than their caring for the Environment. Hence, the e-Waste collected from the SMEs would be acknowledged by IEWMC through a limited profit sharing.

4.1.3.3 Consumers

The "Charity Support" Stream:

Majority of the consumers in the UAE are oriented towards donating e-Waste to charity. The IEWMC would partner with charitable organizations to foster growth for both the institutions. IEWMC would help the charitable organizations in the form of donation of electronic devices and money. As an acknowledgement, the charitable organization will send out an appreciation certificate or letter to the consumer. This process will assure the consumer of a donation made and will make him/her to start trusting the system.

4.2 Conclusions

Awareness: The awareness amongst consumers has to be increased. Consumers have to be targeted through multiple channels and media to spread awareness. Channels like Electronic Dealer Network, Awareness SMS, Pamphlets and Community Collection Centre must be used to spread awareness.

Collection methods: More visibility has to be brought in terms of collection methods. ecoATM[9] and address drop box for collection of e-waste are the two new methods that must be used.

Government Support: The IEWMC model recommended has not taken any Government support into consideration. But, the Government banning the e-Waste (without shredding) from being exported to other countries would help manage e-Waste scenario better.

Paradigm Shift: To discard e-waste responsibly is a paradigm shift and that habit should begin young in one's life. **"e-waste awareness champions"** must be instituted in educational campuses to spread the message.

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[6] International forums in regard to environment and re-cycling happen consistently in the UAE. The Abu Dhabi World Future Energy Summit and Dubai Global Energy Forum have now become a regular event to discuss issues and solutions.

[7] Middle East Internet Usage Stats and Facebook Statistics. 2011. *Middle East Internet Usage Stats and Facebook Statistics*. [ONLINE] Available at:http://www.internetworldstats.com/middle.htm. [Accessed 28 April 2011]

[8] The State of Environmental Initiatives Among UAE Companies – April 22 2009 - Ecoventures

[9] ecoATM is an automated self service kiosk for e-cycling the old mobile phones, developed by ecoATM Inc based in San Diego, California and it is the first and only company to come up with such a technology