

Character and Evolution of Electronic Waste: A Technologically Developing Country's Experience

Authors : Karen C. Olufokunbi, Odetunji A. Odejebi

Abstract : The discourse of this paper is the examination of the generation, accumulation and growth of e-waste in a developing country. Images and other data about computer e-waste were collected using a digital camera, 290 copies of questionnaire and three structured interviews using Obafemi Awolowo University (OAU), Ile-Ife, Nigeria environment as a case study. The numerical data were analysed using R data analysis and process tool. Automata-based techniques and Petri net modeling tool were used to design and simulate a computational model for the recovery of saleable materials from e-waste. The R analysis showed that at a 95 percent confidence level, the computer equipment that will be disposed by 2020 will be 417 units. Compared to the 800 units in circulation in 2014, 50 percent of personal computer components will become e-waste. This indicates that personal computer components were in high demand due to their low costs and will be disposed more rapidly when replaced by new computer equipment Also, 57 percent of the respondents discarded their computer e-waste by throwing it into the garbage bin or by dumping it. The simulated model using Coloured Petri net modelling tool for the process showed that the e-waste dynamics is a forward sequential process in the form of a pipeline meaning that an e-waste recovery of saleable materials process occurs in identifiable discrete stages indicating that e-waste will continue to accumulate and grow in volume with time.

Keywords : Coloured Petri net, computational modelling, electronic waste, electronic waste process dynamics

Conference Title : ICEWMP 2018 : International Conference on Electronic Waste Management and Recycling Process

Conference Location : Boston, United States

Conference Dates : April 23-24, 2018