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Development of a Web Based Electronic Waste Management System: A Study with Special Reference to Recycling Companies in Sri Lanka

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Abstract

Information and Communication technology (ICT) and/or Information Technology (IT) are the effective tools that have been employed in the field of education, research, administration and other ways for the betterment of the human life that brings revolution in the modern era. There are number of advantages and disadvantages available in using ICT for our activities. One of the major disadvantages of ICT and its devices is harmful substances including carbon dioxide (CO₂) to the environment that are not eco-friendly. Software and hardware part of IT has touched most of the parts of social, technical, economic and natural environment. Exponentially increasing production of computer hardware has posed major challenges of proper disposal of the electronic waste (e-waste) produced by this industry. Recycling companies are the key stakeholders in managing e-wastes in developing countries. But, they don't have any proper system to handle those wastes. Therefore, the objective of this research is to explore and investigate the current condition of electronic waste's recycling system in Sri Lanka and to study the problems faced by recycling companies in handling e-wastes as well as to develop a computerized system to solve e-waste recycling problems. The research method was case study and it is comprised of three phases: analysis and problem definition, system design and development and, system implementation. A structured questionnaire and informal interview methods were used to collect data. Secondary data from sources such previous research article on published and unpublished journals, websites, company database information, annual reports, magazines etc. were used. The population of the research was recycling companies of Sri Lanka and the sample size was seven registered recycling companies. It is identified that there are four kinds of recycling activities are processing as return back, recycle, resell and reuse the e-waste by Sri Lankan recycling companies. A web based system, based on the research were developed as the recycling companies of Sri Lanka can put into operation that may be adopted for sustainable management of e-waste. The final system is helpful for e-waste recycling companies to manage e-wastes and it will be benefited to the community and the nation as well.

Keywords: Electronic waste, Recycling, Information Technology, Sustainable development