

REMANUFACTURING AT XEROX: EVALUATING THE PROCESS TO ESTABLISH PRINCIPLES FOR BETTER DESIGN

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ABSTRACT

This paper explains and illustrates the process Xerox uses at its factory in Ireland to return old document equipment (including photocopiers and printers) to an “as new” product. Through a series of industrial processes in a factory environment, a discarded product is completely disassembled. Usable parts are cleaned and restored to their “as new” condition before the product is reassembled with some new parts to produce a unit fully equivalent to the original new product.

Although Xerox has made a profitable business from remanufacturing, there are many barriers to its wider development. This paper outlines some of these barriers to remanufacturing and outlines the development of a design method to enable better design for remanufacturing.

Keywords: Remanufacturing, Design Platforms, Sustainable Development

1 INTRODUCTION

Remanufacturing is the term given to the process of returning products to their as-new standard and form. It is a process that has become increasingly relevant and important given the need to ensure that future economic and manufacturing growth is sustainable - that is “a development that meets the needs of the present without compromising the ability of future generations to meet their own need” [1]. The difference between sustainable and industrial agenda was defined by Stahel [2], who described the former as “a long-term societal vision, concerned with the stewardship of natural resources (stock equals wealth) in order to safeguard the opportunities and choices of future generations”; the latter, meanwhile, is described as a “short-term optimisation of throughput in monetary terms”. The need to move manufacturing closer to a sustainable vision is evident given that virgin development uses high levels of both energy and raw materials, and the current primacy of purchase cost means that it is often cheapest simply to discard an old product and develop again from new – thus producing waste.

This situation has led to a focus on “Extended Producer Responsibility (EPR)” and its application in respect of End-Of-Life (EOL) product take-back [3]. There have been several recommendations and directives issued in this regard. Example items of legislation include: EOL requirements for the automotive sector [4], the provision of guidance for governments on how the EPR issue should be addressed [5], and the regulation of the disposal and reuse of waste from electrical and electronic equipment (WEEE). The European WEEE Directive [6] is intended to achieve three key objectives:

1. Reduction of waste arising from EOL electrical and electronic equipment (defined as being any equipment powered via either mains electricity supply or batteries);
2. Improvement and maximisation of recycling, reuse, and other forms of recovery of EOL electrical and electronic waste materials;
3. Minimisation of the impact upon the environment from the treatment and disposal of electronic and electrical EOL equipment.

