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Disassembly: A Comprehensive Overview

A recent focus on sustainability has its roots in the need of humans to maintain the current and future economic profitability, environmental protection and quality of living standards. Preservation of resources and reduction and elimination of waste, which are part of the mission of product recovery, play an important role in sustainability. One of the most important elements of product recovery is disassembly. Disassembly can be defined as the systematic separation of an assembly into its components, subassemblies materials or other groupings. All product recovery options (viz., reuse, remanufacturing, recycling, and disposal) require some level of disassembly. Over the last decade, researchers have made great strides in identifying and understanding the various issues involved in disassembly. For example, topics such as scheduling, sequencing, line balancing, disassembly to order systems, ergonomics, and automation have become areas of active research. In addition, products specifically designed to facilitate disassembly at the end of their lives have started to gain serious attention. In addition to being environment friendly, effective management of disassembly operations lead to higher profitability and lower costs. Disassembly operations have a strong impact on the elements of forward as well as reverse supply chains such as the storage spaces and transportation capacity. This, in turn, have created many challenges in the areas of network design, transportation, selection of used products, selection and evaluation of suppliers, performance measurement, marketing related issues, end-of-life (EOL) alternative selection, remanufacturing and product acquisition management, to name a few. This talk will present the evolution of disassembly together with an overview of a variety of topics within disassembly and avenues for future research.