Optimal profit for manufacturers in product remanufacturing diffusion dynamics

Kapur, P.K., author

Abstrak

In remanufacturing, companies take the product back from customers when the product reaches its end-of-life, so as to use as a feedstock for manufacturing of new products. Thereby, it reduces the risk of environmental degradation to be caused by these end-of-life products. The real efficiency in remanufacturing lies in the cost-effective use of reused components. In this paper, we formulate an optimization model based on famous Bass diffusion model to depict not only the quantity returned in the remanufacturing process, but also the amount of cost-saving a manufacturer does with efficient remanufacturing. The proposed approach can enable product designers and remanufacturers to quantify the total component reuse volume by considering the quantity returned, diffusion dynamics with coefficient of innovation and imitation and time to begin remanufacturing. Analytical reasoning & numerical illustration to validate the proposed optimization model and explanation of remanufacturing diffusion dynamics are provided.