

Dynamic Management of a Toner Cartridge Supply System for a Fleet of Printers

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Abstract

Printing is a ubiquitous part of the way people do business. The availability of printer supplies and the inventory cost of printer supplies in fleet of printers can be an important tradeoff that needs to be actively managed by an organization. The printer fleet should be able to satisfy the stochastic behavior of printing demand at a given service level while optimizing the cost associated with the inventory management system. In this paper, newly developed inventory models are combined with a simulation model to dynamically identify the reorder points for a fleet of printers. This simulation model utilizes information about printer usage patterns and toner consumption rates of individual printers within a fleet in order to optimize the availability and costs. An important part of this model is an improved toner consumption forecast model that more accurately predicts when the toner supply of an individual printer will be depleted. Various printing configurations are used to evaluate the effectiveness of the proposed models.