## عنوان مقاله:

Determination of Criticality Indexes in the Remanufacturing Process: A GERT-Based Simulation Approach

## محل انتشار:

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## نویسندگان:

Elham Babaei - *M.Sc. Student of Industrial engineering, Isfahan university of Technology, Isfahan, Iran*

Abdollah Aghaie - *Faculty Member of Industrial engineering, K.N. Toosi University of Technology, Tehran, Iran*

Mojtaba Hajian-Heidary - *Ph.D Student of Industrial engineering, K.N. Toosi University of Technology, Tehran. Iran*

## خلاصه مقاله:

The common end-of-life options are reuse, remanufacture, recycle, landfill, and incineration. In this paper one of the important end of life options (remanufacturing) has been analyzed. Among the related studies surveyed the various remanufacturing aspects, less attention has been paid to the stochastic process routing. In this regard, a remanufacturing process routing with stochastic activities is modelled as a GERT network. One of the efficient ways to analyze a remanufacturing process is the identification of the most effective activities on the cost and time of the process during the process implementation. Criticality indexes are suitable scales for this purpose. Therefore, to analyze the important aspects of the remanufacturing process, four criticality indexes are developed in this paper. These indexes measure the cost and time of the process and its activities to identify the activities with high importance in terms of cost and time. On the other hand, simulation is an efficient tool to cope with the uncertainties in the production problems. Hence a Monte Carlo approach (which is developed using Arena software) has been adopted to analyze the GERT based model and to calculate the criticality indexes. In addition, a mathematical approach using Moment Generation Functions has been adopted to calculate the expected value of the criticality indexes. A numerical example (a real case of lathe spindle remanufacturing) has been solved using both proposed .approaches. The results show the acceptable performance of the proposed GERT based simulation approach

## کلمات کلیدی:

Monte-Carlo simulation; GERT problem; Remanufacturing processes; Criticality indexes