Reliability Analysis of Repair Time Data Using Semi-Parametric Measures

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Abstract

Downtime affects the production capability of physical assets by reducing output, increasing operating costs and interfering with customer service. Once a unit experiences a service downtime or downgrade, the covariates or risk factors can directly shows impact on the delay in repairing activities. This study reveals the risk factors that either delay or accelerate repair times, and it also demonstrates the extent of such delay, attributable to specific risk factors. The potential risk factors provide necessary inputs in order to improve operation performance. Once risk factors are detected, the maintenance planners and maintenance supervisors are aware of the starting and finishing points for each repairing job due to their prior knowledge about the potential barriers and facilitators. The study employs semi-parametric approaches in a different way using the proportional hazards model to examine the relationship between repair time and various risk factors of interest. The properties of the hazard function for the repair time problem are critically examined and the major findings are highlighted. This paper demonstrates on technicians underlying characteristics estimation using proportional hazards model. A case study has been performed from a data set collection of 1169 air conditioners maintenance records in 2001 from one of the universities in Malaysia. The sample consists of repair time data and background characteristics of the technicians. The estimation can be used as a