

The Role of Reliability Engineering in Improving Service Logistics

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Abstract

Service excellence is a powerful source of competencies of world-class firms. To manage the quality of service, decision makers must be aware of product reliability and customer behavior. In this talk, we will focus on the important role of reliability engineering in improving service logistics. As part of service provisioning, the demands for warranty and post-warranty repairs need to be accurately predicted prior to resource allocation. We study some important aspects, which are often overlooked in the literature but are of interest to manufacturers, in estimating both warranty and post-warranty repair demands. We consider that the product installed base varies with time due to both new sales and those units that have been taken out of service. When estimating warranty and post-warranty repair demands, we explicitly address the fact that customers may not always request repairs for failed units, and provide insights into some important quantities valuable for risk-related decision making. The proposed model is also extended by considering delayed warranty claims that are frequently seen in practice. In addition, we present an integrated model to estimate the gross profit for a new durable product considering both non-renewable free minimal-repair warranty and non-free post-warranty service.

Bio:



Dr. Haitao Liao is an Associate Professor in the Systems and Industrial Engineering Department at the University of Arizona (UofA). He is also the Director of Reliability & Intelligent Systems Engineering (RISE) Laboratory at UofA. He received a Ph.D. in Industrial and Systems Engineering from Rutgers University. His research interests include (1) reliability models, (2) maintenance and service logistics, (3) prognostics, (4) data analytics, and (5) probabilistic risk assessment. His research has been sponsored by the National Science Foundation, Department of Energy, Nuclear Regulatory Commission, Oak Ridge National Laboratory, and industry. He currently serves as Associate Editors of Journal of Quality Technology, Quality Technology and Quantitative Management, and Journal of Industrial and Production Engineering. He is a recipient of the National Science Foundation CAREER Award in 2010, the winner of the IIE 2010 & 2013 William A.J. Golomski Award, and the winner of 2015 Stan Ofsthun Award. He is the immediate past Chair of INFORMS Quality, Statistics and Reliability (QSR) Section, and the President of IIE Quality Control and Reliability Engineering (QCRE) Division.