Advances in Obsolescence Management Utilizing Reliability Theory

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Abstract: Obsolescence issues continue to grow for many major industries as the lifecycles of most electronic parts decrease in light of the consumer demands for the most updated technology. This talk focuses on forecasting obsolescence for a DoD application and describes a method to forecast the likelihood of lifecycle duration to support a proactive strategy to manage future obsolescence events--specifically when a part or object is no longer obtainable from the original supplier. This methodology will then be applied to a case study on an electronic part. We demonstrate the feasibility of forecasting the risk of a part going obsolete and the conditions where the method works well. The basis is the calculation of corresponding probabilities of obsolescence for each part in a system via relatability theory and Bayesian calculations. This approach is extended by examining the shortening of product life cycle curve which leads to the prediction of obsolescence. The research presents an innovation in system level obsolescence.

Bio: Dr. Christina Mastrangelo is an Associate Professor of Industrial Engineering at the University of Washington. Her primary research field is systems engineering, quality and risk engineering and empirical dynamic modeling applied to manufacturing, healthcare and decision making. She has published over 30 papers in the areas of empirical dynamic modeling, statistical process monitoring, healthcare and manufacturing. One of the papers received the Ellis R. Ott Award for significant contribution to the field of quality engineering. Her research interests include the areas of operational modeling and prediction for quality and manufacturing, system-level modeling for infectious disease transmission, lung-cancer screening centers and healthcare delivery operations, and hierarchical response modeling. Dr. Mastrangelo' s industrial research, sponsored by NSF and ONR, seeks to understand the effects of lower-level processes on system-level outputs. This is applied to obsolescence management, additive manufacturing, and food chain production. She is a member of ASA, ASEE, ASQ, INCOSE, INFORMS, and a senior member of IIE.