



## Acquisition of new technology information for maintenance and replacement policies

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Auteur Nguyen, Khanh TP [1], Yeung, Thomas [2], Castanier, Bruno [3]

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Mots-clés information acquisition [4], maintenance management [5], Markov decision rules [6], Markov modelling [7], replacement policies [8], technology management [9]

Résumé en anglais  
In this paper, we propose the first model that considers the option to acquire information on the profitability of a new technology that is not yet available on the market for asset maintenance and replacement decisions. We consider the uncertainty of future asset characteristics by incorporating information acquisition decisions into a non-stationary Markov decision process framework. Using this framework, we optimise asset maintenance and replacement decisions as well as the optimal timing of new technology adoption. Through mathematical analyses, the monotone properties and convexity of the value function and optimal policy are deduced. Deeper numerical analyses highlight the importance of considering the acquisition of information on future technology when formulating a maintenance and replacement policy for the asset. We also deduce a non-intuitive result: an increase in the arrival probability of new technology does not necessarily make the acquisition of additional information more attractive.

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