

A Systematic Analysis of Knowledge Development Trends in Industrial Maintenance Projects

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Abstract : Industrial assets are prone to degradation and eventual failures due to repetitive loads and harsh environments in which they operate. These failures often lead to costly downtimes, which may involve loss of critical assets and/or human lives. The rising pressures from stakeholders for optimized systems' outputs have further placed strains on business organizations. Traditional means of combating such failures are by adopting strategies capable of predicting, controlling, and/or reducing the likelihood of systems' failures. Turnarounds, shutdowns, and outages (TSOs) projects are popular maintenance management activities conducted over a certain period of time. However, despite the critical and significant cost implications of TSOs, the management of the interface of knowledge between academia and industry to our best knowledge has not been fully explored in comparison to other aspects of industrial operations. This is perhaps one of the reasons for the limited knowledge transfer between academia and industry, which has affected the outcomes of most TSOs. Prior to now, the study of knowledge development trends as a failure analysis tool in the management of TSOs projects have not gained the required level of attention. Hence, this review provides useful references and their implications for future studies in this field. This study aims to harmonize the existing research trends of TSOs through a systematic review of more than 3,000 research articles published over 7 decades (1940- till date) which were extracted using very specific research criteria and later streamlined using nominated inclusion and exclusion parameters. The information obtained from the analysis were then synthesized and coded into 8 parameters, thereby allowing for a transformation into actionable outputs. The study revealed a variety of information, but the most critical findings can be classified into 4 folds: (1) Empirical validation of available conceptual frameworks and models is still a far cry in practice, (2) traditional project management views for managing uncertainties are still dominant, (3) Inconsistent approaches towards the adoption and promotion of knowledge management systems which supports creation, transfer and application of knowledge within and outside the project organization and, (4) exploration of social practices in industrial maintenance project environments are under-represented within the existing body of knowledge. Thus, the intention of this study is to depict the usefulness of a framework which incorporates fact findings emanating from careful analysis and illustrations of evidence based results as a suitable approach which can tackle reoccurring failures in industrial maintenance projects.

Keywords : industrial maintenance, knowledge management, maintenance projects, systematic review, TSOs

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