

## Invited session: “Data-driven decision-making in smart maintenance”

4<sup>th</sup> IFAC Workshop on Advanced Maintenance Engineering, Services and Technologies, 10-11 September 2020, Cambridge, UK

### Session proposers:

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### Description and topics:

Over the last decade, manufacturing has been experiencing a relevant shift towards “digitalization”. The decrease of sensors costs, the reliability and availability of pervasive wireless connectivity, and the generation and collection of big amounts of data are determinant factors to change business processes and decision-making models. Given this trend, maintenance is amongst the business processes that will experience a major transition. The management approach will move towards data-driven decision-making, which drives the change at different levels of the maintenance service, from equipment and plant level to company and extra-company level. Changes will occur in a broad scope, inclusive of technological, organizational, and human aspects to finally create the most value from advanced maintenance decision-making. Therefore, various challenges and opportunities should be addressed in the coming years. Different types of data from a variety of sources (e.g.: design, engineering, operations, maintenance, quality, ...) will be valuable for data analysis. Information management and integration across different enterprise information systems (e.g.: MES, CMMS, EAM, APM, PLM, ...) will be essential to effectively habilitate holistic maintenance decisions contributing to value creation through the asset lifecycle management. Maintenance planning will be changing, relying on predictive and prescriptive analytics and, moreover, synchronizing with other processes in the plant management, thus leading to a potential for collaborative decision-making aimed at optimizing the performance of a manufacturing system. The role of human capital will be also fundamental as decision augmentation is a relevant option, in order to complement the human judgement with capabilities from machine learning. Eventually, new opportunities to reinforce the importance of value networks will grow both to enable machine learning at scale as well as organizational learning induced by strategic relationships between end-users and key suppliers. Novel business models such as Product-Service Systems will be relevant in this scope.

To discuss all aspects of digital transformation towards data-driven decision-making in smart maintenance, this invited session calls for high-quality contributions that investigate main research challenges, technology developments and advancements, case studies, and applications related to the following topics (but not limited to):

- Data-driven methods for maintenance, repair, diagnostics and prognostics.
- Data-driven and joint decision-making in production and maintenance planning.
- Ontologies and data models for information management and integration in advanced maintenance systems.
- Role of information systems for smart maintenance and lifecycle management of industrial assets.
- Role of the maintenance operator in a data-driven maintenance management approach.
- Value networks in advanced maintenance systems.
- New business models for smart maintenance services.

Contributions consisting either of empirical studies, collaborative projects and action researches in an industrial context are particularly welcome.

**INVITED SESSION CODE: - gde1n**

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<https://ifac.papercept.net/conferences/scripts/start.pl>

**IMPORTANT DATES:**

**31<sup>st</sup> Jan 2020:** Paper submission  
**15<sup>th</sup> Mar 2020:** Author notification  
**10<sup>th</sup> May 2020:** Final paper submission  
**09<sup>th</sup> Jun 2020:** Early bird registration  
**10<sup>th</sup>-11<sup>th</sup> Sept 2020:** Workshop