

# Preface

Since the publication of the first book, “Through-life Engineering Services: Motivation, Theory and Practice” much has happened in the world relative to the service and support provision for complex engineering products. Continuing applied research in this area is being undertaken by a number of centres in the UK, Europe and the USA which seeks to develop innovative solutions and promote the exchange of ideas within a rapidly growing community of researchers, academics and industrial practitioners. This has seen progress being increasingly disseminated at the annual Through-life Engineering Services Conference (TESConf) which is hosted by Cranfield University in the UK. In alignment to the increasing international interest of the TES concept and scope TESConf 2017 will leave Cranfield and begin an international journey. As the conference starts it is international journey it will initially be hosted by the Bremen Institute for Mechanical Engineering at the University of Bremen in Germany.

The Through-life Engineering Services Centre at Cranfield University together with its co-collaborating research partners at Durham University (UK) have provided research focus and direction supported by funding from the Engineering and Physical Sciences Research Council and key industrial partners but is now moving to an industrial funding programme. This has demonstrated ongoing strong commitment from its key industrial supporters Rolls-Royce, BAE Systems, Babcock International, the UK Ministry of Defence and Bombardier Transportation. Through-life Engineering Services have also enjoyed support from the British Standards Institute who are now gathering momentum from industry for the development of a framework standard for through-life engineering services.

The most significant recent development has been the development and launch of a UK national strategy in Through-life Engineering Services. This is being led by an industrial and academic steering committee co-chaired by Rolls-Royce and the High Value Manufacturing Catapult. This initiative has captured the minds of a large number of key senior industrialists and is seen as a key milestone by academics and practitioners.

This book contains a compendium of contributions from leading international academics, researchers and practitioners who are continuing to develop Through-life

Engineering Services so as to provide aligned technical and business solutions for organisations seeking to compete through the adoption of ever-increasing service provision in support of their manufactured products. This publication builds upon the work presented in the first book and the accompanying body of literature. In Part I the chapters present the journey undertaken to realise the UK National Strategy for Through-life Engineering Services. They present the outputs from a series of workshops that were synthesised to create the final strategy document. Part II presents contributions relative to TES and the design function. In this section the relationship between warranty supporting the installed product base, and knowledge management are introduced. This is supported by the presentation of service support considerations undertaken when designing a civil aerospace gas turbine.

Part III goes on to discuss the role of data, diagnostics and prognostics within system design engineering for through-life engineering services and supporting complex systems which include both autonomy and design of contracts. The following section offers contributions from academia and industry dealing with how real systems and their components degrade. It looks at novel techniques for assessing such degradation and damage to help inform the replace or repair decision. Section V discusses further the importance of system design and presents a novel solution employing modelling techniques within the UK Rail Sector.

Building upon contributions within the previous book, Part VI presents contributions which address the important subjects of Cost Modelling, Planned Obsolescence and Contract Considerations. The final section of this work (Part VII) offers contributions which further address the importance of autonomous maintenance, self-healing and other emerging product support techniques.

There is no doubt that this field will continue to grow as we manufacture systems and products which are ever more complex and interconnected. The influence of this connectivity is already becoming relevant and as contracting mechanisms change and mature not only is the ownership of the product becoming less certain but also the ownership of the performance data it is producing in operation. We, the editors, look forward to many more years of interesting challenges in this new and exciting field.

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