

LEAN SIX SIGMA IN HIGHER EDUCATION INSTITUTIONS

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The Need to Change

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INVESTOR IN PEOPLE

To Gillian, Alex, Misty, Esme, Jeremy and LJ – thank you, Stephen
To my family, Frenie Antony and Evelyn Antony – love, Jiju

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ABOUT THE AUTHORS

Dr Stephen G. Anthony is one of the leading voices in the UK when it comes to deploying Lean Six Sigma outside of the manufacturing sector. Stephen has trained over 5,000 Lean Six Sigma professionals across the world from a variety of sectors including healthcare, finance, governmental agencies, academia and manufacturing. Stephen holds a leadership diploma from Harvard Business School, MBA, Master of Engineering and has been a Master Black Belt for over 15 years. Stephen is currently the Director and Fellow of the Institute of Six Sigma Professionals and has published a variety of articles in leading Lean Six Sigma journals covering leadership and deployment strategies. Stephen is often invited to present his ideas at world-renowned conferences and has run his own Lean Six Sigma consultancy business for over 20 years.

Dr Jiju Antony is recognised worldwide as a leader in Lean Six Sigma methodology for achieving and sustaining process excellence. He is currently serving as a Professor of Industrial and Systems Engineering at Khalifa University in Abu Dhabi, UAE. He is a Fellow of the Royal Statistical Society (UK), Fellow of the Chartered Quality Institute (CQI), Fellow of the Institute of Operations Management (FIOM), Fellow of the American Society for Quality (ASQ), Fellow of the Higher Education Academy, Fellow of the International Lean Six Sigma Institute, Fellow of the Institute of the Six Sigma Professionals (ISSP) and an Academician of the International Academy of Quality (IAQ). He is a Certified Lean Six Sigma Master Black Belt and has trained over 1,200 people as Lean Six Sigma Yellow, Green and Black Belts from over 20 countries representing over 170 organisations in the last 10 years. Professor Antony has coached and mentored several Lean Six Sigma projects from various companies in the UK ranging from manufacturing, service to public sector organisations including the NHS, City Councils, NHS 24, Police Scotland, ACCESS, Business Stream and a number of Universities. Professor Antony has authored over 500 journal, conference and white papers and 12 text books. He has won the outstanding contribution to Quality Management Practice Award in 2019 from the Chartered Quality Institute

(UK); Life time Achievement Award for his contribution to Lean Six Sigma from the International Lean Six Sigma Institute (UK) in 2020 and Outstanding Contribution to Six Sigma Practice award from the Institute of Six Sigma Professionals, UK, in 2021. His book on *The Ten Commandments of Lean Six Sigma: A Guide for Practioners* has won Walter Mazing Book Price in 2021 (International Academy of Quality, USA) and Crosby Medal (American Society of Quality, USA) in 2022.

PREFACE

This book started with a conversation 10 years ago between the authors at a conference dedicated to Lean Six Sigma in higher educational institutions. In those days little research existed and most improvement leaders in higher education worked alone or in small local teams using what little knowledge they had to make it work. The authors knew that if it was possible to transfer the benefits of Lean Six Sigma into the world of academia, then huge potential benefits could be achieved. The key was always going to be to create a vision of how Lean Six Sigma could be successfully deployed beyond simple administrative processes in an academic environment. The start of a research question formed.

Over the next few years Stephen Anthony, under the mentorship of Professor Jiju Antony, decided to research how academic leadership was impacting the current deployment of Lean Six Sigma and the current state of Lean Six Sigma in higher educational institutions. 8 years later, Stephen successfully defended his PhD based on a Leadership Maturity Model for higher educational institutions wishing to deploy Lean Six Sigma as a force for change. In addition Stephen, under Jiju's guidance, was able to publish several articles in leading journals, including defining academic leadership, benchmarking the deployment of Lean Six Sigma in the UK, using Taguchi techniques to complete a systematic literature review, and building and testing a maturity model for deploying Lean Six Sigma in higher educational institutions.

This book is an abridged version of the PhD thesis and will take the reader on a journey from the creation of universities through the global challenges faced by these institutions today and onto a framework to help them deploy change.

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Over the years of this work the authors have had incredible conversations with academic and Lean Six Sigma professionals relating to how Lean Six Sigma can address the challenges faced by academic institutions. In addition, Stephen Anthony's PhD spanned two universities, 8 years, 6 international conferences and numerous frustrating conversations with his mentor. To create a list is always fraught with danger since many contributors will be missed; however, the authors do need to thank their families, The University of Strathclyde, Herriot Watt University and Emerald Publishing for their support in making first the PhD and then this book happen.

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INTRODUCTION

Lean Six Sigma (LSS) is an Operational Excellence methodology that aims to reduce the costs of poor quality, improve the bottom-line results and create value for both customers and shareholders. LSS has been deployed in organisations in a variety of sectors and cultures for more than two decades. However, its implementation in academic institutions around the world has only just begun to emerge. Furthermore, there is a lack of any empirical evidence to support any successful deployment of LSS in higher educational institutions when addressing the key challenges faced by these institutions today. Therefore, the purpose of this book is to investigate the current status of LSS in academic institutions and present a leadership maturity model to help academic leaders implement LSS in their own academic institutions.

This book is made up of several key pieces of research, including in Chapter 1 a review of academic challenges faced by institution leaders, concluding with the authors' definition of academic leadership. In Chapter 2 the authors present the history of Lean, Six Sigma and the blended approach – Lean Six Sigma. In Chapter 3 the authors present a systematic literature review of papers in the field of LSS and academic leadership published in peer-reviewed and other topic specialist journals, from 2000 to 2020. Chapter 4 is dedicated to a survey looking into the current status of Operational Excellence (OPEX) methodologies in the Higher Education sector. Chapter 5 presents the five characteristics of maturity models needed to develop maturity models used by LSS leaders when deploying change. Chapter 6 follows on from the survey earlier in the book to include a number of semi-structured interviews which provide greater insights into the use of OPEX methodologies adopted by the university sector. Based on the literature review and the findings of the empirical research Chapter 6 concludes with a Lean Six Sigma Maturity Model for higher educational institutions which was developed and tested on a mix of UK and International higher educational institutions, along with a sample of Master Black Belts from the industry. The final chapter summarises the challenges and opportunities for academic leaders as they deliver change within their institutions.