

# Preface

Engineering plays a central role in economies and industries. Its influence goes far beyond the recognisable sectors such as automotive and aerospace. Engineering expertise underpins industries as diverse as food and entertainment, retail and pharmaceuticals. But the ‘invisibility’ of much engineering activity may lead to its significance being underestimated. At a time when new technologies and global economic structures are changing so rapidly this book sets out to explore the role and evolution of engineering in different contexts.

The focus of the book is on those engineering activities which create substantial value. It highlights those activities that are essentially innovative and lead to growth of businesses and improvements in living standards rather than those which simply maintain the status quo—important as that remains. The term High Value Engineering has been coined to characterise these activities though it is recognised that this is an evolving definition and indeed activity.

The book reflects an extended collaboration between leading scholars across Europe and China and draws upon leading research programmes while remaining firmly grounded in engineering practice.

The early chapters explore new approaches to the representation of engineering which it is hoped will provide new insights into the way modern engineering is performed. The recognition of an engineering value chain and the highly networked nature of engineering activities around the world are thought to be particularly important in recognising and managing the role of engineering within companies and indeed nations.

Subsequent chapters address the characteristics of different aspects of modern engineering from design to services. Concepts of value chains and value creation are explored in greater detail demonstrating engineering in its broader business and commercial context. The opportunities and challenges presented by rapid developments in ICT are considered as well as the implications for skills and training. Increasingly important issues surrounding sustainability are tackled recognising again the critical role of engineering in moving towards the environmentally sustainable production and use of goods and services.

The book concludes with a chapter on policymaking with respect to engineering and technology. The complex skills and expertise associated with High Value Engineering represent a precious asset not just for companies but for society more generally. It is essential that these resources are deployed sensibly and knowingly with an understanding their potential and limitations.

The authors earnestly hope that this book will provide new insights into the nature and role of modern engineering, informing industrialists and policymakers and perhaps most importantly enthusing younger scientists, technologists and engineers with excitement for the rapidly developing field of High Value Engineering.

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