Asset Management

Asset Management

Transforming asset dependent businesses

Second edition

Chris Lloyd and Michael Corcoran

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Foreword

When the first edition of this book was published in 2010, the world of Asset Management was very different. ISO 55 000 was five years away, the current proliferation of software tools and good practice guidance had barely started, organisations embracing asset management thinking and practices were seen as early adopters, and the asset management profession was organised nationally rather than as the global community of practice it is today.

The speed at which Asset Management has moved from the fringe to the mainstream of business practice is not so surprising. Globally, in the last ten years, the surge in demand for transport infrastructure, utility services and housing has been history making. Whether they realise it or not, Asset Management is now a core competence for any business whose success depends on physical assets being available in the right condition at the right price.

Whereas the first edition of this book was about the potential of Asset Management to transform the way asset-dependent businesses are run, this new edition celebrates its achievements and points to its future role in handling the impacts of urbanisation and climate change and in developing the next generation of Asset Management professionals. The principles and information set out in the first edition still apply, but there is more emphasis now on the techniques needed to rise to these challenges. From my perspective, where Asset Management can and should make the biggest difference is by ensuring more responsible, far-sighted use of natural capital principles to preserve natural resources, and by educating policymakers in the realities of delivering reliable infrastructure for essential services. So it pleases me to see the greater emphasis given to combatting climate change in this second edition.

Asset Management professionals are becoming more diverse and demanding, bringing with them a wider

range of education and experience, career expectations and learning needs. This book is an invaluable source of reference that will be of value to students, people new to Asset Management roles and experienced Asset Management professionals.

Chris Newsome OBE
President, the Institute of Asset Management

Preface

Producing the second edition of this book has not been the walk in the park I thought it would be when the publishers asked me if I would like to do it. For a start, Asset Management and its context have moved on in many ways, so some of the old content needed to make room for some new content that better reflects where it has got to. The emphasis is less theoretical now, more marked by experiences of trying to get executive attention for Asset Management and deliver its promises. The book is also full of warnings – that Asset Management is still in danger of being mistaken for a branch of engineering and that it needs to step up its game if industry is to mitigate or adapt to climate change, to name but two of them.

It took a good while to get all the chapters into a coherent piece because our contributors are busy people, but it was worth the wait and I would like to thank them for articulating and sharing their thoughts and experiences so freely.

This time around, I decided to share the task of putting the book together with my colleague Michael Corcoran, Associate Director of CAS, the London-based company I founded in 1997, which I now chair. Michael has a distinctive take on how Asset Management can be popularised, how it should be taught and where the profession is headed. His opinions may have been shaped by his work with me on the development of the Institute of Asset Management's Professional Development Framework and for various CAS corporate clients, but they are sharpened by his passion for and achievements in engaging people with science and the arts. For this reason, what started as my cunning plan to cut the workload involved in producing this book quickly became an engrossing collaboration and I thank Michael for that.

My thanks also to Chen Chen, Managing Director of CAS, for her encouragement and, yet again, to Carol.

Chris Lloyd

About the contributors

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Michael Corcoran is a consultant and curator, specialising in the design of creative solutions to education, communication and engagement challenges. He is Associate Director at Competence Assurance Solutions Ltd (CAS) and Head of Professional Development for Arete, was Project Manager for the Institute of Asset Management's 2016–2017 Task Force on Professional Development and Qualifications and works with numerous educational and creative organisations in the UK. He has published several papers internationally on themes relating to interdisciplinary and entrepreneurial education. A passionate advocate for public engagement with the arts and sciences, he regularly curates and hosts exhibitions, festivals and events in his native Wales. He holds a degree in physics and philosophy from Durham University, and is an Associate Fellow of the Higher Education Academy.

Richard Edwards

Richard Edwards MA, MIET, FIAM is a Chartered Engineer who provides strategic advice to a range of global infrastructure owners and regulators on the application and benefits of Asset Management and other business-related issues. After graduating from Oxford University, he worked in the rail industry for 15 years before moving into strategic asset management consultancy. He has been a director of Asset Management Consulting Ltd (AMCL) for 20 years and is currently the Global Technical Director and the technical authority for the development of products and services within AMCL. Richard is the immediate Past President of the Institute of Asset Management (IAM) and continues as a board member and life fellow. He represents the IAM at the Global Forum on Maintenance and Asset Management.

Charles Johnson

Dr Charles Johnson is an Associate Fellow of the British Psychological Society and a Chartered

Occupational Psychologist. Over the last 30 years, he has supplied psychological and human factors expertise to the health industry, financial sector, construction and engineering sectors, chemical and pharmacological industry, military, security and emergency services, transport sectors and various government departments. His work has involved him in organisational development and change management, culture change, crisis management and disaster recovery, competence management, market research, assessment and selection, psychological testing, career counselling, job design and ergonomics. Charles is Managing Director of Johnson Doughty Ltd, Technical Director of CAS and Director of Psychological Services for Cambridge Occupational Analysts Ltd. From 2000 to 2004 he was Chair of the British Psychological Society's Steering Group on Test Standards and remains a member of its test review panel.

Chris Lloyd

Chris Lloyd MA is Chairman of CAS, which helps clients improve the quality and impact of compulsory training and licensing programmes. He also chairs Arete, which delivers educational, training and career opportunities to Chinese graduates, and East Fortune Lifestyles, which develops unique collaborations between contemporary UK artists and brands in China. He is a co-founder and past director of AMCL, Asset Management Academy and Vertex Systems Engineering. His books on Asset Management are key references for students and professionals and he has written many articles on safety, culture and workforce development. A Member of the Institute of Asset Management, in 2006–2014 he led the development of its Competences Framework and Professional Qualifications and in 2016–2017 he headed its Task Force on Professional Development and Qualifications. Chris is volunteer Chairman of Vic Studios – an award-winning, non-profit music service for young people based in Wrexham, North Wales.

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Martin Pilling

Martin Pilling BEng, CEng, MIET, FIAM is a Chartered Engineer with outstanding experience of Asset Management in the utilities, transportation and infrastructure sectors across Europe, the Middle East, Australasia and North America. He is a founding director of AMCL, where his pragmatic approach has been honed through helping organisations in their journey towards Excellence in Asset Management. He has successfully led multidisciplinary teams in the delivery of complex projects to demanding timescales, including the implementation of integrated Asset Management Systems aligned with ISO 55 001 within both highly regulated and commercial environments.

Ralph Rayner

Professor Ralph Rayner is a Professorial Research Fellow in the Centre for the Analysis of Time Series at the London School of Economics and Political

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Michael A Salvato

Michael A Salvato is Vice President of Advisory Services at Mott MacDonald, a global engineering, management and development consultancy. He works with infrastructure owners and operators to unlock the asset value, efficiencies and sustainability required to meet the rising expectations of customers, governments, industry and society. He has pioneered the application of digital technologies to Asset Management, urban infrastructure and smart cities and is a thought leader in Urban Systems and Informatics. In 2018, he retired as Director and Programme Executive for Enterprise Information and Asset Management at the New York State Metropolitan Transportation Authority, where he led a transformational programme to improve the safety, reliability, life cycle costs and resiliency of the New York transportation system, which has US \$1 trillion of infrastructure and assets. He was founding Chair and Country Vice President of the Institute of Asset Management in the USA and on the US delegation that worked on ISO 55 000. He is on the board of Smart City New York, Research Professor of Urban Infrastructure Systems at New York University Tandon School of Engineering, where he helped set up the Center for Urban Science and Progress, and an adviser to Blueprint 2025, a National Infrastructure Plan.

The question driving his work in architecture, engineering, construction, programme management, economic development, information technology and public policy over the last 35 years is how innovation can be applied to create a more sustainable built environment.

Kimberlee Williams

Kimberlee Williams is President of the Center for Strategy Realization, which provides advisory services, capability building programmes, assessments and a proven approach that equips business leaders to fully realise the results of their highest-value initiatives. Her professional domain is business transformation, where the entire organisation must be mobilised to realise the benefits of a number of concurrent megaprojects. Prior to founding the company, she served as Head of Global Change Execution at Merck & Co. during the most transformational period in the company's history. She has also held senior organisation and operational effectiveness roles in firms, where she served Fortune 100 companies across 18 industries on projects that spanned every aspect of the enterprise value chain. She holds a BA in industrial and organisational psychology, an MA in social relations and research methods, and is a certified Master Change Agent and Lean Sigma Black Belt. She resides on the beautiful Hudson River waterfront in Jersey City, New Jersey, USA.

Anthony Vaughan

Dr Anthony Vaughan is Senior Vice President of Infrastructure for Brookfield Asset Management, a leading global alternative asset manager and one of the largest private sector infrastructure investors in the world. Brookfield owns and operates utilities, transport, energy, data infrastructure and sustainable resources assets – delivering essential goods and services across toll roads, rail networks, ports and pipelines. Dr Vaughan provides technical due diligence and operational asset management leadership for the company, and holds a number of board positions. Prior to Brookfield, Dr Vaughan

worked in senior engineering Asset Management roles in energy infrastructure, and operational roles in open-cut and underground mining. Dr Vaughan holds a BEng (Mech), a master's degree in maintenance management and a PhD, for which he investigated the leadership skills required by executives to manage infrastructure assets. He is a Certified Professional Engineer with the Institute of Engineers, Australia, and a member of the Institute of Asset Management (UK), the Asset Management Council (Australia) and the Australian Institute of Company Directors.

Abbreviations

ALARP	as low as reasonably practical
AMCF	Asset Management Competence Framework
AMCL	Asset Management Consulting Ltd
AMEM	Asset Management Excellence Model
AMP	Asset Management Plan
ARM	Asset Risk Management
ASSE	American Society of Safety Engineers
BIM	building information modelling
BSI	British Standards Institute
capex	capital expenditure
CAS	Competence Assurance Solutions
CMMS	computerised maintenance management systems
EAM	enterprise asset management
EAMS	enterprise asset management system
EPSRC	Engineering and Physical Sciences Research Council
ESE	Enterprise Systems Engineering
ET	engineering technologies
FTA	Federal Transit Administration
GFMAM	Global Forum on Maintenance and Asset Management
HKM	Hitchins-Kasser-Massie
HSE	Health and Safety Executive
IAM	Institute of Asset Management
ICE	Institution of Civil Engineers
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers
IoT	Internet of Things
IPCC	Intergovernmental Panel on Climate Change
ISO	International Organization for Standardization
IT	information technologies

ITU	International Telecommunication Union
LIDAR	light detection and ranging
MAP-21	Moving Ahead for Progress in the 21st Century Act
MRM	Maintenance Resource Management
NIST	National Institute of Standards and Technology
Ofgem	Office of Gas and Electricity Markets
OHS	occupational health and safety
OIR	organisational information requirements
opex	operational expenditure
ORR	Office of Rail Regulation
OT	operational technologies
PDKM	product data and knowledge management
PFI	private finance initiative
PMO	project management office
PPP	public-private partnership
PSS	product-service systems
RCM	reliability centred maintenance
RCP	representative concentration pathway
RISE	Research and Innovation Staff Exchange
ROI	return on investment
SAMP	Strategic Asset Management Plan
SBP	strategic business plan
SE	systems engineering
SH&E	safety, health and environmental
SICT	sensing, information and communication technologies
TOGAF	The Open Group Architectural Forum
UKCIP	UK Climate Projections