

Business Information Systems and Technology

A primer

**Brian Lehaney, Phil Lovett and
Mahmood Shah**



Routledge Series in Information Systems

Business Information Systems and Technology



30807600

A primer

Brian Lehaney, Phil Lovett and
Mahmood Shah



First published 2011
by Routledge
2 Park Square, Milton Park, Abingdon, Oxon OX14 4RN

Simultaneously published in the USA and Canada
by Routledge
711 Third Avenue, New York, NY 10017

Routledge is an imprint of the Taylor & Francis Group, an informa business

© 2011 Brian Lehaney, Phil Lovett and Mahmood Shah

The rights of Brian Lehaney, Phil Lovett and Mahmood Shah to be identified as the authors of this work has been asserted by them in accordance with sections 77 and 78 of the Copyright, Designs and Patents Act 1988.

All rights reserved. No part of this book may be reprinted or reproduced or utilized in any form or by any electronic, mechanical, or other means, now known or hereafter invented, including photocopying and recording, or in any information storage or retrieval system, without permission in writing from the publishers.

Trademark notice: Product or corporate names may be trademarks or registered trademarks, and are used only for identification and explanation without intent to infringe.

British Library Cataloguing in Publication Data

A catalogue record for this book is available from the British Library

Library of Congress Cataloging in Publication Data

Lehaney, Brian, 1953–

Business information systems and technology: a primer / Brian Lehaney, Phil Lovett and Mahmood Shah.

p. cm. – (Routledge series in information systems)

Includes bibliographical references and index.

1. Management information systems. 2. Information technology–Management.

I. Lovett, Phil. II. Shah, Mahmood, 1971– III. Title.

HD30.213.L44 2011

658.4'038011–dc22

2010043773

ISBN: 978-0-415-55918-8 (hbk)

ISBN: 978-0-415-55919-5 (pbk)

ISBN: 978-0-203-81846-6 (ebk)

Typeset in Garamond

by Wearset Ltd, Boldon, Tyne and Wear

Business Information Systems and Technology

30807600

Business information systems and business information technology are integral aspects of modern business, and managers in these areas are now expected to have knowledge of human and managerial issues, as well as technical ones.

This concise and readable book is a level-by-level primer that addresses the core subjects in business information systems and business information technology to enhance students' understanding of the key areas. Each chapter begins with a case study and features at the end: a summary of major points, a glossary of terms, suggested further reading and student activities. Some areas covered include:

- Different functional areas of business, including accounting, HRM and marketing
- Development and implementation of information systems
- Methods to support the analysis and design of policy and practice
- Strategic management to align information technology with organizational needs.

Covering the subject matter in a highly accessible manner, this is an ideal text for both undergraduate and masters students on business information systems, business information technology and business information management courses.

Brian Lehaney is Director of Postgraduate Research at the University of Wollongong in Dubai. He has many years of experience in managing and teaching in higher education, as well as in applied research. He focuses on operational and strategic organizational process improvement, especially in regard to knowledge management theory and practice. He is the author of numerous books and journal papers.

Phil Lovett is Senior Lecturer in Information Systems at Coventry University. He has extensive teaching experience with a specialization in database management. His research centres on information modelling, knowledge elicitation and knowledge-based engineering.

Mahmood Shah is Regional Director of the Institute of International Business (IIB) and a Senior Lecturer at the Lancashire Business School. His research interests include mobile government, identity theft prevention methods and technology alignment. He has published papers in several high-quality journals, including the *European Journal of Information Systems*.

Routledge series in information systems

Edited by Steve Clarke

Hull University Business School, UK

M. Adam Mahmood

University of Texas at El Paso, USA

and

Morten Thanning Vendelø

Copenhagen Business School, Denmark

The overall aim of the series is to provide a range of textbooks for advanced undergraduate and postgraduate study and to satisfy the advanced undergraduate and postgraduate markets, with a focus on key areas of those curricula.

The key to success lies in delivering the correct balance between organizational, managerial, technological, theoretical and practical aspects. In particular, the interaction between, and interdependence of, these often different perspectives is an important theme. All texts demonstrate a 'theory into practice' perspective, whereby the relevant theory is discussed only in so far as it contributes to the applied nature of the domain. The objective here is to offer a balanced approach to theory and practice.

Information Systems is a rapidly developing and changing domain, and any book series needs to reflect current developments. It is also a global domain, and a specific aim of this series, as reflected in the international composition of the editorial team, is to reflect its global nature. The purpose is to combine state-of-the-art topics with global perspectives.

Information Systems Strategic Management

An integrated approach, 2nd edition

Steve Clarke

Managing Information and Knowledge in Organizations

A literacy approach

Alistair Mutch

Knowledge Management Primer

Rajeev K. Bali, Nilmini Wickramasinghe and Brian Lehaney

Healthcare Knowledge Management Primer

Nilmini Wickramasinghe, Rajeev K. Bali, Brian Lehaney, Jonathan L. Schaffer and M. Chris Gibbons

Systems Practice in the Information Society

José-Rodrigo Córdoba-Pachón

Business Information Systems and Technology

A primer

Brian Lehaney, Phil Lovett and Mahmood Shah

To our families, friends and loved ones.

Preface

Practical men, who believe themselves to be quite exempt from any intellectual influences, are usually the slaves of some defunct economist.

(John Maynard Keynes¹)

Why read this book?

Starting a degree in business information systems (BIS) or business information technology (BIT) or starting an MBA can be a daunting task. What should you study first? What is most important? How can you grasp the basics of subjects quickly? And so on. This book is not intended as a substitute for reading prescribed module material or for reading around subjects. It has not been written as a 'five week MBA' type of text. It does, however, cover the most common subjects in the domain that are covered in undergraduate and postgraduate study programmes. It covers the subject matter in a highly accessible style. Each chapter commences with a case study, followed by the main text. At the end of each chapter a summary of the major points, a glossary, references, further reading and suggested activities are provided. If you use this material wisely, participation, practice, preparation, reflection and sheer hard work are the key components of your success.

BIS and BIT are integral aspects of modern organizations, and managers in these areas are now expected to have knowledge of human and managerial issues, as well as technical ones. This concise and readable book is a level-by-level primer that addresses the core subjects in BIS and BIT to enhance students' understanding of the core material. Some of the areas covered include:

- models for the development and implementation of information systems;
- approaches in accounting, e-commerce and human resource management;
- methods to support the analysis and design of policy and practice; and
- strategic management to align information technology with organizational needs.

Reasons for this book

BIS are at the heart of every successful organization in today's world. There is still confusion about what BIS do and how they may be used to best effect. There have been many notable failures in information systems and some of these are discussed in the case studies. Most failures have tended not to be due to technology, but more to do with process. Without understanding related issues, good technology may be misunderstood and mishandled by managers and can lead to poor outcomes.

There is no other single book that covers the full range of undergraduate and postgraduate material in this area. Programmes of study tend to treat each subject as separate, with no taught integration. Students are supposed to take all these individual subject areas and somehow integrate them by doing an independent piece of work (the dissertation or project). Typically, they have no prior experience of anything like it, and there is a risk of poor performance in a module that may be worth as much as half of their final year's marks.

The penultimate chapter discusses how to do a dissertation or project, what your markers will expect and how to undertake relevant research that links academic concepts with applied contexts. The case studies in this text show how many different concepts, methodologies, principles, theories and techniques are needed when addressing real-world issues. Being a great technician is not enough. Being good at business is not enough. Most businesses today could not compete without appropriate technology, and might not survive without it. A business run by people who do not understand their information systems will be blown out of the water by a business run by people who do.

The motivation for this book was to produce a primer that introduces the multifarious nature of BIS and BIT for undergraduate and postgraduate students. There are numerous texts that deal with information systems or information technology, but they tend to be geared towards practitioners, either at a very low or very high level. They are normally very specific, so they might be suitable for a single information system or information technology module, but they do not cover the business side of the material. In addition, many texts are simply out of the price range of most students.

This book deals with the essence of BIS and BIT, and covers the material in a simple and easy to understand manner. The authors' extensive experience in both the academic and business worlds has resulted in the presentation of concepts that are academically grounded and credible while remaining vocationally relevant and applicable. By considering carefully the content of every BIS and BIT programme run in the United Kingdom, and combining that with substantial knowledge of MBAs, the content of this book has been devised to provide the vital core material that students in the domain will need.

Who should use this book?

The book is targeted at students new to BIS and BIT. The domain comprises a mix of disciplines such as information system development, project management, organizational behaviour and systems analysis. A good understanding of the core elements of the areas covered in this book is essential for anyone wishing to do well in any related study. The main intended audiences are undergraduate BIS/BIT and MBA students, but new practitioners may also find it helpful, especially if they come from a technical background but lack related business knowledge.

The book would be very helpful to students studying business administration, business studies or management. It would be equally valuable for anyone undertaking a national vocational qualification, diploma in management studies or other masters courses where business and information management form important parts of the study. Managers and practitioners may find they benefit from revision and may learn that the domain has developed since they last studied.

Structure and distinctive features of the book

The layout followed is along the lines found in most texts in the Routledge Information Systems series. The book aims to provide a basis for courses of study appropriate to its target audience.

- The chapters may be used sequentially as subject primers, ranging from initial degree level to MBA.
- As each chapter is 'standalone', chapters may be read in any order to suit the reader. Clearly, a chapter such as 'E-Commerce 3' builds on previous chapters, but a reader with basic knowledge may wish to skip these.
- Each chapter begins with a case study.
- Intended learning outcomes are given at the outset of each chapter.
- Each chapter concludes with a summary that states clearly the main points that have been covered.
- Each chapter has a glossary of terms.
- Further reading is suggested at the end of each chapter.
- Suggested activities are given at the end of each chapter.
- Suggested answers are available to lecturers.

Note

- 1 John Maynard Keynes, *The General Theory of Employment, Interest and Money*, reprinted 2007, Basingstoke: Palgrave Macmillan; main text originally published 1936, London: Macmillan, reproduced with permission of Palgrave Macmillan.

Acknowledgements

The authors thank Professor Steve Clarke (Series Editor) for encouraging and supporting this development from the beginning. We are especially grateful to Terry Clague (Senior Commissioning Editor) and Alexander Krause (Editorial Assistant) at Routledge for their enthusiasm and help in getting the book to publication.

We thank Deborah Matthews for contributing to discussions on the concept of the book and for drafting Chapter 4. We also thank Nick Wright for the material that formed the basis of Case 8.

We thank Dr Thomas Jackson for writing an extremely interesting and positive Foreword.

We thank Peter Donaldson for his constructive comments and proofreading.

We acknowledge our respective employers for allowing us time to work on this project, as well as colleagues, family, friends and partners for their conversation, feedback and patience.

Foreword

In a truly integrated organization the distinction between business processes and information technology systems should be almost indiscernible. Information technology is one of the most diverse and hybrid disciplines, and one that affects each one of us in our everyday life. As the digital information revolution progresses, so the role of the business IT professional continually changes.

This calls for a new skill set, including knowledge about information systems, project management, strategy and information systems, database management, accounting and finance, management and organizations, and a broader range of business issues. The business IT professional needs to be technology- and business-specialized at the same time. For example, how are organizations to innovate if the technologists do not explain the potential benefits to their non-technical colleagues in terms they can understand and act upon? Information management professionals must embrace the business application, be prepared to stand on the bridge between disciplines and get involved in the strategic business decisions. Much of innovation, on which businesses increasingly rely for success and survival, comes from the intermediate spaces between departments and disciplines.

Gaining this knowledge can take time. I can clearly remember my first few weeks as an undergraduate at university, excited at the thought of learning new topics, but also filled with trepidation, wondering if I would be able to cope with the complexities of the new topics I would have to learn to gain my degree. Back then textbooks contained lots of theories but failed to provide case studies to help the reader understand how they could be applied and their value to organizations. Only in recent years has a new breed of author started to emerge and write books that contain both academic theory and its relevance to the world.

The business information systems domain can be complex and difficult to navigate, but this book provides much-needed guidance for both undergraduate and postgraduate students. Covering the core topics and how to gain the maximum from your studies, you will be well equipped for your exciting business information systems journey.

Thomas William Jackson, BSc (Hons), PhD

Contents

<i>List of case studies</i>	xii
<i>List of figures</i>	xiii
<i>List of tables</i>	xv
<i>Preface</i>	xvi
<i>Acknowledgements</i>	xix
<i>Foreword</i>	xx
1 Introduction	1
1.1 <i>Intended learning outcomes</i>	2
1.2 <i>Don't panic!</i>	3
1.3 <i>Chapters</i>	3
1.4 <i>Your study</i>	4
1.5 <i>Summary</i>	9
2 Management and organizations	11
2.1 <i>Intended learning outcomes</i>	12
2.2 <i>What do managers do?</i>	12
2.3 <i>Management decisions</i>	14
2.4 <i>Organizational functions and structures</i>	15
2.5 <i>Summary</i>	20
3 Introduction to information systems	23
3.1 <i>Intended learning outcomes</i>	24
3.2 <i>Introduction</i>	24
3.3 <i>Business information technology and business information systems</i>	27
3.4 <i>Types of information system</i>	27
3.5 <i>Procurement or development?</i>	28
3.6 <i>Information system development</i>	28
3.7 <i>Summary</i>	34
4 Applied information technology	36
4.1 <i>Intended learning outcomes</i>	37
4.2 <i>Introduction</i>	37

4.3	<i>Hardware</i>	37	
4.4	<i>Software</i>	40	
4.5	<i>Summary</i>	50	
5	E-commerce	1	53
5.1	<i>Intended learning outcomes</i>	54	
5.2	<i>Introduction</i>	54	
5.3	<i>The Internet</i>	54	
5.4	<i>Electronic commerce</i>	55	
5.5	<i>E-commerce applications</i>	56	
5.6	<i>Barriers to e-commerce</i>	58	
5.7	<i>Summary</i>	65	
6	Quantitative methods		68
6.1	<i>Intended learning outcomes</i>	69	
6.2	<i>Introduction</i>	69	
6.3	<i>Basic mathematics and statistics review</i>	70	
6.4	<i>Descriptive statistics</i>	75	
6.5	<i>Charts and graphs</i>	78	
6.6	<i>Inference</i>	81	
6.7	<i>Summary</i>	84	
7	Accounting and finance		87
7.1	<i>Intended learning outcomes</i>	88	
7.2	<i>Introduction</i>	89	
7.3	<i>Organizational types</i>	89	
7.4	<i>Financial accounting</i>	91	
7.5	<i>Management accounting</i>	98	
7.6	<i>Summary</i>	100	
8	Database management		102
8.1	<i>Intended learning outcomes</i>	104	
8.2	<i>Introduction</i>	105	
8.3	<i>The data explosion</i>	105	
8.4	<i>A data storage wish-list</i>	105	
8.5	<i>File-based data storage</i>	106	
8.6	<i>Advantages (and some disadvantages) of database storage</i>	107	
8.7	<i>Database design</i>	108	
8.8	<i>Relational databases and logical design</i>	109	
8.9	<i>Physical design</i>	112	
8.10	<i>Database interfaces and SQL</i>	114	
8.11	<i>More database management tasks</i>	117	
8.12	<i>Summary</i>	120	

9 E-commerce 2	122
9.1 <i>Intended learning outcomes</i>	123
9.2 <i>Introduction</i>	123
9.3 <i>Software applications</i>	123
9.4 <i>Customer relationship management systems</i>	125
9.5 <i>Middleware</i>	125
9.6 <i>Mobile e-commerce</i>	127
9.7 <i>Challenges in e-commerce technologies</i>	129
9.8 <i>Summary</i>	132
10 Organizational behaviour	135
10.1 <i>Intended learning outcomes</i>	136
10.2 <i>Introduction</i>	136
10.3 <i>Organizational culture</i>	137
10.4 <i>Types of culture</i>	139
10.5 <i>Organizational development, change and teams</i>	141
10.6 <i>Human resource management</i>	144
10.7 <i>Summary</i>	148
11 Systems analysis and design	150
11.1 <i>Intended learning outcomes</i>	152
11.2 <i>Introduction</i>	152
11.3 <i>Design</i>	152
11.4 <i>Methodologies</i>	162
11.5 <i>An example methodology: SSADM</i>	165
11.6 <i>Summary</i>	168
12 Data warehousing and business intelligence	170
12.1 <i>Intended learning outcomes</i>	171
12.2 <i>Data warehousing</i>	172
12.3 <i>Business intelligence</i>	174
12.4 <i>Summary</i>	184
13 Strategy and information systems	186
13.1 <i>Intended learning outcomes</i>	188
13.2 <i>Overview of strategy</i>	188
13.3 <i>Some approaches to strategic analysis</i>	194
13.4 <i>Information systems strategy</i>	198
13.5 <i>Summary</i>	200
14 Project management	203
14.1 <i>Intended learning outcomes</i>	204
14.2 <i>Introduction</i>	204

14.3	<i>Planning</i>	205	
14.4	<i>Managing projects</i>	206	
14.5	<i>Some project planning techniques</i>	209	
14.6	<i>Setting success criteria</i>	214	
14.7	<i>Project management methodologies</i>	215	
14.8	<i>Other issues</i>	217	
14.9	<i>Common reasons for failure of IT and IS projects</i>	218	
14.10	<i>Summary</i>	220	
15	Digital society		222
15.1	<i>Intended learning outcomes</i>	223	
15.2	<i>Introduction</i>	223	
15.3	<i>Let's be negative</i>	224	
15.4	<i>Computer crime</i>	225	
15.5	<i>Digital technology and ethics</i>	228	
15.6	<i>The digital divide</i>	229	
15.7	<i>IT law</i>	233	
15.8	<i>Employment</i>	235	
15.9	<i>And so on ...</i>	236	
15.10	<i>Summary</i>	237	
16	E-commerce		239
16.1	<i>Intended learning outcomes</i>	240	
16.2	<i>Introduction</i>	241	
16.3	<i>Strategy development</i>	241	
16.4	<i>Customer service</i>	242	
16.5	<i>Security</i>	243	
16.6	<i>Winning customer trust</i>	245	
16.7	<i>E-marketing</i>	246	
16.8	<i>Channel integration</i>	248	
16.9	<i>Media and contents</i>	249	
16.10	<i>Web-enabling the technological infrastructure</i>	249	
16.11	<i>Managing change and user issues</i>	250	
16.12	<i>Ethical issues</i>	252	
16.13	<i>Human resource management</i>	253	
16.14	<i>Summary</i>	253	
17	Knowledge management		257
17.1	<i>Intended learning outcomes</i>	258	
17.2	<i>Background</i>	258	
17.3	<i>What is knowledge management?</i>	261	
17.4	<i>Summary</i>	267	

18 The project	271
18.1 <i>Intended learning outcomes</i>	274
18.2 <i>Introduction</i>	274
18.3 <i>Types of project</i>	274
18.4 <i>Finding and selecting a topic</i>	276
18.5 <i>The title</i>	278
18.6 <i>The proposal</i>	279
18.7 <i>The project report</i>	279
18.8 <i>Aim and objectives</i>	280
18.9 <i>Background</i>	280
18.10 <i>The critical review</i>	281
18.11 <i>Research methods</i>	282
18.12 <i>Presentation of results</i>	283
18.13 <i>Analysis</i>	283
18.14 <i>Plagiarism</i>	284
18.15 <i>Academic writing</i>	284
18.16 <i>Referencing</i>	285
18.17 <i>Project conclusions</i>	286
18.18 <i>Managing your project</i>	286
18.19 <i>Ten ways to fail your project</i>	287
18.20 <i>Ethical, legal and professional issues</i>	288
18.21 <i>Summary</i>	288
19 Final thoughts	290
19.1 <i>Other topics</i>	292
19.2 <i>Conclusions</i>	302
<i>Index</i>	303

Case studies

1.1	K-Mart and Wal-Mart	1
2.1	London Ambulance Service	11
3.1	Usability in an anonymous organization	23
4.1	House of Fraser	36
5.1	Dell Inc.	53
6.1	Caldico Ltd	68
7.1	Computers-R-Us	87
8.1	Driver working hours	102
9.1	E-commerce in Nigeria	122
10.1	Organizational behaviour in the public sector	135
11.1	Child Support Agency	150
12.1	Qualcomm	170
12.2	Marketing intelligence trends 2015	178
13.1	East Slovakia coal industry	186
14.1	Channel Tunnel	203
15.1	Credit card fraud	222
16.1	Bank A	239
17.1	Fujitsu	257
18.1	Example of an abstract and Chapter 1 of a project report	271
19.1	Comair	290