COMPUTERS IN QUANTITY SURVEYING

COMPUTERS IN QUANTITY SURVEYING

R. J. ALVEY F.R.I.C.S., F.I.Q.S.

*Principal Lecturer in Quantity Surveying,
Trent Polytechnic*

M

© R. J. Alvey 1976

All rights reserved. No part of this publication may
be reproduced or transmitted, in any form or by any means,
without permission.

First published 1976 by
THE MACMILLAN PRESS LTD
London and Basingstoke
Associated companies in New York Dublin
Melbourne Johannesburg and Madras

ISBN 978-0-333-17973-4 ISBN 978-1-349-15681-8 (eBook)
DOI 10.1007/978-1-349-15681-8

Set in IBM Press Roman by
PREFACE LTD
Salisbury, Wilts

This book is sold subject to the standard
conditions of the Net Book Agreement.

The paperback edition of this book is sold subject to the condition that it shall
not, by way of trade or otherwise, be lent, re-sold, hired out, or otherwise
circulated without the publisher's prior consent in any form of binding or
cover other than that in which it is published and without a similar condition
including this condition being imposed on the subsequent purchaser.

This book is dedicated to my wife Beryl,
for her patience during its preparation

CONTENTS

<i>Preface</i>	xi
1. The Impact of the Computer	1
The Computer's Abilities	1
Benefits of using a Computer	2
Impact of the Computer	3
The Use of the Computer in the Construction Industry	4
References	6
2. The Nature of the Computer	8
Analog Computers	8
Digital Computers	9
Hybrid Computers	11
Electronic Computers	11
Minicomputers	12
References	13
3. Components of an Electronic Digital Computer	14
The Central Processor	15
Backing Store	19
Computer Configuration	24
Computer Processing Techniques	24
Input Devices for New Data Entry	27
Output Devices for Results	29
References	30
4. Operating the Computer	32
Analysis	32
Flowcharts	34
References	39
5. Computer Programs	40
Operating-system Programs	40
User-written Programs	41
Compiling and Testing Programs	44
Subroutines	46
Macro Instructions	47
References	47

6. Information Resources	49
The Building Process	49
Communications and Flow of Information	53
Data Coordination	56
Coding	58
Coordinated Information System	61
References	64
7. Standardisation of Information	65
Methods of Measurement	65
Standard Descriptions	66
Libraries of Descriptions	72
Classification Categories	74
Bills of Quantities Formats	75
Programs for Quantity Surveyors	78
References	79
8. Bills of Quantities by Computer	80
Procedures	80
Computer Processing	89
Rogue Items	94
Short Coding	96
References	97
9. Unit Quantities	99
Procedure	99
Coding Unit Quantities Dimensions	108
Bills of Quantities from Unit Quantities	110
References	114
10. The Use of the Computer for Ancillary Services	115
Bills of Quantities	115
Bill Sortation	115
Bill Pricing	116
Cost Planning and Cost Analysis	116
Network and Constructional Analyses	120
Financial Forecasts, Interim Certificates and Final Accounts	131
Coordinated Information Systems	132
References	132
11. Computer Services	134
Consultancy Services	134
Application Packages	136
Processing Services	143

Remote Computing	145
Computer Personnel	147
References	150
12. Economics of Computerisation	151
Motivation	151
Computer Selection	152
Effects of Computerisation	157
References	159
<i>Appendix A Unit Quantity Library</i>	160
<i>Appendix B Inland Datel Services</i>	164
<i>Appendix C Glossary of Terms</i>	166
<i>Index</i>	171

PREFACE

Quantity surveyors are becoming increasingly involved in modern methods of data processing and are looking to the computer as a means of solving problems and providing techniques for the more effective use of their skills. The computer provides new techniques that the construction design team can utilise to the betterment of the design and construction processes. The changing economic climate and the introduction of new building techniques have demanded a closer liaison between the professions and the construction team with the object of providing coordinated information systems. Computerisation may be held to be an answer. A study of computers, therefore, is necessary if the quantity surveyor is to keep abreast of modern techniques.

Computer jargon can be very confusing and only confounds the layman; this tends to create an air of mystery. Nevertheless the introduction of computers has created a new professional with an expertise that the quantity surveyor cannot hope to replace. However, to utilise these new skills the quantity surveyor must have some knowledge of the techniques involved. This means that he should have a basic appreciation of the technicalities of computerisation and a knowledge of its potential applications.

This book is directed primarily at students who are preparing for the professional examinations of the Royal Institution of Chartered Surveyors, the Institute of Quantity Surveyors and the Institute of Building. It is hoped that it may also be found useful by students studying for degrees and diplomas in quantity surveying and building and for allied professions and practitioners.

The book makes a study of computers to provide a basic appreciation of their nature and characteristics and to give a better understanding of the manner in which computers may be used satisfactorily by the construction design team with particular reference to the quantity surveyor's needs.

I wish to acknowledge with gratitude all the help and cooperation given by many organisations and persons associated with the computer industry especially R. Aldridge, D. R. Judd and S. K. A. Raza and many others too numerous to mention. My special thanks are due to my colleagues at Trent Polytechnic for their encouragement, especially to Dr I. H. Seeley for his most helpful comments. Grateful thanks are also due to those quantity surveyors with whom I have had some stimulating discussions. Last and by no means least I wish to thank my family for their tolerance and understanding while this book was being prepared.

*Nottingham,
Autumn 1975*

R. J. ALVEY