

**COMPUTER-BASED ASSESSMENT SYSTEM FOR
CERTIFIED ACCOUNTING TECHNICIAN (CAT):
“OFFICE PRACTICE AND PROCEDURE”**

**A project submitted to the Graduate School in partial
Fulfillment of the requirements for the degree
Master of Science (Information Technology)
Universiti Utara Malaysia**

**by
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ABSTRAK (BAHASA MALAYSIA)

Di institusi pendidikan, teknologi komputer digunakan untuk menjalani penilaian semakin menjadi perkara yang biasa pada masa kini. Ini adalah kerana sistem penilaian berasaskan komputer mendatangkan faedah yang begitu banyak berbanding dengan sistem penilaian konvensional yang menggunakan kertas and pen. Di dalam projek ini, masalah yang dihadapi oleh pelajar yang mengambil kursus “Certified Accounting Technician” (CAT) di Malaysia telah dikenalpasti. Pelajar tersebut akan menduduki penilaian berasaskan komputer yang ditawarkan oleh badan perakaunan professional, The Association of Chartered Certified Accountants (ACCA) dari United Kingdom. Masalah utama pelajar-pelajar tersebut merupakan kekurangan pengalaman dalam menggunakan sistem penilaian berasaskan komputer. Oleh yang demikian, satu sistem penilaian berasaskan komputer telah dibina untuk mengatasi masalah yang dihadapi oleh pelajar-pelajar tersebut. Sistem penilaian berasaskan komputer ini hanya fokus pada soalan jenis objektif and pada subjek “Office Practice and Procedures”. Keseluruhan proses pembinaan sistem penilaian berasaskan komputer ini adalah mengikuti metodologi pembinaan tajuk multimedia. Hasil daripada sistem penilaian berasaskan komputer ini telah diedarkan dalam bentuk cakera padat. Dalam pembinaan sistem ini, kekurangan yang dihadapi adalah seperti kekurangan masa, peralatan, pengalaman dan pengetahuan. Pada masa hadapan, sistem penilaian berasaskan komputer ini adalah dicadangkan untuk mengadakan soalan jenis isi tempat kosong dan mengadakan maklumbalas kepada pengguna selepas menjalani penilaian.

ABSTRACT (ENGLISH)

Using computer technology to carry out assessment is getting common among education institutions nowadays. This is because computer-based assessment system brings lots' of benefits compared to the conventional assessment system that uses paper and pen. In this project, the problem faced by the Certified Accounting Technician (CAT) students in Malaysia, who will attempt the computer-based assessment offered by The Association of Chartered Certified Accountants (ACCA), a professional accountancy body in the United Kingdom, is identified. Their main problem is that they do not have the experience using any computer-based assessment system. A computer-based assessment system is developed to overcome this problem. The computer-based assessment system is only focus on multiple choice question type of assessment and only for the subject of "Office Practice and Procedures". The whole process of developing the computer-based assessment system is carried out according to the methodology of developing a multimedia title. The final product of this computer-based assessment system is distributed in a CD. The constraints of developing this computer-based system includes time, resources, experience and knowledge. In future, this computer-based assessment system is recommended to include text-entry type of questions and extra features like providing feedback to user after the assessment.

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Table of Contents

	Page no.
PERMISSION TO USE	II
ABSTRAK (BAHASA MALAYSIA)	III
ABSTRACT (ENGLISH)	IV
ACKNOWLEDGEMENTS	V
TABLE OF CONTENTS	VI
LIST OF FIGURES	VIII
CHAPTER ONE: INTRODUCTION	1
1.1 BACKGROUND	1
1.1.1 <i>The Certified Accounting Technician (CAT) Qualification</i>	2
1.1.2 <i>The Paper of Office Practice and Procedure</i>	4
1.2 PROBLEM STATEMENT	7
1.3 OBJECTIVES	8
1.4 SCOPE OF THE PROJECT	9
1.4.1 <i>Assessment Focus</i>	9
1.4.2 <i>How it works</i>	9
1.5 SIGNIFICANCE	10
CHAPTER TWO: LITERATURE REVIEW	12
2.1 COMPUTER-BASED ASSESSMENT	16
2.2 REASONS OF USING COMPUTER-BASED ASSESSMENT	18
2.3 SUBJECT SUITABLE FOR COMPUTER-BASED ASSESSMENT	21
2.4 QUALITY OF COMPUTER-BASED ASSESSMENT	23
2.5 SECURITY IN COMPUTER-BASED ASSESSMENT	24
CHAPTER THREE: METHODOLOGY – PROJECT FRAMEWORK	26

3.1	DEVELOPMENT PROCESS	27
3.1.1	<i>Planning Phase</i>	28
3.1.2	<i>Creating Phase</i>	33
3.1.3	<i>Testing Phase</i>	34
3.2	HARDWARE AND SOFTWARE USED	35
3.2.1	<i>Hardware</i>	35
3.2.2	<i>Software</i>	36
CHAPTER FOUR: FINDINGS		41
USER INFORMATION ENTRY FORM		45
QUESTION FORM		46
RESULT FORM		47
QUESTION OBJECT		48
4.1	STORYBOARD AND NAVIGATION	53
4.2	CONTENT	55
4.2.1	<i>Splash Screen</i>	55
4.2.2	<i>Information Entry Screen</i>	55
4.2.3	<i>Instruction Screen</i>	56
4.2.4	<i>Question Screen</i>	57
4.2.5	<i>Result screen</i>	58
CHAPTER FIVE: CONCLUSION		59
5.1	CONSTRAINT IN THE PROJECT	59
5.1.1	<i>Time</i>	59
5.1.2	<i>Resources and Funds Available</i>	60
5.1.3	<i>Experience and Knowledge</i>	60
5.2	RECOMMENDATION	60
BIBLIOGRAPHY		63
APPENDIX 1		66
APPENDIX 2		98

LIST OF FIGURES

	Page no.
Figure 1: Data Flow Diagram Level 1	43
Figure 2: Pseudo Code for User Information Entry Form	45
Figure 3: Pseudo Code for Question Form	46
Figure 4: Pseudo Code for Result Form	47
Figure 5: Pseudo Code for Question Object	48
Figure 6: Data Structure	49
Figure 7: Flowchart	53
Figure 8: Storyboard and Navigation	54

CHAPTER ONE: INTRODUCTION

All over the world, more and more companies and educational organizations are using computers for delivering assessments rather than pen and paper. Instead of sitting at a desk and answering examination papers by hand, an examination participant sit in front of a computer screen and use a keyboard or mouse to indicate his/her answers. Instead of the results being returned days or weeks later after laborious manual marking, the computer marks their answers and gives them a score instantly.

1.1 Background

In recent years, computer-based assessment with multiple choice question types of examination has become one of the widely used methods in examination assessment process. Computer-based assessment is popular, especially among professional bodies, like the Association for Investment Management and Research in the United States of America, the Institution of Investment Management and Research in the United Kingdom, The Association of Chartered Certified Accountants (ACCA) and The Chartered Institute of Management Accountants (CIMA). The Association of Chartered Certified Accountants (ACCA) uses computer-based assessment to assess its' Certified Accounting Technician (CAT) students and The Chartered Institute of Management Accountants (CIMA) has just introduced computer-based assessment in May 2001, to assess their students who sign-up for the Foundation Level for the Beyond 2000 new syllabus. Besides, The Association of Chartered Certified Accountants (ACCA) has also just introduced computer-based assessment in June 2001 for its Certified Accounting Technician

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Bibliography

A New Age in Accountancy Training as CIMA Launches Revised Syllabus. [online]. Available: <http://www.cima.org.uk> . (7 June 2000).

ACCA Accounting Technician Computer Based Testing Brochures.

ACCA. (2001). *Computer Based Testing for Accounting Technician Scheme*. [online]. Available: <http://www.accaglobal.com/students/news/cbt.htm>. (16 March 2001).

Barrett, H.C. (2000). *Electronic Portfolio – Multimedia Development – Portfolio Development*. [online]. Available: <http://transition.alaska.edu/www/portfolios/EPDEVProcess.htm/#mmdev>. (26 July 2000).

Bennett, R. (1997). *Reinventing Assessment: Speculations on the Future of Large-Scale Educational Testing*. [online]. Available: <http://www.ets.org/research/pic/reinvtoc.html>. (26 December 2000).

Bocij, P. (1995). *Can Computer-based Testing Achieve Quality and Efficiency in Assessment?* [online]. Available: <http://www.edtech.clara.co.uk/cba/whatiscb.htm>. (19 July 2000)

Callear, D. & King, T. (1998). *Using Computer Based Tests for Information Science*. [online]. Available: <http://www.dis.port.ac.uk/~kingtr/research/dc-tk.html>. (23 July 2000).

CIMA. (2000). *Computer-based Assessment*. [online]. Available: <http://www.cima.org.uk>. (7 June 2000).

CIMA. (2001). *Computer-based Assessment - the way forward*. [online]. Available: <http://www.cima.org.uk/eucationalists/tutors/exams/cba>. (16 March 2001).

Computer-based Assessment. [online]. Available: <http://www.cima.org.uk>. (7 June 2000).

<http://iimr.org.uk> [Access date: 6 June 2000].

<http://www.accaglobal.com> [Access date: 10 September 2001].

<http://www.cima.org.uk> [Access date: 10 September 2001].

Jones, C. M., Liu, Min, Culp, G. H. & Svinicki, M. D. (1999). *Multimedia Best Practices for the University-wide System*. [online]. Available: <http://ccwf.cc.utexas.edu/~jonesc/short1.htm>. (26 July 2000).

Kori Inkpen and et.al. (1993). *We Have Never-Forgetful Flowers In Our Garden: Girls' Responses to Electronic Games*. [online]. Available: <http://ncstrl.cs.cornell.edu>. (4 June 2000).

Mallon, A. (1995). *The Collection and Management of Assets in the Production of a Multimedia Program on Yeats*. [online]. Available: http://ourworld.compuserve.com/homepages/adrian_mallon_multimedia/assetpap.htm. (26 July 2000).

Multimedia. (1st ed.). (1999). Manchester: NCC Education Services Limited.

Pane, John F. (1994). *Assessment of the ACSE Science Learning Environment and the Impact of Movies and Simulations*. School of Computer Science, Carnegie Mellon University. [online]. Available: <http://www.ncstrl.org>. (5 June 2000).

Proctor, A. & Donoghue, D. (1994). *Computer Based Assessment: A Case Study in Geography*. [online]. Available: <http://www.cti.ac.uk/publ/actlea/issue1/proctor/>. (18 July 2000)

Shneiderman, Ben and et. Al. (1998). *Emergent Patterns of Teaching / Learning in Electronic Classrooms*. University of Maryland. [online]. Available: <http://www.ncstrl.org>. (5 June 2000).

Shuman, J. E. (1997). *Multimedia in Action*. US: Wadsworth Publishing Company.

Tanimoto, Steven L. (1998). *Towards an Ontology for Alternative Assessment in Education*. Dept. of Computer Science and Engineering, University of Washington. [online]. Available: <http://www.justresearch.com> . (7 June 2000).

Tatiegi, M. M. J. (1997). *Review: The Multimedia Development Process (Chapter 2)*. [online]. Available: <http://www.scism.sbu.ac.uk/inmandw/review/hypermedia/review/rev23261.html>. (26 July 2000).

Tecuci, Gheorghe and Keeling, Harry. (1999). *Teaching an Agent to Test Students*. Dept. of Computer Science, George Mason University. [online]. Available: <http://www.justresearch.com> . (5 June 2000).

The Application Development Process. [online]. Available: <http://www.imagineit.com/process.htm>. (26 July 2000).

Williams, Gary. (1999). *Overview on Computer-based Assessment*. [online]. Available: <http://www.csu.edu.au/division/oli/celt/edtech/assessment/self.htm>. (26 December 2000).

Yopp, J. (1999). *Educators & Test Advisors: Starting Point for Educators, Student Advisers, and Institutional Score Users*. [online]. Available: <http://www.ets.org/cbt/spedadin.html>. (11 July 2000).