UNIVERSITI PUTRA MALAYSIA

ELECTRONIC BOOK OF NETWORK SECURITY: INTRODUCTION TO NETWORK SECURITY

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ELECTRONIC BOOK OF NETWORK SECURITY: INTRODUCTION TO NETWORK SECURITY

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PROJECT PAPER

ELECTRONIC BOOK OF NETWORK SECURITY:

INTRODUCTION TO NETWORK SECURITY

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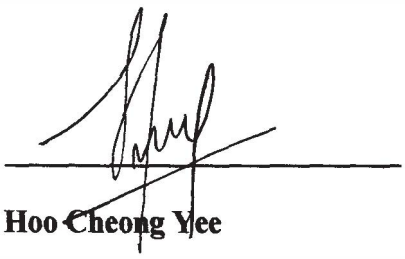
DECLARATION

I hereby declare that the thesis is based on my original work except for quotations and citations which have been duly acknowledged. I also declare that it has not been previously or concurrently submitted for any other degree at Universiti Putra Malaysia or other Institutions.



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ABSTRACT

Technology is now widely used in a variety of educational support situations to improve the quality of education. It can be used to redress the imbalances of the old system and help in developing new teaching and learning strategies.

The basis of this project is to design and develop an electronic book (E-book) tutorial to teach the basics of network security. E-books are developed with the intentions of overcoming the limitations of paper books. They have the advantages over paper books in that they are dynamic, reactive and able to provide the same features as well as new features such as hyper-linking, multimedia technology, digital annotating, digital book-marking and searching function.

This project will pay particular attention to features and functionality of the e-book rather that the contents of the book. This project will involve the development of software application that will combine multimedia elements such as high-quality sound, text, photo images, two and three-dimensional graphics and animation into learning environment.

The E-book will be created using Macromedia Authorware. In order to add interactivity and enhance the user interfaces to the e-book, Macromedia Flash MX and Adobe Photoshop will be used. Finally, there will also be a quiz section for the user after they read the e-book.

ABSTRAK

Pada zaman sekarang, teknologi banyak digunakan dalam pelbagai situasi sokongan pendidikan untuk meningkatkan kualiti pendidikan. Ia boleh digunakan untuk memperbaiki ketidakseimbangan sistem pembelajaran yang lama dan juga membantu mewujudkan strategi baru untuk mengajar dan belajar.

Asas projek ini adalah untuk mereka dan membina sebuah buku elektronik (E-book) tutorial untuk mengajar asas sekuriti rangkaian. Tujuan buku electronic ini dibina adalah untuk mengatasi limitasi buku berasaskan kertas. E-book mempunyai kelebihan dari buku berasaskan kertas kerana ia dinamik, reaktif, dan boleh memberi ciri-ciri yang sama dan juga ciri ciri yang baru seperti hyper-linking, teknologi multimedia, anotasi digital, petanda buku digital, serta fungsi pencarian.

Projek ini lebih memberi perhatian terhadap cirri-ciri dan fingsi-fungsi dalam E-book daripada kandungan didalamnya. Projek ini melibatkan pembinaan perisian aplikasi yang mengabungkan elemen-elemen multimedia seperti bunyi yang berkualiti tinggi, teks, foto, gambar-gambar 2 dan 3 dimensi, serta animasi dalam suasana pendidikan.

E-book ini akan dibina dengan menggunakan Macromedia Authorware. Untuk meningkatkan interaktiviti dan antaramuka pengguna dalam e-book ini, Marcomedia Flash dan Adobe Photoshop digunakan. Akhirnya, E-bbok ini mempunyai sektor quiz untuk menguji pembaca selepas membaca E-book ini.

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CHAPTER 1

INTRODUCTION

1.0 Introduction

The title for this project is Electronic Book of Network Security: *Introduction to Network Security*. Electronic book (E-book) is an *electronic* version of a traditional print book that can be read by using a personal computer or by using an E-book reader.

For the past century, sheets of paper, imprinted with ink and bound between cardboard covers, have been the state-of-the-art classroom information system. In this project, an E-book about network security will be developed. This E-book will put together all the important points of network security, also embedded in with multimedia elements such as narrated animations, pictures, sound, quiz and etc. This new technology will transform the education experiences of students, teachers, and administrators into exciting, engaging, and productive ones.

Technology has the ability to free learning from physical constraints. Even the most geographically isolated school, when online, can tap into the same universe of information available to other schools. And with the help of communications devices and adaptive hardware, students with limited mobility, vision, or hearing can communicate and collaborate with others. Many of the multimedia application now have incorporated interactivity in one form or another. We see educators seeking to transfer courseware materials onto CD-ROMs or publish in Internet in the form of E-book in order to provide their students with more comprehensive and multi-sensory learning platform where they can learn at their own pace.

As the digital era directs businesses toward information systems and knowledge based assets, network security has become a key area of concern for

owners and IT decision makers. It is no longer realistic to operate a network as an unrestricted and trusted environment. Hacking and cracking are activities that generate intense public interest. Stories of hacked servers and downed Internet providers appear regularly in national news. Today, an increasing number of government agencies, businesses, and home users are going online in their environments. However, these groups need to be aware of the security risks associated with online or network environments. They need to develop strategies that help mitigate those risks as they integrate these technologies in their computing environments.

The topic of network security covers a very broad spectrum and is ever expanding. Business owners and IT professionals should strive to continually evaluate their data and business and endeavour to protect at the very least, what is critical to business continuity. Failure to have a pro-active plan in place to mitigate very real threats, is saddling the business with undue risk, much of which can be avoided. The objective of this E-book is to provide the reader with a basic understanding of network security and outlines the associated risks, and offers guidance for mitigating those risks.

In this project, the E-book will be published as a CD-ROM because it offers readers an easy transition to screen-reading. Beside of that, CR-ROM is an innovative, interactive learning with links to the Internet and full hypertext presentation. Perhaps the most obvious form of CD-ROM added value over printed book is the ability within such software to display multiple windows of text

simultaneously. Sound and video also can be included in that greatly enhance the plain text for learning.

1.1 Problem Statements

Interactive E-book with multimedia based is still very uncommon to Malaysian. They are still using the hard copy of book as a medium of delivery the knowledge. This is due to the lack of promotions on the usage of this type of media. Moreover, they are not many local developers who are really concentrating and specialized into this field.

The aim of the project was to develop a new medium of education which is E-book. There are numerous vendors who already provide variety of E-books on the Internet, and some of them achieve this very successfully. The major problem however with all of these book is that they only provide basic facilities and functions and often fail to address many of the more specific issues related to learning. Currently, E-book technology (i.e. either hardware or software based readers) has limited multimedia features.

Throughout are lives, our knowledge, skills and understanding are put to the test. From the exams we sit in school to personality or aptitude tests we may sit when applying for a job. The process of creating, running and marking these exams is very time consuming and cost-inefficient. This problem can be solve by using the quiz in the E-book which is self marking and able to summarize the final mark.

Meanwhile, with the rapid growth of interest in the Internet, network security has become a major concern throughout the world. When you connect your private network to the Internet, you are physically connecting your network to more than 50,000 unknown networks and all their users. Although such connections open the door to many useful applications and provide great opportunities for information sharing, most private networks contain some information that should not be shared with outside users on the Internet. In addition, not all Internet users are involved in lawful activities.

In Malaysia, Internet user is beginning to pick up, but many of these users are unaware of the risks of going online. Many of them are not concern or don't have any knowledge in network security. Every year, there is hundreds of abuse incidents happened in Malaysia alone. The statistics on abuse incidents are shown in **Appendix A.** As our country is moving towards the information age, we should improve their knowledge about network security. By using E-book which is more interactive, attractive and cheaper, hope that the vision will be achieved.

1.2 Scopes

Until recently, classrooms had remained virtually unchanged for nearly a hundred years. Desks were arranged in neat rows facing a white board at the front of the room, students took notes on paper, and read from printed textbooks. Things started to change with the advent projection equipment and, even more recently, individual computers. The trend is continuing, and the next casualty of the technological revolution appears to be the printed textbook. The need to investigate what is happening with technology-enhanced teaching and learning is now

imperative. This includes, among other things, understanding how approaches to teaching are being impacted, how teacher-thought about teaching and learning is being modified, how students' approaches to learning are changing, and how student support is changing with the use of ICT.

The main purpose of this paper is to create an E-book. Educators who have their eyes on school improvement are taking a close look at the increasing popularity of E-book. They are finding that when trained teachers work with E-book creatively, safely, and effectively it can improve teaching and learning so long as it is part of a dynamic system of instruction.

E-books are growing in popularity among certain audiences. Reasons for this vary but their advocates say that E-books are portable, supposedly durable, and increasingly offer useful computerized features that go beyond providing words alone. Such features may hold special promise for helping students improve their educational results because they can be used to support, scaffold, or accelerate learning when trained teachers manage E-books as part of carefully designed instruction.

Education is also evolving to involve electronic curricula that are punctuated with elements of animation, video, sound, graphics and text to make the learning process for the students a more productive and entertaining one. The learners will not feel bored while they exploring this E-book. These modules are self- paced and the student can go over the material as many times as needed. This has been proven to be very effective in increasing productivity and the learning processes of these students.

This E-book provides a wide range of test samples after reading the notes content. Interactivity in these applications involves questions posed by the computer and answered by the user while in the application, with scoring being an immediate feedback.

This E-book is created so that users can reduce the cost and time needed for searching particular information as user can easily find the articles, media, and additional resources they need in seconds by using this E-book with multimedia based. This is because it combines authoritative articles with engaging multimedia, featuring a new interface and easy- to- use search tools that help students find the information they need quickly and easily, from broad topics to in- depth coverage.

1.3 Objectives

The objectives of this project are:

- To provide information to improve the user interface and usability of the modules.
- To identify additional functions and/or features to enhance the effectiveness of the E-book as a medium for learning.
- To identify additional educational functions that could be supported within the modules.
- To provide inexperienced users with a comprehensive source about security.
- To generally heighten public awareness of the need for adequate security.
- To develop an E-book which is written in an easy to follow language. Therefore, the users can read the notes content clearly and at the same time they can understand it well and fast.

CHAPTER 2

LITERATURE REVIEW

2.0 Introduction

Recently, the instructional demand for multimedia applications has positively impacted the education sector. Multimedia application meant that any application that uses multiple media types such as text, still images, audio, digital video, and generated media such as animation and synthesized music. From an educational standpoint, multimedia usage should be interactive; reinforcing the assumption that interactive multimedia is a technology-based stimulation of a process that takes place between a learner and a collection of subject matters (*Reynolds et al., 1996*). Today, multimedia applications in education are delivered in two major formats: CD-ROM based (CDB) and Web based (WB) *(Habash, 1998*). In this project, I have used CD-ROM as the medium to delivery the E-book.

Meanwhile, network security is a complicated subject, historically only tackled by well-trained and experienced experts. However, as more and more people become "wired", an increasing number of people need to understand the basics of security in a networked world. This document was written with the basic computer user and information systems manager in mind, explaining the concepts needed to read through the hype in the marketplace and understand risks and how to deal with them.

2.1 Technologies for Education

Today the demand for educational technology is high, and when technology is used thoughtfully and is learner centered, the results are gratifying. Again and again, we have witnessed the power of technology to enable people to learn and to interact, even in the most remote areas of the developing world. Through increased

outreach we are helping to build the IT capacity of underserved populations such as people in rural areas, women, those with disabilities, and speakers of minority languages. Lower costs and more flexible, adaptable, and user-friendly hardware are making this possible. So, too, is a new generation of teachers, planners, and administrators who understand the value and utility of the technologies (*Moseley, 2002*).

In the educational process, people are central. The role of teachers is always crucial. But, in each of the elements described above, the human element has limits, and other interventions need to be brought to bear strongly into the process of delivery and transformation of knowledge, and verification of results. It is the potential and role of technologies in contributing to improvement in the effectiveness and efficiency of this profoundly human exercise (*Haddad, 2000*). Examples of information and communication technologies are compact discs and CD-ROMs, videodiscs, microcomputer-based laboratories, the Internet, virtual reality, local and wide area networks, instructional software, Macs, PCs, laptops, notebooks, educational television, voice mail, e-mail, satellite communication, VCRs, cable TV, interactive radio, etc.

Education will not be a location anymore, but an activity: a teaching/learning activity. Imagine a highly interactive, synchronous and asynchronous, multimedia learning experience between distant locations over vast national and international networks, allowing learners to obtain simultaneous distance learning services from their geographically dispersed organizations, schools, and other colleagues. In this new paradigm, Technologies are not a substitute for schooling. They constitute one integral element of this education model which supplementing and enriching

traditional institutions, delivery systems, and instructional materials. In this sense, technologies contribute to the whole system of knowledge dissemination and learning (see **Table 2.0**).

FROM	TO
A school building	A knowledge infrastructure (school, labs, radio, television, Internet, etc.)
Classroom	Individual learners
A teacher (as provider of knowledge)	A teacher (as a tutor and facilitator)
A set of textbooks and some audiovisual aids	Multimedia materials (print, audio, video, etc)

Table 2.0: Evolution of New Education Paradigm (*Haddad et. al, 2002*).

Different Technologies have the potential to contribute to different facets of educational development and effective learning: expanding access, promoting efficiency, improving the quality of learning, enhancing the quality of teaching, and improving management systems. Technologies also offer possibilities in lifelong learning, adult training, and e-training for the workplace. Planning for effective use of technologies in education necessitates an understanding of the potential of technologies to meet different educational objectives and, consequently, to decide which of these objectives will be pursued. This decision affects the choice of technologies and the modalities of use (see **Table 2.1**.)

	TECHNOLOGY				
USE	TEXT	AUDIO	VIDEO	COMPUTER	INTERNET
PRESENTATION	x	x	x	x	x
DEMONSTRATION	x	x	x	x	x
DRILL & PRACTICE	x	(e.g. language lab)		x	x
INTERACTIVE	hypertext			x	x
COLLABORATIVE				networked	x

Table 2.1: Uses of Technologies (*Haddad et. al, 2002*).

Frequently, users and experts tend to concentrate on what a specific technology can and cannot do for education. But, as **Table 2.1** illustrates, one technology may have different potentials depending on the purpose for using it. Also, many of the technologies have similar characteristics. Therefore assessments of the potential and appropriateness of particular technologies must be based on educational needs and objectives, rather than on the technologies themselves.

2.2 Electronic Book (E-Book)

Electronic versions of texts have a long history in the digital age. Michael Hart began his Gutenberg project in 1971, with the goal of creating a widely available library of texts of all kinds in plain text format. Similar Gutenberg projects have since been introduced in other countries, notably in Germany and Australia (*Jones, 2003*).

The growing interest in converting paper books to bytes (*Carvajal, 1999*) as well as writing new titles in digital form has resulted in a collection of hybrid definitions of E-books. Initially, paper books that had been converted to a digital format, usually through digitising processes that allow them to be displayed on