

HYBRID DOCUMENT COPYRIGHT PROTECTION



UNIVERSITI TEKNIKAL MALAYSIA MELAKA

BORANG PENGESAHAN STATUS LAPORAN

JUDUL: HYBRID DOCUMENT COPYRIGHT PROTECTION

SES PENGAJIAN: 2020 / 2021

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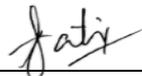
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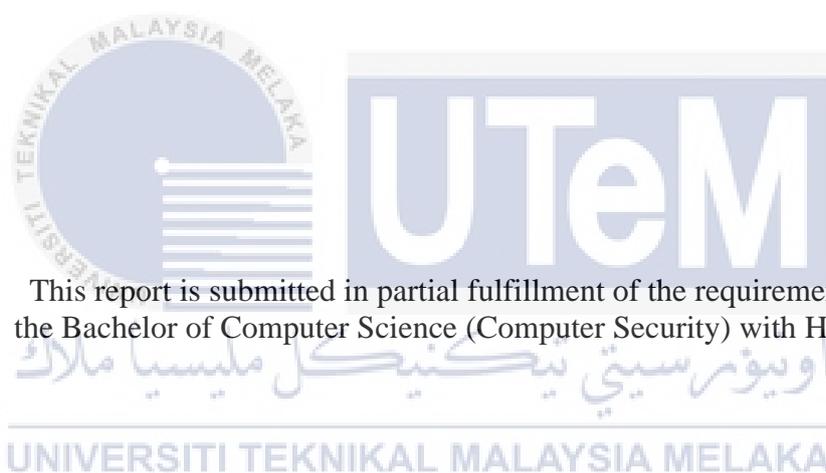
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HYBRID DOCUMENT COPYRIGHT PROTECTION

NOR FATIN SHAZWANI BINTI ADNAN



FACULTY OF INFORMATION AND COMMUNICATION TECHNOLOGY
UNIVERSITI TEKNIKAL MALAYSIA MELAKA
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DECLARATION

I hereby declare that this project report entitled

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Bachelor of Computer Science (Computer Security) with Honours.

DEDICATION

This research is dedicated to my beloved father, who taught me to keep learning even in a difficult situation as long as there is a chance because knowledge is something precious we can have. It is also dedicated to my dearest mother, who taught me to never give up on what I am currently doing. She taught me that even the smallest progress is still considered progress and with the smallest progress I will be able to complete the task.



ACKNOWLEDGEMENTS

All praises to Allah with His Permission and Grace, I am able to complete this final year project report.

First of all, I would like to express my deepest gratitude to my supervisor, Prof. Madya TS Dr. Siti Rahayu Binti Selamat for her guidance, advice, encouragement, and supportive comments throughout the process of completing this project. Without my supervisor's help, I might not be able to complete this report and project successfully.

In addition, my utmost appreciation goes to my beloved parents, Mr. Adnan Bin Husain and Mrs. Norasila Binti Sanip, who have been giving me continuous support and motivation throughout my project. Indeed, without their ongoing support and encouragement, I would not be here.

Lastly, I would also like to take this opportunity to thank all my friends for lending hands every time I need it. Especially, Muhammad Hafiz Bin Jamil, Wan Nurin Jazmina Binti Wan Omar, and Amirah Nadhirah Binti Kamarulzaman, thank you for all the reminders, encouragement, care, guidance, and support. Thank you for inspiring me to finish this project. Words cannot express my gratitude for all your love and support.

ABSTRACT

The E-Learning system has made it easier for lecturers to share their digital lecture notes with the students. Students can access them from their lecturers anywhere and anytime. However, these digital lecture notes are vulnerable to illegal copy and unauthorized distribution because they do not have copyright protection. Therefore, to solve the problem, a QR code technology and a steganography technique have been applied as a mechanism of document protection. In this implementation, the information of the owner's file and the person who downloaded the file are stored and hidden in the QR Code and steganography image. In addition, a UTeM logo also was embedded as a watermark to provide multiple protection to the digital lecture notes. With this information, if the digital lecture notes are misused or distributed on a public platform without the permission of their lecturer, the user who distributed the files can be identified by scanning the QR code contained in that particular file. With that information, the owner of the digital lecture notes also can be proven.

ABSTRAK

Sistem *E-Learning* memudahkan pensyarah berkongsi nota kuliah digital mereka dengan pelajar. Pelajar boleh mendapatkannya dari pensyarah di mana sahaja dan pada bila-bila masa. Walau bagaimanapun, nota kuliah digital ini terdedah kepada salinan haram dan pengedaran yang tidak dibenarkan kerana mereka tidak mempunyai perlindungan hak cipta. Oleh itu, untuk menyelesaikan masalah ini, teknologi Kod QR dan teknik steganografi telah digunakan sebagai mekanisme perlindungan dokumen. Dalam pelaksanaan ini, maklumat fail pemilik dan orang yang memuat turun fail disimpan dan tersembunyi dalam Kod QR dan imej steganografi. Di samping itu, logo UTeM juga dimasukkan sebagai tera air untuk memberi perlindungan berganda kepada nota kuliah digital. Dengan maklumat ini, jika nota kuliah digital disalahgunakan atau diedarkan di platform awam tanpa kebenaran pensyarah mereka, pengguna yang mengedarkan fail boleh dikenal pasti dengan mengimbas kod QR yang terkandung dalam fail tersebut. Dengan maklumat itu, pemilik nota kuliah digital juga boleh dibuktikan.

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LIST OF ABBREVIATIONS

UTeM	-	Universiti Teknikal Malaysia Melaka
UiTM	-	Universiti Teknologi Mara
Covid-19	-	Coronavirus Disease 2019
QR-code	-	Quick Response Code
LSB	-	Least Significant Bits
ISO/IEC	-	International Organization For Standardization/International Electrotechnical Commission
2D code	-	2 Dimensional Code
RSA	-	Rivest-Shamir-Adleman Encryption
VSS	-	Visual Secret Sharing
DWT	-	Discrete Wavelet Transform
HH	-	Higher Highs
HL	-	Higher Lows
LH	-	Lower Highs
LL	-	Lower Lows
DCT	-	Discrete Cosine Transform
HE	-	Histogram Attack
JPEG	-	Joint Photographic Experts Group
SVD	-	Singular Value Decomposition
ID	-	Identification
ERD	-	Entity Relationship Diagram
PHP	-	Personal Home Page
SQL	-	Structured Query Language
RAM	-	Random Access Memory

LCD	-	Liquid Crystal Display
IPS	-	In-Plane Switching
GHz	-	Gigahertz
PnP	-	Plug and Play
ECC	-	Error Correction Capability
Char	-	Character
RGB	-	Red, Blue, Green



CHAPTER 1: INTRODUCTION

1.1. Introduction

Nowadays, online learning is a common way used by the educational industry to deliver their contents to their students because all the country has been hit by the Covid-19 Pandemic. Therefore, all universities have their own online learning platform. For example, U-Learn and i-Learn are the online platforms used by UTeM and UiTM respectively. With the online learning platform, lecturers can upload their material to be used by their students to be accessed anywhere and anytime. This also provides a convenient environment for both of them. However, several issues should be considered to ensure the materials provided are protected and not misused by the students. Therefore, this project is proposed to protect the materials provided by lecturers from any misuse by their students. Hence, this chapter will explain the background, problem, objectives, and significance of the project.

1.2 Project Background

Online learning has long been practiced by many universities, but its uses have increased since the hit of Covid-19 Pandemic. As a result, teaching and learning have been done digitally and using an online learning platform. According to Abdul Rahman et al. (2020), the implementation of teaching and learning activities online can help reduce the risk of Covid-19 infection because it is carried out virtually. As such, the use of digital documents has also increased as it is facilitating the teaching and learning process. However, although the use of digital documents in an online learning platform facilitates all parties, some issues can occur, such as copyright issues and misuse of the lecturer's teaching materials. Therefore, it is important to digitally secure those digital documents from these issues. In the meantime, this project will use a QR code and a steganography image to store information about who download the

document, the owner of the document, and the source of the document as it is simple and reliable just for academic purposes.

1.3 Problem Statement (PS)

Since the Covid-19 pandemic, teaching and learning have been done online. So, all notes and study materials from the lecturer have been uploaded to the online learning platform to make it easier for students to download and study in their respective places. However, the possibility for cases such as misuse of the lecturer's material by distributing it on the public platform without the permission of their lecturer can occur. Nowadays, there are also many public online platforms to share assignments and notes like Coursehero, Quizlet, and Quizizz. Apart from that, some of the lecturers also less consent about the copyright issue because they trust if the material is shared in that platform (such as U-Learn), it will be just between the student only, not with other people. The problem here is, we do not know who is the real person that shares the lecturer's material, where it might cause some problem for the lecturers later. For example, someone can publish a book using the lecturer's study material content.

Table 1. 1: Summary of problem statement

PS	Problem Statement
PS1	Current online learning situation is causing the misused of the lecturer's material and do not know who is behind it.

1.4 Project Question (PQ)

Based on the problem statements listed in Table 1.1, three project question (PQ) are constructed as shown in Table 1.2.

Table 1. 2: Summary of project question

PQ	Project Question
PQ1	What copyright protection technique can be used for documents?
PQ2	How to protect the digital documents from any illegal activities?
PQ3	How to measure the effectiveness of the proposed protection technique?

1.5 Project Objective (PO)

The aim of this project is to secure the lecturer's material. Therefore, to be able to

solve the problem identified in Table 1.1 and to achieve the aim of this project, three project objectives (PO) are derived as shown in Table 1.3.

Table 1. 3: Summary of the project objective

PQ	PO	Project Objective
PQ1	PO1	To analyze copyright protection techniques for documents
PQ2	PO2	To formulate hybrid copyright protection technique
PQ3	PO3	To evaluate the effectiveness of the proposed protection technique

1.6 Project Scope

The main purpose of this project is to generate a QR code and a steganography image that contains information about the user that downloads the document and embeds it into the lecturer material in order to find out who holds that document in case the document is misused by someone. The document also will be embedded with UTeM's logo as a watermark. A system has been developed for the testing part. The document supported to upload to the system is digital materials and the format of the document is .pdf. This project is targeting students and lecturers as this system is an online learning platform. This project will focus on how to solve the problem as stated in the problem statement with the use of QR code technology, steganography, and watermarking technique.

1.7 Project Contribution

Based on the problem statement, project question, and project objectives listed in Table 1.1, Table 1.2, and Table 1.3 respectively, three project contributions (PC) are constructed as shown in Table 1.4.

Table 1. 4: Summary of the project contribution

PS	PQ	PO	PC	Project Contribution
PS1	PQ1	PO1	PC1	Techniques to protect the digital documents from illegal activities or misuse activities
	PQ2	PO2	PC2	A protected document that embedded with QR code, watermark image and steganography image
	PQ3	PO3	PC3	The identity of the document's ownership