INFORMATION SECURITY CURRICULUM FRAMEWORK AT UNDERGRADUATE LEVEL

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requirements for the award of the degree of
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Dedicated to my family

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ABSTRACT

This study focuses on developing Information Security (IS) curriculum framework at undergraduate level. Qualitative technique is used in order to collect information and analyzed that information to obtain useful input for this study. Qualitative technique covers interview, and analyzing secondary sources. The acquired information is used to construct the framework by applying backward design curriculum model. It is an approach that begins with the desired outcomes and goals then, works backward to learning objectives grouped into courses. As a result, the proposed framework named as Information Security Curriculum framework at undergraduate level comprises of six learning outcomes with its core knowledge based on ten IS Common Body of Knowledge (CBK). The proposed framework is then verified according to Malaysia Qualification Framework (MQF) elements qualification.

ABSTRAK

Kajian ini menumpukan terhadap pembangunan rangka kerja bagi kurikulum Keselamatan Maklumat di peringkat ijazah dan diploma. Teknik kualitatif digunakan untuk mengumpul dan menganalisa maklumat untuk mendapatkan input yang berguna bagi kajian ini. Maklumat yang diperoleh digunakan untuk membangunkan rangka kerja ini dengan mengaplikasikan model kurikulum *Backward*. Ia merupakan satu pendekatan yang bermula dengan keputusan dan tujuan yang dijangka, kemudian tujuan pembelajaran yang dikumpulkan membentuk kursus. Hasilnya, rangka kerja yang dicadangkan iaitu rangka kerja kurikulum Keselamatan Maklumat mengandungi enam hasil pembelajaran dan kursus terasnya berpandukan sepuluh ”Common Body of Knowledge (CBK)” Keselamatan Maklumat. Rangka kerja yang dicadangkan ini disahkan mengikut .elemen kelayakan Malaysia Qualification Framework (MQF).

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LIST OF ABREVIATION

CBK	-	Common Body of Knowledge
CERIAS	-	Center for Education and Research for Information Assurance and Security
CIA	-	Confidentiality, Integrity and Availability
CISSP	-	Certified Information System and Security Professional
GIAC	-	Global Information Assurance Certification
GMI	-	German-Malaysia Institute
MOSTI	-	Ministry of Science, Technology and Innovation, Malaysia
MQA	-	Malaysia Qualification Agency
MQF	-	Malaysia Qualification Framework
IS	-	Information Security
ISU	-	Information Security Undergraduate
IT	-	Information Technology
USIM	-	Universiti Sains Islam Malaysia

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CHAPTER 1

INTRODUCTION

1.1 Overview

This chapter describes the idea of the project to construct a framework for Information Security (IS) curriculum at degree level including its problem background, problem statement, and project objective and project scope. This chapter underlines the importance and the needs of conducting this study.

1.2 Problems Background

Historically, courses in Information Security have been offered as special topics, as a small part of a curriculum or as specialized programs designed just for security. As technology, its uses and abuses expand at rapid rates, the need for information security professionals is rising at a demanding rate and more professionals are also slated to join the computer security industry to police and protect cyberspace (Bradley and Kay, 2004).

Besides, there are a number of industry based certifications that contain some aspects of information security, depending on the certifier (Narayan,S., 2004). For example, Microsoft offers a number of courses related to security such as MCSA, MCSE and MCSD have dedicated modules to the topic. In addition, MCSA and MCSE are now offered with security as a specialization. This highlights the importance of IS. Additionally, Certified Information System and Security Professional (CISSP) certification is the ultimate goal for an information security practitioner.

In Malaysia, CyberSecurity is the national cyber security specialist under the purview of the Ministry of Science, Technology and Innovation, Malaysia (MOSTI). CyberSecurity provide services to assist Malaysian Internet Users in the detection, interpretation and response to computer security incidents. Besides, there are also Digital Forensic, Security Assurance, Research and Development, and Training and Outreach services. It shows that Malaysia has the demand for IS professional and IS field has growing attention.

Furthermore, there are crime cases that need IS expertise. Meaning that, IS is not a field that relate with virus, hacker, malicious issues only. For example, there is one case in 2007 where a digital forensic expert has needed to present his analysis of the CCTV (in mStar Online). Besides, social engineering has been growing in Malaysia and one of the famous cases is the Akademi Fantasia case where the victims were persuaded to transfer their money because they had won the Akademi Fantasia competition. It is kind of exposing information security awareness to people and we need specialist people who can organize the awareness program and perform continuous research to plan an effective program.

Obviously our industry needs computer security expertise and it becomes the academician responsibility to fill the gap. The development of Information Security program framework is one way to assist in producing graduates with appropriate information security specialized knowledge. Information Security has become a specialized field in this era.

A study by Bradley and Kay at 2004 has identified a shortage of security expertise. This shortage could be remedied by increasing and developing security education as specialized collegiate degrees programs with security related courses.

Hence, this project is intended to develop an information security curriculum framework for undergraduate program in order to provide accurate and proper knowledge for graduate to fulfill industry requirement.

1.3 Problem Statement

Currently, Information Security is a new topic at Malaysian hot discussion. In globalization, information security is very important to hold back the significant on information with the intention that exploitation from irresponsible people. For the reason with the intention of awareness to secure the vital information, certain of highest institutions in Malaysia would like to produce a new program in consequence to Information Security but until now, nobody of highest institution within Malaysia contain a genuine program in information security.

1.4 Project Objective

There are three objectives for this study. The objectives are:

i) To identify the IS curriculum learning outcomes.
ii) To design the IS curriculum content and its structure.
iii) To verify the propose curriculum framework for undergraduate program in Information Security (IS).

1.5 Project Scope

This study reviewed curriculum design approach and also reviewed existing curriculum framework design, especially for IS program. Besides, this study is focuses to identify the curriculum learning outcomes, the core knowledge area and the curriculum structure.

1.6 Summary

This chapter provides an overview on the purposes and needs to develop this project. The demand in the job market and incidents that involve IS expertise shows that it is relevance to develop IS program in Malaysia. The project scope or boundaries is highlight as well. In the next chapter, literature review is conducted to obtain valuable input to complete this study.

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