

ACADEMIC ACHIEVEMENT REPORT AND ANALYSIS SOFTWARE

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This report is submitted in partial fulfilment of the requirements for the award of Bachelor of Electronic Engineering (Computer Engineering) With Honours

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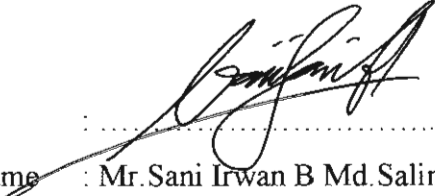
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Special dedicated to my beloved parents, family, lecturers and fellow friends, who had strongly encouraged, help and supported me in my entire journey of learning.

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ABSTRACT

Universities in Malaysia are practicing an education model which is known as Outcomes Based Education. This model involves developing learning outcomes for a certain course and those works are usually done manually where all procedures are done on paper. Therefore, there is a need for academic performance analysis software that will cater current sophisticated analytical process in education system. The academic performance analysis software performs all analysis in programming level and provides standard documentation for reporting. Therefore, this is a software-based project that provides numerical analysis on academic achievement. The thesis concentrates on how to develop the academic performance analysis software that can be used by every lecturer in faculty. This project includes interface development, database development and documentation template. Interface development is focused on user graphic interface development where a proper interface with user-friendly and simple elements is designed. Meanwhile, the database development is focused on the construction of database for data storing and data analysis. In addition, the documentation template concentrated on creating a standardize template for documentation for reporting. Visual Basic 6, Microsoft Access and Microsoft Excel are utilized as software development platform throughout the project.

ABSTRAK

Universiti di Malaysia mengaplikasikan satu model pendidikan yang dikenali sebagai Pembelajaran Berasaskan Hasil. Model ini melibatkan proses menghasilkan Hasil Pembelajaran untuk sesebuah kursus dan proses itu biasanya dijalankan secara manual iaitu semua proses dijalankan di atas kertas. Dengan itu, adanya permintaan untuk perisian penilaian pencapaian akademik yang akan merangkumi proses penilaian terkini dalam sistem pendidikan. Perisian ini akan melakukan kesemua proses penilaian secara automatic dan memberikan satu keadah dokumentasi yang tersusun. Oleh itu, ini adalah satu projek yang berasaskan perisian untuk menghasilkan applikasi penilaian kepada pencapaian akademik. Tesis ini akan tumpukan bagaimana menghasilkan perisian penilaian pencapaian akademik yang boleh digunakan oleh semua pengguna. Projek ini merangkumi bahagian penghasilan GUI, bahagian penghasilan *database* dan akhir sekali adalah template dokumentasi. Bahagian penghasilan GUI akan mengfokus untuk menghasilkan GUI yang sesuai untuk pengguna serta mudah difahami and ringkas. Manakala untuk bahagian penghasilan *database*, ia akan mengfokuskan dalam rangka sesebuah *database* itu yang akan digunakan dalam penyimpanan maklumat serta penilaian maklumat. Bahagian seterusnya iaitu template dokumentasi akan menumpukan dalam proses menghasilkan satu template yang sesuai dan umum yang akan digunakan semasa membuat domentasi. *Visual Basic 6*, *Microsoft Access* dan *Microsoft Excel* telah digunakan demi untuk menghasilkan perisian penilaian pencapaian akademik.

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LIST OF ABBREVIATION

ARA2009	- Academic Achievement Report And Analysis Software
OBE	- Outcome-Based Education
PEO	- Program Educational Objectives
PO	- Program Outcomes
EAC	- Engineering Accreditation Council
LO	- Learning Outcomes
ID	- Identification
DAO	- Data Access Objects
VBA	- Visual Basic For Applications
IDE	- Integrated Development Environment
DLL	- Dynamic-Link Library
OLE	- Object Linking And Embedding
API	- Application Programming Interface
OS	- Operating System
LO CQI	- Learning Outcomes Continual Quality Improvement
PO CQI	- Program Outcomes Continual Quality Improvement
BENC	- Bachelor of Electronics Engineering (Computer Engineering) with honours
BENE	- Bachelor of Electronics Engineering (Industrial Electronics) with honours
BENT	- Bachelor of Electronics Engineering (Telecommunication Electronics) with honours
BENW	- Bachelor of Electronics Engineering (Wireless Communication) with honours
SQL	- Structured Query Language

CHAPTER I

INTRODUCTION

1.1 Project Introduction

Nowadays, current trend of education model adopted by Malaysia in all universities is Outcomes Based Education model. There are certain rules that needed to be obeyed in this education model such as developing learning outcomes for a certain course and those works are usually done by manually that is all procedures is done in paper-work. Thus there is a need for academic performance analysis software for benchmarking and enhancing performance of education system. Current sophisticated analytical process in education system is not flexible and do not cater the implementation method adopted by universities.

The project is a software-based that provides numerical analysis on academic achievement of a certain faculty. The software is based on Microsoft Visual Basic while can be integrated as network-based system. All the required data are input by user and stored inside the database in Microsoft Access format while other prefixed data or description also are store in Microsoft Access. The sample data comes from reports of subject's achievement obtained from faculty's lecturer and the result analysis is done accordingly.

The software is also provide compatibility as it can present reports and outcomes through various other software such as excel, word for general

consumption. The software also can prints out the report and analysis result in plain paper for user to carry around. The software also considers several access categories such as lecturer privilege's and administrator's privilege.

1.2 Project Objectives

There are four objectives had been come out for the success of this project and there are listed as below:

- i. Design the interface of the software, simple interface that user friendly.
- ii. Integrate output of the software to be compatible with other application such as Microsoft Excel.
- iii. Integrate the software as a network-based system.
- iv. Integrate Microsoft Access with Visual Basic 6 as the backbone of this software.

1.3 Problem Statements

Current trend of academic achievement reporting and analysis is done manually where lecturers need to write out everything and do analysis by themselves. Therefore, this project is to design software that can help lecturers to do those tasks and provides numerical analysis automatically. Thus, the reason for the development of this project is to overcome several problems such as:

- i. Current operation is using manual calculation to provide data analysis. This will lead to incorrect results thus provide inaccurate decision.
- ii. Current system is inefficient in terms of updating data and organization.
- iii. Reporting method of results and data analysis is not standardized and varies from format to another.

1.4 Project Scope

The scope of the project has been set in order to make sure the project stand on the right course and using the appropriate resources to accomplish this project. There are several scopes have been set and there are shown as below:

- i. This project uses Visual Basic 6 to design the interface of the software and also control the process flow of the software.
- ii. Microsoft Access is used as database foundation to store any data get from user and use it in next level for analysis purpose.
- iii. Microsoft Office 2007 also is used to export the analysis report to other formats such as Excel or Word.
- iv. The target user for this project will be concentrated on Administrator and Lecturer. Administrator will has full privileges over the software while Lecturer will have limited privileges.

1.5 Report Layout

The project thesis is done basically to document all the conceptual theories, activities and outcomes of the project that is relevant to the project progress. The thesis consists of five main chapters where all the chapters are essential to describe all the architecture and functionality of the project itself.

Chapter 1 describes briefly about the project's introduction. It is also discuss about the objectives, scopes of project and project application. Chapter 2 describes about the literature review that consists of the background of the project. It also describes about the same projects that have been done of previous person and it is more to make research on different, advantages and disadvantages of previous project. Chapter 3 describes about the methodology of this project. It defines the physical block diagram, system overview and flow chart operation of the Academic Achievement Report and Analysis software. Chapter 4 describes matters regarding results and analysis on the subjected items. This chapter will discuss about the interface of the software, debugging of that software and also system testing on other

computer. Chapter 5 describes about conclusion and recommendation. This section will conclude about knowledge that comes out from the project and some recommendation to the further study regarding to the upgrading option for Academic Achievement Report and Analysis software.

CHAPTER II

LITERATURE REVIEW

2.1 Introduction

Outcome-based Education (OBE) is a method of teaching that emphasizes what students can actually do after they are trained. Decisions on teaching and learning are made based on how best to facilitate the desired outcome which in turn leads to a planning process that is different from traditional educational planning. In OBE, the desired outcome is first identified before the curriculum is created to support the intended outcome (Fitzpatrick, 1995; Furman, 1994).

In industrial training program such as the teaching program for graduating Education students, the students are required to keep journals or learning logs. Journals, particularly the type that emphasizes the students' reflections on their performance, are believed to enlighten the students and their lecturers on issues such as the students' level of motivation, the challenges faced and how those challenges were overcome (Faizah, 2004). Indirectly, this could lead to better observations of the students' demonstration of what they have been trained for.

2.2 The Malaysian Engineering Education Model

In order to overcome the capabilities of engineers in the fast changing world, there is a need to have great emphasis on the knowledge of engineering science so that they are flexible and capable to move across several engineering disciplines. As a result, a suitable training is required to prepare engineers who are capable to perform useful function in the industry, able to communicate effectively, manages or leads organization and having innovative thinking skills.

To prepare engineers ready for future challenges, five criteria were identified as important in the Malaysia Engineering Education Model and they are:

- i. **Scientific strength**, which provides engineers who are innovative, able to work in research and development activities, and adaptable in different engineering fields.
- ii. **Professional competencies**, which provide engineers who are able to identify, formulate, and solve engineering problems, responsible professionally, and able to use techniques, skills, and modern engineering tools for engineering practice.
- iii. **Multi-skilled**, which provides engineers who are able to work in different engineering fields and function in multidisciplinary teams
- iv. **Well-respected and potential industry leader**, which provide engineers who are able to understand the impact of engineering solutions in a global/social context, knowledgeable of contemporary issues, able to communicate effectively and be involved in community or social projects.
- v. **Morally and ethically sound** which provide engineers who understand ethical and moral responsibility.

Besides, six skills and competencies, as shown in Table 2.1 are identified as highly necessary in preparing engineering students to satisfy the five criteria mentioned. There is a freedom to emphasize on scientific or professional skills and competencies or balancing both components. Appropriate emphasis on global and strategic skills, adequate exposure to industrial and practical skills and incorporating humanistic skills also allow completeness in the training.

Table 2.1: Recommended Skills and Competencies in MEEM

Skills & Competencies	Characteristics	Typical Subjects (Civil)
Global & Strategic	These skills enable students to adapt easily within the borderless world that is experiencing rapid expanding knowledge.	Languages, Strategic Planning, Information Technology, Multimedia, International Business
Industrial	Skills that go beyond the scientific and professional and which are necessary in the advanced phase of the graduate's career.	Environment, Management Finance, Economics, Engineers in Society, Communication Skills, Law, Occupational Safety, Human Resource Management, Innovation
Humanistic	These skills help create a balanced engineer with high ethical and moral standards.	Islamic Civilization, Asian Civilization, Nationhood, Islamic Studies, Moral Education,
Practical	These enable students to be directly involved with hands-on activities or real-life situations, thus providing the basis for integrating the intra and inter engineering and non-engineering knowledge	Final Year Project, Industrial Project, Practical Training, Engineering Design
Professional	Such skills cover technical competency aspects required to perform specific engineering tasks.	Professional Subjects in Civil Engineering e.g. Foundation Engineering, Water & Waste Engineering, Highway Engineering, Concrete Structures, Public Health Engineering, Surveying
Scientific	They enable students to have a firm foundation in engineering science, thus enabling them to realign themselves with the changes in emphasis in the scientific field and to develop an interest in R&D and design.	Engineering Sciences e.g. Engineering Mathematics, Engineering Materials, Fluid Mechanics, Engineering Statistics, Thermodynamics, Engineering Mechanics, Programming

2.3 Outcome Based Education

There is no one single model to describe OBE. According to Faouzi et al (2003, pp. 204), the frameworks for OBE is to share an emphasis on systems-level change, observable, measurable outcomes, and the belief that given time, all students can learn. Glatthorn (1993) and Guskey (1994) also postulate that the shift towards OBE is resulted from worries about the traditional education system. According to them, there is a classic belief that the input the traditional education system provides cannot prepare students for life and work in the twenty-first century. Hence, there exists a need for a more effective approach which focuses on the potential and actual abilities of the students after they are trained.

The following are the three important aspects of OBE:

- i. The focus on outcomes
- ii. The curriculum design process which starts from the exit level outcome downwards.
- iii. The responsibility of the institution and teacher/trainer to supply appropriate learning experiences for the success of all students.

On the part of the curriculum design and implementation of the curriculum, there are several conditions which are controllable and they include:

- i. Where the instructional focus is placed.
- ii. How long, how often, and when the time for learning is provided.
- iii. What learning is expected from whom, and how it is rewarded.
- iv. How the curriculum is designed and organized (Gerber, 1997).