

# UNIVERSITI TEKNOLOGI MARA FACULTY OF INFORMATION MANAGEMENT

INDUSTRIAL TRAINING REPORT:
BAHAGIAN PENYELIDIKAN, JARINGANINDUSTRI DAN ALUMNI
(UITM CAWANGAN MACHANG KELANTAN)
BUKIT ILMU, 18500 MACHANG, KELANTAN

SPECIAL PROJECT : DEVELOP E-SCHOLAR TRACKING SYSTEM (e-STRAs)

BY MUHAMMAD AKIF BIN ABDULLAH 2015110975

IM245 - BACHELOR OF SCIENCE (HONS.)
INFORMATION SYSTEM MANAGEMENT
FACULTY OF INFORMATION MANAGEMENT
UNIVERSITI TEKNOLOGI MARA KELANTAN

01 FEBRUARY 2018 - 30 JUNE 2018

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FACULTY SUPERVISOR
MADAM IZZATIL HUSNA BINTI ARSHAD

REPORT SUBMITTED IN FULLFILLMENT OF THE REQUIREMENT FOR THE INDUSTRIAL TRAINING FACULTY OF INFORMATION MANAGEMENT UNIVERSITI TEKNOLOGI MARA KELANTAN

01 FEBRUARY 2018 - 30 JUNE 2018

### **DECLARATION**

I hereby declare that this is my original work. I have not copied from any other student's work or from other sources. I am also declare that no part of this report has been published or submitted for publication except where due to reference or acknowledgement is made explicitly in text, nor has any part been written for me by another person. I confirm that I have read and understood the UiTM regulations with regards to plagiarism and will be penalized by the university if found guilty.

Signed by

Muhammad Akif Bin Abdullah

2015110975

Date of submission: 12 July 2018

**ABSTRACT** 

This report was completed during the industrial training for the period 1st February 2018

until 30th June 2018 at Universiti Teknologi MARA Cawangan Kelantan at Department of

Research, Industrial Linkages and Alumni (PJIA). Monitoring and tracking lecturers career

path and success in higher institution is crucial to the management of the university and

indirectly to lecturers themselves. During the industrial training period, a system on tracking

the lecturers progress and performance was developed as an early indicator of problems that

need to be corrected and improve. This system was named as e-Scholar Tracking System (e-

STRAS) which able to improve and enhance the performance of lecturers in line with

strategic and operational objectives of the university.

Keywords: e-STRAS, Progress, Performance, Researchers

ii

### **ACKNOWLEDGEMENT**

IN THE NAME OF ALLAH, THE MOST GRACIOUS AND THE MOST MERCIFUL

I am grateful to Allah S.W.T for giving me these strengths and His blessings in completing this project successfully. I would not be able to finish this project within the given time without His help.

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Finally, an honourable mention goes to my parents and family for their endless love, pray, sacrifice, patience, and understanding throughout the completion of my project. May Allah bless all of you. Thank you.

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### **CHAPTER 1**

### INTRODUCTION

### 1.1 Background of Organization

This section covers the background and a bit of history of UiTM Cawangan Kelantan (UiTMCK), organizational's vision and mission, and organizational chart of UiTMCK.

### 1.1.1 Profile of UiTM Cawangan Kelantan (UiTMCK)



Figure 1.1 Universiti Teknologi MARA Cawangan Kelantan (UiTMCK)

Universiti Teknologi MARA (UiTM) Cawangan Kelantan (UiTMCK) was formerly known as Institut Teknologi MARA (ITM). The ninth branch campus establishment was officially introduced on the 1st July, 1985 by Y.A.B. Tan Sri Dato' Haji Mohamad bin Yaakob, Menteri Besar of Kelantan at that time. The establishment of UiTM was the outcome of the collaboration between UiTM and the Federal Government. As a result of this close cooperation, Federal Government allocated 12 acres of land property owned by Majlis

Pengakap Negeri Kelantan at Kem Kijang, 8 kilometres from the city of Kota Bharu. Renovation of a few old building and the construction of new buildings were funded by Federal Government at a cost of RM1.5 million.

The first batch of 185 students was taken for the semester of July – December 1985. In the earlier stages, a number of employees were only 71 where 7 of them were lecturers and the other 64 were non-academic staff. The construction of permanent campus was initiated in 1993. Federal Government allocated 200.32 hectares of land at Bukit Anjing, Machang for the construction. Bukit Anjing was then been reestablished to Bukit Ilmu, which was an inspiration from former Director of ITM, Allahyarham Dato' Nik Abd Rashid Nik Abd. Majid. The name Bukit Anjing was changed as it is compatible with the function of providing learning opportunities in various knowledge disciplines for Bumiputras. The official resettlement to Machang campus began on the 1st January, 1996. UiTMCK formerly known as ITM was upgraded to Universiti Teknologi MARA on 26th August, 1999. Today, UiTMCK is emerging to meet the needs of a premier university, in the state of Kelantan in particular.

### 1.1.2 Vision

Enhance knowledge and expertise in all areas of program delivery through professional, research and community service based on the values and ethics of professionalism.

### 1.1.3 Mission

To be the finest University-based scholarly and academic excellence to lead the dynamism in all areas of professional world class so that established graduates who are competitive, global and ethical.

# 1.2 UiTMCK Organization Chart



Figure 1.2 UiTMCK Organizational Chart

### **CHAPTER 2**

### ORGANIZATION INFORMATION

### 2.1 Profile of Department of Research, Industrial Linkage, Community & Alumni

Research, Industry & Alumni Division or Bahagian Penyelidikan, Jaringan Industri dan Alumni (PJIA) was established on 01 January 2007 which started and operated as a small unit, Research Management Unit (RMU). Over the years It has been expanded as one of the main divisions of UiTM Kelantan Branch which provides various facilities to support academic development programs and activities such as research, writing, publishing, consulting and commercialization of lecturer's research products.

The main function of the PJIA Division is to manage matters relating to the management of research, writing, publishing, entrepreneurship, consulting, alumni, intellectual property protection and commercialization. The PJIA Division is also entrusted to assist academics in the field of writing by increasing the value-added of research results for publication in high-impact journals. Apart from that, the PJIA division also collaborates with government agencies, private organizations and communities to provide programs that can enhance graduates' marketability, generate research opportunities and provide community services to surrounding people.



Figure 2.1 Bahagian Penyelidikan, Jaringan Industri & Alumni (PJIA)

### **2.1.1** Vision

The PJIA vision is to be an excellent management center for research and development, consultancy, research and industrial networking and entrepreneurship.

### 2.1.2 Mission

PΠA mission is to enhance the university's knowledge, creativity and innovation capabilities through quality services and become the bridge of information, knowledge and technology between universities and industries.

### 2.1.3 Objectives

The objectives of the department are:

- Manage, coordinate and provide services needed for successful research, consulting and publishing research.
- ii) Help to explore new areas through innovation and creativity.

- iii) Set up groups of research and consultancy among lecturers.
- iv) Disseminate information and provide training in research, consultancy and publishing research.
- v) Assist industry in collaboration with the research, development, commercialization and consultancy.
- vi) Creating opportunities to UiTM and industry through activities related to student and addition knowledge and skills and employability of students.
- vii) Relationship with the community to build progressive community.
- viii) Initiate students entrepreneurial activities..
- ix) Nurture innovation among students

### 2.2 Department Organization Chart

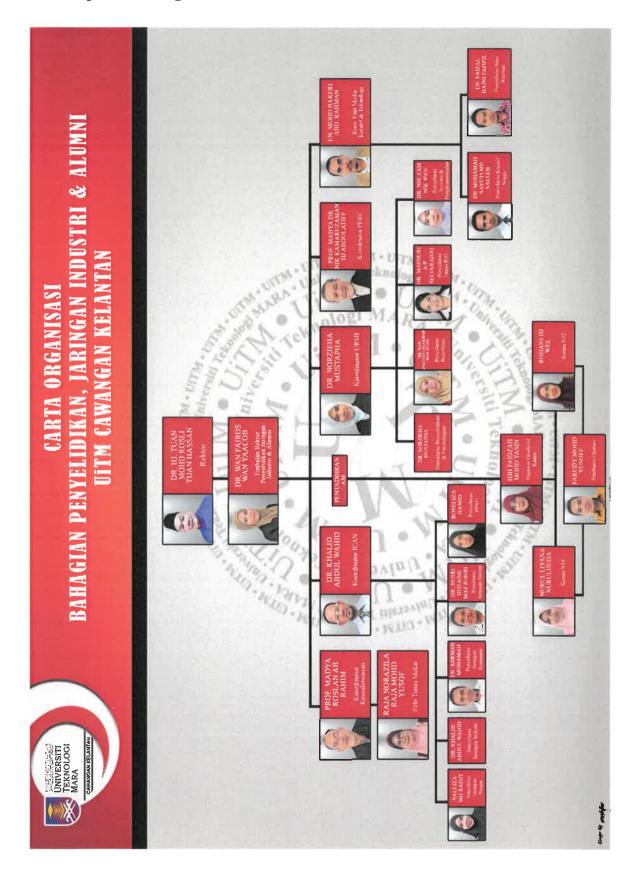


Figure 2.2 PJIA Organizational Chart

### 2.3 Department Function

There are several units hold by this department. The units and the function were explained in detail as follows.

### i) General Administration Unit

This department consist with three staff that responsible to do all the office work include make letter, photocopy, manage file and also management work. They also responsible to handle meeting that related to this department. Besides that, all record will be handling by this department such as receiving letter, packaging, and file.

### ii) URMI (Unit of Research Management & Innovation)

URMI is a department that will handle all the research management, publishing, consultation and commercialization.

### iii) ICAN (Industrial, Community and Alumni Network)

ICAN is a unit that responsible on industrial student, industrial network, society network, and alumni. It also functions by creating collaboration between universities, community, and alumni. Then, increase the availability of entrepreneurial graduates from student.

### iv) MASMED (Malaysian Academic of SME & Entrepreneurship Development)

The responsibility of this unit is to promote product commercialization among the Bumiputera entrepreneurs. Then, it also support University Entrepreneurship thrust as outlined by Ministry of Education. To encourage entrepreneurship values among student and staff in increasing the employability.

### v) PERC (Poverty Eradication Research Centre)

It responsible on value added product research and improvement of socio economic project.

# vi) UCMT (Unit of Creative Media & Technology)

This department more focuses on talent achievement, and related to art. Therefore, it responsible to handle platform that combine on creative art.

### **CHAPTER 3**

# INDUSTRIAL TRAINING ACTIVITIES

# 3.1 Training Activities

During the internship programme, there were several activities that have been carried out. The activities were summarized and listed as follows.

# 3.1.1 Department of Research, Industrial Linkage, Community & Alumni

# i) Department Organization Chart

The contribution made for the PJIA department is by redesign the department organizational chart.



Figure 3.1 The chart is shown as in Chapter 2 in section 2.2.

### 3.1.2 Persatuan Alumni UiTM Kelantan (PAUK)

This Alumni Community was established allows to both re-connect with old classmates as well as enabling to utilize the trusted Universiti Teknologi MARA (UiTM) environment to expand your professional network. In addition, this community also allow to find and reminisce with fellow graduates, see what they have been up to and stay in touch.

Contributions or activities made for this alumni community during my internship programme were designing the PAUK food stall banner, food wrap paper stamp and PAUK's sticker. The figures are portrayed as follows.

### i) Design PAUK Food Stall Banner



Figure 3.2 PAUK Food Stall Banner

### ii) Design Stamp for Food Wrap Paper



Figure 3.3 PAUK Food Wrap Paper Stamp

### iii) Design Sticker for PAUK



Figure 3.4 PAUK Sticker

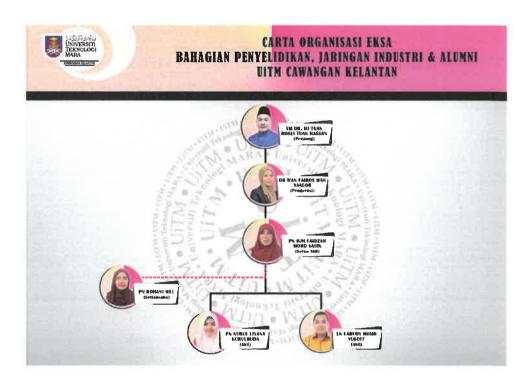
### 3.1.3 Ekosistem Kondusif Sektor Awam (EKSA) Programme

EKSA or Ekosistem Kondusif Sektor Awam is a program that was introduced to replace the practice of 5S activity. This step is in line with the efforts to strengthen the organizational culture of high performance and innovative among public sector agencies by providing the environment, culture and values that will be practiced by the public sector agencies. Before

the implementation of the EKSA, the trainee and the administration staff in PJI conduct the meeting.

Contributions or activities made for this alumni community during my internship programme were designing the EKSA organizational chart, the recycling bins and the recycle logo. The figures can be seen as follows.

### i) Design EKSA Organizational Chart



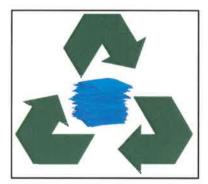
Figures 3.5 EKSA Organizational Chart

# ii) EKSA Logo



Figures 3.6 EKSA Logo

# iii) Recycle Logo and Recycle Bins







Figures 3.7 Recycle Logo



Figures 3.8 Recycle Bins

### iv) EKSA Activity



Figures 3.9 EKSA Activity

### 3.1.4 Research, Industry & Alumni Community (ReIACT Day) 2018

ReIACT Day 2018 was conducted as to give exposure to campus, industry and alumni in relation to the needs of the relationship between university, alumni and industry as well as their respective roles and functions that need to be emphasized to improve relationships both for mutual benefit.

Contributions or activities made for this alumni community during my internship programme were designing the posters, buntings, banners, signage board, backdrop programme and layout event. The related figures are shown as follows.

### i) Design ReIACT Day Poster/Banner/Bunting



Figures 3.10 ReIACT Day Poster



Figures 3.11 ReIACT Day Banner



Figures 3.12 ReIACT Day Bunting

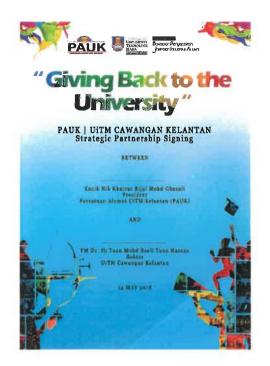
# ii) Design Layout Event

### PETA LOKASI AKTIVITI REIACT DAY 2018



Figures 3.13 ReIACT Day Layout Event

### iii) Design Signing Board (PAUK - UiTMCK)





Figures 3.14 ReIACT Day Signing Board

### iv) Design Backdrop for Alumni Talk Event



Figures 3.15 Alumni Talk Backdrop

### v) Design Alumni Talk Bunting



Figures 3.16 Alumni Talk Bunting

### 3.1.5 Others

Other task which has been assigned during the internship is designing a board of the history of UITMCK. This board is placed in front of student affairs department door.

### i) Design UiTMCK History Board



Figures 3.17 UiTMCK History Board

### ii) Design Participation Certificate



Figures 3.18 Certificate

### 3.2 Special Project

The trainee has been given a special project in order to complete it during the industrial training of 5 month period by creating a new system for IID 2018 competition. The system is called e-Scholar Tracking System (e-STRAS).

### 3.2.1 Project Overview

e-Scholar Tracking System (e-STRAS) is a tracking system aims to provide management with regular feedback on lecturer's progress and performance and early indicators of problems that need to be corrected and improved. This includes reporting on actual performance against what was planned or expected. The system will proactively help improve and enhance the performance of lecturers in line with the strategic and operational objectives of the university. At present, many systems were developed independently to meet the necessity of certain tasks. Different system were developed such as personal records for human resource department, grant records for research department, publication records for library department and so on. This has made it difficult for the management to update the lecturers' performance when the data needed comes from diverse systems and only can be accessed by the lecturers themselves.

Monitoring and tracking lecturers career path and success in higher institution is crucial to the management of the university and indirectly to lecturers themselves. Currently, in Universiti Teknologi Mara (UiTM) Kelantan, most of the data about lecturers are stored and managed at the main campus in Shah Alam. Since UiTM have many branches, ad-hoc data on lecturer status and progress such as information needed by the management to trace performance and

assist them on lecturer's career path is difficult to be retrieved. Lacking of this information leads to several risks such as poor or untimely reporting of lecturer's status, audit findings, inefficient and poor management of lecturer's confirmation and promotion. Thus a tracking system is needed to clearly guide and indicate the current and expectation pathway for promotion and development of lecturers. Therefore, this system is develop a monitoring system for measuring and managing lecturers' career development known as e-Scholar Tracking System (e-STRAS).

This system is a system designed to help the university management team in monitoring the performance of lecturers and indirectly for lecturer's self-evaluation. The system is developed using software tools such as PHP Framework and MySQL. This system will be capable to update lecturer's personal details and also their publication, research, innovation, and reward. Other than that, the system will be able to monitor performance of lecturer either individually or based on faculty zone. In this system, the lecturer are divided into six different zone based on the criteria fulfilment.

Zone	Blue	Yellow	Orange	Red	Maroon	Green
Crite	✓ <3 years	✓ 3-5 years	✓ 3-5 years	✓ < 5-10	✓ >10 years	<b>√</b> >10
ria	✓ DM45	✓ DM45	✓ DM45	years	✓ Confirme	years
	× Confirmed	× Confirmed	✓ Confirmed	✓ Confirmed	d	✓ Confirm
	× PhD	× PhD	× PhD	* PhD	✓ DM52	ed
				* DM52	✓ PhD	✓ DM54
					➤ DM54	✓ PhD

Table 3.1 Colour of Zones

### 3.2.2 Methodology

In the methodology, it discusses about the type of system methodology, the development that will be used as a framework in the development. According to Jason Charvat, methodology development means the ways to develop the project from segment to segment. The choices of a right development will ease the product development along with the right time segment.

There are lots of methodology models that can be used to develop a system such as waterfall model, prototype model and so on. Each of these models has a varied concept. Therefore, choosing the right methodology is very important in order to make sure the system that are develop can be done in a systematic and efficiently according to phase that has been set. In this system, framework is built to structuring, planning and controlling the development process that will be built. The methodology model that will be used for the e-STRAS is the Waterfall SDLC that has five phases.

In order to develop an organized, orderly and systematic system calls for neat design so that every system built reach the specification and the main objective in developing the system that can facilitate all the users. A systematic and steady planning can develop a system that can be accepted and used by the user.

The selection for Waterfall Model for this project have five phase for the development of the system is planning phase, analyzing phase, designing phase, implementation phase and the last phase is maintenance phase. There is probability of recurrence in application of each phase if there is any failure along the way of completing the process for the next phase.

The recurrence phase will be done if the previous phase cannot be implement or deadlocked. For example, if the designing phase for some reason failed to be implement, therefore the recurrence for the analyzing phase will be done to analyze and repairing for the purpose to ease the designing phase to be done. This process will keep on repeating until the designing phase is successful and the same thing will be done for the other phase. Figure 1.1 shows a more detailed about the phases that are used in the development process.

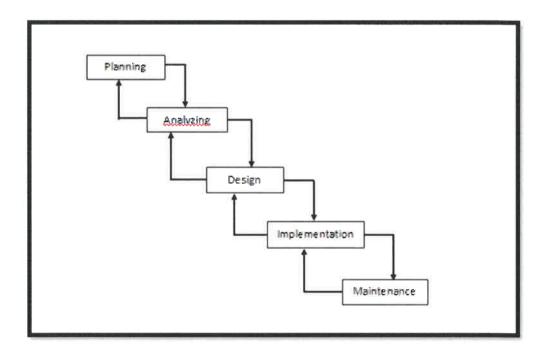


Figure 3.19 Waterfall Models

### 3.2.3 Planning Phase

Planning phase is a part of processes that should be go through to identify the problems that arise in understanding the system and specification before any system are develop. In this

phase, timeframe and the flow of system development are planned and framed to make sure the development of the system is running smoothly and can be completed at the specified time. The activity that was done in this phase is discussion and consultation with the supervisor which is Prof Madya Dr. Hj. Ghazali Osman to discuss regarding the selection of the system title that it considers appropriate for developing the system. e-STRAS is then chosen as the system that will be developed.

In the planning phase, the documentation about title introduction, the assessment problem statement about the weaknesses of the existing system, identify the objective and scope of user that will use the system. In this phase also, the selection of methodology is done to determine the development of the system can be implemented following the specified time so that the flow of the system development is more consistent and systematic. The selection is done based on suitability of the system that will be developed. Every phase of methodology method that was selected is studied to do the planning to be designed for the suitability of the system that will be developed. The Waterfall Model that was adapted from the Alan Dennis and Barbara Haley Wixom is chosen based on suitability of each phase that may repeat the previous phase. If the next phase cannot be implemented, the repetition of phase will be done until the phase is completed. The process of system development flow is planned and framed in this planning phase. Each flows of the system development flow are included in the Gantt Chart.

### 3.2.4 Analyzing Phase

The analyzing phase are a crucial phase that need to be done in the developing the system. The study about problems, objective and scope will be determined in this phase. In this phase the user scope will be analyze in order to gather information of the numbers of user that will be using the system. There are two scopes of users that will be using the system which is the management (Rector, Deputy Rector from HEA and PJI, Assistant Rector, and Head of Faculty) and the lecturers.

The problem background study is analyzed to develop a better system and then ease the admin to manage the system more systematically. In order to find a compatible system that are using the complaint system, the research is by finding the compatible system from another university in Malaysia that already implemented the online application for students' system online. The comparison with a compatible system to find out the strength and weaknesses of the system, this comparison is done to develop a better system. Other than that, information on development of the system can also be found from other sources such as books, journal, internet and other resources that can be used as guidance. In this phase, the process flow is done and sketch which is flow chart, data flow diagram (DFD), and entity-relationship diagram are generated to get a real picture of the process system flow clearer and organized.

The interviews are done to analyze the needs that should be included in the development of the system, e-Scholar Tracking System (e-STRAS). This is because through the interview that has been done it ease the information collection process in order to develop the system.

# 3.2.5 System Requirement Justification

The software and hardware requirement are analyzed to find out the total of hardware and software that will be used rendering the suitability of the system that will be developed. Table 1 and table 2 showed explanation of system development requirement.

No	Hardware	Description
1	ACER Monitor 17.5" (White)	<ul> <li>21.5-inch Acer G215HV Widescreen LCD Monitor General Features: Black color</li> <li>21.5-inch widescreen LCD display 1920 x 1080 maximum resolution 16:9 aspect ratio</li> <li>0.248 mm pixel pitch 200 cd/m2 brightness 5,000:1 dynamic contrast ratio</li> </ul>
2	Printer Canon PIXMA	<ul><li>Ink efficient</li><li>Wi-Fi connection</li><li>Scanner</li></ul>

Table 3.2 Hardware requirement

No	Software	Description
1	Google Chrome	The Google Chrome is a web browser which available for Windows, Mac OS X, Linux Android and many more.  Chrome was developed by Google in 2008 which is one of the popular web browsers.
2	Mozilla Firefox	Mozilla Firefox is a one of the web browser gives users a simple interface and fast for user. Firefox also one of the popular web browser that people use.
3	Microsoft window 7	Windows 7 followed Windows Vista and featured various changes from prior operating systems. One of these was the Quick Launch Toolbar, which revolutionized how the users find various commands and menu options. Windows 7 also includes items like support for virtual hard disks, gaming additions, and other new features
3	Wamp	The acronym WAMP refers to a set of free (open source) applications, combined with Microsoft Windows, which are commonly used in Web server environments.  The WAMP stack provides developers with the four key elements of a Web server: an operating system, database, Web server and Web scripting software.

Table 3.3 Software requirement

# 3.2.6 Design

After the analyzing phase has been done, the third phase of System Development Life Cycle (SDLC) is continued which is design. In this phase, interface and database will be design in order to develop the system that has been planned. It is a design based on the need of the system.

Database is built in order to create the relationship between the entities. This process are translated into the flow chart diagram, data flow diagram (DFD) and entity-relationship diagram (ERD. All of the all incoming and outgoing system flows are implemented inside the database that has been built. The incoming data of the system, such as personal information of the lecturers are obtained from the lecturers that registered to use the system. After the lecturer has register, they can continue with other activities such as update information and so on.

Interface for each module is designed according to suitability of the system and are design to give satisfaction to the users that will be using the system. Apart from that, the data selection process and attribute for the database are also done in order to make sure that the database can be manage perfectly according to the interface module that has been done.

# 3.2.7 Implementation

Implementation phase is a phase where a system will begin to develop rendering to the planned according to the specification that has been stated. In this phase, each module of the system that has completed will be combined to be a complete system and after that are tested in the final phase which is testing phase. Database design and interface are merged to enable the system to be implemented and administered. In this implementation phase, the process of coding is done to enable the system to operate perfectly. This process is an important process to make sure the system is developed. It is used to connect between interfaces to another interface.

#### 3.2.8 Maintenance

Maintenance phase where is the system that have been tested and implement for the user's use. It is usually involves with the software that have been used to create or develop the system which for example it might be includes some minor of bug fixes that are usually made during this phase. Then, the clients or users may have the ideas or suggestions in improving the systems or they might be request for a new requirements for the system that will be creates or develops which it will need a modification. In this phase, it will increase the quality of the system which where it will be used by the clients or users directly. This phase is very important which It will maintain the existence of the system so that it will continue to be able to help the clients or users to use it.

# 3.2.9 Objective

The objectives of the project are as follows:

- To provide the management a way to monitor and manage lecturer's progress and performance through immediate feedback
- ii. To update the lecturers on their career path status according to pre-determined zones
- iii. To develop a monitoring system for measuring and managing lecturer's career development

## 3.2.10 Problem Statement

The problem statement of the project are as follows:

- i. The difficulty on retrieve the information to measure the lecturer's performance.
- ii. The difficulty for the management to update the lecturer's information.
- iii. Poor and untimely reporting of lecturer's status, audit findings, inefficient and poor management of lecturer's confirmation and promotion.

# 3.2.11 Target Users

The system developed for:

 Management: Rector, Deputy Rector from HEA and PJI, Assistant Rector, Head of Faculty (HOF).

# 3.2.12 Project Schedule

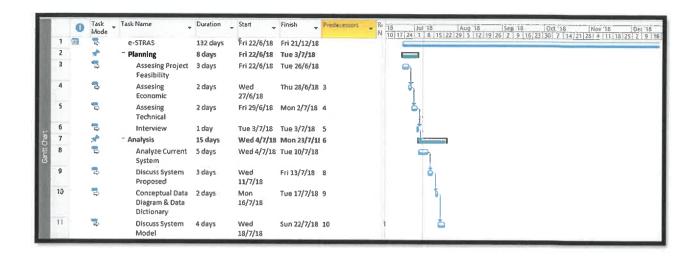


Figure 3.20 Gantt chart for Planning phase until Analysis phase

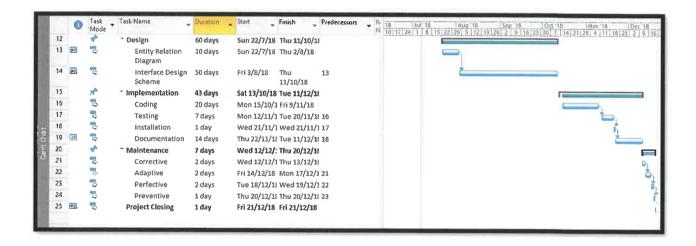


Figure 3.21 Gantt chart for Design phase until Maintenance phase

#### 3.2.13 Literature review

Literature review is done in order to discuss the direction and definition that are related to the e-Scholar Tracking System (e-STRAS). This study needs to be done to identify relevant methods, problems that might arise and was on how to prevent or overcome it.

According to Mohamed, N. M., et al (2001), literature review is a detailed review about a system development that encourage and promoting good idea interactions and balancing their own opinions with profound cooperation through the views and activities that have been made by the previous researcher in developing a system. Literature review is also main requirement in system developer to prove that system that will be developed already go through a detailed selection process in terms of software and hardware.

Comparison with equivalent system is also used as a guideline for researcher to develop a quality system and have its own standard. Knowledge and results of the research that was attained enable the system developer to search and generate ideas about ways to overcome problems faced by the existing system and developing a better application according to needs and wants of the application and users. With the existence of this literature review allows to identify problems and further find opportunities to make improvements. With existing knowledge and results of the study will help and then generate ideas about how to overcome the problems faced by the existing system.

## i) MySQL Database Management Systems

MySQL pronounced either "My S-Q-L" or "My Sequel," is an open source relational database management system. It is based on the structure query language (SQL), which is used for adding, removing, and modifying information in the database. Standard SQL commands, such as ADD, DROP, INSERT, and UPDATE can be used with MySQL. This MySQL we used to store the database in our system.

# ii) Wamp server software

WAMP stands for "Windows, Apache, MySQL, and PHP." WAMP is a variation of LAMP for Windows systems and is often installed as a software bundle (Apache, MySQL, and PHP). It is often used for web development and internal testing, but may also be used to serve live websites. You will be able to tune your server without even touching the setting files. Wamp Server is the only packaged solution that will allow you to reproduce your production server. This wamp serves we used to access the local host and database.

## iii) PHP (Hypertext Preprocessor)

PHP or also known as Hypertext Preprocessor is one of the programming languages in developing a website. PHP itself is known as Personal Home Page. According to Sklar, et al (2003), unlike ASP and ColdFusion, PHP is one of the open source language. To develop this system, PHP is used because it can be acquired and use for free. PHP provide technical support and is always improving and updating the main function of the PHP. PHP usually used together with software such as MySQL, TextEditor and Apache Server.

Other than that, PHP is also used on few other different platforms. PHP script can be run throughout the system operation such as Linux, Windows, Solaris, Open BSD, Mac OS and it also provides support to all major web server clients like Apache, IIS, IPlanet and others. Lastly, the used of PHP is used to develop the system, aims so that the source code can be modified for future use.

# 3.2.14 Analyze Other Comparable System

According to the research that has been done, there are two system that are compatible that can be compared with the propose system. The comparison is done to find out about the strength and weaknesses and also features that are available in that system. The comparable system is on the web page of Integrated RMI Services (iRMIs) and Publication Repository Information System Management (PRISMa). Integrated RMI Services (iRMIs) system.

Publication Repository Information System Management (PRISMa) is created to provide the current information on publication which it is a database management system of University Teknologi MARA (UiTM) that keeps all the research that have be done by academic or non-academic staff to publish it through online. Besides that, both of iRMIs and PRISMa systems have a several differences which it can be used by academic and non-academic staffs. The differences that have been found is about the functionality of both systems which iRMIs can manage and assists the researcher for making their research through online because of nowadays there are many materials and resources that can help them in researches. While that, the PRISMa is to help the researcher improving their reporting with systematic reviews and also as the storage of the journals and reports that have been published which for the

reviewing of quantities of the research that have been done by the researcher from academic or non-academic staffs.

In addition, the other differences that have been found for the both systems which IRMIS have been divided in 2 categories, IRMIS for submission of research report and IRMIS for application of research assistant. Those categories have their own purposes and functions to help the researcher in making their researches which the IRMIS for submission of research report it is to provide the academic staff or non-academic staff to submit and keep it their research report with efficiently. The other IRMIS for application of research assistant which is to provide the services for the researcher that assists them to complete the researches.

Furthermore, there are another differences between the both of iRMIs and PRISMa systems which for the iRMIs system is only use for the research that also provides some services that can assists the researcher to do their research while for the PRISMa system is use for the publication which the researcher can secure their research report with publish it in the system that have been provided.

## 3.2.15 System Requirements Analysis

After the information needed fulfill the scope of the system, the next process are describes the journey of this system by using data flow diagram. Analyze the needs of the e-STRAS system will refer to the illustrated description.

In this phase, the context, diagram and data flow diagram (DFD) are illustrated and implemented in order to design the system. Modules identified in terms of the development needs of this system, are staff module, research module and publication module. The important system requirements in the development of this system to meet the requirements of the users who use this system then implement the system requirements to function and meet the criteria that are already planned and framed to develop the system more systematically.

# 3.2.16 Context Diagram

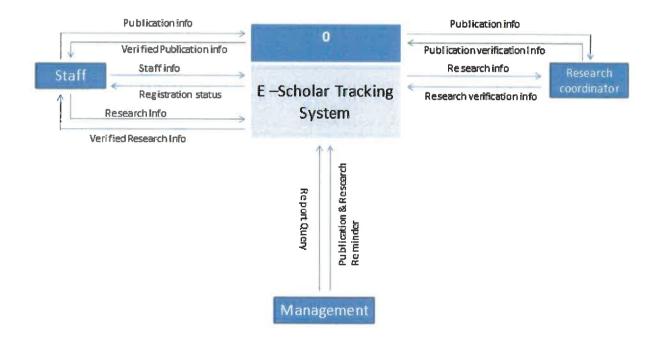


Figure 3.22 Context Diagram (CD)

Figure 5 shows the context diagram for the e-STRAS system. In the diagram there are three entities that are involved which s staff, management and research coordinator. The processes that involve in the staff entities are that the staff needs to register.

## 3.2.17 Data Flow Diagram (DFD)

Data flow diagram are used to show the flow of the system more details and in this diagram also use all the entities that exist to illustrate all the data flow of the system as illustrated in the context diagram.

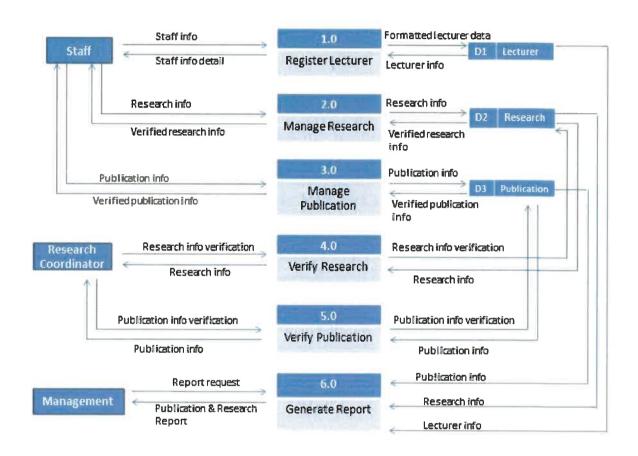


Figure 3.23 Data Flow Diagram (DFD)

Figure 5 shows the data flow diagram that has six processes. Processes that are involved in the system are the lecturer registration process, manage research process, manage publication process, verify research process, verify publication process and generate report process. All

the process involved has a relationship between the entities involved. The data flow diagram has three data stores which is lecturer, research and publication.

# 3.2.18 Flow Chart Diagram

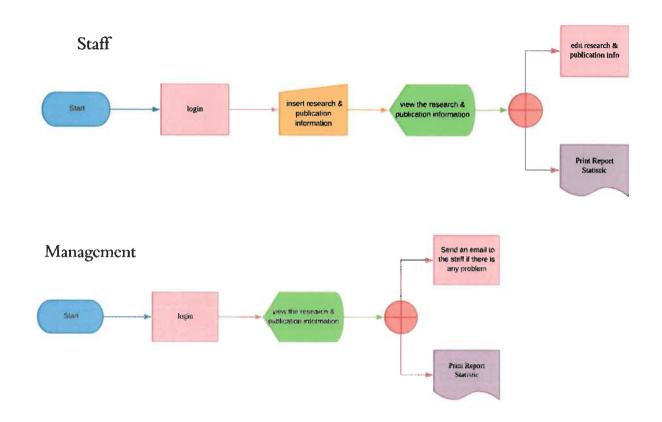


Figure 3.24 Flow chart of e-STRAS

Figure 6 shows the flow charts for the e-STRAS system. The flow chart are involved the process of how the data and information that have been access by staff and management which they can retrieve the data and information that they needs. The processes that involve this flow charts are ids and passwords of the user.

# 3.2.19 Database Design

Database design for the e-STRAS system is explained according to the tables that have been presented in order to give an idea of the actual database that are built.

# i) Staff Data Dictionary

Field	Data type	Size	Key
staff_id	int	6	Primary key
staff_name	varchar	255	-
gred	varchar	5	-
staffdateentry	date	-	-
staffdateappointment	date	-	-
faculty	varchar	100	-
confirmation	varchar	255	-
Research_id	varchar	255	Foreign key
Publication_id	varchar	255	Foreign key

Table 3.4 Data dictionary of staff

# ii) Research Data Dictionary

Field	Data type	Size	Key
staffid	Int	6	Primary key
researchid	int	11	-
rmifileno	int	11	-

varchar	100	-
varchar	100	-
varchar	500	-
varchar	100	-
date	-	-
date	-	-
varchar	100	-
	varchar varchar date date varchar varchar varchar varchar	varchar         100           varchar         500           varchar         100           date         -           varchar         100           varchar         100           varchar         100

Table 3.5 Data dictionary of research

# iii) Publication Data Dictionary

Field	Data type	Size	Key
pld	int	11	Primary key
rid	int	11	-
grantlevel2	varchar	100	-
projectitle2	varchar	500	-

Table 3.6 Data dictionary of publication

# iv) Admin Data Dictionary

Field	Data type	Size	Key
aid	int	11	Primary key
staffed	int	6	-
staffname	varchar	100	-
staffdesignation	varchar	100	-
staffpassword	varchar	255	-

Table 3.7 Data of dictionary admin

# 3.2.20 Entity-Relationship Diagram (ERD)

Entity relationship diagram is a data model technique that illustrates the flow of the data pertaining to entities between entities in a system.

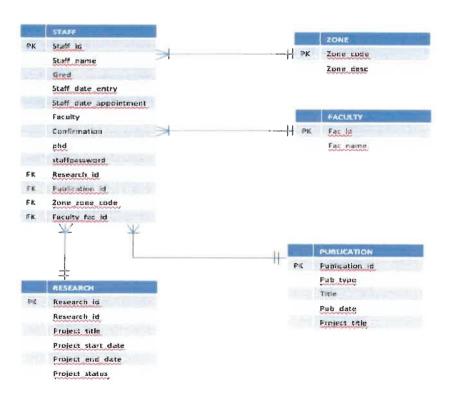


Figure 3.25 Entity-Relationship Diagram (ERD)

Figure 7 shows five entity relationship that are involve which is staff, research, publication, faculty and zone. Each of these entities has attributes and its own relationship. Attribute has main characteristic of each entities in the system. Meanwhile the relationship explains and describe about the interdependence of entities between entities. Entities that exist have primary key in order to connect the relationship between entities.

## 3.2.21 Interfaces

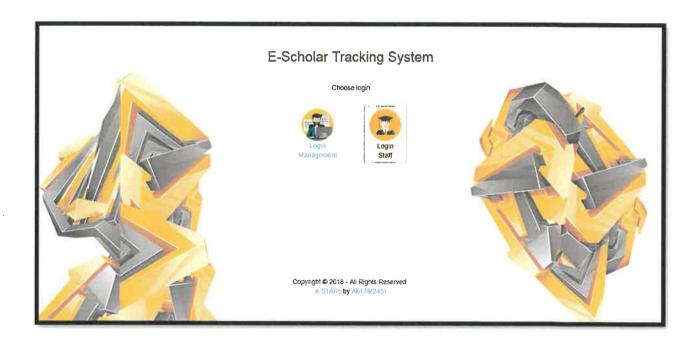


Figure 3.26 Login page for management and staff

# 3.2.22 Implementation

Early planning has been done and arranges neatly to ease the process of implementation phase done. In order to produce modules for this system, there are few activity involve in the process of software installation in order to develop the system.

Election of the software is important in developing a system, software such as WAMP are used in implementing the interface of the system. Process of sketching and modifying pictures, is used to design pictures and logo. For system development, programming language that been used is PHP (Hypertext Preprocessor).

## 3.2.23 Maintenance

The Maintenance Phase emerges once the system is operational. It incorporates usage of changes that product quality under go over some stretch of time, or execution of new prerequisites after the product is sorted out at the client area. In addition, the upkeep period of the SDLC endures the longest of the considerable number of stages. Most programming programs proceed being used until the point when they end up noticeably obsolete because of changes in a client's needs or until the point when the cost of keeping up the product turns out to be excessively costly for the advantages got in kind.

Additionally, new programming and systems may be discharged while more established programming is as yet being kept up in the business. The support stage likewise incorporates taking care of the mistakes of the coding system that may exist in the product even after the testing stage. This stage likewise screens system execution, asked for changes are made. Upkeep, regularly turned help, is an essential action for connecting the encounters of clients or clients with the item conveyance association. We consider sees on innovative support from troubleshoot settling through to configuration centered exercises.

## 3.2.24 Advantages of the System

The e-Scholar Tracking System (e-STRAS) has its own abilities which can be benefits for UiTM to use because it will help the researcher to reduce the risks in handling the research report. There are several benefits of using the e-STRAS which it will be centralized the information that allows ensuring all necessary research report are kept in one place. Through this system the researcher or staff to know where to find the information that they needs. Then, the other benefits with using E-STRAS is efficiency which will ensuring they can find of what they are searching for that can be found with quickly and efficiency. Besides that, archiving with online also can be one of the benefits with using E-STRAS which any research report that have been kept or published will be stores in the system. This is because the research report can be prohibitive for any research that are needed for the new researcher which can assist them in doing the research. It is also the best solution that can prevent any issues that are related with the storage spaces.

Next, benefits with using the E-STRAS is synchronized of the updates which when the data and information that will be kept in centralized can ensures that the E-STRAS can be updating with synchronized as the changes occur. It will be reduce the complex changes that can be automatically will be updates. Other benefits of using the E-STRAS is it will be enhance the security information which it will limited the access of the system with using their own usernames and passwords of the researcher or staff. The security information will be ensure for the data and information is being kept safely.

# 3.2.25 Suggestion for Improvement

The suggestions are needs for the improvement which it can enhance the quality of management information system. There are several of suggestions for improvement that have been found is prepare for the back-up which it is to prepare any unnecessary events happen. If the data and information is accidentally lost the back-up software can be uses to recover back the data and information that have been kept in the E-STRAS. Next, the other suggestions for the improvement is implement and audit for the accountability of the E-STRAS which it should be consider that allows to track the strengths and weakness of the E-STRAS so that it can be improving to be a better tracking system for the organization to use it.

#### **CHAPTER 4**

#### **CONCLUSIONS**

# 4.1 Knowledge Gained

During undergoing industrial training in the department of research and industrial linkages, various advantages are obtained by performing a variety of work arrangements given. The trainee has got a lot of new knowledge, skill and experience that cannot be gain during the class lesson. It is because the different environment during internship and class lesson has given the trainee an opportunity to adapt in any situation for the future. Besides, during the internship, the trainee can apply all the information and knowledge that they learn during the class lesson to complete some task and problem.

In addition, from the internship program the trainee also can improve themselves in many aspects by joining many activity and task. For example, the trainee has been appointed as the secretariat of UiTM 88<sup>th</sup> convocation. It is a big opportunity for the trainee to be involved in a big formal event and know the workflow of the program especially from the top-level management until the low level. Besides that, during the internship program, I am able to expand my creativity in designing posters, banners and buntings for UiTM big event such as ReIACT Day 2018 and other small events. Other than that, the trainee also was assigned a special project on the e-scholar tracking system for UiTMCK lecturers. This special project is tough and challenging yet possible to do it with the help of supervisor faculty and supervisor department. From this special project, I gained a valuable knowledge and experience in completing the system. In addition to this, this system will be submitted for Kelantan

International Learning & Innovation Exhibition (KILIEx 2018) which is to be held on 15th August 2018.

# 4.2 Personal Thought and Opinion

In conclusion, the internship program can produce and generate students who are credible in his responsibility as an employee. In addition, this internship program can examine the student's credibility to deal with real working environment in the future, learn protocols and learn how to handle challenging job task in real life with superior. Hence, practical training programme for 20 weeks had given comprehensive practical experience towards the organization governance structure of the company. Furthermore, the employer can easily assess an organization of a university system and can assess the level of credibility and the quality of students towards effectiveness in undergoing an internship program that has been assigned to the students.

In addition to this, instead of gaining a real work environment, the trainee also able to improve the skills that he has. This is because, most employers require students who are capable and experienced in order to be employed soon after graduation. Moreover, students with a good working experience stand a chance to be employed. It is also believed that the trainee able to learned skills from the internship program such as management skills, communication skills, interpersonal skills and critical thinking skills for their own benefit.

#### 4.3 Lessons Learnt

Here are several lessons learnt during the internship program.

## i) Punctuality in all aspects

Whether it's arriving early in the morning or getting a task done on time, punctuality is essential. Manage the time well to get things done. This show that that person is dedicated to his/her work, and that he/she is capable of responsibility and professionalism. For example, I manage to complete every task given to me within the time given.

# ii) New and improved skills and how to apply them

One of the most important things that the trainee can gain from an internship is newfound knowledge. This can include knowing how to fulfil tasks that are relevant to his desired career path and sharpening the skills that he already possess. For example, I experienced from my special project. Although the system is so challenging to me, but I manage to complete it.

#### iii) Professional communications

One of the most valuable skills you will gain from an internship is the ability to speak with people in a professional setting. Discussions with bosses or co-workers are different from discussions with lecturers or fellow students. For example, I am able to deliver my speech, ideas with the department deputy rector in a good way.

## iv) Making a networking with people

It is important for the trainee to make a good communication and networking with people. This is because, these people will be his/her references in the future such as try to leave internship with new connections: senior employees, clients, fellow interns, etc. In addition to this, these people can provide guidance, advice and help him/her in future job searches. The

trainee should keep them in the loop and offer to help them whenever he/she can. As a consequence, this will not only the trainee end up creating great memories and making friends, but he/she able to wide professional network. For example, when I was assigned with tasks /projects, I tried to maintain a good relationship with lecturers and co-workers.

## v) Taking constructive criticism well

Every trainee should take every critics from their bossess or co-workers for their own good and growth as it will improve the quality of their work. Naturally, no one likes to be criticised and performance evaluations can be quite scary. Every people tend to make a few mistakes and receive constructive criticism about their work from both colleagues and boss. For example, I took every critics and comments from department deputy rector and departments's supervisor for my works with open mind as I believed that critics actually can sharpen my skills instead of learning to be better.

#### 4.4 Limitations and Recommendations

Internship at PJIA Department was a great experience for me. I have learnt many things throughout my internship period. From my little knowledge what I see some limitations and I made some recommendations as follows:

# 4.4.1 To the Department

# i) Facility

The department should provide facility such as computers to the practical students so that the tasks assigned to the student can be completed within the time given and as to espond to the dynamic competition environment.

# ii) More opportunities to students to do intern in their organization

The intern would also recommend the department to continue giving internship placements to as many students as they can because some miss this experience which is also important requirement of the University due to the fact that they failed to get placements.

# iii) Serious supervision to the workers and students

The department should increase and ensure more supervision over the employees in order to work effectively and also eliminate workers who relax, work lazily and perform actively after seeing their supervisors.

# 4.4.2 To the University

## i) Allowances

The organization should give allowances to interns because the working hours for interns are similar to other workers. In addition to this, the interns are assigned with many tasks so it is reasonable to pay them. Therefore, the intern recommends the University to put that in to action in order to motivate interns and boost their productivity levels in performing their tasks during the field attachment.

# ii) Secure Internship placements for students

The University should help students to secure internship positions according to their respective programs undertaken at the University through giving students recommendations in order to ease their training periods and also avoid the ache gotten by students in search of internship placements.

# iii) Should continue with internship program

It helps to prepare the students for their careers in future and also enable the students to practice the theoretical knowledge obtained during class be exercised practically. It is also helps to develop students understanding of work ethics, employment demands, responsibilities and opportunities.

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# APPENDICES



Contents lists available at <u>Science-Gate</u>

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# Development of e-Scholar Tracking System for Measuring the Performance of Lecturer

Syerina Azlin Md Nasir<sup>1</sup>, Wan Fairos Wan Yaacob<sup>2</sup>, Marziana Madah Marzuki<sup>3</sup>, Faizal Haini Fadzil<sup>4</sup>

1Faculty of Computer and Mathematical Sciences, Universiti Teknologi MARA Kelantan, Bukit Ilmu, Machang, Kelantan, Malaysia; syerina@kelantan.uitm.edu.my

2Faculty of Computer and Mathematical Sciences, Universiti Teknologi MARA Kelantan, Bukit Ilmu, Machang, Kelantan, Malaysia; wnfairos@kelantan.uitm.edu.my Faculty of Accounting, Universiti Teknologi MARA Kelantan, Bukit Ilmu, Machang, Kelantan, Malaysia 3 Faculty of Accounting, Universiti Teknologi MARA Kelantan, Bukit Ilmu, Machang, Kelantan, Malaysia; marziana@kelantan.uitm.edu. 4Faculty of Information Management, Universiti Teknologi MARA Kelantan, Bukit Ilmu, Machang, Kelantan, Malaysia; 958

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#### ABSTRACT

Measuring the performance of lecturers received little attention compared to the performance of students in higher education level. However measures of performance are needed to assess whether they meet their set of objectives and foster an environment of continuous improvement. The objective of this paper is to develop a monitoring system for measuring and managing lecturers' career development. Maintaining the lecturers' record such as personal, research details, publication works, innovation and award achievements is an important factor for the management level. This research proposed a scholar tracking system called E-STRAS. This tracking system aims to provide management with regular feedback on lecturer's progress and performance and early indicators of problems that need to be corrected and improved. This includes reporting on actual performance against what was planned or expected. The system will proactively help improve and enhance the performance of lecturers in line with the strategic and operational objectives of the university.

#### 1. Introduction

Every university has certain criteria for measuring the performance of their academicians or lecturers. Keeping the accurate record is important to the university because finding and generating the necessary data for any institutions was described as a complicated and time-consuming process (Al-Turki & Duffuaa, 2003; Sohail & Daud, 2009). At present many systems were developed independently to meet the requirements of certain task. Different systems were developed such as personal records for human resource department, grant records for research department, publication records for the library department and many others. It becomes difficult for the management to update the lecturers' performance when the data needed comes from diverse systems and only can be accessed by the lecturers themselves.

Monitoring and tracking lecturers career path and success in higher institution is crucial to the management of the university and indirectly to lecturers themselves. Currently, in Universiti Teknologi MARA (UiTM) Kelantan, most of the data about lecturers are stored and managed at the main campus in Shah Alam. UiTM is Malaysia's largest

higher learning institution with 13 state campuses and more than 21 state satellite campuses. Due to this, ad-hoc data on lecturer status and progress such as information needed by the management to trace performance and assist them on lecturers' career path is difficult to be retrieved. Lacking of this information leads to several risks such as poor or untimely reporting of lecturer's status, audit findings, inefficient and poor management of lecturer's confirmation and promotion. Thus a tracking system is needed to clearly guide and indicate the current and expectation pathway for promotion and development of lecturers. Therefore, this paper aimed to develop a monitoring system for managing lecturers' measuring and development known as e-Scholar Tracking System (E-STRAS). The objectives of the system are as follows: 1) to provide the management a way to monitor and manage lecturer's progress and performance through immediate feedback and; 2) to update the lecturers on their career path status according to pre-determined zones.

In this article, a review on university performance measures is discussed. The proposed system is described in the next section, followed by a discussion on the development and future plan of the system.

## 2. Background

# 2.1. Lecturers' Performance and the Challenges in Universities

Traditionally, the task of lecturers in university is mainly focusing on teaching and lecturing, while doing some additional work in research and analysis as well as administrative work. Nowadays, with increasingly demanding environment, lecturers do more complex work. Even though the role of lecturers is still remain according to the three domains of teaching, research and administration, nevertheless the workloads and accountability of the domains are keep increasing. Houston et al. (2006) stressed that one of the factor of intensification of academic work among the lecturers is the adoption of performance funding of research budget components by the government for higher education.

Previous studies (Harman, 2003; Houston, 2006; Shin & Jung, 2014) stated that academician in universities have two conflicting dimensions of academic work which are intrinsic motivation and external work condition. According to their intrinsic motivation, lecturers are satisfied with their job itself. Nevertheless, their dissatisfaction is related to work conditions which related to work environment. Fredman and Doughney (2012) stressed that one of the concern on work environment is increasing in workloads and management culture.

With primary emphasis placed upon dual core functions of knowledge creation and knowledge transmission through the processes of research and teaching, tensions are exist among the lecturers in order to balance the demands on time as well as variable recognition and rewards. Jenkins (2004) highlighted that the commitments to teaching and research can be synergistic and complementary or antagonistic and competing. Therefore he argued that the relationships between research, teaching, broader work expectations, and rewards need to be defined and managed at the institutional. departmental, and individual levels to avoid potentially undesirable effects and counterproductive behaviours.

# 2.2. Measuring Performance of Lecturers in Universities

Shin & Jung (2014) examined job satisfaction and job stress across 19 higher education systems and found that higher education management which is measured by the performance-based management is the main source of academic job stress. Kinman (2016) stressed that effort-reward imbalance (ERI) of job stress lead to several indices of wellbeing in UK academics such as mental ill health, job satisfaction and leaving intentions. Based on a sample of 649 academic employees working in higher education institutions in the UK, he found that employees who believe that their efforts are not

counterbalanced by sufficient rewards will experience impaired wellbeing. In addition, feelings of ERI are more experienced by employees who are over-committed to the job. Thus a good performance measurement system is needed to ensure that the lecturers are sufficiently rewarded.

Previously, universities based their performance on performance metrics such as teaching units, number of publications in top journals, research income generation, students' satisfaction, citizenship or patents and this metrics have become part of the day-to-day lexicon of academia (Franco-Santos, 2016). These performance metrics are used at all levels such as individual, department, faculty and institution. This approach is generating one size-fitsall performance measurement systems that do not appear to take into consideration universities' distinctive mission. Rather it is described as merely reacting to the multiple demands of powerful stakeholders especially government and thus not proactively attempting to manage their own performance.

Based on extensive survey data among the employees at Finnish universities, Kallio and Kallio (2012) found that performance measurement which has been practised by the universities is based on quantitative rather than qualitative measures. Kallio et al. (2017) highlighted that such system has led to negative effect on academic staff work motivation. This is because the motivation to engage in challenging knowledge-intensive work such as the work carried out at universities is typically intrinsic. Such finding has lead to interpretation that future measurement system should also consider and embed qualitative factors to ensure lecturers can be intrinsically motivated in their academic works.

# 2.3. Performance Measurement System (PMS) in Universities

In realizing the importance of performance measurement system that can intrinsically motivate the lecturers, many studies have been conducted to investigate and propose the system. Franco-Santos (2016) proposed PMS using business canvas model. Their proposed model is based on the argument that "one size does not fit all". This is because each department in universities have different operating models. Thus, his proposed model design a system that enable university departments and centres to design and develop their own "sustainability model", which in turn may help them develop more appropriate performance measurement systems.

Franco-Santos (2016) presents their business modelling framework in the form of a "canvas" consisting of nine components: Customer Segments, Value Propositions, Customer Channels, Customer Relationships, Revenue Streams, Key Activities, Key Resources, Key Partners and Cost Structure. The Business Model Canvas becomes "a shared language for describing, visualizing, assessing and changing business models". In the context of universities, the term 'business' should be replaced with

'sustainability' as the overall mission of most universities is not to make a profit. Thus he argues each department within the university will have its own 'Sustainability Model Canvas'. Such model can help universities to develop more strategic performance measures.

Chen et al. (2015) proposed a novel framework for evaluating teaching performance based on the combination of fuzzy AHP and fuzzy comprehensive evaluation method. Using this method, teaching performance index system was established after determining the factors and sub-factors of teaching performance. In the index system, the factor and sub-factor weights were then estimated by the extent analysis fuzzy AHP method. Employing the fuzzy AHP method in group decision-making can facilitate a consensus of decision-makers and reduce uncertainty.

Perkman et al. (2011) propose a performance measurement system for university-industry alliances. The system distinguishes between different process stages, including inputs, in-process activities, outputs and impacts. For each stages, specific measures are discussed and explained how they should be deployed. The resulting framework includes both prospective and retrospective measures and subjective and objective measures. The first stage of the process is input which is the mobilization of adequate resources consist of availability of resources, presence of high-quality researchers, and presence of motivated researchers. Research is an activity that has high fixed costs. Thus, working with industry allows firms to achieve economies of scale.

Second stage is in-process activities. It involves the presence of high-quality researchers and resources should encourage high-quality research. In the third stage, the above in-process activities should subsequently lead to the generation of actual outputs which consisting of generating new scientific knowledge that is publishable in peer-reviewed journals. In the final stage, the exploitation of these outputs should lead to a range of impacts, ranging from exploitation to exploration.

Despite of various model and approach in measuring performance of lecturers in universities, it is believed that the previous systems still lack of intrinsic motivation for lecturers to do the best in their work. This is because it does not take into account the path that the lecturers should follow in the next stages. A good system does not only take into account the status of their achievement, but in addition the system also should consider of what should they do if they have achieved certain measures of performance? Thus this study will fill the gap by proposing a system that takes into account the path of lecturers' career.

#### 3. System Description

Electronic Scholar Tracking System (E-STRAS) is an in-house system designed to help the university management team in monitoring the performance of

lecturers and indirectly for lecturer's self-evaluation. The system is developed using software tools such as PHP Framework based on Codeigniter and MySQL. The main capabilities of E-STRAS are:

- Able to update lecturer's personal details and also their publication, research, innovation, reward,
- Able to monitor performance of lecturer either individually or based on faculty or zone.
- Able to link with university's internal information systems.
- Able to produce statistical reports on the number of lecturers in each pre-determined zone.

#### 3.1 System Requirements

This part explains the requirements identified for the proposed system:

## 3.1.1 Targeted Users

The identified users for the proposed system can be categorized to management and lecturers as follows:

## Management

Rector, Deputy Rector (HEA, PJI), Assistant Rector, Head of Faculty (HOF).
Roles:

- 1. Search and view individual records by staff ID or faculty name (However, HOF can only search and view the faculty's lecturers)
- Monitor progress and performance of lecturers.
- 3. Able to give advice on lecturer's career path through personal message (in progress).

# Lecturers

All permanent lecturers.

Roles:

- 1. Add/update/view their details.
- Only can view their own status on predetermine zones.

#### 3.1.2 Determinant Parameter

The proposed system depends on four parameters to measure the performance of the lecturers. The parameters are as follows:

Years of Service (YS) -duration of service or employment

**Salary Grade** (SG) – compensation system that defines the amount of pay an employee will receive

**Confirmation Status** (CS) – confirmation of appointment to end a probation period and to appoint an employee permanently.

**PhD Status** (PS) - earned doctoral degree awarded by universities

#### 3.2 Rules for Monitoring System

This section elaborates the fundamental elements of the system which primarily depends on the determinant parameters. Thus, there are six (6) categories of zones identified for the system. The rules for the monitoring process which is based on the zones (see Fig. 1) are explained as follows:

#### Rule 1: Criteria Fulfilment

Blue zone - those who serve less than 3 years with grade DM45.

Yellow zone - those who serve between 3 to 5 years with grade DM45 (lecturer) but not yet confirmed.

Orange zone – those who serve between 3 to 5 years, permanent with grade DM45 (lecturer).

Red zone - those who serve between 5 to 10 years, permanent but still with grade DM45 (lecturer).

Maroon zone – those who serve more than 10 years, permanent with grade DM52 (senior lecturer) and hold PhD degree.

Green zone - those who serve more than 10 years, permanent with grade DM54 (associate professor) and hold PhD degree.

The division of zones indicates not only the criteria that has been fulfilled but also the criteria that need to be fulfilled in order to move to the next zone.

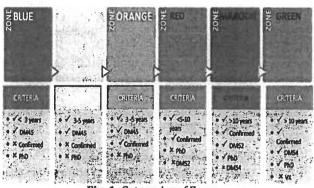


Fig. 1: Categories of Zone

#### Rule 2: Risky Zone

The zones that lecturer must be in alert are yellow and red zone. This is because when they are in yellow zone, they must make sure to get confirmation of appointment within immediate time or face penalty from the university. If they are in a red zone, they must plan for promotion to grade DM52 or further their study. The management must be aware of the lecturers who are in this zone and motivates them to come out of the zone or fall under 'Comfort Zone'. Comfort zone is defined as those lecturers who are comfortable with their situation and does not have any motivation or initiative to upgrade themselves to meet with university's Key Performance Indicator (KPI).

#### Rule 3: Individual Responsibility

Each lecturer is responsible to update information about themselves regarding their research, publication, innovation and awards received. Based on these inputs, management be able to generate reports and monitor lecturers' progress and performance.

#### 3.3 System Design and Implementation

This section describes the database design and web application design which satisfies the specific needs and requirements as mentioned earlier in the previous section. It involves defining elements, interfaces and data for the system.

Oracle SQL Developer Data Modeler is adopted to model the logical structure of the database using Barker notation. At this stage, every objects are defined clearly. It is to set the definition of the Entity, Attributes and Data Type. Each object should also be set to a Unique Identifiers. It also involves mapping process, which is performed by selecting the relationship type (see Fig. 2). There are seven entities created where four of them are subtypes.

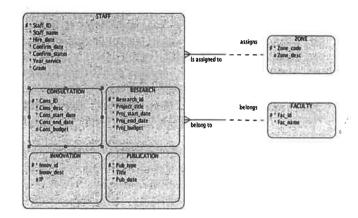


Fig. 2: Logical Model of the Proposed System

The logical model is then transformed to the relational schema (Engineer to Relational Model) as shown in Fig.3. The conversion is necessary so that the model can be implemented directly in a database.

For example, Fig. 5 shows a profile page for a lecturer who successfully login into the system. The status of the user will automatically be displayed on the screen along with other related details. The user can update their profile anytime, anywhere and the updated information will be feed to the management Thus, the information is used by the management team to monitor the progress of the lecturers. It is possible since E-STRAS automatically update the lecturer's status by moving to the next zone when the four main criteria mentioned have been satisfied. The tracking is made easier since the system able to isolate lecturers who fall into the category of "Comfort Zone". With this information, management team can work on strategic plans to uplift this group and move them away from this Apart from that, the system able to category. produce statistical reports on the number of lecturers for each zone and faculty for auditing purposes. For lecturers, they are aware and alert of their current status, hence motivate them to achieve their profession target.

Despite all that, the system relies heavily on lecturers to key-in all the data required, namely publication, consultation, paper presentation, innovation etc. In other words, the credibility and objectivity of the system depend very much on the independence of the users to enter data into the system. It will be time-consuming and challenging since it requires full support from all lecturers to feed the data willingly. At the same time, there are existing internal information systems that cater for publication (PRISMA), research (IRMIS) consultation (iCONS) separately. Therefore, the user might feel entering the same data on different systems as redundant works. This factor should be considered in the development of the proposed system.

#### 5. Conclusion

Effective monitoring system can be best achieved through record keeping and proper reporting systems, to help in figuring out whether the lecturer deliver and perform to the desired university direction. With the implementation of E-STRAS, it helps to determine exactly when a lecturer is on track and when intervention may be needed for those who deviate from the track. This strategic role makes the system an important tool in measuring the performance of lecturers. The system successfully fulfils the basic requirements of its development. However, it can be further improved in the future. The system should be embedded with personal message application between management and lecturer to exchange ideas and information directly. Other than that, data visualization feature such as graphs and charts could illustrate better the performance of lecturers. Finally, the system should provide a link to the university's internal information system so that the relevant information required by the proposed system can be updated easily.

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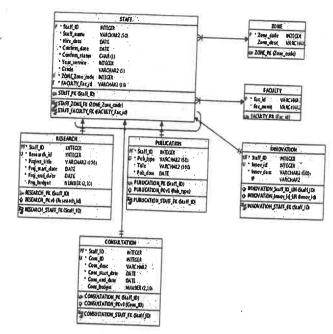


Fig. 3: Relational Schema of the Proposed System

Next, we look into the database application for this project which is developed using PHP and MySQL. Before that, the algorithm shown below demonstrates the part where the system checks the rules of the system in determining the zone.

```
if SG = DM45 AND !PHD
   if !CS
       if YS < 3
         then ZONE = BLUE
      else if YS >= 3 AND YS < 5
        then ZONE = YELLOW
   else
      if YS >= 3 AND YS < 5
        then ZONE = ORANGE
      else if YS >= 5 AND YS < 10
        then ZONE = RED
else if SG = DM52 AND PHD
   if CS
      if YS >= 10
        then ZONE = MAROON
else if SG = DM52 AND PHD
  if CS
      if YS >= 10
        then ZONE = GREEN
```

The following is an example of line code to find research information by lecturer name.

```
<?php
$query = "SELECT Staff_Name, Zone_ID
FROM Research";
$result = mysql_query($query);
?>
>
-label for = "Staff_Name" class =
"fixed_required">Staff Name: </label>
<select name="select_Staff"</pre>
id="select_Zone" />
<?php
while ($line =
mysql_fetch_array($result,
MYSQL_ASSOC)) {
<option value="<?php echo</pre>
```

```
if(isset($_POST['select_Staff'])) {
  if(mysql_real_escape_string($_POST['sel
    ect_Staff']) ==$line['Zone_ID']) {
        echo "selected"
}?>
    <?php echo $line['Staff_Name'];?>
    </option>
    <?php</pre>
```

# 4. Results and Discussion

In this section, the final output and the benefits of the proposed system are presented. The sample interfaces of the web application, 'E-STRAS' is shown in Fig. 4 that depicts the main page of the system. This is the initial version of the proposed system. In this system two applications for two different users (management and lecturer) are developed that are linked to each other. Only lecturer of the university is permissible to access the information and services from the system since the system is using a private network.



Fig. 4: Landing Page

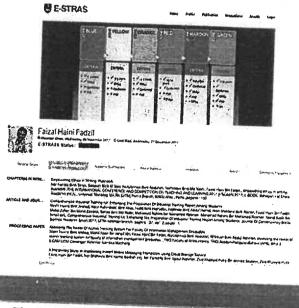


Fig. 5: Successful Login Page with Individual Profile

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## SAMPLE OF FORM

Unit Misi Akademik & MDAB (UMAD) Tel: (09)976 2041 Faks: (09) 976 2156 Email: misiakademik@gmail.com

Pejabat Timbalan Rektor (Hal Ehwal Akademik) Universiti Teknologi MARA Cawangan Kelantan Bukit Ilmu, 18500 Machang, Kelantan, MALAYSIA Tel: (09)976 2000/3300 Faks: (09) 976 2156



Rujukan kami

100-CK (HEA-UMAD 26/7/1)

Tarikh

26hb Jun 2018

Dr. Wan Fairos Wan Yaacob Timbalan Rektor Penyelidikan Jaringan Industri & Alumni Universiti Teknologi MARA Cawangan Kelantan 18500 Machang **KELANTAN DARUL NAIM** 

الكلايكليكية

Dr.

JUN 2018 nomi makair

PERMOHONAN MEMINJAM SEORANG PELAJAR PRAKTIKAL UNTUK MEMBANTU UNIT MISI AKADEMIK DAN MDAB DI DALAM PROGRAM 'CYBERSAFETY FOR STUDENTS 2018' DI SEKOLAH KEBANGSAAN BELUKAR.

Perkara di atas adalah dengan hormatnya dirujuk.

Adalah dimaklumkan bahawa pihak Unit Misi Akademik dan MDAB ingin meminta jasa baik pihak puan untuk memberikan kebenaran kepada pihak kami untuk meminjam seorang pelajar Praktikal Unit puan iaitu Muhammad Akif Bin Abdullah untuk membantu kelancaran Program 'Cybersafety for Students 2018' di Sekolah Kebangsaan Belukar. Maklumat program ini adalah seperti berikut:

Tarikh

: 28hb Jun 2018 (Khamis)

Waktu

: 8.00 pagi - 11.00 pagi

Tempat : Sekolah Kebangsaan Belukar (SK Belukar)

Sehubungan itu, pihak kami memohon jasa baik daripada pihak puan untuk memberikan kebenaran terhadap perkara ini. Di masa depan, jika pihak puan memerlukan bantuan daripada pihak Unit Misi Akademik dan MDAB daripada segi bantuan tenaga kerja, In Shaa Allah kami boleh membantu. Kerjasama daripada pihak puan amat kami hargai dan didahului dengan ucapan terima kasih. Sekian. Terima kasih.

Yang benar

ENCIK NOW AIDIL ABDUL AZIZ

Koordinator

Unit Misi Akademik & MDAB (UMAD)

Timbalan Rektor Penyelidikan & Varingan Industri UITM CAWANGAN KELANTAN.

## Pejabat Timbalan Rektor (Penyelidikan, Jaringan Industri & Alumni)

Deputy Rector Office (Research, Industrial Linkages & Alumni) Universiti Teknologi MARA Cawangan Kelantan Bukit Ilmu, 18500 Machang, Kelantan, MALAYSIA Tel: (09)976 2251/2252 Faks: (09) 976 2253 E-Mail: tppjikln@kelantan.uitm.edu.my



Surat Kami: 500-CK(PJI 23/4)

Tarikh

: 26 April 2018

En Muhammad Akif Abdullah Pelaiar Praktikal Bahagian Penyelidikan Jaringan Industri & Alumni Universiti Teknologi MARA Cawangan Kelantan **Bukit Ilmu** 18500 Machang

**KELANTAN DARUL NAIM** 

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Tuan

## PELANTIKAN AHLI JAWATANKUASA RelACT DAY 2018 UITM CAWANGAN KELANTAN

Perkara di atas adalah dengan hormatnya dirujuk.

- 2. Sukacita dimaklumkan bahawa pihak Universiti Teknologi MARA Cawangan Kelantan Kampus Machang telah melantik tuan sebagai Ahli Jawatankuasa Persiapan Hiasan dan Grafik bagi Program RelACT DAY 2018 UiTM Cawangan Kelantan pada 14 - 15 Mei 2018.
- 3. Semoga tuan dapat menjalankan tugas dan tanggungjawab yang telah diamanahkan demi kepentingan dan kemajuan Universiti Teknologi MARA.

Segala kerjasama dan komitmen yang diberikan oleh tuan didahului dengan ucapan terima kasih.

Sekian.

والسلام

Yang benar

DR. WAN FAIROS WAN YAACOB

Timbalan Rektor Penyelidikan, Jaringan Industri & Alumni

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## PICTURES





























### Sijil Penyertaan

Sijil ini dianugerahkan kepada

MUHAMMAD AKIF BIN ABDULLAH 2015110975

atas penyertaan dan penglibatan dalam program

RESEARCH, INDUSTRY & ALUMNI COMMUNITY (ReIACT DAY)

pada 14 -15 MEI 2018

bertempat
FOYER PENTADBIRAN



DR. WAN FAIROS WAN YAACOB Timbalan Rektor Penyelidikan Jaringan Industri & Alumni





# Perakuan

Bijil ini dianugerahkan kepada

U'Clicb (UiTM Click Club)

untuk ditindikkan bersama

(Unit of Creative Media & Technology) UCMT

pada 14 MAY 2018

Club Attachment dibawah program



DR. WAN FAIROS WAN YAACOB Timbalan Rektor Penyelidikan Jaringan Industri & Alumni





# ijil Penghargaan

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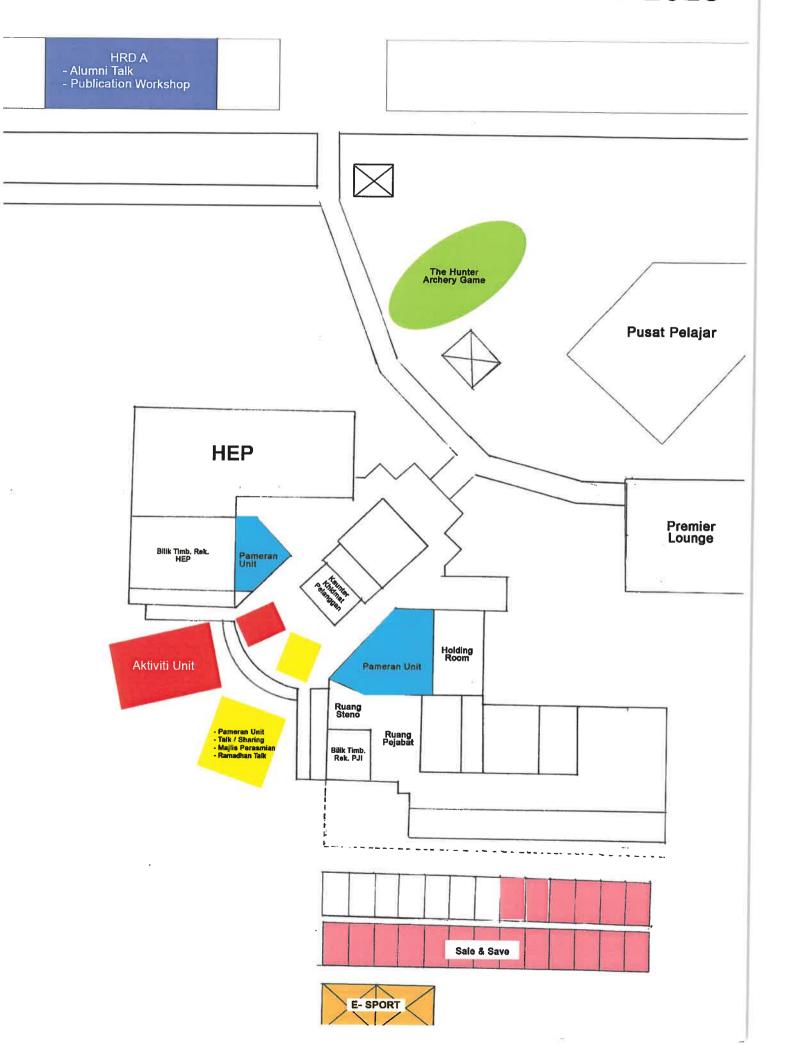
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## PHOTOBOOTH BUSINESS

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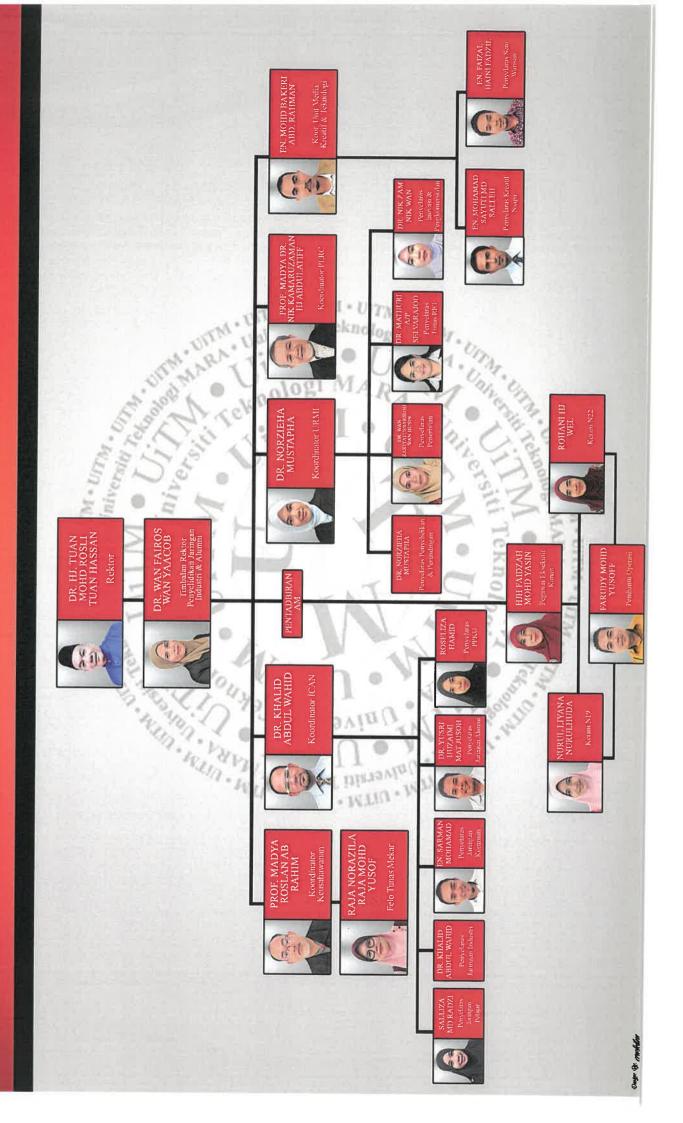


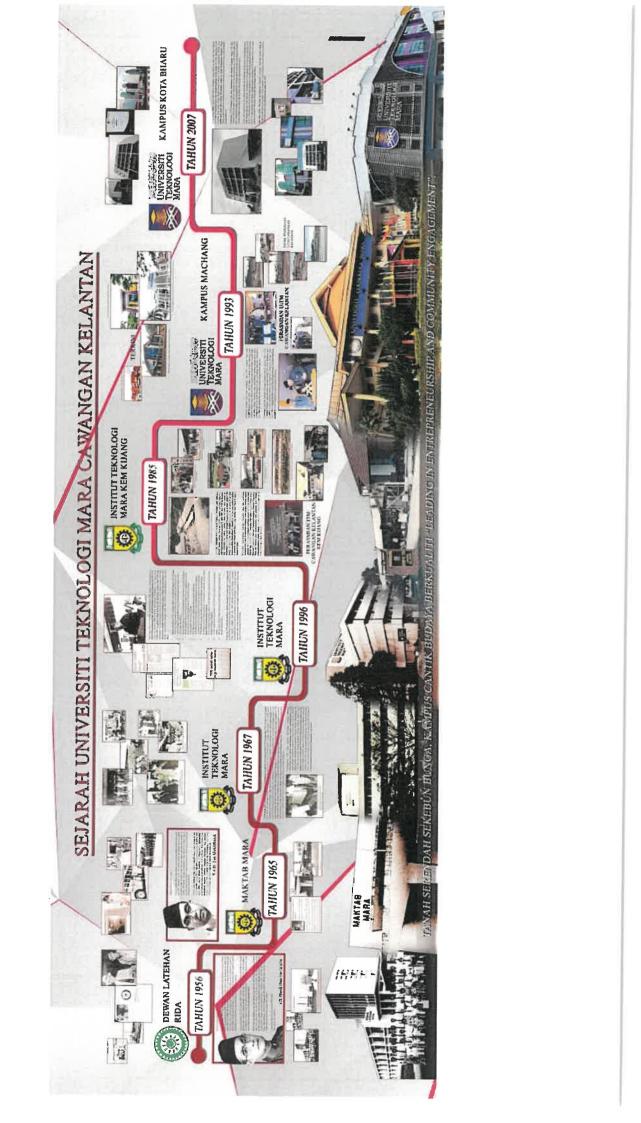
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## BAHAGIAN PENYELIDIKAN, JARINGAN INDUSTRI & ALUMNI UITM CAWANGAN KELANTAN





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