Key Performance Indicator Tracking System

by

Nur Shafiqa binti Shahirol

Dissertation submitted in partial fulfillment of
the requirements for the
Bachelor of Technology (Hons)
(Business Information System)

SEPTEMBER 2011

Universiti Teknologi PETRONAS
Bandar Seri Iskandar
31750 Tronoh
Perak

CERTIFICATION OF APPROVAL

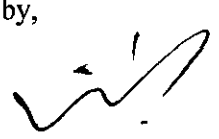
Key Performance Indicator Tracking System

by

NurShafiqabintiShahirol

A project dissertation submitted to the
Business Information System Programme
UniversitiTeknologi PETRONAS
in partial fulfillment of the requirement for the
BACHELOR OF TECHNOLOGY (Hons)
(BUSINESS INFORMATION SYSTEM)

Approved by,



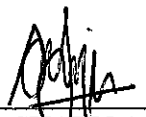
DR. P. D. D. DOMINIC
Associate Professor
Computer & Information Sciences Department
Universiti Teknologi PETRONAS
Bandar Seri Iskandar, 31750 Tronoh
Perak Darul Ridzuan, MALAYSIA

(Assoc. Prof. Dr. DhanapalDurai Dominic)

UNIVERSITI TEKNOLOGI PETRONAS
TRONOH, PERAK
September 2011

CERTIFICATION OF ORIGINALITY

This is to certify that I am responsible for the work submitted in this project, that the original work is my own except as specified in the references and acknowledgements, and that the original work contained herein have not been undertaken or done by unspecified sources or persons.



NUR SHAFIQA BINTI SHAHIROL

ABSTRACT

The Performance Measurement Systems (PMS) relies on the usage of numeric indicators to quantify success or failure, normally referred to as key performance indicators (KPIs) and most all of the government and private organizations are implementing the KPI. The usage of KPI is not being excluded to the higher learning institution as well, for example, Universiti Teknologi PETRONAS (UTP). The purpose of this paper is to propose a new calculation method of the KPI for lecturers. The methodology is based on the relevant literature review that has been reviewed. This study identifies reasons for implementing the new proposed calculation method that are to achieve the visibility of the final result to the users and to minimize the human factor in calculating the KPI marks.

ACKNOWLEDGEMENT

I would like to acknowledge the advice and guidance of Assoc. Prof. Dr. Dhanapal Durai Dominic, my FYP supervisor, who has guided me from the beginning of the research activities until the system development phase. Without his knowledge and assistance, this study would not have been successful.

I also thank the staffs of Universiti Teknologi PETRONAS Human Resource Department and the lecturers that have participated during the survey execution phase. Not to forget my friends, my highest appreciation would go to them for the supports and knowledge sharing.

I would like to thank my family members, especially my parents, Shahirol Ahmad and Norzi Shukor, for moral and financial supports. Without their encouragement, it would be impossible for me to complete this project and my degree.

TABLE OF CONTENT

LIST OF FIGURES

LIST OF TABLES

CHAPTER 1

INTRODUCTION

1.0 INTRODUCTION

1.1 PROJECT BACKGROUND

Performance Management System is a process which contributes to the effective of management of individuals and teams in order to achieve high level of organizational performance [1]. The approach of Performance Management is commonly often used in the workplace such as schools, local community meetings, government agencies and even political settings. The needs of Performance Management principles are everywhere, for as long as there are interactions between people with their environment. It is to make sure only the desired effects are being produced. Self-management or the formal chains of management typically found in most of the organizations can be involved in this management process where people work in groups or teams. In addition, performance Management helps in achieving the best possible results in given period of time as well.

Organizations are constantly on the lookout for a performance system that is appropriate to their environment and work culture. One form of Performance Management System that is widely used by the government and private institution is the Key Performance Indicators (KPIs). KPIs are customizable business metrics utilized to visualize status and trends in an organization [2]. Once a business or other organization defines its mission or objectives, KPIs can be employed to measure progress toward

those objectives. In general, each KPI can have a target value and actual value. The target value represents a quantitative goal or object that is considered key or critical to the success of a business or organization. KPIs are advantageous in that they provide a clear description of organizational goals and provide huge quantities of data down to a single value that can be utilized to continuously monitor business performance and its progress toward organization benchmarks. However, it should be noted that for as long as the KPIs reflect critical success factors, it can be very helpful in organization management and can be measured consistently with accuracy.

The contents of this report will be in detail about the current KPI system that is currently being used in UTP. Specifically, details on the new proposal of KPI calculation for lecturers will be explained in depth. Throughout this report, the term user will be used to represent the lecturers, as they are the main user for this KPI system.

1.2 PROBLEM STATEMENT

The form of KPI has helped UTP to upgrade its productivity as the implementation of KPI can be the assistance in keeping track the employees' performance, making sure the organization is using the resources in the right direction and guiding towards achieving its short term and long term goals.

Performance Planning and Appraisal System (PPA) is a web-based system which is currently being used in UTP for the purpose of monitoring the staffs' performance. The goals of developing the system are:

a) Automating tasks in monitoring staff performance,
b) Reducing errors in measuring performance,
c) Making the staff performance information more reliable and allowing for easy distribution of information for authorized users.

1.2.1 Problem Identification

The concept of the current KPI system used by UTP is beneficial in terms that it can track the lecturers' performance and it can improve the daily work processes. However, there are several identified flaws that the current system has, which are:

a) The current calculation method that is being implemented needs to be improved. The coded calculation in the current system does not flexibly respond to users' input.
b) The current system used does not display the actual percentage marks, it only displays the grade achieved. Thus, this would be impossible for the users to know the actual achievement in numerical values.
c) The calculated marks are not favorable to the users.

1.2.2 Significance of the Project

This new system that will be developed will be using the new proposed calculation method. As the purpose of the concept of KPI is to reduce the human factors in evaluating the performance, this system is expected to assist in making the calculation process more efficient.

1.3 OBJECTIVES

There are two identified main objectives for this study/ project, which are described as below.

a) To propose a new calculation method for the KPI of UTP lecturers to be coded into the new developed system.
b) To have a system that displays the transparent results of the total marks and grades.

1.4 SCOPE OF STUDY

As for the scope of study, it has been clearly stated in the objective that the new improvement for the current KPI system of UTP will only be applied for UTP lecturers. The reasons of limiting this scope of study are due to these reasons:

a) Lecturers are the majority group of staffs in UTP.
b) Time given to complete the research report and the new system with improvement is less than one year. Due to the time constraint, the study has to be conducted with only one group of staffs.
c) Current KPI calculation for lecturers needs to be improved in terms of formula used and its transparency of totalling the marks.

1.5 PROJECT FEASIBILITY WITHIN THE SCOPE AND TIME FRAME

The system development has two phases and each phase will be detailed out in the Table 1.0 below.

Table 1.0 Project Feasibility

PHASE	PERIOD OF TIME	PARTICIPANTS	EXPLANATION
Phase 1	January – May	• Lecturers • UTP HR staffs	At this phase, the information on current system used by UTP is being gathered. Also, a survey to collect the feedbacks among the UTP lecturers has been conducted as well. This is to get the feedback on the calculation

			method that has been proposed.
Phase 2	September - December	• Lecturers	This is the stage where the system development will be executed. The new KPI system will be developed based on the new proposed calculation method. PHP is chosen as the language to develop this system and MySQL will be used as the database.

CHAPTER 2

THEORY

2.0 THEORY

Control is "leading operations to achieve to targets". Organization should be under control of manager and defines an improvement plan if it recognizes any gap. Controlling system acts as a mind of organization by comparing actual situation with planned target shows gaps. By implementing the appraisal model, controlling systems can assess results and their alignment with organization strategy. Appraisal model defines some indicators which quantify organization performance; on the other hand, the number of indicators is limited and managers only concentrate on them and they are named Key Performance Indicators (KPIs) [3]. KPIs can help directors of organization directly or indirectly to lead and diagnose organization.

A Performance Indicator or Key Performance Indicator (KPI) is an industry jargon term for a type of Measure of Performance [4]. Existing KPIs are mainly used to benchmark the construction projects against each other and to show whether improvement can be made. In recent years indicators have been developed to measure different aspects of project performance. A major characteristic of these however is that most of them are used mainly for benchmarking purposes but are of little use for controlling the performance during a project. There are few existing indicators that can be used to inform stakeholders of how well their processes are going during the various stages of the project. For example, in their work to develop tools on measuring performance, Feurer & Chaharbaghi [5] recommended to keep the focus of measurement on processes rather than on the functions of the project. Koskela [6]

highlighted that process performance is an important feature of performance indicators to improve process transparency so that the relevant and invisible attributes of the process become visible. Pillai [7] also suggested in measuring the construction processes rather than their outcomes. This suggestion was supported later by Marosszeky [8], who proposed to identify the critical process targets so that the measurement reflects the proposed project direction and provides feedback in the process.

The purposes of this literature review are to analyze the current calculation method that is being implemented by the PPA system. There are four phases of the KPI calculation that will be repeated each year. Below are the explanations for each phase:

Table 2.0 Phases in the KPI calculation

(Source: UTP Performance Management System, 2009)

Phase 1 Performance Planning	• Top down KPI cascading • One-to-one expectation setting discussion on performance, competencies, and development plan. • Submission of Individual Performance Contract (IPC). • Ownership on the targets set.
Phase 2 Coaching and Feedback	• Feedback on performance and competencies. • Provide opportunities for staff to improve or close gaps.
Phase 3 Performance Review & Appraisal	• Assessment on performance and competencies. • Discussion on development plan. • Performance ranking to differentiate top, middle and bottom.

Phase 4 Rewards and Consequences	• Meaningful differentiating rewards. • 'Firm but Fair' Consequence Management.

Each year, the calculation of KPI for each lecturer will be calculated and be finalized during the third phase (Performance Review and Appraisal). The calculation will be varied, depending on the lecturers' status and the factors that will be referred to in calculating the KPI are as follows:

Table 3.0 LECTURERS' KPIs – Overall Lecturers' Workload by Percentage

(Source: UTP Lecturer's KPI, 2009

		MA1	MA2	MA3	MA4	MA5
1. Teaching		50%	40%	30%	20%	15%
2. Supervision		10%	15%	15%	20%	20%
3. Research	**Funding**	15%	15%	25%	25%	30%
	Publication	15%	20%	20%	25%	25%
4. Services		10%	10%	10%	10%	10%
		100%	100%	100%	100%	100%

1. Teaching

Table 4.0 LECTURERS' KPIs – Teaching

			MA 1		MA 2		MA 3		MA 4		MA 5	
			50%		40%		30%		20%		15%	
Objectives		SW	B	S	B	S	B	S	B	S	B	S
Teaching	Lecturers' teaching rating	30	5.0		5.0		5.0		5.0		5.0	
	Contact hours	15	10		10		10		6		6	
	Class Size	15	80		80		80		80		80	
	Course Load per Semester	10	1.5		1.5		1.5		1		1	
	Course Mgt & CQI	30	Meeting all the requirement									

2. Supervision

Table 5.0 LECTURERS' KPIs – Supervision

			MA 1		MA 2		MA 3		MA 4		MA 5	
			10%		15%		15%		20%		20%	
Objectives			B	S	B	S	B	S	B	S	B	S
Supervision	FYP per Sem		5		4		3		2		2	
	ETP/FYDP/ Internship per semester		1gp		1gp		1gp		-		-	
	Masters enroll		-		2		3		4		5	
	PhD enroll		-		1		2		3		4	
	Post Graduate Year of study		Students completed their study within the stipulated time frame									

3. Research

i- Publication

Table 6.0 LECTURERS' KPIs – Research Publication

		MA 1		MA 2		MA 3		MA 4		MA 5		
		15%		20%		20%		25%		25%		
Objectives		B	S	B	S1	B	S1	B	S1	B	S1	Remarks
Publications	Non Indexed Journal	2										
	Indexed Journal			1		2		3		4		Listed in SCOPUS, ISI & Other data bases
	Chapter Initiated					1		1		2		
	Book Authored											
	Book Initiated									1		
	Indexed Conferences											Cited proceeding (limited to only one international conference using University funding)

ii- Grant

Table 7.0 LECTURERS' KPIs – Research Grant

		MA 1		MA 2		MA 3		MA 4		MA 5		
		15%		15%		25%		25%		30%		
Objectives		B	S	B	S	B	S	B	S	B	S	Remarks
Grant	STIRF	1		1								Proposal submitted to REO
	National – E Science/CIDB/ FRGS or equivalent			1		2		2		2		1/2 proposals submitted (First 15 /9/ and Second bef ore 31/11/09)
	PRF/Techno-fund or equivalent							1		1		1 proposals submitted (before 31/10/09)
	International									1		1 proposals submitted (before 31/10/09)
	Member											

4. Services

Table 8.0 LECTURERS' KPIs – Services

		MA 1		MA 2		MA 3		MA 4		MA 5		
		10%		10%		10%		10%		10%		
Objectives		B	S	B	S	B	S	B	S	B	S	Remarks
Services	Department	x		x		x		x		x		
	University	x		x		x		x		x		
	State					x		x		x		
	PETRONAS					x		x		x		
	National							x		x		
	International									x		

Table 3.0 to Table 8.0 shown above have the description in details on each weightage for each factors. Each factor will have its own minimum requirement to be achieved by lecturers. However, as being stated earlier, the method of calculation that is being implemented to the system is not transparent as it does not provide the exact figure on the final grading. Besides that the calculation method is being influenced and very subjective to nature.

CHAPTER 3

METHODOLOGY

3.0 METHODOLOGY

3.1 RESEARCH METHODOLOGY

As mentioned earlier in this report, the main objective of this development of system is to propose a new calculation method to be implemented to the new KPI system that is expected to give more visibility to the users on the final total marks and to reduce the involvement of the human factors in the calculation. There are stages of developing the system and generally the summary for the procedures that will involve are being shown as in the figure below.

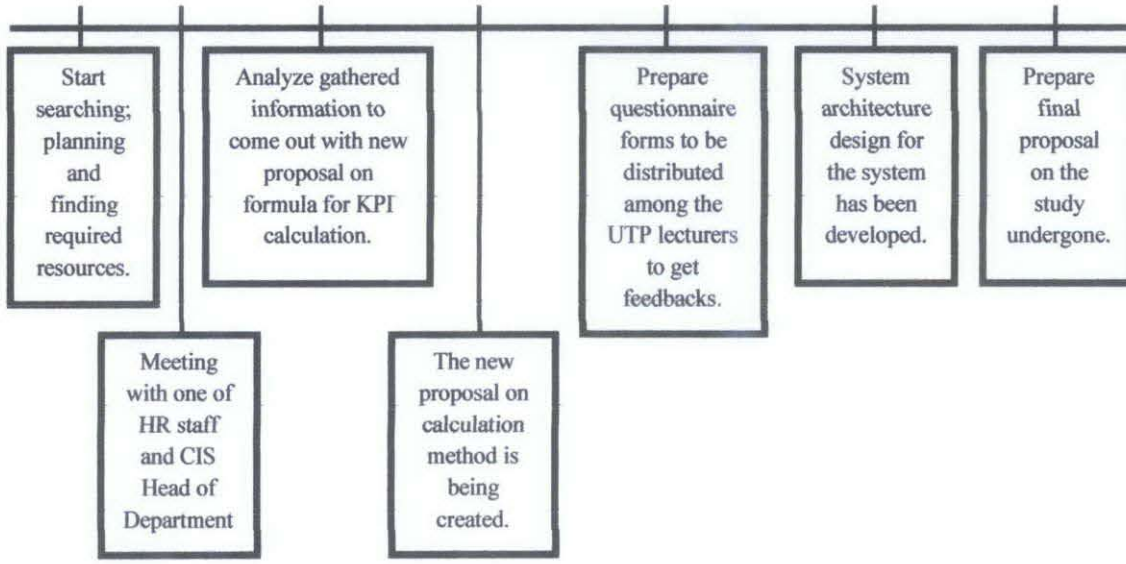


Figure 1.0 Flow of Activities

As in Figure 1.0 above, it is to be identified that there are four main stages that have to be conducted before coding process of the system is taking part. The four stages will be explained in detail as below.

3.1.1 Information and Data Collection

This is the stage where all the information and data on current KPI system used and the work process in calculating the KPI of lecturers for each year has been done. The information is used to assist in creating the new calculation method.

Participants

Table 9.0 Group of Participants and its Descriptions

Group of Participants	Description	
Human Resource Management Department of UTP	A staff that is in charging on UTP staffs' KPI has been approached. Information that has been gathered from this person are as below: a) Information on the current flow of KPI calculation throughout the year. b) Information on the current flow for UTP KPI system. c) The problems faced by the staffs to multiply the marks based on each weightage.	
Computer Information & Science Department of UTP	Head of Department	Information on the process involved in gathering all the report submitted by the lecturers has been gathered.
	Lecturers	The feedbacks and responds from the lecturers related to the

		current KPI calculation will be gathered. A proposal on the new method and formula of the calculation will be introduced to each one of them and a questionnaire form will be prepared to get the feedbacks.

3.1.2 New Calculation Method Creation

As being stated in the introduction part, there are four main criteria that will determine the KPI of the lecturers which are the criteria of *Teaching, Supervision, Research (Publications and Grant),* and *Services.* A proposal of the new calculation method will be detailed out as below.

Teaching

For the criteria of Teaching, a new proposed grading table has been created. The lecturers will get the marks for each subjects taught at the end of the year and the average of those marks will be calculated. The marks will then be referred to the grading table and will be multiplied with the percentage depending on the level position of the lecturers.

Example: Calculation for teaching criteria for the lecturers at MA3 level.

Table 10.0 Proposed Grading Table

Percentage (100%)	Score
10	1.0 – 1.4
20	1.5 – 1.9
30	2.0 – 2.4
40	2.5 – 2.9
50	3.0 – 3.4
60	3.5 – 3.9
70	4.0 – 4.4
80	4.5 – 4.9
100	5.0
120	5.1 – 5.4
140	5.5 – 5.8
160	5.9 – 6.2
180	6.3 – 6.6
200	6.7 – 7.0

Course Name	Management Information System
Course Code	TBB1122
No. of Students	75
Semester	July
Year	2011
Marks	6.3

Course Name	E-Commerce
Course Code	TBB1133
No. of Students	4
Semester	July
Year	2010
Marks	7

Percentage for TEACHING for MA3 level is 30%.

Average Marks for both subject (6.2 + 7.0) / 2

= 6.6

Based on the table above: 6.6 = 180

= 180 x 0.3

= 54 **(TOTAL MARKS)**

Supervision

The minimum numbers of students (FYP, ETP, Masters and PHD) and the percentage the lecturers have to supervise are depending on their position. With this new calculation method, each student supervised will have its own marks. The total marks are being calculated by multiplying the number of students with the respective marks. Below are the tables that show the marks for each student that have allocated for different level of lecturers.

Table 11.0 Marks for each Student

MA1 (10%)			
Supervision	**No. of students/ group**	**Marks per student/ group**	**Total (100%)**
FYP per semester	5	15	75
ETP/ FYDP/ Internship per semester	1 grp	25	25
Master enroll			
PHD enroll			

MA2 (15%)			
Supervision	**No. of students/ group**	**Marks per student/ group**	**Total (100%)**
FYP per semester	4	10	40
ETP/ FYDP/ Internship per semester	1 grp	10	10
Master enroll	2	15	30
PHD enroll	1	20	20

MA3 (15%)			
Supervision	**No. of students/ group**	**Marks per student/ group**	**Total (100%)**
FYP per semester	3	5	15
ETP/ FYDP/ Internship per semester	1 grp	10	10
Master enroll	3	15	45
PHD enroll	2	15	30

MA4 (20%)			
Supervision	**No. of students/ group**	**Marks per student/ group**	**Total (100%)**
FYP per semester	2	2.5	5
ETP/ FYDP/ Internship per semester			
Master enroll	4	12.5	50
PHD enroll	3	15	45

MA5 (20%)			
Supervision	**No. of students/ group**	**Marks per student/ group**	**Total (100%)**
FYP per semester	2	5	10
ETP/ FYDP/ Internship per semester			
Master enroll	5	10	50
PHD enroll	4	10	40

Example: Calculation for supervision criteria for the lecturers at MA3 level.

FYP	**5 students**	**5 x 5 = 25**
ETP	-	**0 x 10 = 0**
Master	**3 students**	**5 x 15 = 75**
PHD	**2 students**	**2 x 15 = 30**
	TOTAL	**130**

Percentage for SUPERVISION for MA3 level is 15%.

130 x 0.15 = 19.5

Research

i- Publications

The minimum numbers of research and the percentage the lecturers have to supervise are depending on their position. With this new calculation method, each published publications will have its own marks. The total marks are being calculated by multiplying the number of publications published with the respective marks. Below are the tables that show the marks for each publication published that have allocated for different level of lecturers.

Table 12.0 Marks for each Publication

MA1 (15%)			
	No.	**Marks**	**Total**
Non Indexed Journal	2	50	100
Indexed Journal		100	
Chapter Initiated		100	
Book Authored		100	
Book Initiated		100	
Conference Proceeding	4 Conference Proceedings = 1 Indexed Journal		

MA2 (15%)			
	No.	**Marks**	**Total**
Non Indexed Journal			
Indexed Journal	1	100	100
Chapter Initiated		200	
Book Authored		200	
Book Initiated		200	
Conference Proceeding	4 Conference Proceedings = 1 Indexed Journal		

MA3 (20%)			
	No.	**Marks**	**Total**
Non Indexed Journal			
Indexed Journal	2	30	60
Chapter Initiated	1	40	40
Book Authored		80	
Book Initiated		80	
Conference Proceeding	4 Conference Proceedings = 1 Indexed Journal		

MA4 (25%)			
	No.	**Marks**	**Total**
Non Indexed Journal			
Indexed Journal	3	20	60
Chapter Initiated	1	40	40
Book Authored		80	
Book Initiated		80	
Conference Proceeding	4 Conference Proceedings = 1 Indexed Journal		

MA5 (25%)			
	No.	**Marks**	**Total**
Non Indexed Journal			
Indexed Journal	4	15	60
Chapter Initiated	2	10	20
Book Authored			
Book Initiated	1	20	20
Conference Proceeding	4 Conference Proceedings = 1 Indexed Journal		

Example: Calculation for research (publication) criteria for the lecturers at MA3 level.

Indexed Journal	**6**	**6 x 30 = 180**
Chapter	**2**	**2 x 40 = 80**
Initiated		
Book Authored	**0**	**0 x 80 = 0**
Book Initiated	**0**	**0 x 80 = 0**
	TOTAL	**260**

Percentage for RESEARCH PUBLICATION for MA3 level is 20%.

260 x 0.20 = 52

ii- Grant

The minimum numbers of grant the lecturers have to collect are depending on their position. With this new calculation method, each grant received will have its own marks. The total marks are being calculated by multiplying the number of grant received with the respective marks. Below are the tables that show the marks for each grant received that have allocated for different level of lecturers.

Table 13.0 Marks for each Grant

MA1 (15%)			
	No.	Marks	Total
STIRF	1	100	100
National- E Science/ CIDB/ FRGS or equivalent			
PRF/ Techno-fund or equivalent			
International			
Member			

MA2 (15%)			
	No.	Marks	Total
STIRF	1	40	40
National- E Science/ CIDB/ FRGS or equivalent	1	60	60
PRF/ Techno-fund or equivalent			
International			
Member			

MA3 (25%)			
	No.	Marks	Total
STIRF			
National- E Science/ CIDB/ FRGS or equivalent	2	50	100
PRF/ Techno-fund or equivalent			
International			
Member			

MA4 (25%)			
	No.	Marks	Total
STIRF			
National- E Science/ CIDB/ FRGS or equivalent	2	30	60
PRF/ Techno-fund or equivalent	1	40	40
International		80	80
Member			

MA5 (30%)			
	No.	Marks	Total
STIRF			
National- E Science/ CIDB/ FRGS or equivalent	2	20	40
PRF/ Techno-fund or equivalent	1	30	30
International	1	30	30
Member			

Example: Calculation for publication (grant) criteria for the lecturers at MA3 level.

National- E Science/ CIDB/ FRGS or equivalent	**3**	**3x 50 = 150**
PRF/ Techno-Fund or equivalent	**0**	**0 x 100 = 0**
International	**0**	**0 x 100 = 0**
	TOTAL	**150**

Percentage for RESEARCH GRANTT for MA3 level is 25%.

150 x 0.25 = 37.5

Services

The minimum numbers of services the lecturers have to conduct are depending on their position. With this new calculation method, each services conducted will have its own marks. The total marks are being calculated by multiplying the number of services conducted with the respective marks. Below are the tables that show the marks for each service conducted that have allocated for different level of lecturers.

Table 14.0 Marks for each Service

MA1 (10%)			
		Marks	**Total**
Department	X	50	50
University	X	50	50
State	X	100	100
PETRONAS	X	100	100
National	X	100	100
International	X	100	100

MA2 (10%)			
		Marks	**Total**
Department	X	50	50
University	X	50	50
State	X	100	100
PETRONAS	X	100	100
National	X	100	100
International	X	100	100

MA3 (10%)			
		Marks	**Total**
Department	X	20	20
University	X	20	20
State	X	30	30
PETRONAS	X	30	30
National	X	60	60
International	X	60	60

MA4 (10%)			
		Marks	**Total**
Department	X	10	10
University	X	10	10
State	X	25	25
PETRONAS	X	25	25
National	X	30	30
International	X	60	60

MA5 (10%)			
		Marks	**Total**
Department	X	10	10
University	X	10	10
State	X	15	15
PETRONAS	X	15	15
National	X	20	20
International	X	30	30

Example: Calculation for services criteria for the lecturers at MA3 level.

Department	/	20
University	/	20
State	-	0 x 30
PETRONAS	-	0 x 30
National	-	0 x 60
International	/	60
	TOTAL	**100**

Percentage for **SERVICES** for MA3 level is **10%**.

100 x 0.10 = 10

Final Calculation

All the marks from each criterion will be sum up and the final marks will be referred to the final grading table to get the final grading. The example of calculation is as below. (*Note: All the numbers are the one calculated as in the previous examples shown earlier).*

MA3			
Teaching		**30%**	**54**
Supervision		**15%**	**19.5**
Research	**Grantt**	**25%**	**52**
	Publishing	**20%**	**37.5**
Services		**10%**	**10**
		100%	**173**

Table 15.0 Proposed Final Grading Tables

FINAL SCORE & GRADE						
Excellent	**Exceeding Requirement**	**Meeting Requirement**	**Meeting Requirement**	**Meeting Requirement**	**Below Requirement**	**Far Below Requirement**
1	**2**	**3A**	**3B**	**3C**	**4**	**5**
200	150 - 199	100 - 149	99 - 90	89 - 80	79 - 70	69 - 60

3.1.3 Analysis

A set of survey form has been prepared to get the feedbacks from the lecturers of UTP on the proposed calculation method. 30 lecturers from various departments have been approached. They have been asked on the level of acceptance or protestation on the new calculation method for each of the criteria; teaching, supervision, publications (research and grant). Below are the survey results.

Each criterion can be rated according from the scale 1 to 5. Appropriate words are assigned for each number depending on what is being rated. The scales are as below.

1 = Strongly Disagree

2 = Disagree

3 = Neutral

4 Agree

5 Strongly Disagree

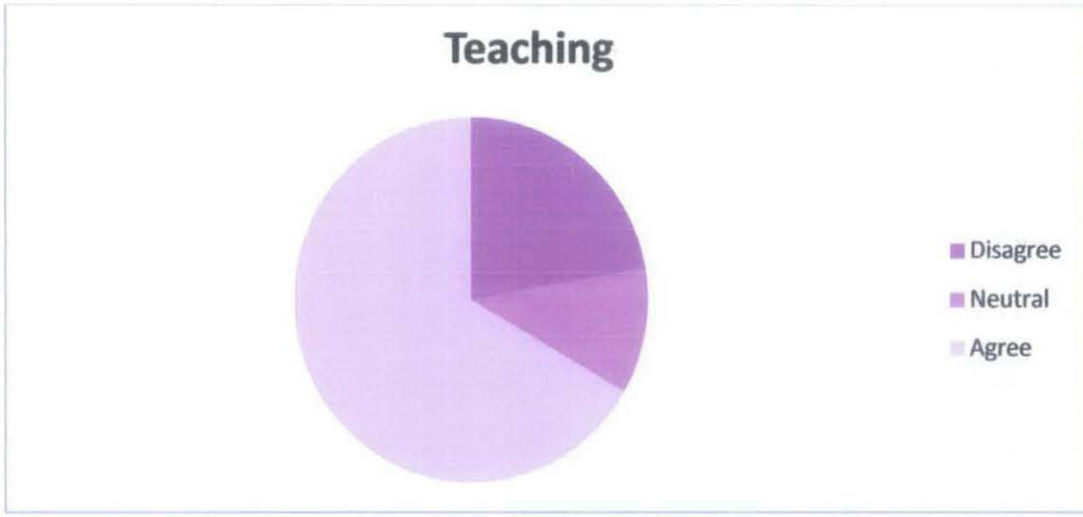


Figure 2.0 Survey Result for Teaching Criteria

Based on Figure 2.0, it shows that 65% of the 30 lecturers are agreed with the proposed calculation method for teaching criteria. 14% are not agreed with this method and 21% have the natural feeling on this new method of calculation.

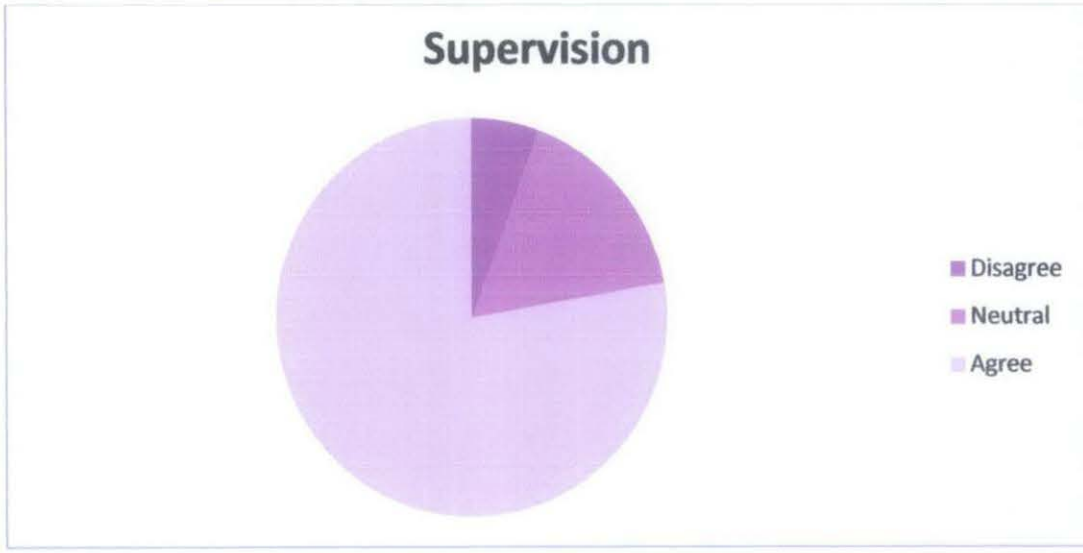


Figure 3.0 Survey Result for Supervision Criteria

Based on Figure 3.0, it shows that 78% of the 30 lecturers are agreed with the proposed calculation method for supervision criteria. 15% are not agreed with this method and 7% have the natural feeling on this new method of calculation.

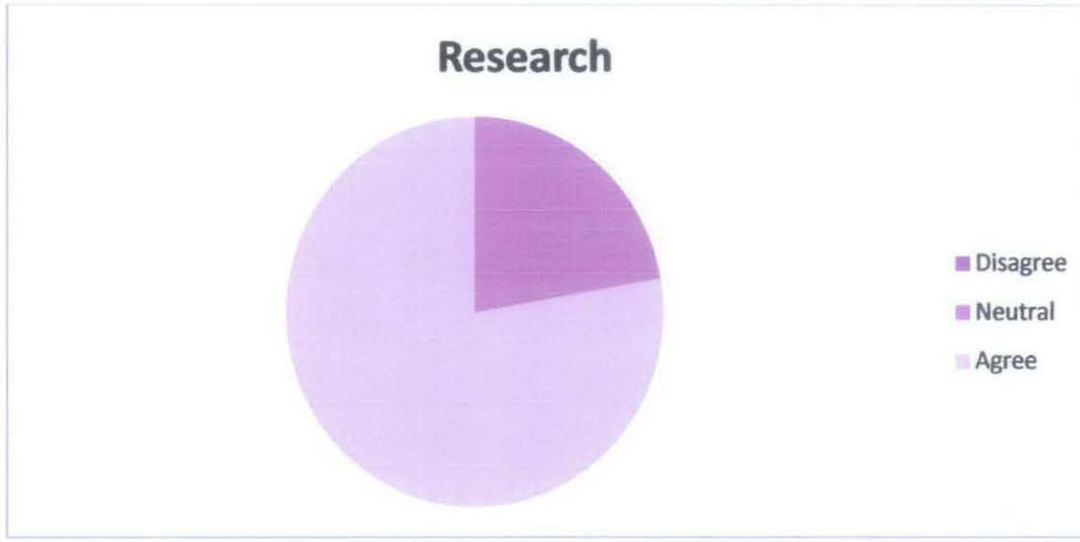


Figure 4.0 Survey Result for Research (Publications & Grant) Criteria

Based on Figure 4.0, it shows that 80% of the 30 lecturers are agreed with the proposed calculation method for teaching criteria. 20% have the natural feeling on this new method of calculation.

Figure 5.0 Survey Result for Services Criteria

Based on Figure 5.0, it shows that 68% of the 30 lecturers are agreed with the proposed calculation method for teaching criteria. 32% have the natural feeling on this new method of calculation.

3.1.4 Design

This section will be detailed out on the underneath design of the system. All the flow process involved, the action for each button when click, and the display of the final result will be shown as well.

i- System Architecture

As for the proposed KPI system, the concept of three-tiered architecture will be adopted. A three-tiered architecture uses three sets of computers (see Figure 6.0). In this case, the web-based system on the client computer is responsible for presentation logic, an application server is responsible for application logic and a separate database server is responsible for data access logic and data storage.

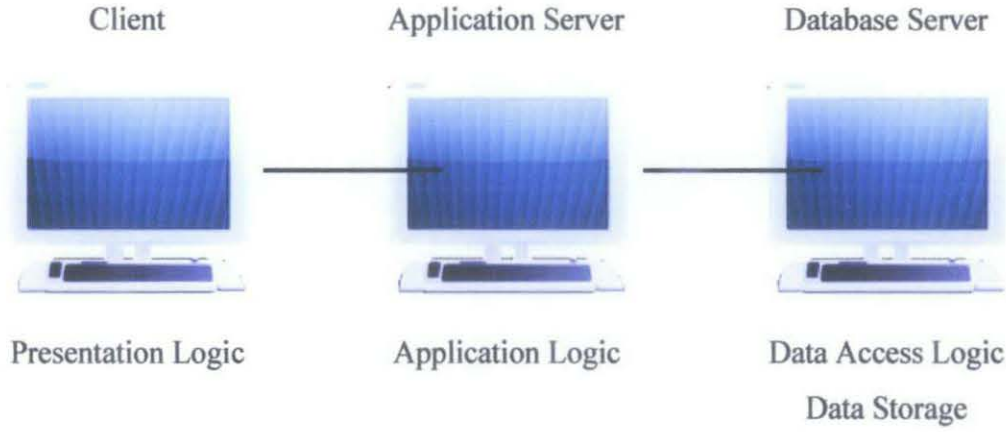


Figure 6.0 Three-Tier Architecture

The advantages of three-tier architecture are:

a) It is easier to modify or replace any tier without affecting the other tiers. This advantage caters the reliability of the system.

b) The separation of functions of application and database gives the loading balancing.

c) Allows adequate security policies to be enforced within the server tiers without hindering the clients.

ii- Activity Diagram

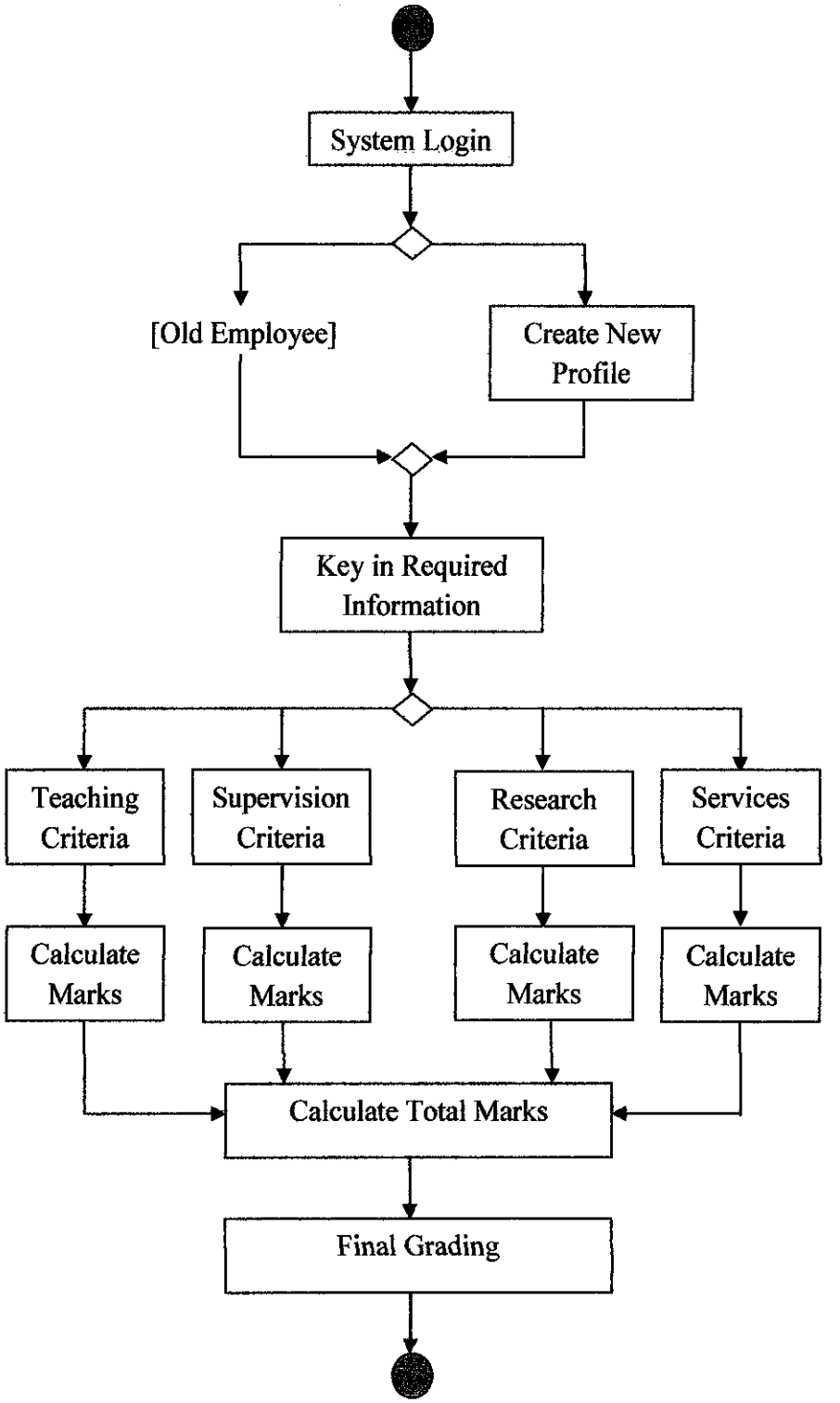


Figure 7.0 Activity Diagram of KPI Tracking System

iii- Use Case

Use Case Diagram

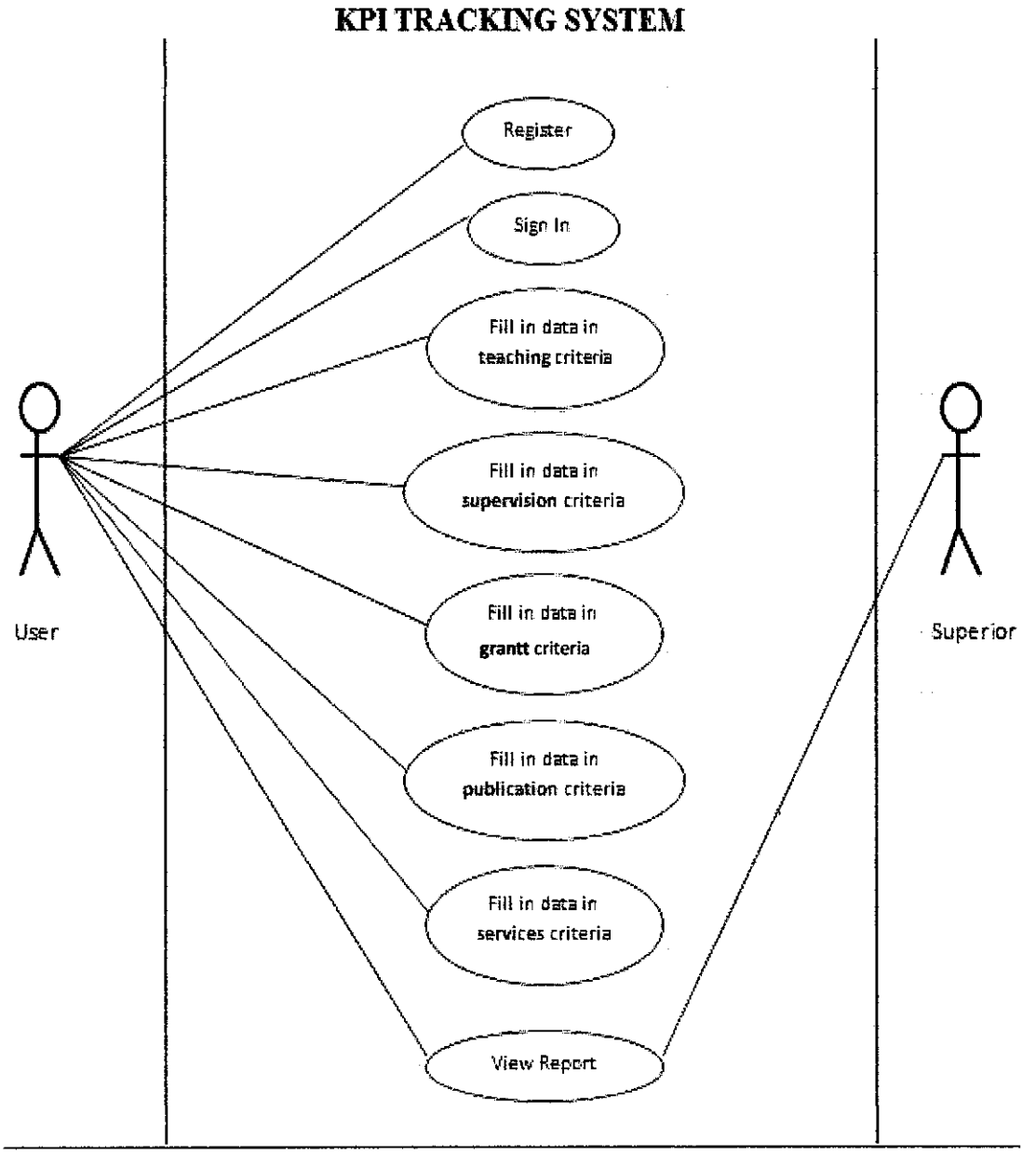


Figure 8.0 Use Case Diagram of KPI Tracking System

3.2 Gantt Chart

Table 16.0 Gantt chart on the activities planned through the semester (Stage 1 and Stage 2)

ACTIVITIES PLANNED	WEEKS (January 2011 – May 2011)													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Doing research on the topic studies (finding journals, related books, online paper works, etc.)														
Meeting the participants (HR staff, HOD of CIS department, and CIS lecturers)														
Analyzing current KPI system (A-PRAISe)														
Setting up new formula of the KPI calculation														
Submission of extended proposal														
Distributing the questionnaire forms to CIS lecturers														
Getting feedbacks from lecturers and analyzing the information.														
Submission of defense proposal														
Submission of interim report (Final Submission)														

Table 17.0 Gantt chart on the activities planned through the semester (Stage 3 and Stage 4)

ACTIVITIES PLANNED	WEEKS (September 2011 – December 2011)													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Development of System (coding & system algorithm)														
Development of System (user interfaces)														
Submission of progress report														
Getting feedbacks from the stake holders														
Poster Presentation														
System Improvement														
Submission of dissertation report														
Submission of technical report														

Key Milestone **Progress**

3.2 Tools

Table 18.0 Tools and its Functionalities

Tools/ Platform	Functionalities
Mozilla Firefox	Firefox will act as the browser to test the system during execution testing phase.
PHP language	PHP is the main internet programming language that will be used.
MySQL	MySQL is an open source database system that will act mainly on storing the data.
WAMPP Server	This will act as the server to do the compilation of the coding line.
Other internet programming languages: - CSS, Javascript, HTML	-CSS: This language will be used to design the system interface design. -Javascript: It will be used to code the related formula.

CHAPTER 4

RESULTS AND DISCUSSIONS

4.0 RESULTS AND DISCUSSIONS

4.1 USER NEEDS ASSESSMENT AND ANALYSIS

The user needs assessment process was carried out through interviews with the system's stakeholders which are the UTP lecturers. Among the stakeholders that have been interviewed are:

a) Assoc. Prof. Dr. Dhanapal Durai Dominic (Computer & Information Science Department (CIS))
b) Dr. Mohamed Nordin Bin Zakaria (Computer & Information Science Department(CIS))
c) En. Abu Bakar Sedek bin Abdul Jamak (Management & Humanities Department(MH))

The reasons the people stated above are being interviewed because there are among the main users for this KPI Tracking System. Their feedbacks and opinions are important as it can help the KPI system that has been newly developed to be improved.

As for the first interviewee, Assoc. Prof. Dr. Dhanapal Durai Dominic one of the lecturer from CIS department, which is also the author's FYP supervisor, has been picked to be interviewed because the idea of proposing the new calculation method to be

coded into the system have arisen after author has made discussions with him. His opinions are important as to make sure the system's user interfaces are correctly sync with the calculation algorithm that has been coded by author.

The other interviewees are Dr. Nordin Bin Zakaria, also lecturer from CIS department, and Mr. Abu Bakar Sedek bin Abdul Jamak, a lecturer from MH Department. Their feedbacks are really important they were not involved in the planning and development period. Therefore, it is important to have them as the external examiners or testers for this system during the testing period in making the interfaces friendlier to the users and to improve the system algorithm so it will be easier to do the system maintenance in future.

After collecting information from the feedbacks and considering all the issues rose regarding the user interfaces, the database connection and the report display, with few discussions with supervisor, Dr. Dominic, author has made small changes to the user interfaces and for the other part of the system, it will be maintained the same as the one being developed earlier.

4.2 PROTOTYPE

4.2.1 User Interfaces

The user interfaces that are shown in this report are the web pages or forms that the users will be using when using/dealing with this KPI Tracking system. This system has four main functions, which are user registration, login, home page, users' input data collection and report generation.

User Registration

This form will allow the *first-time* users to register themselves to the system, so that the system will recognize the user's identity each time they have logged in. To go through this process is a must for every *first-time* users as the user will not be allowed to access the system without the identified authorization.

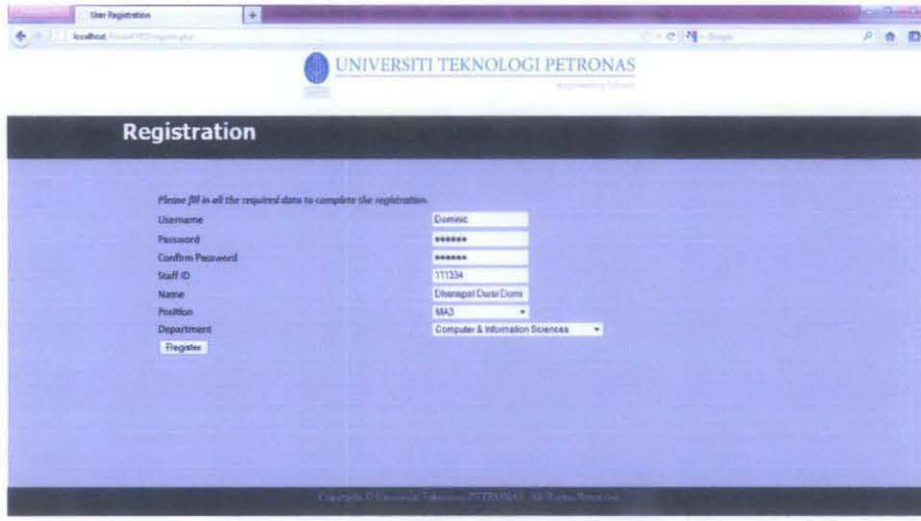


Figure 9.0 Registration Form

Login

This login form has the functionalities that allow the users to key in their personal identity information, to make the system to recognize and identify each one of the different users.

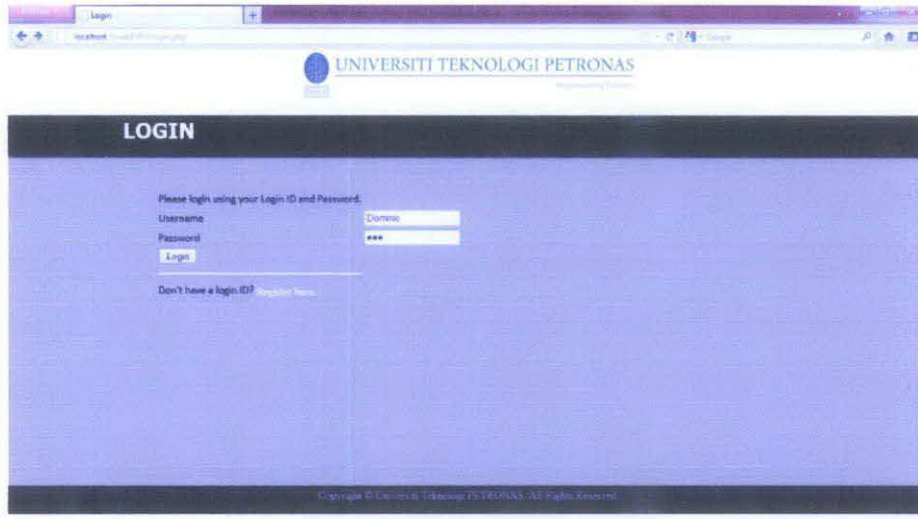


Figure 10.0 Login Form

Home Page

At this Home Page Form, users can select the other sections in the system they intend to view. For example, Teaching Form, Supervision Form or Report Form.

Figure 11.0 Home Page Form

User's Input Data Collection

There are five different forms with the functionalities of collecting data from users, which are:

a) Teaching Form

This form is intended to collect all the data related to the courses/subjects that the user has taught in one particular year. The data needed to be inserted to the system includes the *Course Code, Course Name, No. of Students, Semester, Year* and *Marks.* Here in this form, the users can add more than one subjects taught as this form have the functions of *"shopping-cart"* concept.

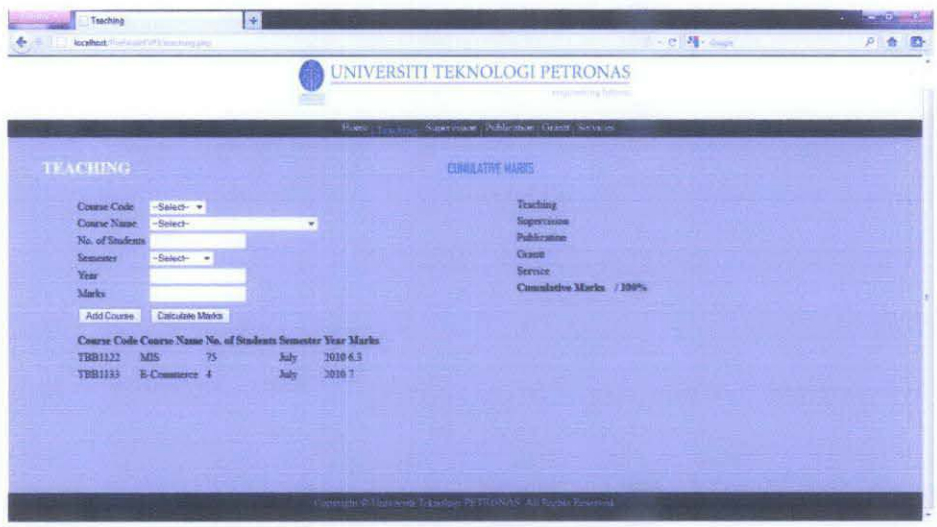


Figure 12.0 Teaching Form

b) Supervision Form

This form is to collect all the data related to numbers of students that the user has supervised in one particular year. The required data to be inserted through this form is number of students supervised for *Final Year Project 1 (FYP 1), Final Year Project 2 (FYP 2), Engineering Team Project (ETP), Technopreneurship Team Project (TTP), Master* and *PHD.*

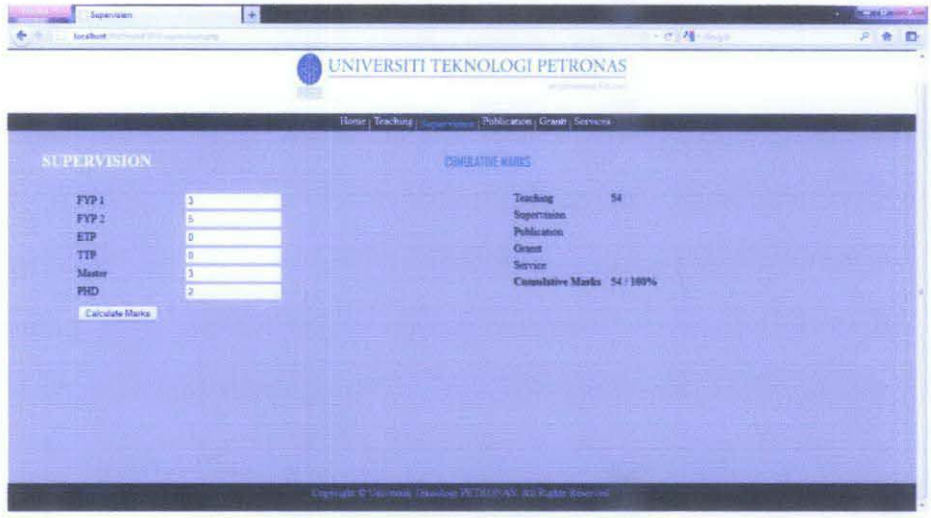


Figure 13.0 Supervision Form

c) Publication Form

This form is for the user to key in the data related to the number of varies types of publications that the user has completed for a particular year. Data that need to be inserted are the number of published/completed *Non-Indexed Journal, Indexed Journal, Chapter Initiated, Book Authored, Book Initiated,* and *Conference Proceedings*.

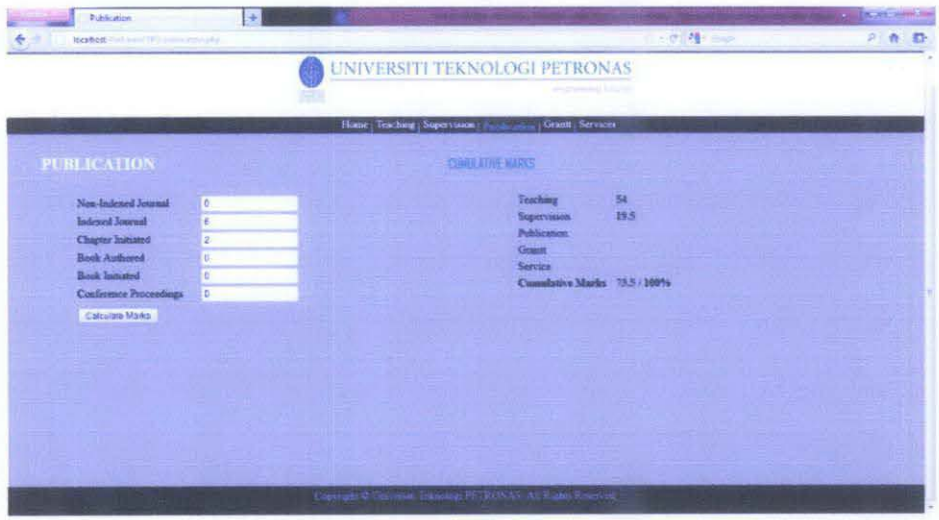


Figure 14.0 Publication Form

d) Grantt Form

As for this Grantt Form, it needs the user to key in the data related to the number of grant received to fund the research activities. As in the form, user needs to key in the number of grant received from different level; *STIRF, National- E Science, PRF* and *International.*

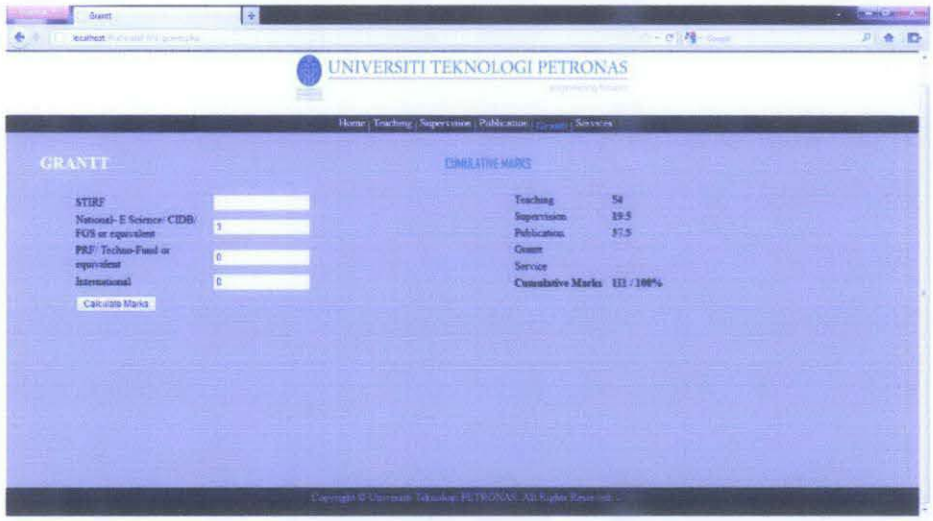


Figure 15.0 Grantt Form

e) Service Form

This form is to get the data on the contributed services by the users at different level. User has to tick on the particular level of their contributed services (*Department, University, State, PETRONAS, National,* and *International*).

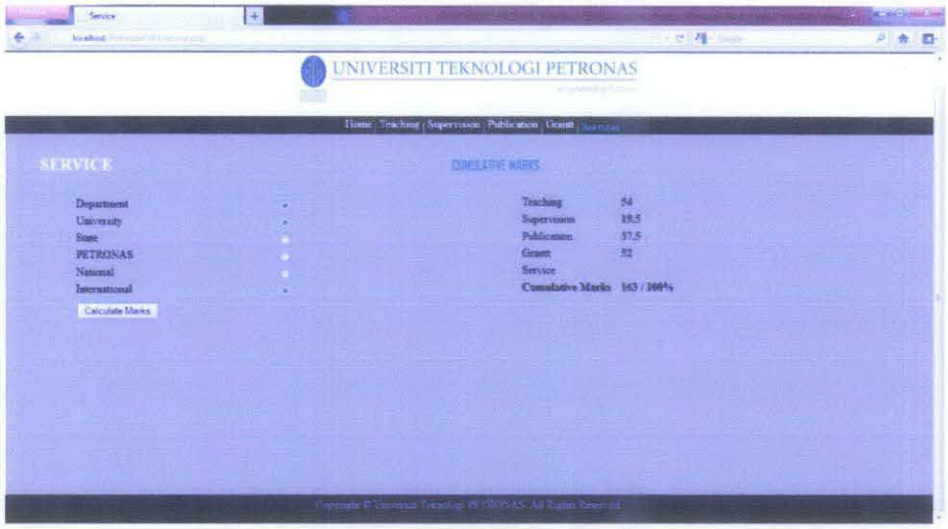


Figure 16.0 Service Form

For this new KPI Tracking System, the variables for each criterion will be treated uniquely. It means that, the calculation for each variable will not affect the other variables. Thus, this gives the flexibility for the users to perform at which ever activities they are at best.

In addition, as being shown in each of the forms, users can have and keep track the information on their current percentage marks for each criterion at the right side of the forms. This gives more transparent and visible results for the users.

Report Generation

After user has key-ed in all the required data from different criteria, user can have the overall information related to their calculated percentage for each criterion, as well as the total percentage and the grade the user has achieved.

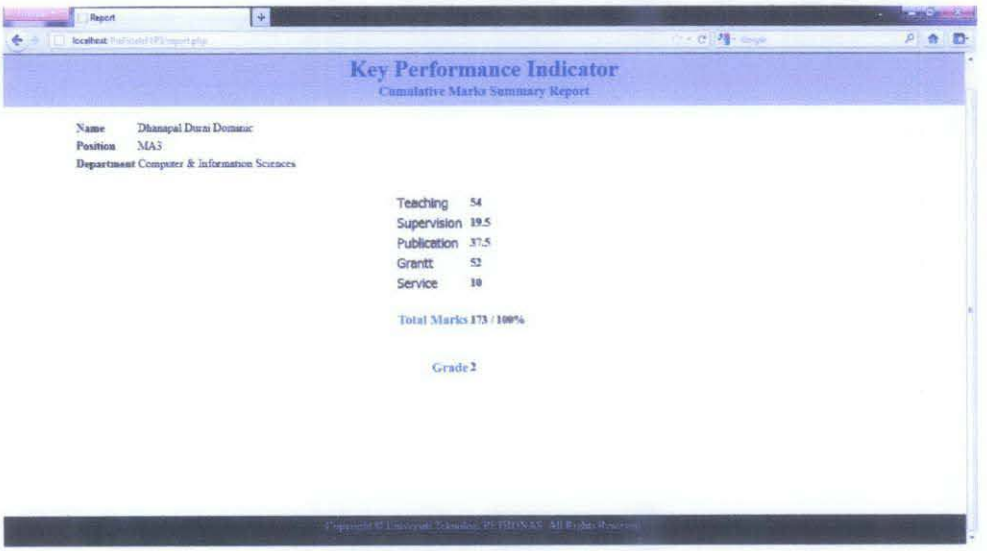


Figure 17.0 Summary Report

4.3 PROJECT DELIVERABLES

The deliverables of this project includes the submission of few reports from the beginning of the project in Final Year Project 1 (FYP/1) that were submitted in January Semester 2011 and the other remaining reports submitted in Final year Project 2 (FYP/2) in September Semester 2011. The reports among others include:

- FYP/1 Extended Proposal (submitted in January Semester)
- FYP/1 Proposal Defense (presented to Supervisor and External Examiner in January Semester)
- FYP/1 Interim Report (submitted to Supervisor and External Examiner)
- FYP/2 Progress Report (submitted to Supervisor)
- FYP/2 Pre-EDX (presented with prototype and posters to External Examiners)
- FYP/2 Dissertation (to be submitted to External Examiner and Supervisor)
- FYP/2 Viva (to be presented to Supervisor and External Examiner)

This project delivered all of the required deliverables including the posters and the prototype of the project.

CHAPTER 5

CONCLUSION AND RECOMMENDATION

5.0 CONCLUSION AND RECOMMENDATION

Key Performance Indicator is a very helpful tool as it can manage the tracking of performance for organizations. However, the formula in calculating the performance needs to be accurate and the concept transparency of calculation should be adhered towards making the work place as the healthy competitive environment.

This system could be considered as 80% completed because it has successfully produced the prototype as planned and according to the schedule of the project timeline. This system has able to produce almost all the functionalities that have been planned in the Planning and Designing phase of the project.

It is to be recommended that in future, besides having this KPI system for lecturers be available and can be accessed through their own PCs, it is suggested that in the future, the system should allow the lecturers to access through their own mobile phones as it can ease the lecturers to check the update on their KPI marks.

REFERENCES

[1] Grzegorz Guzik, Amir Netz, Marin Bezic. (2005).
Key performance indicator system and method.

[2] Saxena, D. (2010). Performance Management System.
Global Journal Of Management And Business Research, 10(5). Retrieved from http://journalofbusiness.org/index.php/GJMBR/article/view/201

[3] Feurer, R. & Chaharbaghi, K. 1995. Strategy Formulation: a Learning Methodology. Benchmarking for Quality, Management and Technology 2(1): 38-55

[4] Carol Taylor Fitz-Gibbon (1990), "Performance indicators"

[5] Feurer, R. & Chaharbaghi, K. 1995. Strategy Formulation: a Learning Methodology. Benchmarking for Quality, Management and Technology 2(1): 38-55

[6] Koskela, L. 2000. An Exploration Towards a Production Theory and its Application to Construction. Espoo, VTT Building Technology: 296

[7] Pillai, A. 2002. Performance Measurement of R&D Projects in a Multi-project, Concurrent Engineering Environment. International Journal of Project Management 20: 165-177

[8] Marosszeky, M., Karim, K., Davis, S., & Naik, N. 2004. Lessons learnt in developing effective performance measures for construction safety management. *Proceedings of Twelfth Annual Conference of the International Group for Lean Construction (IGLC-12)*, Elsinore, Denmark.

[9] Lukman Ab Rahim, Ahmad I. Z. Abidin and Ainol R. Shazi, 2007. Designing An Automated Staff And Organization Performance Appraisal System: A Web-Based Approach, Platform Volume 5 Number Two: 62-69

Key Performance Indicator Tracking System

by

Nur Shafiqa binti Shahirol

Dissertation submitted in partial fulfillment of
the requirements for the
Bachelor of Technology (Hons)
(Business Information System)

SEPTEMBER 2011

Universiti Teknologi PETRONAS
Bandar Seri Iskandar
31750 Tronoh
Perak

CERTIFICATION OF APPROVAL

Key Performance Indicator Tracking System

by

Nur Shafiqa binti Shahirol

A project dissertation submitted to the
Business Information System Programme
Universiti Teknologi PETRONAS
in partial fulfillment of the requirement for the
BACHELOR OF TECHNOLOGY (Hons)
(BUSINESS INFORMATION SYSTEM)

Approved by,

_____
(Assoc. Prof. Dr. Dhanapal Durai Dominic)

UNIVERSITI TEKNOLOGI PETRONAS
TRONOH, PERAK
September 2011

CERTIFICATION OF ORIGINALITY

This is to certify that I am responsible for the work submitted in this project, that the original work is my own except as specified in the references and acknowledgements, and that the original work contained herein have not been undertaken or done by unspecified sources or persons.

_____

NUR SHAFIQA BINTI SHAHIROL

ABSTRACT

The Performance Measurement Systems (PMS) relies on the usage of numeric indicators to quantify success or failure, normally referred to as key performance indicators (KPIs) and most all of the government and private organizations are implementing the KPI. The usage of KPI is not being excluded to the higher learning institution as well, for example, Universiti Teknologi PETRONAS (UTP). The purpose of this paper is to propose a new calculation method of the KPI for lecturers. The methodology is based on the relevant literature review that has been reviewed. This study identifies reasons for implementing the new proposed calculation method that are to achieve the visibility of the final result to the users and to minimize the human factor in calculating the KPI marks.

ACKNOWLEDGEMENT

I would like to acknowledge the advice and guidance of Assoc. Prof. Dr. Dhanapal Durai Dominic, my FYP supervisor, who has guided me from the beginning of the research activities until the system development phase. Without his knowledge and assistance, this study would not have been successful.

I also thank the staffs of Universiti Teknologi PETRONAS Human Resource Department and the lecturers that have participated during the survey execution phase. Not to forget my friends, my highest appreciation would go to them for the supports and knowledge sharing.

I would like to thank my family members, especially my parents, Shahirol Ahmad and Norzi Shukor, for moral and financial supports. Without their encouragement, it would be impossible for me to complete this project and my degree.