CERTIFICATION OF APPROVAL

ONLINE KEY PERFORMANCE INDICATOR MANAGEMENT SYSTEM

FOR CIVIL ENGINEERING DEPARTMENT, UTP

by

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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.

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ABSTRACT

Key Performance Indicator (KPI) is a set of quantifiable measures that a company or organization used to indicate and evaluate the employees performance. The company need establish its strategic, missions, and goals and then choose the right KPIs which suites to achieve those goals. The KPIs also vary between companies and industries and it depends on their culture and performance criteria. The Online Key Performance Indicator Management System is developed for UTP Civil Engineering Department as a pilot project. This project is about the development of five modules for online KPI management system that allows the users to be able to carry out management functions correlated to KPI. Currently all five modules are being captured and consolidated manually by using Microsoft Excel. By developing This Online KPI Management System, it will help the academic staffs and Civil Engineering department lecturers to manage their own KPI information efficiently.

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To the Head and Academic Executives of Civil Engineering Department, thank you for your cooperation and assistance in completing this project.

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CHAPTER 1

INTRODUCTION

1.1 Background

Key performance indicator or KPI are mainly used by the organization to indicate and evaluate the employee's performance. The KPI also assist and guide them towards archiving the objectives and goals and ensure that they are on the right track. The KPI not only indicate the employee's performance, but it also helps them to identify the weaknesses that need to be improved and corrected.

The Online Key Performance Indicator Management System is a project that intended to replace the current manual system of monitoring and reporting the lecturers and staffs KPI. This online computerize system are expected to efficiently stored all information regarding the lecturers KPI and mining out all information in a form of dashboard to ease the management to produce reports and decision making.

The project is about the development of remaining module for online KPI management system that allows the users to be able to carry out management

functions correlated to KPI. There are five main modules proposed for this system which consists of Publication, Research Grants, Teaching, Supervision, and Services. The Publication and Research grants module prototype have been successfully developed. The remaining modules consist of Supervision and Services need to be developed in order to ensure the system can be fully functioning for the Civil Engineering Department.

1.2 Problem Statement

Key Performance Indicators cooperate as one of the crucial business role in order to assist the top management in monitoring the companies or organizations overall performance to achieves their goals. Since KPI elements are different between organizations and departments, a custom made system need to be developed in order to satisfied the needs for managing and reporting the KPI.

Currently Civil Engineering Department managed their staff KPI manually by using Microsoft Excel spreadsheet. There are a lot of limitations to update and manage those KPI if the staffs are not available or going outstation. Those KPI are very important to all Civil Engineering Department staff to indicate where they are in the organization.

There are five elements in Online KPI management system:

- Publications
- Research Grants
- Teaching
- Supervision
- Services

The manual system is not very effective because it is based on Microsoft Excel Spreadsheet. The head of department or superior will have the difficulties to access or monitor their staffs KPI's when the staff is not around. Therefore, the manual KPI system need to be convert into automated and online KPI monitoring system to ease the staffs and lecturers to updates, monitors, tracks and reports department's KPI.

1.3 Aims and Objectives

Aims

- Develop an online KPI application where it can make the KPI management become easier and more efficient.
- Develop a KPI Dashboard to assist in decision making.

Objectives

- Investigate how the current process of KPI management in UTP.
- Design and develop the Online KPI Management System.
- Implementation of the Pilot System for Civil Engineering Department.

1.4 Scope of project

The project is currently developed for the UTP Civil Engineering Department. If this system successfully implemented and used by the Civil Department, it will be expected to be implemented in other departments in the University Teknologi PETRONAS because the template used by every department in UTP are slightly the same.

The Online KPI management system will also assist the lecturers or academic staffs to manage their own KPI data which later will be used to update the current annual Staff Performance Management System (PMS) and

UTP's Publication Repository System (e-Prints). The preparation of KPI data for both PMS and e-Prints system are still manually prepared and processed by the academic staffs or academic executives in every respective academic department. Thus, the development of this Online KPI Management System will expected to replace the manual process mentioned earlier and make the management of the lecturers and staffs KPI become more efficient.

1.5 Feasibility Study

1.5.1 Technical Feasibility

The system was currently developed by using:

- Language: PHP, MySQL Database, html, CSS, Javascript
- Web-development software: Macromedia Dreamweaver, macromedia flash, swish Max
- Web Browser: Internet Explorer, Mozilla Firefox, Opera, Google Chrome

1.5.2 Schedule Feasibility

The development of the system is probably going to be completed by the end of April 2011. Refer to Gantt chart in appendices.

1.5.3 Operational Feasibility

After the system has been fully developed and tested, it will be hosted on the free web server for the testing purposes. If the system meet the requirement and accepted by the civil department, it will be proposed to be hosted in the UTP server.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction to KPI

Key Performance Indicator (KPI) is a measurement tool used in management practice to measure the performance of an organization towards mission, objectives and goals. Key Performance Indicators are scientific dimensions, agreed to beforehand, that imitate the significant success factors of an organization. It differs based on the organization.

The examples of the measurements are for business sectors, they may have the KPI percentage on its income that received from customers, a school might evaluate their KPI based on graduation rates of its student and same goes to the University level. Whatever KPI selected, it must relate and reflect the organization's objectives and goals. There must be "keys" for it and that "key" must be measurable. Normally, the Key Performance Indicator has been used as the long-term plan or considerations. And the Key Performance Indicator objectives or goals will change based on the organization's objectives or goals change.

2.2 Research on Key Performance Indicator (KPI)

A key performance indicator (KPI) can be simply defined as a measure of performance. It can be measured as individual or departmental level. Such measures are generally used to facilitate an organization define and evaluate how successful it is. Parmenter define KPI as a guideline that tells the organization on what to do in order to increase its performance dramatically (Parmenter, 2007). The KPIs differ based on the nature of the organization and the strategies of the organization itself. This KPI can help to assess the development of an organization towards its vision and long-term goals.

Management is well aware of the significance of focusing on key performance indicators (KPIs).These measures report "the pulse" of the organization (Parmenter, 2007). In UTP Civil Engineering Department, the staffs and lecturers also need to setup their own KPI and this KPI will be update on quarterly basis.

2.3 Current Technology related to KPIs

There are many other software that related and offers the functionalities of managing the KPI and most of the software can be accessed via online. The technology like Business Intelligence System – BI are made from different platforms, developed by different big companies from IT industry like Oracle and Microsoft (Kelly, 2010). Some of the tools offers by these companies are Oracle Exadata v2 and Microsoft Office SharePoint. They offer the system that can caters the demands of the users such as flexibilities, low maintenance cost, scalability and quick deployment (Kelly, 2010).

KPI system that embedded with Business Intelligence System (BI Systems) is now included with advance functions but it is still within the concept of storing and retrieving the data from the data warehouses and database query reporting which involve data mining concept in order the

produced the dashboard. Each of the systems provided has their own architectures to ensure that the KPI elements can be customized based on the user requirements. In relation to this Online KPI Management System, it is a fully customize system which based on the lecturers and academic executives needs and requirements. It was totally developed by using open source software and database application; PHP and MySQL.

2.4 Research and study on the Online Key Performance Indicator Management System.

The Online Key Performance Indicator Management System was developed based on five main modules, Publication, Research grants, Teaching, Supervision, and Services. Two of these modules have been developed and have been tested by using real data; Publication and Research grants modules.

In order to have a complete Online Key Performance Indicator Management System, the remaining three modules need to be completed first and the understandings about the whole system are crucial before continuing developing it. Therefore, I have personally consulted with Academic Executives and Head of the Civil Engineering Department, about the needs and requirements of the system.

The main objectives of the supervison module are to capture the number of student supervised by the lecturers in the Civil Department and the objectives of the services module are to capture the services information for every lecturers and staffs. The current manual system required the lecturers to key in the information based on the MS Excel template, and the template will be consolidate by the academic executives to generate the overall report for the civil department.

In UTP, KPI elements are focusing towards achieving a research university status by year 2013. The determined set of KPI elements are based on academic staff job grades. All this KPI elements are recorded without proper computerized system. Below is the brief process of KPI practice being implemented in UTP.

1) Workshop Involving HODs and Director decided the KPI elements.
2) Head Of Department (HOD) communicates the KPI elements to AE to identifying the Department's KPI
3) Academic Executives (AE) captures the required KPIs for their respective department.
4) AEs capture each staffs KPI progress monthly or quarterly.
5) AEs consolidate all the collected KPI achievements from staff.
6) AEs prepare the department's KPI performance.
7) Department's KPI updated to the UTP's Top Management.

This current step need to be done in computerize system to ensure the reliability of information given and to ease the Academic Staff to consolidate all KPI data. With a proper system, the KPI can be easily monitored and organized.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction

This section will cover on how the projects are planned to be complete in order to fulfill the objectives. The process of developing this Online KPI Management System will be estimated to complete by the end of April 2011. For the methodology of this project, I have used Incremental Model. The incremental model is one of the Software Development Life Cycle models. It is an evolution of waterfall model. The project can be designed, implemented, integrated, and tested as a series of development cycles. The development of this project has gone through the planning, requirements gathering, analysis & design, and testing phase. During the testing phase, the end users had requested some modification for the Supervision part. So the project methodology will cycle back to the analysis and design phase to ensure the system meets the user requirements. By using this incremental methodology, the development process of this system can be more flexible if the scope or requirements have been change. It will be easier for the developer to test or debug if the system need any modification or alteration.

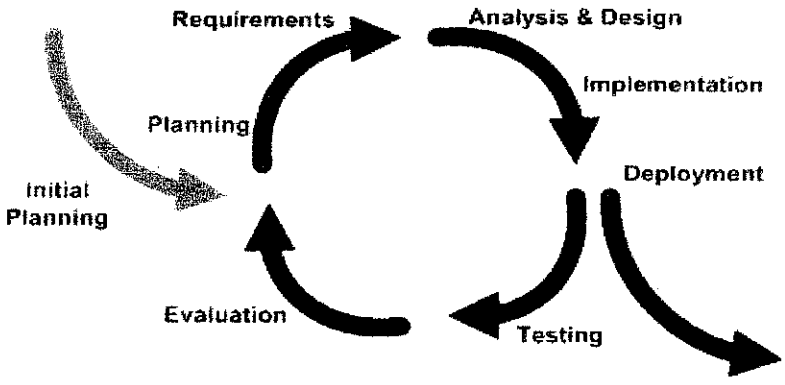

Figure 1: Incremental Model [8]

This project requires integration from current system developed by previous developers, thus this is the main reason why incremental model is applicable and chosen over other types of model. Every KPI module was developed separately and will be combined after each module completed. The benefits of separating the module are if one of the modules has error or not functioning, it will not affect other modules.

There are also several crucial factors that need to be considered for this project as this project has a tight deadline. The cooperation with the end users is also important to ensure that the system meet the end user requirements and expectations. The Gantt chart in the appendices shows the timeline on enhancing the Online KPI Management System.

3.2 System Architecture

Below is the system architecture diagram for the Online KPI Management System.

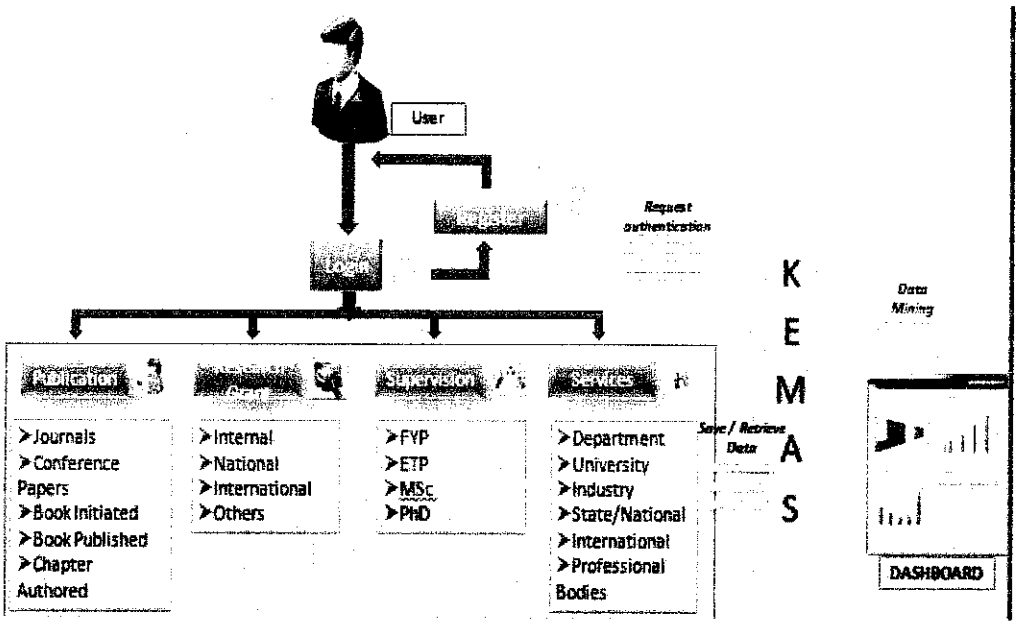

Figure 2: System Architecture

The academic executives needs to login to the system in order to access the KPI elements. After successfully login, they can access through all KPI elements, adding, access, and mining all related information. All information and data are then stored into the database. And from the database, the data will be mining to produce the KPI Dashboard.

3.3 Tools Utilization

The Online Key Performance Indicator Management System was developed by using several tools. Below are some explanations about the tools used.

3.3.1 PHP

Why using php?

PHP can be used on all major operating systems such as Linux, Microsoft Windows, Mac OS X, RISC OS, and probably others. Most of the web server today has support the PHP language.

This includes Apache, IIS, and many others. So with PHP, we have the freedom of choosing an operating system and a web server. If there are any changes of the server, this system can be easily merge or transferred to the new server without major modification. Furthermore, PHP also have the choice of using procedural programming or object oriented programming (OOP), or a mixture of them both. PHP are not limited to output HTML. PHP's abilities include outputting images, PDF files and it can even generate flash movies. It can easily output any text, such as XHTML and any other XML file. PHP can auto generate these files, and save them in the file system, instead of printing it out, forming a server-side cache for your dynamic content. One of the strongest and most significant features in PHP is its support for a wide range of databases.

3.3.2 Wamp5 server

WampServer is a platform for Web development under Windows. It allows you to develop dynamic Web applications using the Apache 2 server, the scripting language PHP and a MySQL database. It also has PHPMyAdmin to more easily manage your databases.

Unlike other solutions, WampServer allows you to faithfully reproduce your production server. WampServer also has a "TrayIcon" allowing you to simply manage and configure your servers, without affecting the configuration files.[13]

3.3.3 PHPMyAdmin and MySQL

PHPMyAdmin is a free software tool written in PHP intended to handle the administration of MySQL over the World Wide Web.

phpMyAdmin supports a wide range of operations with MySQL. The most frequently used operations are supported by the user interface (managing databases, tables, fields, relations, indexes, users, permissions, etc), while you still have the ability to directly execute any SQL statement.

The MySQL that used in this system development are bundled in the WAMP Server. This project uses MySQL as its back end database to allow the system administrators or lecturers to store all collected data as well as for setting purposes such as creating user accounts. The SQL embedded in the PHP codes will send the data and save it in the database that created earlier. The database for the Online KPI Management System consists of 20 tables and it covered four KPI elements: Publications, Research grants, Supervisions, and Services.

3.3.4 Apache 2 Web Server

Web Server is a computer program that is responsible for accepting HTTP requests from clients which are known as web browsers. The web server also serves the clients HTTP responses along with optional data contents which usually are web pages such as HTML documents and linked objects (image).

Apache are used for developing this system because it is an open source and most popular web server. The stabilities and reliabilities are the key factors why this system are developed using this web server. The apache web server can configure their own error messages, content negotiation. Content negotiation is a method defined in the HTTP design that makes it possible to access various versions of a document.[8]

CHAPTER 4

RESULT AND DISCUSSION

4.1 Introduction

The requirement gathering phases are very important in developing or transforming from the manual system to the computerize system. At the moment, the Academic Staff used basic Office software tools, Microsoft Excel to gather all KPI information. By understanding on how the manual system works, the process of developing the system will become easier.

Below are the results of the tested functionalities for the Online KPI management system.

Case	Functionality Being Tested	Input Details	Result
1	Journals	Submit data Upload journal	Successful
2	Conference paper	Submit data Upload Conference paper	Successful
3	Book Initiated, Book Published Chapters Authored	Submit Data Retrieve Data	Successful
4	Research Grants	Submit and retrieve internal, National, international, and others grants	Successful

5	Supervision	Submit and retrieve Supervision data -FYP -ETP -MSc -PhD	Successful
6	Services	Submit and retrieve Services data	Successful
7	Dashboard	Dashboard details by using Google Visualizations tools	modification process

Table 1: Result for tested functionalities.

During the development of Supervision and Services module, the database have been altered and modified based on the user requirements. Below are the details for the Supervision and Services module database.

4.2 The Online KPI Management System Database

The Online Key Performance Indicator Management System consists of 20 tables. The Supervision module used 5 tables and the Services module uses only 1 table. See Appendices section for calss diagram and database table details.

4.3 Supervision Module

For the development of the Supervision sites, some research has been done in order to minimize the user input errors. The usage of Javascript below helps to reduce human error on selecting or searching for a data.

```
<select name="searchoption" onchange="this.form.submit();" >
       <option value="<?php $searchoption ?>">Search By :</option>
       <option value="1">Lecturer Name</option>
       <option value="2">Student Name</option>
       <option value="3">Student ID</option>
 </select>
```

The usage of "onchange" function helps to refresh the form and load the new options data from the database. The user can just select the desired information from the drop down menu instead of typing it.

The error checking mechanisms are very important in the website form. For the web based programming, Javascript are the easiest method to check errors before submitting any data into the database. Below is part of Javascript codes embedded for user input checking mechanisms.

```
<script language="JavaScript" type="text/javascript">
function checkform ( form )
{
    if (form.searchoption.value == "0") {
    alert( "Please choose your search type" );
    form.searchoption.focus();
    return false ;
  }
   if (form.search.value == "") {
    alert( "The search form can't be blank!" );
    form.search.focus();
    return false ;
  }
 return true ;
}
</script>
```

See figure 7 in appendices section for the screen shot of Supervision Module form.

4.4 Services Module

Services module site are quite simple compared to Supervision Module. The usages of the Services site are for capturing the services detail for lecturers during the specific financial year. There are six types of services that required to be filled by the academic executives or lecturers.

1) Department level
2) University level
3) Industry level
4) State / National level
5) International level
6) Membership in relevant professional bodies

There are basically two sites developed for the services module. The first site was developed for capturing the services data and the second site was developed for viewing purposes. On the services view site, the users can also edit or delete their own services information. See figure 8 for the screen shot of the services site.

4.5 Dashboard

The dashboard site was developed for the academic executives or higher management to easily monitor the required information in graphical form. This Online KPI management system are integrated with Google charts tools or Visualization API powered by Google. Below is the screenshot of the drafted dashboard for the system.

Figure 3: Dashboard

To develop this Visualization, the dashboard page must have the HTML elements, such as to hold and display the visualization. This visualization required three libraries that need to be import from the Google: The Google AJAX API, the Google visualization API, and the library for the visualization itself. [10]

Include the Google AJAX API - This API is used to load the Google Visualization API library, the visualization libraries, and perform other important tasks.[10]

Load the Google Visualization API - The Google Visualization API includes common classes and methods used to create and handle visualizations, for example: DataTable to hold the data; a query object for querying data providers; and error handlers to help trap and display errors on the page.[10]

Below is the example of manipulated Visualization codes done by me. The purpose of these codes is to view the journals and conference paper in interactive way.

```
<script type="text/javascript">
      google.load("visualization", "1", {packages:["corechart"]});
      google.setOnLoadCallback(drawChart);
      function drawChart() {
        var data = new google.visualization.DataTable();
        data.addColumn('string', 'Year');
        data.addColumn('number', 'Journals');
        data.addColumn('number', 'Conference Paper');
        data.addRows(<?php echo $fyRows ?>);
        data.setValue(0, 0, '<?php echo $years[0]?>');
        data.setValue(0, 1, <?php echo $totalJournal[0]?>);
        data.setValue(0, 2, <?php echo $totalConference[0]?>);
        data.setValue(1, 0, '<?php echo $years[1]?>');
        data.setValue(1, 1, <?php echo $totalJournal[1]?>);
        data.setValue(1, 2, <?php echo $totalConference[1]?>);
        data.setValue(2, 0, '<?php echo $years[2]?>');
        data.setValue(2, 1, <?php echo $totalJournal[2]?>);
        data.setValue(2, 2, <?php echo $totalConference[2]?>);
        data.setValue(3, 0, '<?php echo $years[3]?>');
        data.setValue(3, 1, <?php echo $totalJournal[3]?>);
        data.setValue(3, 2, <?php echo $totalConference[3]?>);
        var chart = new google.visualization.BarChart
                          (document.getElementById('chart_div'));
        chart.draw(data, {width: 500, height: 300,
                    title: 'Research Papers by Financial Years',
                          vAxis: {title: 'Financial Years',
                                  titleTextStyle: {color: 'red'}}
                         });
      }
    </script>
```

The codes above are some of the codes to generate the dashboard. It used direct link to the Google Visualization site to generate the interactive graph.

Load the Visualization Library - There are basically two kinds of visualizations which are Google – Authored Visualization and third party visualization. For the moment, these dashboards are developed by using the Google – Authored Visualization because the sources are stable and reliable.[10]

4.6 User Acceptance Testing (UAT)

The user acceptance testing has been conducted on the fifth week of Jan 11 semesters. The focal user, Mr Amirul from the Civil Engineering department has reviewed the system and he required some minor modifications and additions for the supervision and the services module. For the supervision module, the user wants to add more columns for the "Add MSc student form" and "Add PhD student form". The modifications of the information and data from the form will effects the database. So the database for the online KPI management system also need to be reviewed and modified accordingly in order to makes sure the data can be submit into the database without any errors.

CHAPTER 5

CONCLUSION AND RECOMMENDATION

5.1 Project Summary

The development of Online Key Performance Indicator Management System has been started upon requested by the UTP Civil Engineering Department. The main objectives of developing this system are to improve the department's KPI management process. Currently the staffs and lecturers manages and monitors their KPI manually and the inefficient process also being used in used in the consolidating and reporting process.

Thus, there is a need for a system to assist the staff and the Academic Executives to manage the monitor the department's KPIs. This system will also help the Head Of Departments (HOD) to have the updated KPI information and ease them to monitor and manage their respective departments.

The progress of developing the Online KPI Managements System has arrived to the level of modification and monitoring phase. The prototype will be shown to the end user and it will be proceeding to the next phase once the end user confirm and satisfied with design and functions.

5.2 Future Work

The project is still in the monitoring process and it will be continuously developed. More features and functionalities will be embarked into the system later. For example, the automatic calculation of staff KPI grade and interactive, meaningful dashboard to ease the higher management to monitor the department's KPI. Once the development process completed, it will be implemented as a pilot project for Civil Engineering department. It is a continuous project as the system still needs to be monitor and enhance according to the user needs. The methodology used in this development process will not disturb or interrupt the current working system.

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APPENDICES

No	Activities	Months									
		2010					2011				
		Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
1	**Planning**										
	Choose topic										
	Preliminary research on topic										
	Specify scope										
	Feasibility analysis										
2	**Analysis**										
	Requirements gathering										
	System Analysis										
	System Design										
4	**Development**										
5	**Testing**										
6	**Implementation**										
7	**System Delivery**										

Table 2: Project Gantt Chart

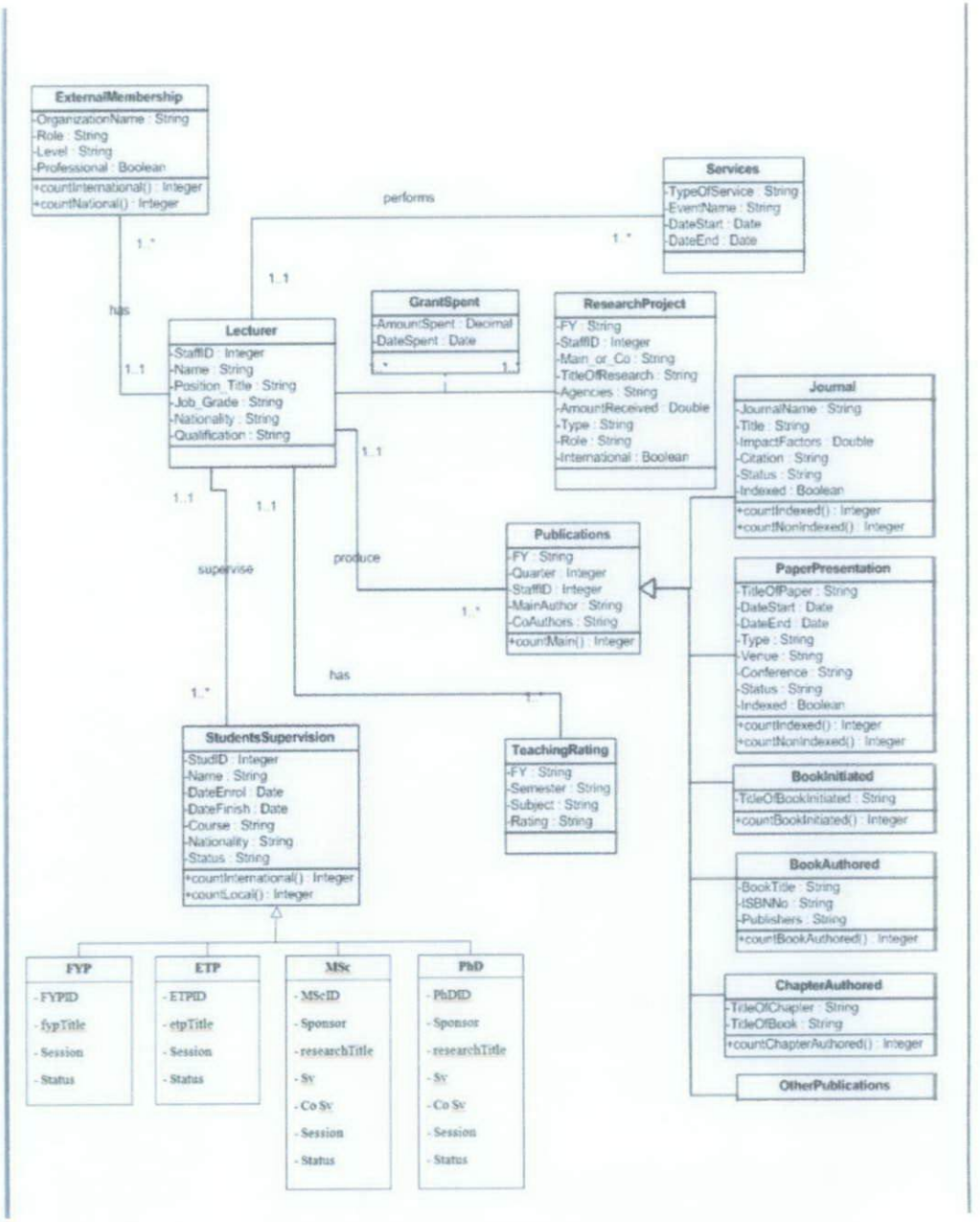

Figure 4 : Class Diagram

Server: localhost ▸ Database: kemasdb3 ▸ Table: tblsupervisionfyp "InnoDB free: 3072 kB"

Browse | Structure | SQL | Search | Insert | Export | Import | Operations | Empty | Drop

Field	Type	Collation	Attributes	Null	Default	Extra	Action
lecturerId	varchar(10)	utf8_general_ci		No			
session	varchar(10)	utf8_general_ci		No			
studId	varchar(6)	utf8_general_ci		No			
studName	varchar(50)	utf8_general_ci		No			
studCourse	varchar(30)	utf8_general_ci		No			
fypTitle	varchar(50)	utf8_general_ci		No			
telNo	varchar(15)	utf8_general_ci		No			
status	varchar(20)	utf8_general_ci		No			
fypId	int(10)			No		auto_increment	

Figure 5: Supervision FYP table

Server: localhost ▸ Database: kemasdb3 ▸ Table: tblsupervisionetp "InnoDB free: 3072 kB"

Browse | Structure | SQL | Search | Insert | Export | Import | Operations | Empty | Drop

Field	Type	Collation	Attributes	Null	Default	Extra	Action
etpId	int(10)			No		auto_increment	
lecturerId	varchar(10)	utf8_general_ci		No			
session	varchar(10)	utf8_general_ci		No			
etpGroup	varchar(10)	utf8_general_ci		No			
etpTitle	varchar(50)	utf8_general_ci		No			
telNo	varchar(15)	utf8_general_ci		No			
status	varchar(20)	utf8_general_ci		No			

Figure 6: Supervision ETP table

Server: localhost ▸ Database: kemasdb3 ▸ Table: tblsupervisionmsc "InnoDB free: 3072 kB"

Browse | Structure | SQL | Search | Insert | Export | Import | Operations | Empty | Drop

Field	Type	Collation	Attributes	Null	Default	Extra	Action
mscId	int(11)			No		auto_increment	
mscType	varchar(20)	utf8_general_ci		No			
sponsor	varchar(40)	latin1_swedish_ci		No			
intake	varchar(10)	latin1_swedish_ci		No			
sv	varchar(20)	latin1_swedish_ci		No			
coSv	varchar(60)	latin1_swedish_ci		No			
studId	varchar(10)	latin1_swedish_ci		No			
studName	varchar(50)	latin1_swedish_ci		No			
studCourse	varchar(10)	latin1_swedish_ci		No			
researchTitle	varchar(50)	latin1_swedish_ci		No			
email	varchar(50)	latin1_swedish_ci		No			
telNo	varchar(15)	latin1_swedish_ci		No			
status	varchar(20)	latin1_swedish_ci		No			
remark	varchar(50)	latin1_swedish_ci		No			
updateBy	varchar(20)	latin1_swedish_ci		No			

Figure 7: Supervision MSc table

Server: localhost ▸ Database: kemasdb3 ▸ Table: tblsupervisionphd "InnoDB free: 3072 kB"

Browse | Structure | SQL | Search | Insert | Export | Import | Operations | Empty | Drop

Field	Type	Collation	Attributes	Null	Default	Extra	Action
phdId	int(10)			No		auto_increment	
phdType	varchar(20)	latin1_swedish_ci		No			
sponsor	varchar(40)	latin1_swedish_ci		No			
intake	varchar(10)	latin1_swedish_ci		No			
sv	varchar(20)	latin1_swedish_ci		No			
coSv	varchar(60)	latin1_swedish_ci		No			
studId	varchar(10)	latin1_swedish_ci		No			
studName	varchar(50)	latin1_swedish_ci		No			
studCourse	varchar(10)	latin1_swedish_ci		No			
researchTitle	varchar(50)	latin1_swedish_ci		No			
email	varchar(50)	latin1_swedish_ci		No			
telNo	varchar(15)	latin1_swedish_ci		No			
status	varchar(20)	latin1_swedish_ci		No			
remark	varchar(50)	latin1_swedish_ci		No			
updateBy	varchar(20)	latin1_swedish_ci		No			

Figure 8: Supervision PhD table

Server: localhost ▸ Database: kemasdb3 ▸ Table: tblservices "InnoDB free: 3072 kB"

Browse | Structure | SQL | Search | Insert | Export | Import | Operations | Empty | Drop

Field	Type	Collation	Attributes	Null	Default	Extra	Action
servicesId	int(10)			No		auto_increment	
lecturerId	varchar(10)	utf8_bin		No			
FY	varchar(10)	utf8_general_ci		No			
quarter	varchar(5)	utf8_general_ci		No			
department	varchar(50)	utf8_general_ci		No			
university	varchar(50)	utf8_general_ci		No			
industry	varchar(50)	utf8_general_ci		No			
state	varchar(50)	utf8_general_ci		No			
international	varchar(50)	utf8_general_ci		No			
proBodies	varchar(50)	utf8_general_ci		No			

Figure 9: Services table

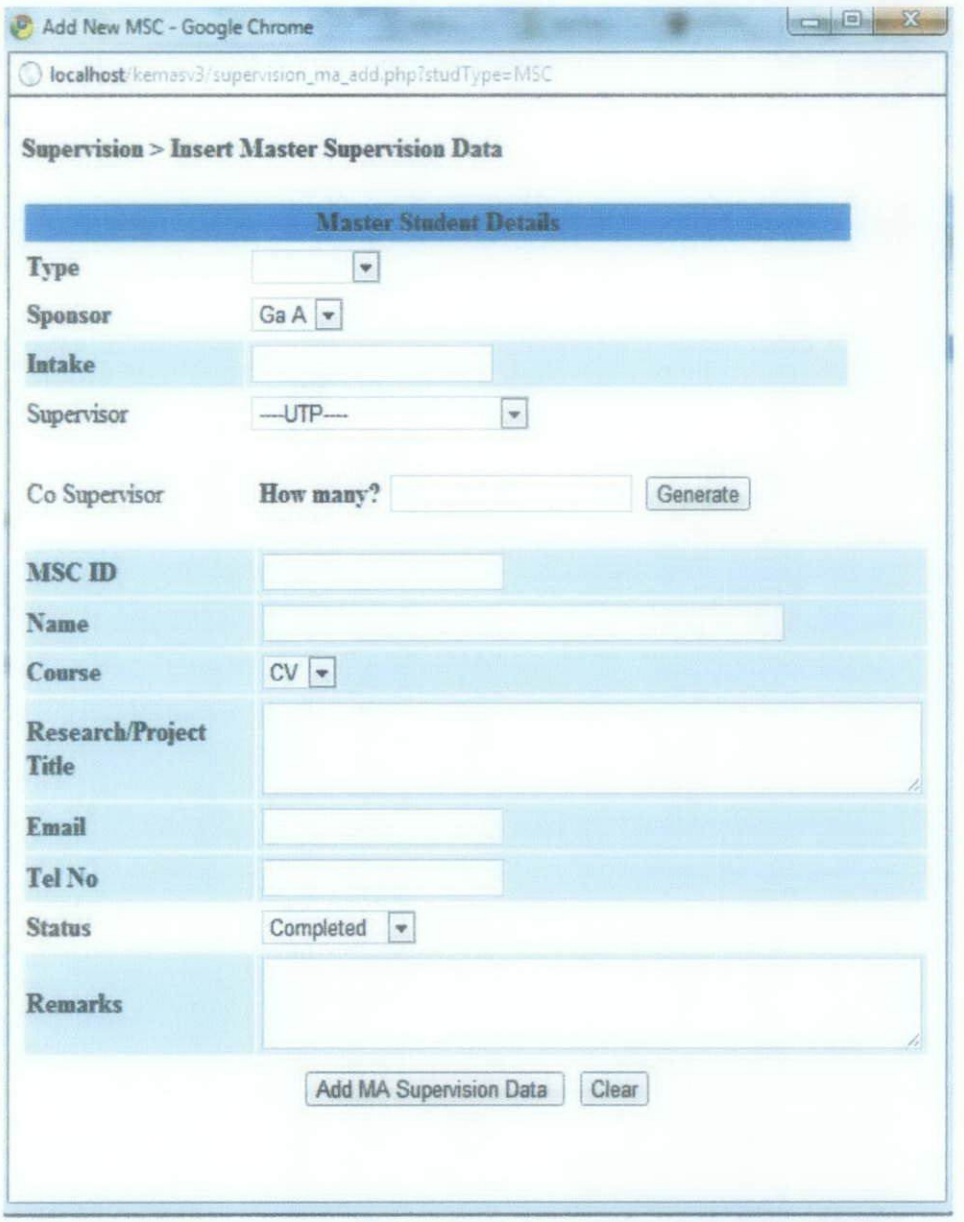

Figure 10: Supervision MsC – Add Data

Services > Insert Services Data

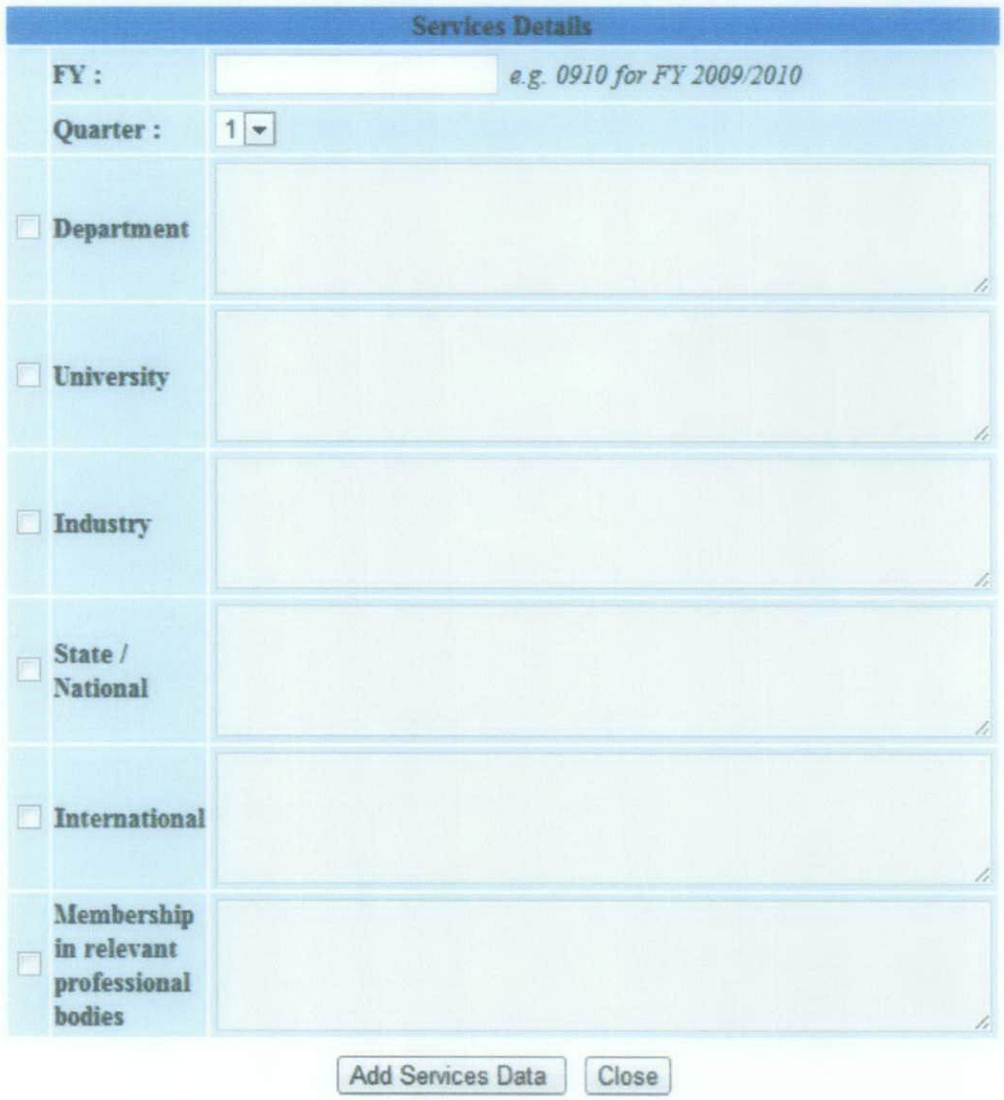

Figure 11: Services Add Data