

**INTEREST GROUP USING ELECTRONIC  
MANAGEMENT SYSTEM  
(i-GEMS)**

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MANAGEMENT SYSTEM  
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requirements for the award of the degree of  
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To my beloved mother, father and brother.

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## **ABSTRACT**

This thesis studies and analyzes the existing situation of Tunku Abdul Rahman College (TARC) in relation to academic collaboration and information sharing among its six campuses, as well as the status and limitations of TARC's existing electronic learning application. Based on the study, an Interest Group Using Electronic Management System (i-GEMS) is proposed to serve as a platform solution in supporting the collaboration and academic information sharing that is customized to TARC's circumstances.

The i-GEMS is a web-based application that developed using ASP.NET programming language, while Unified Approach (UA) that advocates Object-Oriented Methodology (OOM) in system implementation and Unified Modeling Language (UML) for diagram modeling are selected as a guide in developing the proposed i-GEMS system.

Through the i-GEMS, lecturers from different campuses can collaborate and share academic information with each other. This in turn can lead to delivery of standardized education throughout the six campuses of TARC. In addition, lecturers can broaden their knowledge other than their own fields of teaching through accessing other academic information from the i-GEMS.

In short, i-GEMS is a system that advocates managing academic information through collaboration across the campuses, information sharing and learning throughout different academic modules, as well as promoting higher interaction and information sharing among the students and lecturers.

## ABSTRAK

Tesis ini dilaksanakan bagi mengkaji dan menganalisa situasi di Kolej Tunku Abdul Rahman (KTAR) berkenaan kerjasama akademik dan perkongsian informasi di antara enam kampus. Ini termasuk juga status dan kelemahan perisian pembelajaran elektronik sedia ada. *Interest Group Using Electronic Management System (i-GEMS)* dicadangkan sebagai landasan bagi menyokong kerjasama dan perkongsian informasi akademik berdasarkan situasi di KTAR.

I-GEMS adalah perisian yang dibangunkan dengan menggunakan bahasa aturcara *ASP.NET* berdasarkan konsep *Unified Approach* yang menggalakkan penggunaan metodologi berorientasikan objek untuk membina sistem dan *Unified Modeling Language* bagi pemodelan diagram.

Melalui i-GEMS, pensyarah dari kampus yang berlainan dapat berkerjasama dan berkongsi infomasi akademik di antara satu sama lain. Dengan ini, pendidikan yang selaras dan konsisten akan dapat disampaikan di keenam-enam kampus KTAR. Selain itu, para pensyarah dapat memperluaskan pengetahuan dalam bidang lain dengan menggunakan segala informasi yang terdapat di dalam i-GEMS.

Kesimpulannya, i-GEMS adalah sistem yang menggalakkan pengurusan informasi akademik melalui kerjasama antara kampus, perkongsian informasi dan pembelajaran melalui modul akademik yang berlainan serta menggalakkan interaksi dan perkongsian informasi di antara pelajar dengan pensyarah.

## TABLE OF CONTENTS

<b>CHAPTER</b>	<b>TITLE</b>	<b>PAGE</b>
<b>1</b>	<b>PROJECT OVERVIEW</b>	<b>1</b>
	1.1 Introduction	1
	1.2 Background of Problem	2
	1.3 Statement of the Problem	3
	1.4 Project Objectives	5
	1.5 Project Scope	6
	1.6 Importance of Project	9
	1.7 Chapter Summary	10
<b>2</b>	<b>LITERATURE REVIEW</b>	<b>11</b>
	2.1 Introduction	11
	2.2 TARC's Existing Application	12
	2.2.1 TARC's E-Learning System	13
	2.3 E-Learning System	17
	2.3.1 Overview	17
	2.3.2 E-Learning Providers	19
	2.3.3 Impact of E-learning	24
	2.4 Future Trend and Development	26
	2.4.1 Overview	26
	2.4.2 The Emerging Approach	27
	2.5 Chapter Summary	32

<b>3</b>	<b>METHODOLOGY</b>	<b>34</b>
	3.1 Introduction	34
	3.2 Project Methodology	35
	3.2.1 Object-Oriented Methodology (OOM)	37
	3.2.2 Unified Modeling Language (UML)	41
	3.3 System Development Methodology for i-GEMS	44
	3.4 Project Schedule	46
	3.5 Chapter Summary	49
<b>4</b>	<b>SYSTEM DESIGN</b>	<b>50</b>
	4.1 Organizational Analysis	50
	4.2 Current Business Process and Data Model	55
	4.2.1 UML Diagrams	55
	4.2.2 System Architecture for Existing Application	60
	4.3 User Requirements	61
	4.4 Conceptual Design	63
	4.4.1 Business Process and Data Model (UML Diagrams)	63
	4.4.2 Process Framework for Proposed System	76
	4.5 Physical Design	77
	4.5.1 Database Design	77
	4.5.2 Program (Structure) Chart	80
	4.5.3 Interface Chart	80
	4.5.4 Detailed Modules / Features	84
	4.5.5 System Architecture (Physical Design)	87
	4.6 Hardware Requirements	88
	4.7 Test Plan	89
	4.8 Chapter Summary	94
<b>5</b>	<b>DESIGN IMPLEMENTATION &amp; TESTING</b>	<b>95</b>
	5.1 Coding Approach	95
	5.1.1 Snapshot of Critical Programming Codes	99
	5.2 Test Result / System Evaluation	107

5.2.1 Administrator User	107
5.2.2 Academic Staff User	108
5.2.3 Student User	114
5.2.4 User Acceptance Test	117
5.3 User Manual for Administrator	118
5.4 Chapter Summary	133
<b>6 ORGANISATIONAL STRATEGY</b>	<b>134</b>
6.1 Roll-out Strategy	134
6.2 Change Management	136
6.3 Data Migration Plan	138
6.4 Business Continuity Plan (BCP)	138
6.5 Expected Organizational Benefits	139
6.6 Chapter Summary	143
<b>7 DISCUSSION &amp; CONCLUSION</b>	<b>144</b>
7.1 Achievements	144
7.2 Constraints & Challenges	146
7.3 Aspiration	148
7.4 Chapter Summary	149
<b>REFERENCES</b>	<b>150</b>
<b>APPENDIX A –H</b>	<b>152 - 161</b>

## LIST OF TABLES

<b>TABLE NO</b>	<b>TITLE</b>	<b>PAGE</b>
2.1	Set Of Tools Offered By The Providers In E-Learning System.	23
2.2	Changing Roles For Both Educators And Students.	25
2.3	Emerging Approaches Against The Four Exemplary Studies.	31
4.1	Database - Description Of 19 Tables For I-GEMS.	78
4.2	I-GEMS Interface Chart.	83
4.3	Hardware Requirements For Supporting The I-GEMS System.	88
5.1	System Evaluation – Administrator User.	108
5.2	System Evaluation - Academic Staff User.	111
5.3	System Evaluation – Control Panel.	114
5.4	System Evaluation – Student User.	116

## LIST OF FIGURES

<b>FIGURE NO</b>	<b>TITLE</b>	<b>PAGE</b>
2.1	Existing Circumstance For Academic Staff To Communicate Across Campuses.	15
2.2	Existing Possible Communication Approaches For Academic Staff To Communicate Across Campuses.	16
3.1	The Unified Approach (UA) Process Structure In Iterative Form.	36
3.2	Data And Functions Packaged Together As An Object.	37
3.3	Object Oriented Systems Development Approach.	39
3.4	Proposed Operational Framework For I-GEMS System.	44
3.5	I-GEMS Project Schedule	47
4.1	Use Case For Existing Communication Circumstance.	55
4.2	Sequence Diagram For Existing Communication Approach Across Campuses.	56
4.3	Use Case For Existing E-Learning Application.	57
4.4	Sequence Diagram For Existing E-Learning Application – Lecturer View.	58
4.5	Sequence Diagram For Existing Application – Student View.	59
4.6	System Architecture For Existing E-Learning Or Cel System.	60
4.7	Use Case For I-GEMS System.	63
4.8	Sequence Diagram For Lecturer User.	64
4.9	Sequence Diagram For Student User.	65
4.10	Sequence Diagram For Administrator User.	66

4.11 Activity Diagram For Overall System.	67
4.12 Activity Diagram – Access Academic Module.	68
4.13 Activity Diagram – Access Discussion Module.	69
4.14 Activity Diagram – Access Test Module.	70
4.15 Activity Diagram – Access Other Subject’s Module.	71
4.16 Activity Diagram – Access Q & A Module.	72
4.17 Activity Diagram – Access Registration Module.	73
4.18 Activity Diagram – Maintain Lecturer Account.	74
4.19 Activity Diagram –Maintain Student Account.	75
4.20 Process Framework For The Proposed I-GEMS System.	76
4.21 I-GEMS Database Relationship Diagram	79
4.22 I-GEMS Structure Chart.	80
4.23 System Architecture For The Proposed I-GEMS System.	87
5.1 ASP.NET Web Controls.	96
5.2 Connecting Access Database Using Code Wizards	99
5.3 To Retrieve An Announcement From Access Database By Using Code Wizard.	100
5.4 To Insert An Announcement Into Access Database.	101
5.5 To Update An Announcement Into Access Database.	102
5.6 To Delete An Announcement From Access Database.	103
5.7 Create Folder And Upload File.	104
5.8 Datagrid Control.	105
5.9 Drag Datagrid Control From Web Control Toolbox.	105
5.10 Binding A Datagrid Control To Announcement Table.	106
5.11 Microsoft .NET Framework 1.1 Installation Setup.	118

5.12 Prompt That Showing Completed Installation Of Microsoft .NET Framework 1.1.	118
5.13 Microsoft ASP.NET Web Matrix - InstallShield Wizard.	119
5.14 Prompt Showing Completed Installation Of Microsoft ASP.NET Web Matrix.	119
5.15 Window's Control Panel.	120
5.16 Windows XP Setup.	120
5.17 Selecting IIS From Windows Components Wizard.	121
5.18 Windows Components Wizard – Configuring Components.	121
5.19 Completing The Windows Components Wizard.	122
5.20 Running I-GEMS System Using Web Matrix ASP.NET Compiler.	123
5.21 Microsoft Asp.Net Web Matrix.	124
5.22 Start Web Application.	124
5.23 I-GEMS Login Page.	125
5.24 I-GEMS Administrator's Main Page.	126
5.25 Registration Of Academic Staff To The Corresponding Teaching Subject.	127
5.26 Edit An Academic Staff Teaching Record.	127
5.27 Updating An Academic Staff Teaching Record.	128
5.28 Removing An Academic Staff From A Subject.	129
5.29 Adding A Student Course To A Corresponding Studying Subject.	130
5.30 Updating A Student Course To A Corresponding Studying Subject.	131
5.31 Removing A Course From A Subject.	132
6.1 Estimated Cost Incurred For A Student Who Fails A Subject.	141

## LIST OF ABBREVIATIONS

<b>EITF</b>	Estonian Information Technology Foundation
<b>ELCH</b>	E-Learning Consortium Hamburg
<b>ICT</b>	Information and Communication Technologies
<b>IT</b>	Information Technology
<b>i-GEMS</b>	Interest Group Using Electronic Management System
<b>IS/IT</b>	Information System / Information Technology
<b>MCA</b>	Malaysian Chinese Association
<b>OOM</b>	Object-Oriented Methodology
<b>TARC</b>	Tunku Abdul Rahman College
<b>UA</b>	Unified Approach
<b>UML</b>	Unified Modeling Language
<b>UTM</b>	Universiti Teknologi Malaysia

## LIST OF APPENDICES

<b>APPENDIX</b>	<b>TITLE</b>	<b>PAGE</b>
A	E-learning Application Form	152
B	Staff Information Sheet	153
C	Projected Cost Benefits	154
D	Unit Plan for subject “Introduction To Information Technology”	156
E	User Acceptance Test for i-GEMS System – Administrator User	158
F	User Acceptance Test for i-GEMS System – Academic Staff User	160
G	User Acceptance Test for i-GEMS System – Student User	163
H	I-GEMS Screen Design	165

# CHAPTER 1

## PROJECT OVERVIEW

### 1.1 Introduction

The title for the project is *Interest Group Using Electronic Management System (i-GEMS)*. The title i-GEMS symbolizes that the system will serve as an electronic platform to gather a group of people who are having common interest on particular education information which is precious and valuable, just like jewels (gems), to the lecturers and students across campuses of Tunku Abdul Rahman College (TARC). Hence, i-GEMS is selected as the title for the project.

## 1.2 Background of Problem

Interest Group Using Electronic Management System (i-GEMS) is a proposed project intended for managing academic information through electronic system for tertiary education environment. The system is developed based on the author's working environment – Tunku Abdul Rahman College (TARC).

Currently the college's main campus is located at Setapak, Kuala Lumpur, with five other branches located at five different states (Penang, Perak, Pahang, Johor and Sabah) to provide education to the public. As one of the academic staff for TARC, the author has practical experienced some difficulties in communicating with other academic staff from other branches in sharing academic information. As a result, an initiative to develop an electronic information management system solution, which is custom made based to TARC atmosphere, culture and mission, is duly purposed.

Currently there are 105 courses offered in TARC. For illustration purpose, this project is only concentrating on computer science first year diploma courses.

Fundamentally, as TARC has six campuses within the nation, it is said that lack of communication exists among lecturers from different campuses who are teaching the same subject. This is due to the current environment that does not provide a proper platform to allow different campuses lecturers to communicate with each other in order to share and manage education information effectively and efficiently. As a result, lecturers from different campuses may cover subject scope differently and produce inconsistent teaching materials. The problem is worsen when some campuses students are not able to answer the examination questions due to different scope covered by their lecturer. Consequently, these groups of students may fail the particular examination.

The next section 1.3 – statement of the problem, will serve as a continuous to illustrate an overview of the existing problems.

### 1.3 Statement of the Problem

As briefed on the previous section, on the whole, the problems faced by the lecturers of TARC can be listed as below:

- Lecturers do not acquaint with lecturers from other branches, including those lecturers who are teaching the same subject.
- A lecturer can only get to know other branches lecturers' contact details through course tutor (course tutor is an academic staff who is in-charge of a small group of lecturers) or human resource personnel, which is quite a tedious task.
- Lack of information sharing and collaboration among the same field lecturers.
- Lack of proper channel that allows lecturers to share their expertise and academic knowledge among themselves.
- Lack of standardization among the teaching materials prepared by the lecturers from different campuses.

On the other hand, the problems faced by students can be short listed as follows:

- Communication between the students and lecturers are mostly restricted to classroom teaching only, which provide very limited time for student to ask question.
- Some students are shy or not confident to voice their question in the classroom, as a result, their enquiries are not handled and subsequently cannot catch up with the syllabus.
- Students may have questions after they have done their revision and wish to send their questions to the lecturer's email account and they have to wait for the replies. However, as some lecturers may not use the e-mail system constantly, students may get the reply within a week, a month or even never get reply from the specific lecturer. As a result, it de-motivate students from asking the lecturer questions.
- Students may not be aware of the important message or announcement made by their lecturer if they are absent from lecture.

- Some students may not receive the complete study materials before a class. For instance, prior to attending tutorial class, some students may not receive the required lecture notes for reference. As a consequence, they come to class without any preparation.

Seeing such problems exist among the lecturers and students, it motivates the author to develop i-GEMS system, which is a customized system solution that developed based on TARC circumstances.

## 1.4 Project Objectives

The following is a list of objectives for the proposed system – i-GEMS:

- To analyze TARC's existing circumstances in relation to:
  - i. Communication and collaboration approach in academic information sharing and management among the lecturers from different campuses.
  - ii. Difficulties of students in communicating with lecturers.
  
- To formulate a framework, to serve as:
  - i. Organization strategies in implementing the proposed system, which advocate academic information sharing and collaboration among the campuses of TARC.
  - ii. A cheaper and faster mechanism that enable standardization of academic materials among the campuses without the needs of face-to-face meeting.
  
- To develop a proposed system, that is:
  - i. Designed and customized to TARC environment, which can facilitate the communication and cooperation in academic information sharing among the lecturers of different campuses.
  - ii. To design a solution that facilitates communication between students and lecturers without restricted by the location boundaries.
  - iii. To develop a solution that allows students access to the academic materials, as well as important announcements made by the lecturers.

## 1.5 Project Scope

The proposed system – i-GEMS, is developed based on Tunku Abdul Rahman College (TARC) context and circumstances. For illustration purpose, the project is only focusing on computer science first year diploma courses.

On the whole, the major functionality of i-GEMS is to serve as a platform to facilitate communication and cooperation among the lecturers of different campuses through developing and managing a common subject module. In addition, the proposed system allows lecturer to post their academic materials, such as lecture notes, tutorial questions, and assignment that can be accessed by the students. When a lecturer has an important announcement to inform students, he or she can make the announcement through the i-GEMS system that is accessible by the students.

From this system, a lecturer can upload objective questions to test students' understanding. Once a student has finished answering the test questions, the system is capable to process and mark the students' answers automatically and produce summary result to the participant. In addition, to enhance the knowledge of academic staff, a lecturer is allowed to access other first year diploma computer science subjects, other than the subject he or she is currently handling.

From the student perspective, students are allowed to access the lecture notes, tutorial questions, assignment or announcement from the proposed system. Whenever students have uncertainties for a particular subject, they can raise queries on the system. Through the system, students' queries are not only can be answered by their own campus lecturer, but also lecturers from other campuses who are teaching the same particular subject. As student's question and answering session can also be accessed and discussed by other students who are studying the same subject, hence information sharing exist among the student group.

The raw data such as lecture notes, tutorial questions, announcement, students' name and so forth, which is used in developing the i-GEMS system will be the combination of actual data that is based on the author's hands-on working at

TARC, as well as some simulation data that is based on other computer science diploma subjects.

To develop the i-GEMS system, the following list of software will be utilized.

- Operating System – Microsoft Windows XP Professional.
- Internet Information Services (IIS) – The powerful web server, IIS 5.0 is used to provide a highly reliable, manageable, and scalable application infrastructure for the web-based i-GEMS system.
- Web Browser - Internet Explorer 6.0 is used to view and display the contents of the electronic system.
- Microsoft dot Net Framework1.1 – The software is needed to support ASP.NET programming application development. The software can be downloaded free from the Internet (<http://www.microsoft.com/downloads/>).
- Web Matrix – The software is one of the most powerful ASP.NET compilers. It allows system developer to build and maintain a proposed system. The software can be downloaded free from the Internet (<http://www.asp.net/webmatrix/>).
- Microsoft Office Suite - Microsoft Office 2000 is required to assist in documentation of the project.
- Microsoft Project – Microsoft Project 2002 is utilized to plan and track the schedule for the i-GEMS system.
- Microsoft Visio - Microsoft Visio 2002 is utilized as a diagramming program that allows the author to visualize the system information effectively through the creation of modeling diagram such as UML diagrams.

- Microsoft Access - Microsoft Access 2000 is required to serve as a database for the i-GEMS system.
- Programming language - ASP.NET programming language is the core programming language that is used in developing the i-GEMS system. As the dot net application is capable to support various types of platform, users are freed from using various types of technologies that drives today's computing marketplace.

As i-GEMS is developed based on web-based approach, the system will be developed using Object-Oriented (OO) methodology and modeled by using Unified Modeling Language (UML), which will be discussed in detail in chapter 3.

Generally, users of the proposed i-GEMS system will be academic staff and students from computer science division of TARC. Once the system is developed, a plan for component test and integration test will be produced. Based on the testing plan, each unit component is tested and then followed by the integration test. For further information on the i-GEMS system development methodology, reader can refer to chapter 3.

## **1.6 Importance of Project**

From the proposed system – i-GEMS, lecturers and students of TARC are the two major groups of people who will benefit from the system.

When compared to the current system, the proposed electronic system solution will provide the easiest, fastest and most efficient way that allows 24-by-7 basis of communication among lecturers from different campuses. Through the proposed system, it enables the different campuses' lecturers who are teaching the same subject to cooperate with each other through the cheapest cost media to produce standardized teaching materials throughout the whole nation. Hence, it helps avoid the problem of covering inconsistent teaching scope among the lecturers from different campuses. As a result, students who are studying the same subject, no matter which branches they are from, their performance can be evaluated fairly and accurately. In addition, through I-GEMS, it enables the knowledge sharing and discussion exists among the lecturers through discussion board provided by the system.

On the other hand, through the proposed electronic system, students and lecturers communications are no more restricted to classroom only. Instead, a student can consult a lecturer from anywhere and at any time. In addition, whenever students have any enquiries, they can refer to their own lecturer, as well as lecturers from other campuses who are teaching the same subject. Through I-GEMS, the system ensures that students would not miss any study materials or important announcement even though they may be absent from the class. Moreover, students can participate in objective test questions from the system whenever they get prepared. They can take the test at any time and any place, provided that they are connected to the electronic system.

In short, the proposed i-GEMS system is significant to TARC as it contributes benefits to the lecturers and students in information collaboration and sharing. As a result, these contributions can then further enhance the college efficiency and effectiveness in delivering the academic education as well as increase the reputation of TARC.

## 1.7 Chapter Summary

The chapter has provided an overview on the proposed system – i-GEMS, which is a system solution that customized to TARC’s existing circumstances. Based on the chapter, a reader can have an understanding on the problem statement, objectives, scope and importance of the proposed project.

On the whole, i-GEMS is a solution that will serve as a channel to allow different campuses’ lecturers to get acquainted with each other. It facilitates information sharing and management among the lecturers of different campuses who are teaching the same subjects. For those lecturers who want to broaden their knowledge other than their own field of teaching, they can improve themselves by learning from other academic modules that offered by the proposed system.

In addition, i-GEMS is developed to provide a channel that allows better information communication between the students and lecturers of TARC. Students can access the course materials, announcement, assignment and even a test from the system. The proposed system also will serve as a platform for students to raise their inquiries to lecturers. The answering section is not restricted to the student’s lecturer only, instead, other campuses’ lecturers who are teaching the same subject can also answer the inquiries. Therefore, a student can receive a reply faster than using e-mail approach, where it is directed to one lecturer only. Moreover, i-GEMS allow the question and answering session to be shared and participated by all those students who are studying the same subject.

In short, the I-GEMS system is served as a platform for communication and collaboration in academic information management among the lecturers and students of TARC.

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